



SCREENING PART 2 FORM PROJECT SPECIFIC INFORMATION REQUIREMENTS (PSIR)

1. SUBMISSIONS

The Proponent must submit all information pertaining to the Project as a whole. The information requirements below are designed for the purpose of environmental assessment and are not limited to the scope of a single permit or license application.

IMPORTANT: Please be advised of the following:

1. NIRB does not accept references to an ftp or web sites as a submission.
2. The Proponent must provide NIRB with 1 (one) electronic copy and 1 (one) hardcopy of the required information in English.
3. All maps should be shapefiles, be legible, and should include grids, be of appropriate scale, indicate the scale, include latitude and longitude references, NTS Maps numbers, title, legend and a north arrow. To the extent possible, avoid hand-drawn demarcations and faxed maps; and,
4. Please complete all required information in each section below. If the required information is not applicable to the project proposal, please indicate this in the response with "n/a". If the request has been provided in a different section or report, please note the section or report where the response can be found.

2. GENERAL PROJECT INFORMATION REQUIREMENTS

Project Coordinates and Maps

1. The preferred method for submitting project coordinates information is through the use of a Geographic Information System (GIS) compatible digital file. Although an ESRI ArcView 3.x shape file (in decimal degrees) is the preferred interchange format, the NIRB has the capacity to receive over 100 GIS and CAD related formats, including MapInfo and AutoCAD, provided proper format and projection metadata is also submitted. The NIRB requires coordinates for the project proposal which reflect the entire project area as defined by:
 - Area/sites of investigation;
 - Boundaries of the foreseen land use permit/right-of-way area(s) to be applied for;
 - Location of any proposed infrastructure or activity(s); and,
 - Boundaries of the mineral claim block(s) where proposed activities will be undertaken.

The project extents are as follows:

NW:	Latitude: (63° 44' 40" N)	Longitude: (68° 33' 03" W)
NE:	Latitude: (63° 44' 40" N)	Longitude: (68° 32' 51" W)
SE:	Latitude: (63° 44' 34" N)	Longitude: (68° 32' 51" W)
SW:	Latitude: (63° 44' 34" N)	Longitude: (68° 33' 03" W)

2. Map of the project site within a regional context indicating the distance to the closest communities.

A map showing the project site location can be found in Appendix B

3. Map of any camp site including locations of camp facilities.

No camp facility will be constructed for this project

4. Map of the project site indicating existing and/or proposed infrastructure, proximity to water bodies and proximity to wildlife and wildlife habitat.

A map showing the proposed infrastructure can be found in Appendix B

Project General Information

5. Discuss the need and purpose of the proposed project.

A large majority of the hazardous materials and hazardous and/or contaminated waste that comes into Nunavut remains in Nunavut, as there are limited options for managing these types of waste. The purpose of the proposed project is to reduce the amount of environmental contamination and products that could cause negative environmental impacts in Nunavut. This will be done by offering viable, cost-effective solutions for managing the waste.

6. Discuss alternatives to the project and alternative methods of carrying out the project, including the no-go alternative. Provide justification for the chosen option(s).

The only alternative is to continue with the *status quo*, which leaves the waste and environmental contaminants in place. This would result in an increased risk of adverse environmental impacts being generated. This is also the "no-go" alternative.

7. Provide a schedule for all project activities.

Permit applications	January to April 2016
Site construction	May to October 2016
Start of operations	May 2016

8. List the acts, regulations and guidelines that apply to project activities.

- Federal Legislation;
 - Canadian Environmental Protection Act, [1999, c.33],
 - Fisheries Act [R.S.C., 1985, c. F-14],

- Transport of Dangerous Goods Act [SOR/2015-100],
- Canada Wildlife Act [R.S.C., 1985, c. W-9],
- Canada Shipping Act [S.C. 2001, c. 26] and Regulations ,
- Navigable Waters Protection Act [SOR/2009-202],
- Canada Labour Code [R.S.C., 1985, c. L-2] and Regulations,
- National Fire Code;
- Territorial Legislation;
 - Environmental Protection Act (Nunavut), [R.S.N.W.T. 1988, c. E-7],
 - *Environmental Guideline for Site Remediation* (2002), Government of Nunavut Department of Environment,
 - *Environmental Guideline for Contaminated Site Remediation*, (2003) Government of Nunavut Department of Environment;
- Guidelines and Policies;
 - CCME:
 - Canadian Environmental Quality Guidelines (CEQG), and
 - Canadian Water Quality Guidelines for the Protection of Aquatic Life.

9. List the approvals, permits and licenses required to conduct the project.

- Water licence from the Nunavut Water Board:
 - QE currently holds a licence from the Nunavut Water Board (Licence Number 1BR-TH1419); a copy is presented in Appendix C;
 - QE is in the process of requesting an amendment to the licence to cover all activities to be carried out at the Environmental Waste Processing Facility;
- Registration with the Government of Nunavut as a Generator and Transporter of Waste:
 - QE is already registered with the GN. A copy of the approvals are presented in Appendix C;
- Registration of a Hazardous Waste Management Facility with the GN:
 - QE is already registered with the GN. A copy of the approval is presented in Appendix C;
- Commissioner's Land Use Authorization; Land Lease with GN ED and T:
 - date (anticipated date) of issuance: April 2016, see correspondence in Appendix C;
- City of Iqaluit Development Permit
 - date (anticipated date) of issuance: April 2016, see notice of determination in Appendix C.

DFO Operational Statement (OS) Conformity

10. Indicate whether any of the following Department of Fisheries and Oceans (DFO) Operational Statement (OS) activities apply to the project proposal:

- Bridge Maintenance
- Clear Span Bridge
- Culvert Maintenance
- Ice Bridge
- Routine Maintenance Dredging
- Installation of Moorings

Please see DFO's OS for specific definitions of these activities available from DFO's web-site at <http://www.dfo-mpo.gc.ca/regions/central/habitat/os-eo/index-eng.htm>

Not applicable, none of these types of activities will be carried out as part of this project. QE will not require any authorizations from DFO.

11. If any of the DFO's OS apply to the project proposal, does the Proponent agree to meet the conditions and incorporate the measures to protect fish and fish habitat as outlined in the applicable OS? If yes, provide a signed statement of confirmation.

Not Applicable

Transportation

12. Describe how the project site will be accessed and how supplies will be brought to site. Provide a map showing access route(s).

Access to the site will be done using the municipal roads maintained by the City of Iqaluit. All supplies and materials will be shipped to Iqaluit by sealift or by commercial or chartered air cargo to the Iqaluit International Airport. A map showing the access routes is presented in Appendix B.

13. If a previous airstrip is being used, provide a description of the type of airstrip (ice-strip/all-weather), including its location. Describe dust management procedures (if applicable) and provide a map showing location of airstrip.

Not applicable, no previous airstrips will be used.

14. If an airstrip is being constructed, provide the following information:

- a. Discuss design considerations for permafrost
- b. Discuss construction techniques
- c. Describe the construction materials, type and sources, and the acid rock drainage (ARD) and metal leaching (ML) characteristics (if rock material is required for airstrip bed).
- d. Describe dust management procedures.
- e. Provide a map showing location of proposed airstrip.

Not applicable, no airstrip is being constructed.

15. Describe expected flight altitudes, frequency of flights and anticipated flight routes.

Not applicable, flights will be through Iqaluit International Airport only.

Camp Site

16. Describe all existing and proposed camp structures and infrastructure

Site is currently vacant, only infrastructure is electrical lines at the property limits. Locations of electrical lines are shown in Figure 4 of Appendix B.

17. Describe the type of camp:

- a. Mobile
- b. Temporary
- c. Seasonal
- d. Permanent
- e. Other

An office building will be built using an ATCO-type prefabricated trailer. All storage on-site will be done using intermodal marine transport containers (i.e., Seacans). The location details of all site installations are presented in Figure 4 of Appendix B.

18. Describe the maximum number of personnel expected on site, including the timing for those personnel involved with the project.

QE has 2 full-time representatives in Iqaluit. Seasonal or temporary staff are hired in Iqaluit, or brought to Iqaluit, as needed, for periods not greater than 6 weeks.

Equipment

19. Provide a list of equipment required for the project and discuss the uses for the equipment.

- Water Treatment Unit (WTU):
 - the WTU consists of a 40-ft insulated marine container that has been divided into two sections: the treatment area, and the electrical room and materials storage area. There are also 6 water storage tanks, two 20 foot marine containers, that have had a liner installed that are used for snow melting and storage of contaminated water and 2 tanks for contaminated water that hold a total of 30,000 L and 2 tanks for treated water that hold a total of 25,000 L. This unit will be used to treat contaminated water to respect the discharge criteria provided by the Nunavut Water Board. Additional reservoirs or temporary holding basins may be added to the treatment facility as needed,
 - the WTU location details are shown in Figure 4 of Appendix B and the WTU layout is shown in Figures 5 and 6 of Appendix B;
- Soil Treatment Area:
 - the soil treatment area will consist of lined berms used to segregate non-contaminated from contaminated soils. The contaminated soils will then be moved to a separate pad, where they will be treated using either a biopile or landfarm treatment method. The biopile will require pipes to be laid beneath the soils and a ventilation system to bring air into the pile to promote soil biodegradation;

- Vacuum Trailer:
 - QE owns a PACS 1000 vacuum unit mounted on a trailer that can be pulled by a pick-up truck. This unit will be used for moving contaminated bulk liquids to the Environmental Waste Processing Facility, as needed;
- Heavy Equipment:
 - heavy equipment will be used as needed to assist with moving waste to be managed to the Environmental Waste Processing Facility, as well as to the beach barging area in Iqaluit where it will be transport south for disposal. This will be done using forklifts to load and unload flatbed trucks that are used to transport the waste. At the Environmental Waste Processing Facility, loaders will be used to assist with the movement and processing of waste and contaminated soils. Excavators will be used to assist with the management of contaminated soils, including aeration of the piles and mixing of amendments used in the treatment process. A screener unit may be used to assist with the removal of non-contaminated materials from contaminated soils,
 - heavy equipment will be sourced from local contractors on an as- needed basis; QE does not own any heavy equipment. All heavy equipment used at the site will be cleaned to remove any contaminants, if necessary, before leaving the site.

20. If possible, provide digital photos of equipment.

No photos are available.

Water

21. Describe the location of water source(s), the water intake methods, and all methods employed to prevent fish entrapment. Provide a map showing the water intake locations.

The water that will be used on the site will come from contaminated water or snow collected from spill sites, the washing of reservoirs, holding basins or berms and contaminated water provided by clients. This water will be analyzed by a Canadian Association for Laboratory Accreditation certified laboratory.

22. Describe the estimated rate of water consumption (m³/day).

The amount of water used per day will vary based on the inputs from the water sources. The WTU can process a maximum of 15 m³ per day.

23. Describe how waste water will be managed. If relevant, provide detail regarding location of sumps, including capacity of sumps and monitoring.

Contaminated water will either be treated to meet discharge criteria or used for moisture conditioning of contaminated soils, under the strict condition that the contaminated water will not introduce new/additional contaminants to the soils.

Treated water that meets the discharge criteria may be used for cleaning equipment or other washing needs. This water will be collected and once again tested prior to

discharge in the event there was a potential for it to become contaminated based on its use. Any extra water will be discharged at the approved discharge location as stipulated in the licence issued by the Nunavut Water Board.

24. If applicable, discuss how surface water and underground water will be managed and monitored.

Monitoring wells will be installed around the perimeter of the site to monitor the groundwater quality and to ensure that QE's operations are not having a negative effect on any groundwater that leaves the site. The location of the monitoring wells is shown in Figure 4 of Appendix B.

A ditch will be dug around the site to ensure that no surface water enters the site and that the site's grounds remain as dry as possible. The site will be graded so that surface run-off water will flow to one corner of the site. Water samples will be collected annually at this location to ensure that the surface water leaving the site does not have a negative impact on the downstream waterbodies.

Waste Water (Grey water, Sewage, Other)

25. Describe the quantities, treatment, storage, transportation, and disposal methods for the following (where relevant):

- Sewage

Sewage water from the office building will be collected by the City of Iqaluit and disposed of at their sewage water processing facility.

- Camp grey water

Grey water from the office building will be collected by the City of Iqaluit and disposed of at their grey water processing facility.

- Combustible solid waste

Depending on the type of combustible solid waste, it will either be disposed of at the City of Iqaluit landfill, or packaged and shipped south for disposal at a provincially approved facility.

- Non-combustible solid waste, including bulky items/scrap metal

Non-combustible solid waste will be disposed of at the City of Iqaluit landfill, unless it is feasible for it to be shipped south and recycled at a provincially approved recycling centre.

- Hazardous waste or oil

Hazardous waste will be packaged according to Canadian TDGR and shipped south for disposal. Oil may either be shipped south for disposal at a provincially approved facility or burned in a CSA approved waste oil furnace used to heat a work area.

- Contaminated soils/snow

Contaminated soils that can be treated using bioremediation techniques will be treated on-site in a landfarm or biopile. Soils contaminated with metals will be shipped south for disposal at a provincially approved facility. All contaminated soils may be subject to volume reduction if it can be shown that the rocks do not contain any of the subject contaminant.

- Empty barrels/ fuel drums

Empty drums will be cleaned for re-use or cleaned, crushed and disposed of at the local landfill. QE will be seeking certification from Transport Canada to recertify drums for use in accordance with TDG regulations.

- Any other waste produced

Clients and QE's activities may generate other waste, such as batteries, waste paint and paint related materials, electrical components, glycols, sludge and filter media from the WTU, absorbants, and regulated building demolition debris. These materials will all be packaged according to TDG regulations and shipped south for disposal at a provincially approved facility.

26. If the project proposal includes a landfill or landfarm, indicate the locations on a map, provide the conceptual design parameters, and discuss waste management and contact-water management procedures.

Figure 4 of Appendix B shows the landfarm/biopile. An operations manual that includes sections on waste management and contact water management is presented in Appendix N.

Fuel

27. Describe the types of fuel, quantities (number of containers, type of containers and capacity of containers), method of storage and containment. Indicate the location on a map where fuel is to be stored, and method of transportation of fuel to project site.

Fuel for the office heating system will be stored on-site in an approved reservoir. Waste fuel may also be stored on-site in 205 L drums, or overpack drums, while awaiting sealift south for disposal in a provincially approved facility.

28. Describe any secondary containment measures to be employed, including the type of material or system used. If no secondary containment is to be employed, please provide justification.

Secondary containment will be used in the following areas:

- Under the reservoirs used for water treatment;
- Under the soil processing and treatment areas;
- Under the waste processing area.

These areas are shown in Figure 4 of Appendix B.

Secondary containment will consist of a geotextile-geomembrane-geotextile liner covered with a protective layer of sand.

29. Describe the method of fuel transfer and the method of refuelling.

Only limited refuelling operations will occur on-site. This will be done using a third party fuel truck that will come to the site to refuel the equipment. The truck drivers will all be trained in spill response and will be capable of immediately responding to a fuel spill.

30. Describe spill control measures in place.

QE possesses a vast inventory of absorbents and spill response equipment available on-site. This inventory greatly surpasses what would be required to respond to a spill on-site, as QE maintains an inventory for resale.

A detailed spill contingency plan for the site is presented in Appendix O.

In addition, the outlet for run-off from the site can be blocked to prevent any spill materials from escaping from the site.

Please refer to Environment Canada's fuel storage tank system regulations (*Storage Tank System for Petroleum and Allied Petroleum Products*) website at <http://www.ec.gc.ca/st-rs/> for details on fuel storage requirements.

Chemicals and Hazardous Materials*

**included but not limited to oils, greases, drill mud, antifreeze, calcium or sodium chloride salt, lead acid batteries and cleaners*

31. Describe the types, quantities (number of containers, the type of container and capacity of containers), method of storage and containment. Indicate the location on a map where material is to be stored, and method of transportation of materials to project site.

The table on the following page presents the types, quantities, storage and containment methods for varying types of waste. The map showing the location where materials will be stored is presented in Appendix B.

Heavy equipment will be used as needed to assist with moving waste to be managed to the Environmental Waste Processing Facility as well as to the beach barging area in Iqaluit for transport south for disposal. This will be done by using forklifts to load and unload flatbed trucks that are used to transport the waste.

Type of Waste	Composition	Quantity Generated	Method of Storage and Containment
Contaminated Water	Water is tested to meet discharge criteria.	Varies depending on the source of the contaminated water. Our treatment unit can treat a maximum of 15 m ³ /24 hrs.	<ul style="list-style-type: none"> • holding tanks
Waste Petroleum, Oil, and Lubricants (POL)	Hydrocarbons collected from the settling tank and oil/water separator or from other clients in Iqaluit.	Varies	<ul style="list-style-type: none"> • drums or tote tanks or a combination of both
Waste filter media from treatment units and used absorbent materials	<ul style="list-style-type: none"> • ULTRASORPTION™ (shredded absorbent); • Granular activated carbon; • Particulate filters; and • Absorbents used during spill response. 	<ul style="list-style-type: none"> • Varies depending on volume of water to be treated and level of contamination; • Maximum 5 m³/yr of each waste type 	<ul style="list-style-type: none"> • Drums or waste wranglers
Sludge	Acid and or caustics used for pH adjustment, coagulating agent, metals.	<ul style="list-style-type: none"> • Varies depending on volume of water to be treated, metal concentration, and process efficiency; • Estimated maximum 5 m³. 	<ul style="list-style-type: none"> • Drums
Contaminated Soils	Soils contaminated by organics and metals.	Varies, maximum 500 m ³ .	<ul style="list-style-type: none"> • Covered treatment cells
Glycols	Antifreeze agents used in machinery and vehicles, as well as waste antifreeze used for de-icing purposes.	Varies according to client needs.	<ul style="list-style-type: none"> • Drums or tote tanks or a combination of both
Batteries	Batteries from vehicles and other equipment.	Varies according to client needs.	<ul style="list-style-type: none"> • Wet batteries: battery packs; •
Paint and/or paint related materials	Waste paint from building construction or demolition.	Varies according to client needs	<ul style="list-style-type: none"> • Waste wranglers
Regulated Building Demolition Debris	Ballasts, light bulbs, capacitors, thermostats, asbestos.	Varies according to client needs.	<ul style="list-style-type: none"> • Drums
Biohazard, medical waste	Medical sharps	Varies according to client needs.	<ul style="list-style-type: none"> • Biohazard packaged in proper Class 8 containers at the hospital or health centre; • Containers will be consolidated in a locked marine container.

32. Describe any secondary containment measures to be employed, including the type of material or system used.

Secondary containment will consist of a geotextile-geomembrane-geotextile liner covered with a protective layer of sand. Secondary containment will be constructed in the locations identified in Figure 4 of Appendix B.

33. Describe the method of chemical transfer.

The transfer of liquid chemical products will be done using pumps and hoses. The hoses will be secured to the containers in such a way as to ensure that they will remain in place and not spill any product on the ground.

Powdered or solid chemical products will be handled according to the manufacturer's recommendations. All product handling will be carried out so as to ensure that none of the product is spilled on the ground.

34. Describe spill control measures in place.

All areas where chemicals and hazardous materials will be handled and repackaged will be lined as described in Section 32. Spill kits will be strategically placed so that any spills that occur will be quickly addressed. Storage areas will be inspected regularly (a minimum of once per week) to ensure that all stored materials are neither leaking nor exposed to the environment. Any issues identified during inspections will be immediately remedied.

In addition, the surface run-off drainage on the site will pass through one point, which can be blocked should a spill occur and risk off-site migration. This point will be kept blocked until the spill is remediated.

Additional details regarding spill response procedures presented in the Spill Contingency Plan in Appendix O.

Workforce and Human Resources/Socio-Economic Impacts

35. Discuss opportunities for training and employment of local Inuit beneficiaries.

QE's majority owner is Qikiqtaaluk Corporation, an Inuit birthright development corporation wholly owned the Qikiqtani Inuit Association. As such, one of QE's mandates is to provide maximum benefits to the community where the work is being executed, as well as to Inuit beneficiaries. QE works very closely with its sister company, Qikiqtani Industry Ltd., who provides QE with Inuit beneficiaries to work on our projects, as needed. QE usually works with one supervisor who has the necessary training to perform the required work. Unfortunately, QE has been unable to find and/or train Inuit beneficiaries to assume this role to date. The preference for the remainder of the work team is Inuit beneficiaries.

Last year QE provided specialized training to 2 Inuit beneficiaries to become mould and asbestos abatement supervisors. These 2 individuals worked for us for 3 months following the training, but unfortunately they decided to move on to other types of work. However, QE is still working to identify other Inuit beneficiaries who could receive this type of training and continue to work with us in the future as worksite supervisors.

36. Discuss workforce mobilization and schedule, including the duration of work and rotation length, and the transportation of workers to site.

Mobilization will be done using commercial flights for personnel and air cargo and sealift for supplies and materials. Workers from southern Canada will work 7 days a week, with a "6-week on, 2-week off" rotation, on an as-needed basis. Local workers will be given a minimum one day off per week, or follow the same rotation as workers from southern Canada, depending on the project needs.

37. Discuss, where relevant, any specific hiring policies for Inuit beneficiaries.

As previously mentioned, part of QE's role is to maximize the use of Inuit beneficiaries in its projects. As such, QE works closely with its sister company, Qikiqtani Industry Ltd., who has a database of more 300 beneficiaries who could work on QE's projects on an as-needed basis.

Public Involvement/ Traditional Knowledge

38. Indicate which communities, groups, or organizations would be affected by this project proposal.

This project will be done within the limits of the City of Iqaluit.

39. Describe any consultation with interested Parties which has occurred regarding the development of the project proposal.

The only consultations that have been done are with the authorities having jurisdiction over this project to ensure that all required authorizations are in place prior to commencing the work.

40. Provide a summary of public involvement measures, a summary of concerns expressed, and strategies employed to address any concerns.

No public consultation has been done in relation to this project.

41. Describe how traditional knowledge was obtained, and how it has been integrated into the project.

As QE is an Inuit owned firm, we are in constant contact with the Inuit and obtaining their input on our projects. This is especially useful in determining the historical land use and areas of potential contamination within the City.

42. Discuss future consultation plans.

There are no plans for future consultations, other than reporting to the authorities having jurisdiction.

3. PROJECT SPECIFIC INFORMATION

The following table identifies the project types identified in Section 3 of the NIRB, Part 1 Form. Please complete all relevant sections.

It is the proponent's responsibility to review all sections in addition to the required sections to ensure a complete application form.

Sections 1 to 11 have been struck out as they are not applicable to this application.

Table 1: Project Type and Information Required

Project Type	Type of Project Proposal	Information Request
1	All-Weather Road/Access Trail	Section A-1 and Section A-2
2	Winter Road/Winter Trail	Section A-1 and Section A-3
3	Mineral Exploration	Section B-1 through Section B-4
4	Advanced Mineral Exploration	Section B-1 through Section B-8
5	Mine Development/Bulk Sampling	Section B-1 through Section B-12
6	Pits and Quarries	Section C
7	Offshore Infrastructure (port, break water, dock)	Section D
8	Seismic Survey	Section E
9	Site Cleanup/Remediation	Section F
10	Oil and Natural Gas Exploration/Activities	Section B-3 and Section G
11	Marine Based Activities	Section H
12	Municipal and Industrial Development	Section I

Sections A through H have been struck out as they are not applicable to this application.

~~SECTION A: Roads/Trails~~

~~A-1. Project Information~~

- ~~1. Describe any field investigations and the results of field investigations used in selecting the proposed route (e.g. geotechnical, snow pack)~~
- ~~2. Provide a conceptual plan of the road, including example road cross-sections and water crossings.~~
- ~~3. Discuss the type and volume of traffic using the road/trail (i.e. type of vehicles and cargo and number of trips annually).~~
- ~~4. Discuss public access to the road.~~
- ~~5. Describe maintenance procedures.~~

6. ~~Describe whether any portion of the road will be located outside of the Nunavut Settlement Area and whether any other regulatory requirements must be met (e.g. CEEA).~~

~~A-2. All-Weather Road/Access Trail~~

7. ~~Discuss road design considerations for permafrost.~~
8. ~~Describe the construction materials (type and sources for materials), and the acid rock drainage (ARD) and metal leaching characteristics of the construction materials.~~
9. ~~Discuss construction techniques, including timing for construction activities.~~
10. ~~Indicate on a map the locations of designated refuelling areas, water crossings, culverts, and quarries/borrow sources.~~
11. ~~Identify the proposed traffic speed and measures employed to ensure public safety.~~
12. ~~Describe dust management procedures.~~

~~A-3. Winter Road/Trail~~

13. ~~Describe the surface preparation, including the use of snow berms or compaction, and any flooding. If flooding is to be used, provide the location of the water source on a map.~~
14. ~~Describe the operating time period.~~
15. ~~Identify the proposed traffic speed and measures employed to ensure public safety.~~
16. ~~Discuss whether the selected route traverses any fish-bearing water bodies.~~

~~SECTION B: Mineral Exploration /Advanced Exploration /Development~~

~~B-1. Project Information~~

1. ~~Describe the type of mineral resource under exploration.~~

~~B-2. Exploration Activity~~

2. ~~Indicate the type of exploration activity:~~
 - ~~Bulk Sampling (underground or other)~~
 - ~~Stripping (mining shallow bedded mineral deposits in which the overlying material is stripped off, the mineral removed and the overburden replaced)~~
 - ~~Trenching~~
 - ~~Pitting~~
 - ~~Delineation drilling~~
 - ~~Preliminary Delineation drilling~~
 - ~~Exploration drilling~~
 - ~~Geophysical work (indicate ground and/or air)~~
 - ~~Other~~
3. ~~Describe the exploration activities associated with this project:~~
 - ~~Satellite remote sensing~~
 - ~~Aircraft remote sensing~~
 - ~~Soil sampling~~
 - ~~Sediment sampling~~
 - ~~On land drilling (indicate drill type)~~
 - ~~On ice drilling (indicate drill type)~~

- ~~▪ Water based drilling (indicate drill type)~~
- ~~▪ Overburden removal~~
- ~~▪ Explosives transportation and storage~~
- ~~▪ Work within navigable waters~~
- ~~▪ On site sample processing~~
- ~~▪ Off site sample processing~~
- ~~▪ Waste rock storage~~
- ~~▪ Ore storage~~
- ~~▪ Tailings disposal~~
- ~~▪ Portal and underground ramp construction~~
- ~~▪ Landfilling~~
- ~~▪ Landfarming~~
- ~~▪ Other~~

B-3. Geosciences

4. Indicate the geophysical operation type:
 - ~~a. Seismic (please complete Section E)~~
 - ~~b. Magnetic~~
 - ~~c. Gravimetric~~
 - ~~d. Electromagnetic~~
 - ~~e. Other (specify)~~
5. Indicate the geological operation type:
 - ~~a. Geological Mapping~~
 - ~~b. Aerial Photography~~
 - ~~c. Geotechnical Survey~~
 - ~~d. Ground Penetrating Survey~~
 - ~~e. Other (specify)~~
6. Indicate on a map the boundary subject to air and/or ground geophysical work.
7. Provide flight altitudes and locations where flight altitudes will be below 610m.

B-4. Drilling

8. Provide the number of drill holes and depths (provide estimates and maximums where possible).
9. Discuss any drill additives to be used.
10. Describe method for dealing with drill cuttings.
11. Describe method for dealing with drill water.
12. Describe how drill equipment will be mobilized.
13. Describe how drill holes will be abandoned.
14. If project proposal involves uranium exploration drilling, discuss the potential for radiation exposure and radiation protection measures. Please refer to the *Canadian Guidelines for Naturally Occurring Radioactive Materials* for more information.

B-5. Stripping/ Trenching/ Pit Excavation

15. Discuss methods employed. (i.e. mechanical, manual, hydraulic, blasting, other)
16. Describe expected dimensions of excavation(s) including depth(s).
17. Indicate the locations on a map.
18. Discuss the expected volume material to be removed.

19. Discuss methods used to determine acid rock drainage (ARD) and metal leaching potential and results.

B-6. Underground Activities

20. Describe underground access.
21. Describe underground workings and provide a conceptual plan.
22. Show location of underground workings on a map.
23. Describe ventilation system.
24. Describe the method for dealing with ground ice, groundwater and mine water when encountered.
25. Provide a Mine Rescue Plan.

B-7. Waste Rock Storage and Tailings Disposal

26. Indicate on a map the location and conceptual design of waste rock storage piles and tailings disposal facility.
27. Discuss the anticipated volumes of waste rock and tailings.
28. Discuss methods used to determine acid rock drainage (ARD) and metal leaching (ML) potential and results.

B-8. Stockpiles

29. Indicate on a map the location and conceptual design of all stockpiles.
30. Describe the types of material to be stockpiled. (i.e. ore, overburden)
31. Describe the anticipated volumes of each type of material to be stockpiled.
32. Describe any containment measures for stockpiled materials as well as treatment measures for runoff from the stockpile.
33. Discuss methods used to determine acid rock drainage (ARD) and metal leaching (ML) potential and results.

B-9. Mine Development Activities

34. Indicate the type(s) of mine development activity(s):
- ☐ Underground
 - ☐ Open Pit
 - ☐ Strip Mining
 - ☐ Other
35. Describe mine activities.
- ☐ Mining development plan and methods
 - ☐ Site access
 - ☐ Site infrastructure (e.g. airstrip, accommodations, offshore infrastructures, mill facilities, fuel storage facilities, site service roads)
 - ☐ Milling process
 - ☐ Water source(s) for domestic and industrial uses, required volumes, distribution and management.
 - ☐ Solid waste, wastewater and sewage management
 - ☐ Water treatment systems
 - ☐ Hazardous waste management
 - ☐ Ore stockpile management
 - ☐ Tailings containment and management
 - ☐ Waste rock management

- ~~Site surface water management~~
 - ~~Mine water management~~
 - ~~Pitting and quarrying activities (please complete Section C)~~
 - ~~Explosive use, supply and storage (including on site manufacturing if required)~~
 - ~~Power generation, fuel requirements and storage~~
 - ~~Continuing exploration~~
 - ~~Other~~
36. ~~Describe the explosive type(s), hazard class, volumes, uses, location of storage (show on map), and method of storage.~~

~~B-10. Geology and Mineralogy~~

37. ~~Describe the physical nature of the ore body, including known dimensions and approximate shape.~~
38. ~~Describe the geology/ mineralogy of the ore deposit~~
39. ~~Describe the host rock in the general vicinity of the ore body.~~
40. ~~Discuss the predicted rate of production.~~
41. ~~Describe mine rock geochemical test programs which have been or will be performed on the ore, host rock, waste rock and tailings to determine acid generation and contaminant leaching potential. Outline methods and provide results if possible.~~

~~B-11. Mine~~

42. ~~Discuss the expected life of the mine.~~
43. ~~Describe mine equipment to be used.~~
44. ~~Does the project proposal involve lake and/or pit dewatering? If so, describe the activity as well as the construction of water retention facilities if necessary.~~
45. ~~Discuss the possibility of operational changes occurring during the mine life with consideration for timing. (e.g. open pit to underground)~~
46. ~~If project proposal involves uranium mining, consider the potential for radiation exposure and radiation protection measures. Particular attention should be paid to *The Nuclear Safety and Control Act*.~~

~~B-12. Mill~~

47. ~~If a mill will be operating on the property in conjunction with mining, indicate whether mine water may be directed to the mill for reuse.~~
48. ~~Describe the proposed capacity of the mill.~~
49. ~~Describe the physical and chemical characteristics of mill waste as best as possible.~~
50. ~~Will or does the mill handle custom lots of ore from other properties or mine sites?~~

~~SECTION C: Pits and Quarries~~

1. ~~Describe all activities included in this project.~~
- ~~Pitting~~
 - ~~Quarrying~~
 - ~~Overburden removal~~
 - ~~Road use and/or construction (please complete Section A)~~
 - ~~Explosives transportation and storage~~
 - ~~Work within navigable waters~~
 - ~~Blasting~~
 - ~~Stockpiling~~

- ~~Crushing~~
 - ~~Washing~~
 - ~~Other~~
2. ~~Describe any field investigations and the results of field investigations used in determining new extraction sites.~~
 3. ~~Identify any carving stone deposits.~~
 4. ~~Provide a conceptual design including footprint.~~
 5. ~~Describe the type and volume of material to be extracted.~~
 6. ~~Describe the depth of overburden.~~
 7. ~~Describe any existing and potential for thermokarst development and any thermokarst prevention measures.~~
 8. ~~Describe any existing or potential for flooding and any flood control measures.~~
 9. ~~Describe any existing or potential for erosion and any erosion control measures.~~
 10. ~~Describe any existing or potential for sedimentation and any sedimentation control measures.~~
 11. ~~Describe any existing or potential for slumping and any slump control measures.~~
 12. ~~Describe the moisture content of the ground.~~
 13. ~~Describe any evidence of ice lenses.~~
 14. ~~If blasting, describe methods employed.~~
 15. ~~Describe the explosive type(s), hazard class, volumes, uses, location of storage (show on map), and method of storage.~~
 16. ~~Discuss methods used to determine acid rock drainage (ARD) and metal leaching (ML) potential and results.~~
 17. ~~Discuss safety measures for the workforce and the public.~~

SECTION D: Offshore Infrastructure

D-1. Facility

1. ~~Describe any field investigations and the results of field investigations used in selecting the site (i.e. aerial surveys, bathymetric surveys, tidal processes, shoreline erosion processes, geotechnical foundation conditions)~~
2. ~~Provide a conceptual plan, profile description and drawing(s) indicating shoreline, facility footprint, tidal variations, required vessel draft, keel offset, deck height freeboard~~
3. ~~Discuss how anticipated loads on the seabed foundation and on the offloading platform will be incorporated into the design.~~
4. ~~Describe how vessels will manoeuvre around the facility. (e.g. pull alongside or in front)~~
5. ~~Discuss the anticipated life of the facility.~~
6. ~~Describe whether part of the facility or project will be located outside of the Nunavut Settlement Area and whether any other regulatory requirements must be met (e.g. CEAA).~~

D-2. Facility Construction

7. ~~Describe the types of material used for construction (i.e. granular or rock, steel piling or sheet piling, concrete). If material is granular, consider acid rock drainage potential, metal leaching potential, percentage of fines, size.~~
8. ~~Describe dredging activities.~~
9. ~~Indicate source of granular or rock material used in construction.~~
10. ~~List quantities of the various types of material used in construction.~~

- ~~11. Describe construction method(s).~~
- ~~12. Indicate whether a site engineer will be on-site to inspect construction.~~
- ~~13. If proposed construction method involves dumping of fill into water, discuss measures for mitigating the release of suspended solids.~~

~~D-3. Facility Operation~~

- ~~14. Describe maintenance activities associated with the facility (e.g. dredging, maintenance to account for potential settlement of facility.)~~
- ~~15. Discuss whether the public will have access to the facility(s) and describe public safety measures.~~
- ~~16. Describe cargo and container handling, transfer and storage facilities.~~
- ~~17. Indicate whether fuel will be transferred from barges at this site and describe the method of that fuel transfer.~~
- ~~18. Discuss frequency of use.~~

~~D-4. Vessel Use in Offshore Infrastructure~~

- ~~19. Please complete Section H~~

~~SECTION E: Seismic Survey~~

~~E-1. Offshore Seismic Survey~~

- ~~1. Indicate whether the survey is 2D or 3D at each site.~~
- ~~2. Describe the type of equipment used, including:~~
 - ~~▪ Type and number of vessels including length, beam, draft, motors, accommodation capacity, operational speeds when towing and when not towing~~
 - ~~▪ Sound source (type and number of airguns)~~
 - ~~▪ Type and number of hydrophones~~
 - ~~▪ Number, length, and spacing of cables/ streamers~~
- ~~3. On a map, indicate the grid, number of lines and total distance covered by each line, the distance to nearby community/communities and sensitive areas (e.g., National Parks, National Wildlife Areas, Migratory Bird Sanctuaries, recognized breeding grounds or migratory routes).~~
- ~~4. Indicate the discharge volume of the airguns, the depth of airgun discharge, the noise levels of acoustic signal at various distances from the source (e.g., 500 metres, 1000 metres), and the frequency and duration of airgun operation at each site.~~
- ~~5. Discuss the potential for dielectric oil to be released from the streamer array, and describe proposed mitigation measures.~~
- ~~6. Indicate whether additional seismic operations are required for start-up of operations, equipment testing, repeat coverage of areas.~~
- ~~7. Indicate whether air gun procedures will include a “ramping up” period and, if so, the proposed rate of ramping up.~~
- ~~8. Indicate whether the measures described in the *Statement of Canadian Practice for Mitigation of Noise in the Marine Environment* will be adhered to for this project.~~
- ~~9. Describe whether any part of the project will be located outside of the Nunavut Settlement Area and whether any other regulatory requirements must be met (e.g. CEAA).~~

~~E-2. Nearshore/Onshore Seismic Survey~~

- ~~10. For each site, indicate whether nearshore and onshore surveys will be conducted during the ice season or once the ice has melted~~
- ~~11. Describe how nearshore and onshore areas will be accessed.~~
- ~~12. Describe the survey methods to be used (e.g. explosive charge, vibration, air or water gun, other)~~
- ~~13. Describe equipment to be used~~
- ~~14. If applicable, indicate number, depth and spacing of shot holes~~
- ~~15. Describe explosive wastes including characteristics, quantities, treatment, storage, handling, transportation and disposal methods.~~

~~E-3. Vessel Use in Seismic Survey~~

- ~~16. Please complete Section H.~~

SECTION F: ~~Site Cleanup/Remediation~~

- ~~1. Describe the location, content, and condition of any existing landfills and dumps (indicate locations on a map).~~
- ~~2. Identify salvageable equipment, infrastructure and/or supplies.~~
- ~~3. Provide a list of all contaminants to be cleaned up, anticipated volumes and a map delineating contaminated areas. This includes buildings, equipment, scrap metal and debris, and barrels as well as soil, water (surface and groundwater) and sediment.~~
- ~~4. Describe the degree of pollution/contamination, and list the contaminants and toxicity.~~
- ~~5. Describe technologies used for clean up and/or disposal of contaminated materials. Include a list of all the physical, chemical and biological cleanup/ remediation methods, operational procedures, and the dosage/frequency of reagents and bacterial medium.~~
- ~~6. Identify and describe all materials to be disposed of off site, including the proposed off site facilities, method of transport and containment measures.~~
- ~~7. Discuss the viability of landfarming, given site specific climate and geographic conditions.~~
- ~~8. Describe the explosive types, hazard classes, volumes, uses, location of storage (indicate on a map), and method of storage (if applicable).~~
- ~~9. If blasting, describe the methods employed.~~
- ~~10. Describe all methods of erosion control, dust suppression, and contouring and re-vegetation of lands.~~
- ~~11. Describe all activities included in this project.~~
 - ~~*—Excavation (please complete Section B-5)~~
 - ~~*—Road use and/or construction (please complete Section A)~~
 - ~~*—Airstrip use and/or construction~~
 - ~~*—Camp use and/or construction~~
 - ~~*—Stockpiling of contaminated material~~
 - ~~*—Pit and/or quarry (please complete Section C)~~
 - ~~*—Work within navigable waters (please complete Section H)~~
 - ~~*—Barrel crushing~~
 - ~~*—Building Demolition~~
 - ~~*—Other~~

SECTION G: ~~Oil and Natural Gas Exploration/Activities~~

G-1. Well Authorization

1. ~~Identify the location(s) of the well centre(s) by latitude and longitude. Attach a map drawn to scale showing locations of existing and proposed wells.~~
2. ~~Indicate if the site contains any known former well sites.~~
3. ~~Include the following information for each well:~~
 - a. ~~Well name~~
 - b. ~~Surface location~~
 - c. ~~Proposed bottomhole location~~
 - d. ~~Ground elevation (in metres)~~
 - e. ~~Spacing area (in units)~~
 - f. ~~Identify the well type:~~
 - i. ~~Production~~
 - ii. ~~Injection~~
 - iii. ~~Disposal~~
 - iv. ~~Observation~~
 - v. ~~Storage~~
 - vi. ~~Experimental~~
 - vii. ~~Other (specify)~~
 - g. ~~Identify the well classification:~~
 - i. ~~Exploratory wildcat~~
 - ii. ~~Exploratory outpost~~
 - iii. ~~Development~~
 - h. ~~Drilling operation (deviation):~~
 - i. ~~Vertical~~
 - ii. ~~Directional~~
 - iii. ~~Horizontal~~
 - iv. ~~Slant~~
 - i. ~~Objective Zones (copy chart style below)~~

Objective Formation	Fluid (oil/gas/water)	Depth (mTVD)	Core (Y/N)

- j. ~~Proposed Total Depth in mTDV and mMD:~~
- k. ~~Formation of Total Depth~~
- l. ~~Sour well? (yes or no)~~
 - i. ~~If Yes: Maximum H₂S concentration in mol/kmol~~
~~Emergency planning zone radius in km~~
- m. ~~Blowout Prevention (Well Class I—VI)~~
- n. ~~Deviation Surveys~~
 - i. ~~Will be run at intervals less than 150m? (yes or no)~~
- o. ~~Wireline logs~~
 - i. ~~Will run logs in hole for surface casing? (yes or no)~~
 - ii. ~~Will run a minimum of 2 porosity measuring logs? (yes or no)~~

G-2. On-Land Exploration

4. ~~Indicate if the site contains any known:~~

- a. ~~Waste Dumps~~
 - b. ~~Fuel and Chemical Storage Areas~~
 - c. ~~Sump Areas~~
 - d. ~~Waste Water Discharge Locations~~
5. ~~Attach maps drawn to scale showing locations of existing and proposed items identified in (2) above, as well as all proposed:~~
- a. ~~Sumps~~
 - b. ~~Water sources~~
 - c. ~~Fuel and chemical storage facilities~~
 - d. ~~Drilling mud storage areas~~
 - e. ~~Transportation routes~~
6. ~~If utilizing fresh water, estimate maximum drawdown and recharge capability of the river or lake from which water will be drawn.~~
7. ~~Indicate if permafrost is expected to be encountered under:~~
- a. ~~Camp Facilities~~
 - b. ~~Well Site~~
 - c. ~~Access Routes~~
 - d. ~~Sumps~~
 - e. ~~Other: _____~~
8. ~~Indicate any potential for encountering artesian aquifers or lost circulation within the surface hole (to casing depth).~~
9. ~~Will drilling wastes contain detrimental substances (including, but not limited to, oil-based or invert mud and high salinity fluids)? If yes, indicate the substances and estimated volumes.~~
10. ~~Indicate methods for disposal of drilling wastes:~~
- a. ~~Sump~~
 - b. ~~Down Hole (requires NEB approval)~~
 - c. ~~On Site Treatment (provide plan)~~
 - d. ~~Off Site (give location and method of disposal)~~
11. ~~If a sump is being used, attach the following information:~~
- a. ~~scale drawings and design of sumps~~
 - b. ~~capacity in cubic metres~~
 - c. ~~berm erosion protection~~
 - d. ~~soil permeability and type~~
 - e. ~~recycling/reclaiming waters~~
 - f. ~~surface drainage controls~~
 - g. ~~abandonment procedures~~
12. ~~Attach the proposed or existing contingency plan which describes the course of action, mitigative measures and equipment available for use in the event of system failures and spills of hazardous materials.~~
13. ~~Attach an outline of planned abandonment and restoration procedures.~~

~~G-3. Off Shore Exploration~~

- ~~14. Will drilling wastes contain detrimental substances (including, but not limited to, oil-based or invert mud and high salinity fluids)? If yes, indicate the substances and estimated volumes.~~
- ~~15. Attach the proposed or existing contingency plan which describes the course of action, mitigative measures and equipment available for use in the event of system failures and spills of hazardous materials.~~
- ~~16. Attach an outline of planned abandonment and restoration procedures.~~
- ~~17. Please complete Section H.~~

~~G-4. Rig~~

- ~~18. Type of Rig. Draw works, make and model~~
- ~~19. Derrick/Mast make and model~~
- ~~20. H.P. available to draw works~~

SECTION H: ~~Marine Based Activities~~

~~H-1. Vessel Use~~

- ~~1. Describe the purpose of vessel operations.~~
- ~~2. List classes and sizes of vessels to be used.~~
- ~~3. Indicate crew size.~~
- ~~4. Indicate operating schedule.~~
- ~~5. Provide a description of route to be traveled (include map).~~
- ~~6. Indicate whether the vessel will call at any ports. If so, where and why?~~
- ~~7. Describe wastes produced or carried onboard including the quantities, storage, treatment, handling and disposal methods for the following:~~
 - ~~a. Ballast water~~
 - ~~b. Bilge water~~
 - ~~c. Deck drainage~~
 - ~~d. Grey and black water~~
 - ~~e. Solid waste~~
 - ~~f. Waste oil~~
 - ~~g. Hazardous or toxic waste~~
- ~~8. List all applicable regulations concerning management of wastes and discharges of materials into the marine environment~~
- ~~9. Provide detailed Waste Management, Emergency Response and Spill Contingency Plans~~
- ~~10. Does the vessel(s) possess an Arctic Pollution Prevention Certificate? If yes, indicate the date of issue and the name of the classification society.~~
- ~~11. Describe the source of fresh water and potable water~~
- ~~12. Indicate whether ice breaking will be required, and if so, approximately where and when? Discuss any possible impacts to caribou migration, Inuit harvesting or travel routes, and outline proposed mitigation measures.~~
- ~~13. Indicate whether the operation will be conducted within the Outer Land Fast Ice Zone of the East Baffin Coast. For more information on the Outer Land Fast Ice Zone, please see the Nunavut Land Claims Agreement (NLCA), Articles 1 and 16.~~

- ~~14. Indicate whether Fisheries or Environmental Observers or any other *Qualified Marine Observer* will be onboard during the proposed project activities. If yes, describe their function and responsibilities.~~
- ~~15. Describe all proposed measures for reducing impacts to marine habitat and marine wildlife (including mammals, birds, reptiles, fish, and invertebrates).~~
- ~~16. Describe whether any part of the project will be located outside of the Nunavut Settlement Area and whether any other regulatory requirements must be met (e.g. CEAA).~~

H-2. Disposal at Sea

- ~~17. Provide confirmation you have applied for a *Disposal at Sea* permit with Environment Canada.~~
- ~~18. Provide a justification for the disposal at sea.~~
- ~~19. Describe the substance to be disposed of, including chemical and physical properties.~~
- ~~20. Indicate the location where the disposal is to take place.~~
- ~~21. Describe the frequency of disposals (disposals per day/week or month).~~
- ~~22. Describe the route to be followed during disposal and indicate on a map.~~
- ~~23. Indicate any previous disposal methods and locations.~~
- ~~24. Provide an assessment of the potential effects of the disposal substance on living marine resources.~~
- ~~25. Provide an assessment of the potential of the disposal substance, once disposed of at sea, to cause long term physical effects.~~
- ~~26. Describe all mitigation measures to be employed to minimize the environmental, health, navigational and aesthetic impacts during loading, transport and disposal.~~

SECTION I: Municipal and Industrial Development

1. Describe the business type, including public, private, limited, unlimited or other.

Qikiqtaaluk Environmental Inc. is a privately held, Inuit owned, corporation.

2. Describe the activity (e.g. development of quarry, development of hydroelectric facility, bulk fuel storage, power generation with nuclear fuels or hydro, tannery operations, meat processing and packing, etc.).

Operation of an Environmental Waste Processing Facility.

3. Describe the production process or service provision procedures.

Activities at the site will centre around 3 main areas:

- Contaminated water management;
- Contaminated soil management;
- Management of hazardous and non-hazardous waste.

Operation and maintenance manuals for all 3 of these operations are included in Appendix N.

4. Describe the raw materials used in this activity, the storage and transportation methods. If hazardous materials are included in raw materials, products or by-products; include safety regulations methodology.

Raw materials used include:

- Contaminated water;
- Contaminated soils;
- Hazardous and non-hazardous waste (batteries, petroleum, oil and lubricants; glycols, asbestos, absorbents, contaminated paint and painted materials, waste paints, building demolition debris, and electronic equipment).

Contaminated water will be stored in reservoirs until it can be processed through the water treatment unit. Treated water will be stored in different reservoirs until laboratory results show that it respects discharge criteria and authorization has been obtained from INAC to discharge at the predetermined discharge location.

Contaminated soils will be placed in a lined storage area until space is available for treatment. Stored soils will be covered to limit the amount of contact water that is generated. When ready for treatment, the soils will be transferred to the soil treatment area and remediated through a biological treatment process. Any contaminated soils that cannot be treated using a biological treatment process will be packaged in large bulk bags and shipped south for disposal in authorized facilities.

All waste will be packaged according to TDG regulations. All handling and packaging of waste will be done in a lined area to reduce the risk of contamination exiting the handling area. Waste will be stored on-site until it can be shipped south for disposal at a provincially approved facility.

5. Provide detailed information about the structure and/or building in which the activity will be conducted.

The water treatment unit is set up inside a 40-ft insulated marine container. The refrigeration unit is no longer operational on this container.

The offices will be in an ATCO-type trailer, 40 ft long, divided as needed to make office a storage space. There will also be heated storage in 2 - 40-ft marine containers.

The waste processing area will be constructed of 6 - 20-ft marine containers that will form a U around the processing area. The processing area will be lined and bermed to prevent spills from escaping the area. In addition, a fabric roof mounted on a steel frame will be set up over the processing area and a curtain will be installed over the front opening to limit the amount of precipitation that can come into contact with the waste processing area.

Additional unheated 20-ft marine containers will be used for the storage of waste products to be shipped south and the storage of QE's materials, equipment and supplies.

6. List the PPE (personal protective equipment) and tools to be used to protect personal health and safety.

All QE personnel working at the Environmental Waste Processing Facility will be required to wear the following PPE:

- Hard hat;
- Safety glasses;

- Coveralls;
- Gloves;
- Steel toe boots.

PPE worn will be suitable for use with the types of products being handled. In addition, the safety data sheets for the products being handled will be consulted to ascertain if any additional PPE is required, if so, it shall be worn.

7. Describe the firefighting equipment that are or will be installed.

QE will install fire extinguishers at key areas around the site. At a minimum, fire extinguishers will be found at the following locations:

- Water Treatment Unit;
- Main Office;
- Waste Processing Area.

In the event of fire, the Iqaluit fire department will be contacted and will be responsible for ensuring that the fire is extinguished and no longer poses a risk of further ignition.

8. Describe the noise sources, noise level in work area, technical measurements that will be adopted to abate the noise levels and regulatory requirements for noise abatement and noise levels.

The occupational exposure limit to noise is 85 dB for an 8-hour day. The only pieces of equipment utilized by QE that could possibly exceed this limit are the vacuum unit and air compressor used to operate the water treatment unit. The vacuum unit is equipped with a noise reducing muffler; however it is not possible to further reduce the noise level of this machine. The use of this machine is limited to short durations and is not expected to have an impact beyond the limits of the site. Workers will be required to wear hearing protection when operating the vacuum unit.

The air compressor is installed inside the container that houses the water treatment unit. As such, when the door is closed, it is not anticipated that the compressor sound levels will have an impact beyond the limits of the site.

9. Describe the type of gaseous emission that will be produced during this activity. Include the allowable thresholds and mitigation measures.

The only type of gaseous emission will be the volatilization of organic contaminants from the landfarm/biopile. There are currently no regulations regarding this type of emission in Nunavut.

10. Describe odours that the activity might release and include corresponding allowable threshold. Describe mitigation measures if thresholds are exceeded.

This project is not expected to generate any odours that can be detected beyond the limits of the project site.

11. Describe radiation sources that might be emitted during the activity. Include type and source and include mitigation measures. Also describe preventative measures for human exposure (i.e. PPE).

No radiation sources will be emitted as a result of this activity.

12. Discuss the employee safety and environment protection training program.

QE's supervisors all receive extensive training in health and safety and spill response measures. Prior to the beginning of every shift or new activity, supervisors are required to hold a "toolbox meeting" where safety issues are discussed. In addition, reports detailing common safety issues must be completed by supervisors. For jobs posing a higher risk of injury, supervisors are provided with a detailed job safety analysis specific to the task to be completed. In addition, project managers and directors are required to complete a worksite safety inspection a minimum of once a month, and when carrying out high risk activities.

13. If the activity involves a bulk fuel storage facility, include drawings showing the bulk fuel storage facility location in proximity to natural water courses, high water marks, etc.

No bulk fuel storage is currently planned for the site.

14. If the activity involves the development of a new quarry or expansion of an existing quarry, complete Section C.

Not applicable.

4. DESCRIPTION OF THE EXISTING ENVIRONMENT

Describe the existing environment, including physical, biological and socioeconomic aspects. Where appropriate, identify local study areas (LSA) and regional study areas (RSA).

Please note that the detail provided in the description of the existing environment should be appropriate for the type of project proposal and its scope.

The following is intended as a guide only.

Physical Environment

Please note that a description of the physical environment is intended to cover all components of a project, including roads/trails, marine routes, etc. that are in existence at present time.

- Proximity to protected areas, including:
 - i. designated environmental areas, including parks;

The site is located approximately 500 m from the boundary to Sylvia Grinnell Park. The site is not located next to any other known designated environmental areas.

- ii. heritage sites;

There are no known heritage sites within the property limits. Please see the correspondence with the Inuit Heritage Trust and Government of Nunavut Archaeologists presented in Appendix P. In addition, the land was already disturbed during previous site use.

The following sections are struck out as they are not applicable.

- ~~iii. sensitive areas, including all sensitive marine habitat areas;~~
- ~~iv. recreational areas;~~
- ~~v. sport and commercial fishing areas;~~
- ~~vi. breeding, spawning and nursery areas;~~
- ~~vii. known migration routes of terrestrial and marine species;~~
- ~~viii. marine resources;~~
- ~~ix. areas of natural beauty, cultural or historical history;~~
- ~~x. protected wildlife areas; and~~
- ~~xi. other protected areas.~~
- ~~Eskers and other unique landscapes (e.g. sand hills, marshes, wetlands, floodplains).~~
- ~~Evidence of ground, slope or rock instability, seismicity.~~
- ~~Evidence of thermokarsts.~~
- ~~Evidence of ice lenses.~~
- ~~Surface and bedrock geology.~~
-
- Topography.

The property is relatively flat with a gentle grade toward Koojesse Inlet.

- Permafrost (e.g. stability, depth, thickness, continuity, taliks).

Permafrost on the site can be found at depths of between 1 and 2 m, depending on the location on the site. QE's activities will add fill over the existing soils, and redirect surface drainage away from the site, which will serve to protect the permafrost.

- Sediment and soil quality.

The existing soils on the site are glacial till, consisting mainly of sand.

- Hydrology/ limnology (e.g. watershed boundaries, lakes, streams, sediment geochemistry, surface water flow, groundwater flow, flood zones).

There is a ditch that drains along Iqaluit Lane and a drainage ditch that drains around the perimeter of the lot that empties into the ditch along Iqaluit Lane. The ditch along Iqaluit Lane passes under the road at the southeast corner of the lot and travels northeast for 140 m before turning to the east and eventually emptying into Koojesse Inlet.

- Tidal processes and bathymetry in the project area (if applicable).

Not applicable.

- Water quality and quantity.

Water will originate from various spill sites around the City of Iqaluit. Contact water will be collected from the POL reservoir cleaning operations in Iqaluit, containment berms within the city, water from clients that has come in contact with organic and/or metal contaminants and from containment pads at QE's Environmental Waste Processing Facility. Water may have several different types of organic and inorganic contaminants.

QE's water treatment facility can treat a maximum of 15 m³ per day.

- Air quality.

It is not anticipated that QE's operations have an impact on the City of Iqaluit's air quality.

- Climate conditions and predicted future climate trends.

It is not anticipated that climate change have an effect on our QE's operations, as there are no permanent structures in place.

- Noise levels.

The noise from the site will have no greater impact than the current surrounding land use.

- Other physical Valued Ecosystem Components (VEC) as determined through community consultation and/or literature review.

None were identified.

Biological Environment

The following sections were struck out as they are not considered applicable.

- ~~Vegetation (terrestrial as well as freshwater and marine where applicable).~~
- ~~Wildlife, including habitat and migration patterns.~~
- ~~Birds, including habitat and migration patterns.~~
- ~~Species of concern as identified by federal or territorial agencies, including any wildlife species listed under the *Species at Risk Act (SARA)*, its critical habitat or the residences of individuals of the species.~~
- ~~Aquatic (freshwater and marine) species, including habitat and migration/spawning patterns.~~
- ~~Other biological Valued Ecosystem Components (VEC) as determined through community consultation and/or literature review.~~

Socioeconomic Environment

- Proximity to communities.

This project is located within the municipal boundaries of the City of Iqaluit.

- Archaeological and culturally significant sites (e.g. pingos, soap stone quarries) in the project (Local Study Area) and adjacent area (Regional Study Area).

There are none known.

- Palaeontological component of surface and bedrock geology.

There are none known.

- Land and resource use in the area, including subsistence harvesting, tourism, trapping and guiding operations.

Not applicable.

- Local and regional traffic patterns.

Not applicable.

- Human Health, broadly defined as a complete state of wellbeing (including physical, social, psychological, and spiritual aspects).

This project will remove contaminants from the environment and remove hazardous waste for proper disposal before it causes contamination. As such this will contribute to the wellbeing of all the peoples living in the area affected by this project.

- Other Valued Socioeconomic Components (VSEC) as determined through community consultation and/or literature review.

No other issues were identified.

5. IDENTIFICATION OF IMPACTS AND PROPOSED MITIGATION MEASURES

1. Please complete the attached Table 1 – Identification of Environmental Impacts, taking into consideration the components/activities and project phase(s) identified in Section 4 of this document. Identify impacts in Table 1 as either positive (P), negative and mitigable (M), negative and non-mitigable (N), or unknown (U).

Table is attached in Appendix S.

2. Discuss the impacts identified in the above table.

As this project endeavors to remove contaminants from the environment and properly dispose of waste only positive impacts were identified.

3. Discuss potential socioeconomic impacts, including human health.

The purpose of this project is to remove contaminants from the environment and dispose of them according to industry and regulatory standards. This project will create part-time employment for local residents working on the projects, with a potential for training and, eventually, full time employment for those who are interested. This project will have a positive impact on human health as it will be removing existing and potential contaminants from the environment.

4. Discuss potential for transboundary effects related to the project.

The only transboundary effect will be the waste shipped south for disposal. However, all waste to be shipped south will have originated from the south, and as such the effects are considered to be minimal.

5. Identify any potentially adverse effects of the project proposal on species listed under the *Species at Risk Act (SARA)* and their critical habitats or residences, what measures will be taken to avoid or lessen those effects and how the effects will be monitored.

The purpose of this project is to remove current and potential contaminants from the environment. This will only benefit at-risk habitats and species, as they will be exposed to fewer environmental contaminants. Monitoring these effects is beyond the scope of this project.

6. Discuss proposed measures to mitigate all identified negative impacts.

The only negative impact would come from a hazardous waste spill. The potential for this to occur will be minimized by training all persons involved in the handling of hazardous materials in safe handling procedures (such as using spotters with forklifts to reduce the risk of puncturing containers) to reduce the risk of spills. Should a spill occur, staff will be trained in spill response procedures and will respond immediately to any spill to ensure that the effects are minimized. A copy of the Spill Contingency Plan is presented in Appendix O.

6. CUMULATIVE EFFECTS

A cumulative impact (or effect) can be defined as the impact on the environment that results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions. Cumulative impacts can also result from individually minor but collectively significant actions taking place over a period of time.

Discuss how the effects of this project interact with the effects of relevant past, present and reasonably foreseeable projects in a regional context.

The purpose of this project is to reduce environmental contamination. As such, the cumulative effects would be positive through the reduction of existing contamination and the risk of future spills occurring.

7. SUPPORTING DOCUMENTS

Where relevant, provide the following supporting documents:

- Abandonment and Decommissioning Plan

The Abandonment and Decommissioning Plan is presented in Appendix M. It should be noted that this project is planned as a permanent installation, and as such decommissioning is not anticipated.

- Existing site photos with descriptions

Existing site photos are presented in Appendix R.

- Emergency Response Plan

The Emergency Response Plan is included in the Spill Contingency Plan in Appendix O.

- Comprehensive Spill Prevention/Plan (must consider hazardous waste and fuel handling, storage, disposal, spill prevention measures, staff training and emergency contacts)

The Comprehensive Spill Prevention/Plan is presented in Appendix O.

Waste Management Plan/Program

The Waste Management Plan/Program is presented in Appendix N.

- Monitoring and Management Plans (e.g. water quality, air pollution, noise control and wildlife protection etc.)

The Environmental Protection Plan is included in Appendix Q.

- If project activities are located within Caribou Protection Areas or Schedule 1 Species at Risk known locations, please provide a Wildlife Mitigation and Monitoring Plan

Not applicable.

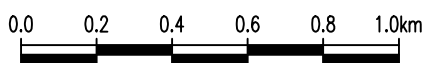
In addition, for Project Type 9 (Site Cleanup/Remediation), please provide the following additional supporting documents:

- Remediation Plan including cleanup criteria and how the criteria were derived.
- Human Health Risk Assessment of the contaminants at the site.

Not applicable.

APPENDIX B

FIGURES



Source: GoogleEarth; 2015.

Presented to:



Property located at:
Lease parcels O and Q,
Airport lands in Iqaluit, NU

Figure 1

Regional Site Location

NIRB AND NWB LICENCE APPLICATIONS

Drawn by: J. Bergeron	Verified by: G. Johnson	Approved by: S. Laberge
Date: 2016-02-17	Drawing no.: QE15-102-2-05 A	Geodetic reference: Latitude/Longitude



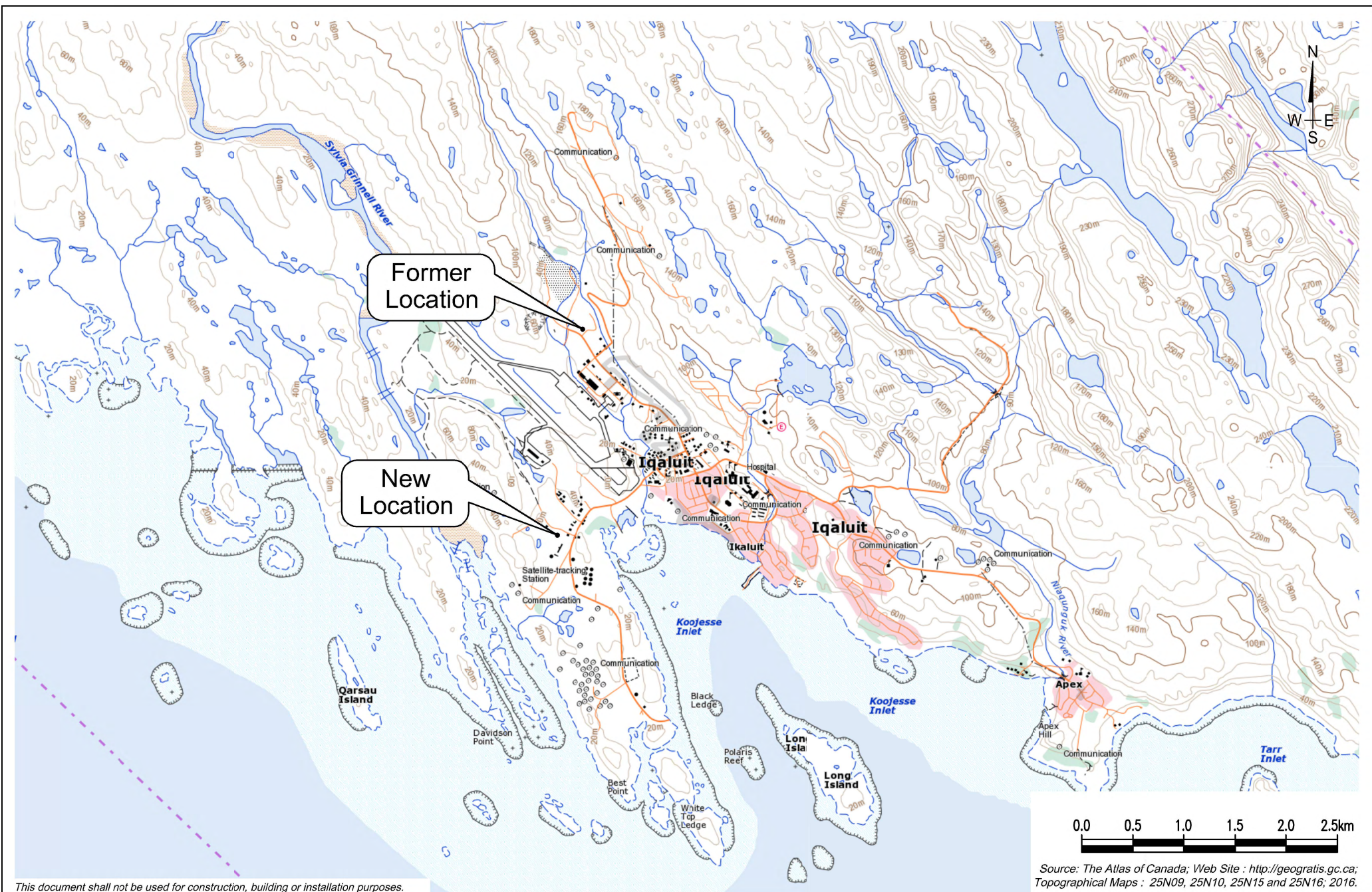
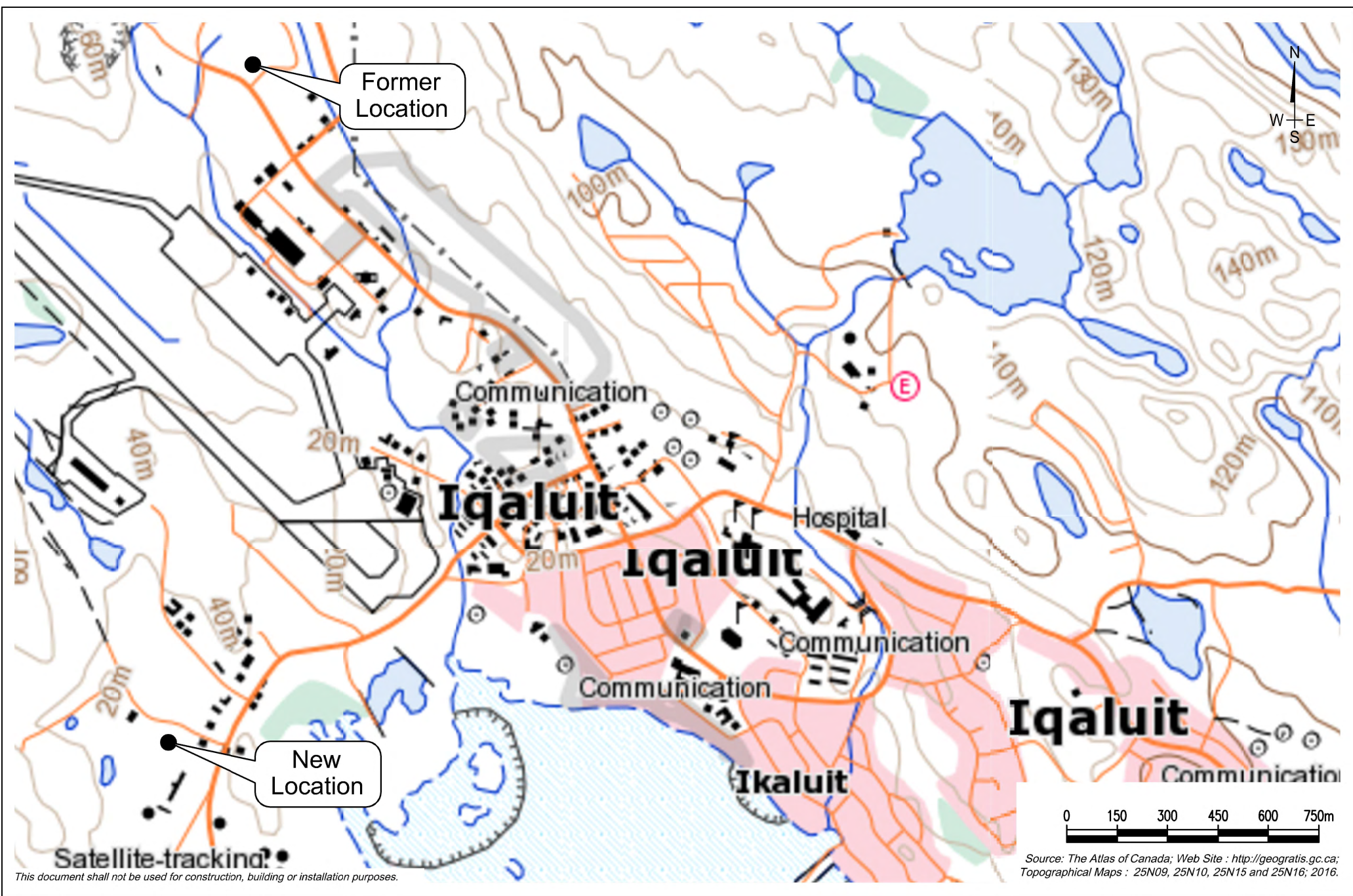


Figure 2
Regional Site Location - scale: 1: 50,000

NIRB AND NWB LICENCE APPLICATIONS

Drawn by: H. Longval	Verified by: G. Johnson	Approved by: S. Laberge
Date: 2016-02-17	Drawing no.: QE15-102-2-04	Geodetic reference: UTM/NAD83 Zone 19





Presented to:



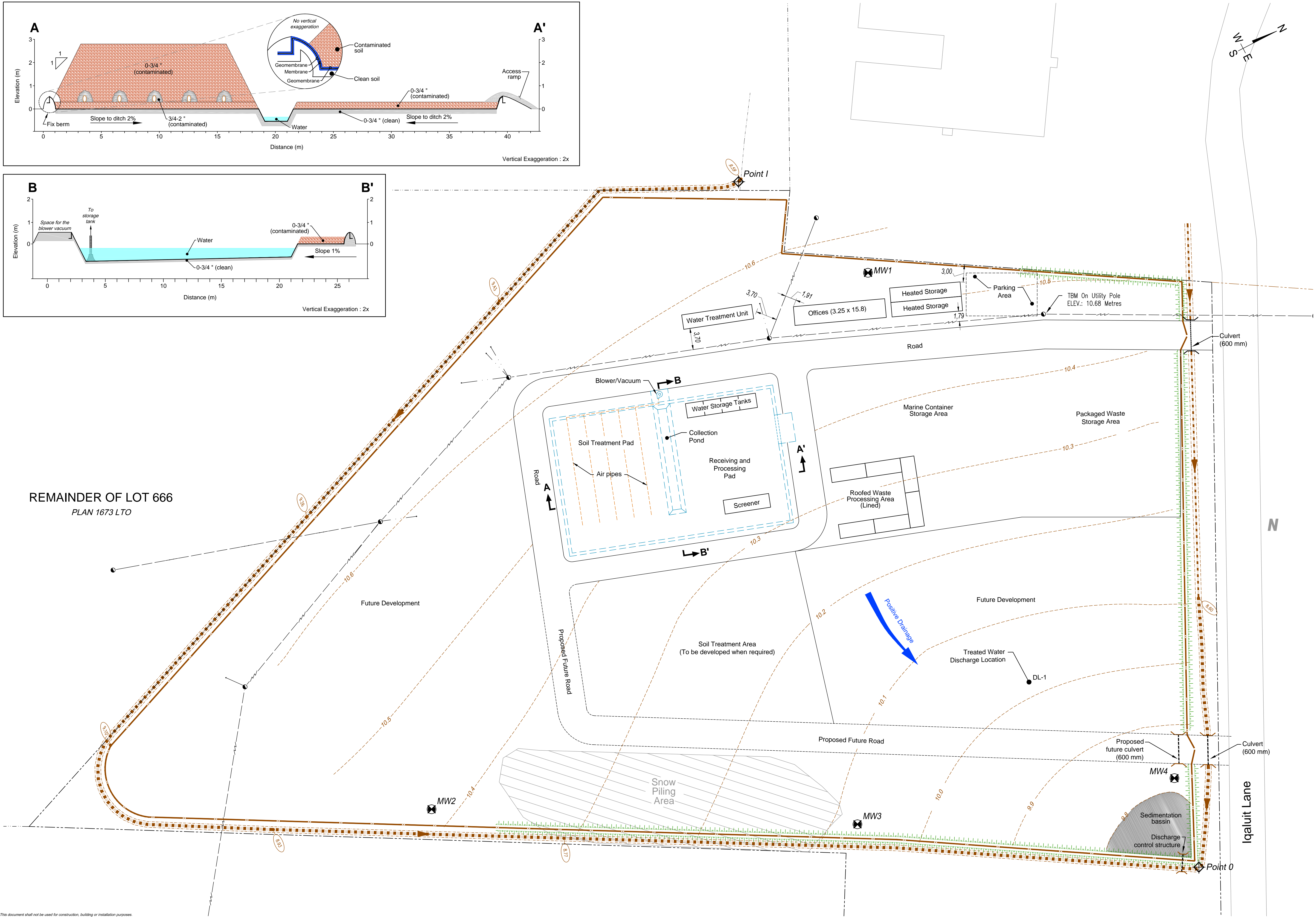
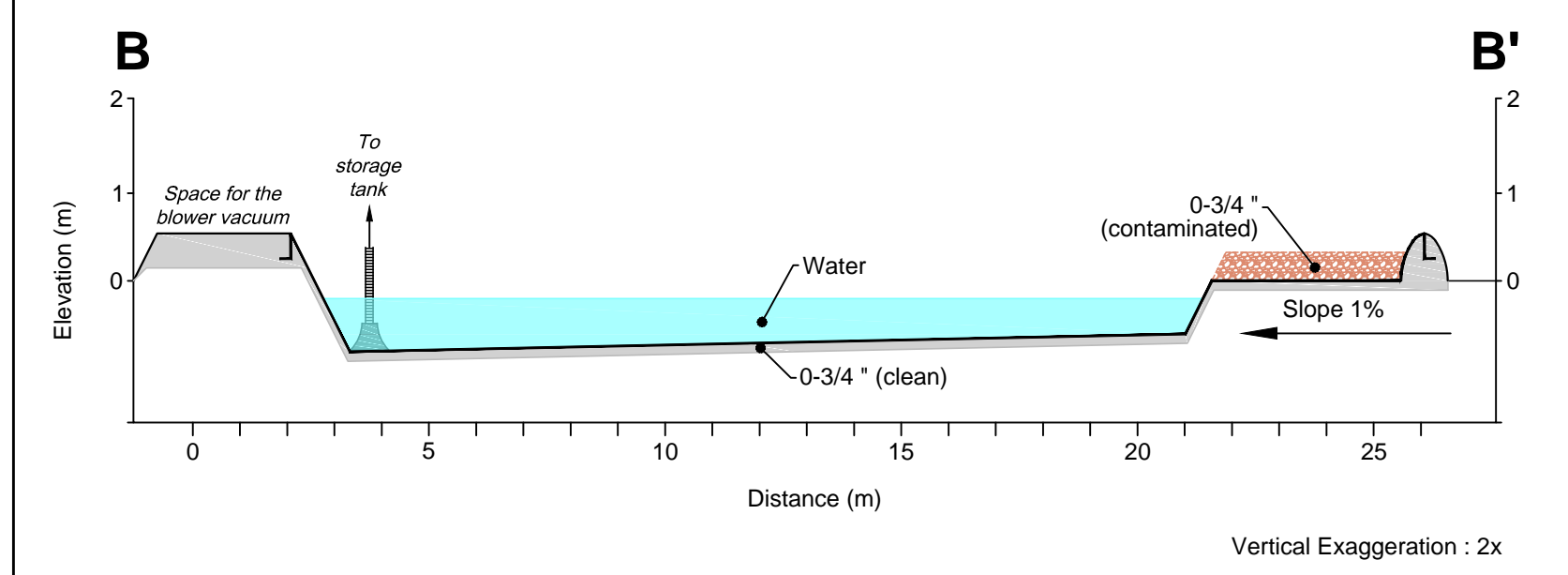
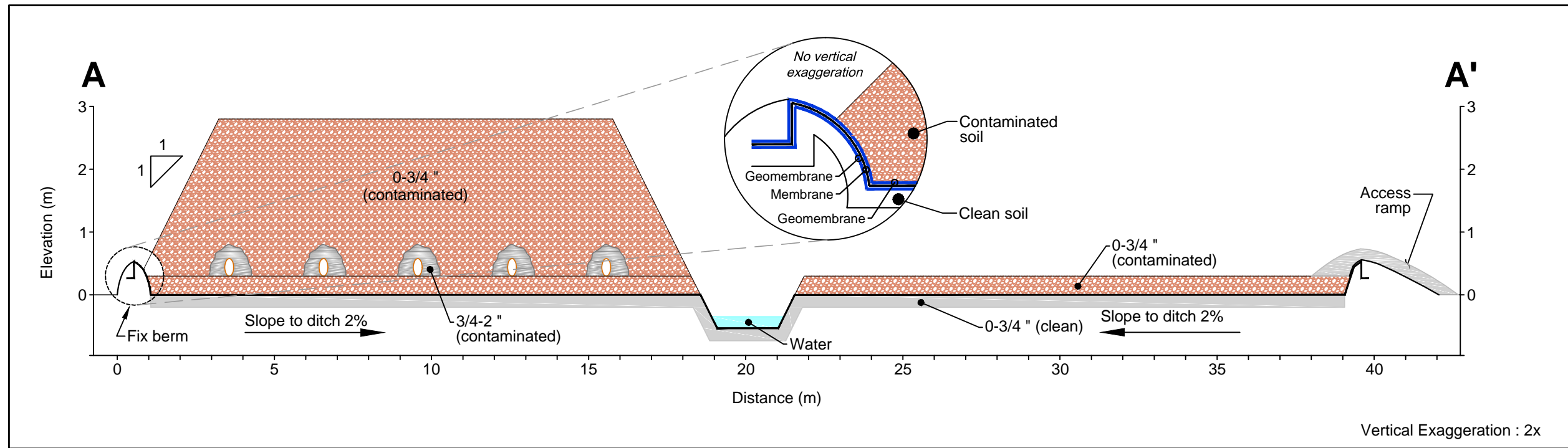
Properly located at:
Lease parcels O and Q,
Airport lands in Iqaluit, NU

Figure 3

Regional Site Location - scale: 1: 15,000

NIRB AND NWB LICENCE APPLICATIONS

Drawn by: H. Longval	Verified by: G. Johnson	Approved by: S. Laberge
Date: 2016-02-17	Drawing no.: QE15-102-2-04	Geodetic reference: UTM/NAD83 Zone 19



Legend

- Proposed monitoring well
- Proposed water quality monitoring point
- Proposed draining ground elevation (m)
- Proposed drainage ditch elevation (m)
- Proposed fence
- Proposed ditch
- Berm to be built to final ground design elevation
- Overhead electrical line
- Utility pole and guy wire
- Lot line
- Parcel identification
- Proposed parcel
- Boundary of lease (approximate location)
- Processing and lines soil treatment area

Source :

- Sub-Arctic Surveys Ltd : File no. 15-206-QE-JL14-TOPO; July 16, 2015;
- Iqaluit - Survey Sketch 001.2015.dwg

Figure 4

Site Plan

NIRB AND NWB LICENCE APPLICATIONS

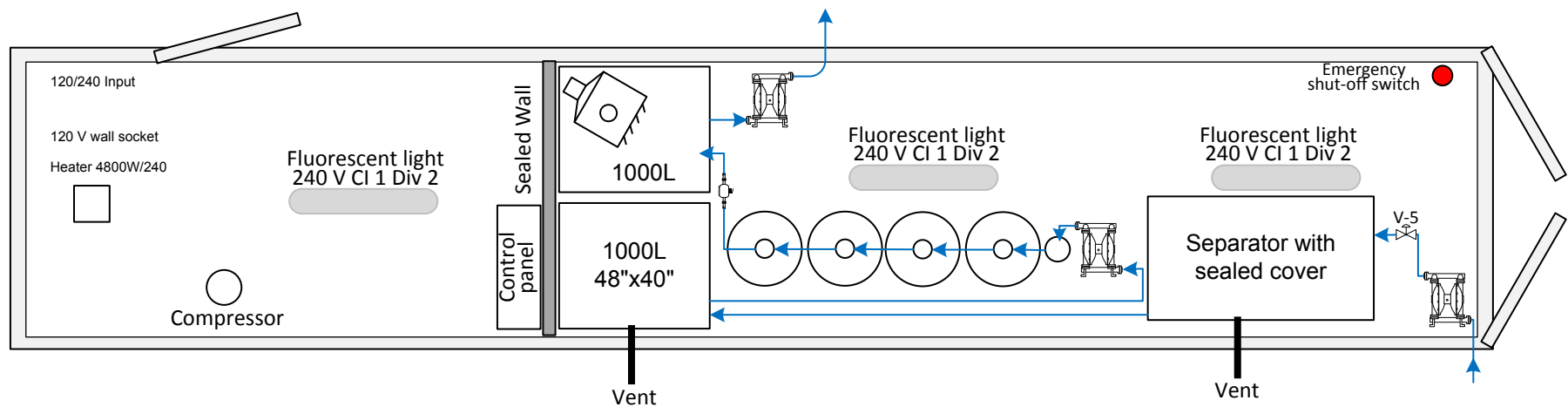
Presented to:

Property located at:
Lease parcels O and Q,
Airport lands in Iqaluit, NU


Drawn by: J. Bergeron
Verified by: C. Johnson
Approved by: J. Dion


Date: 2016-02-17
Drawing no.: QE15-102-2-05 | B | MTM/NAD83 Zone 6
Geodetic reference:



Qikiqtaaluk environmental



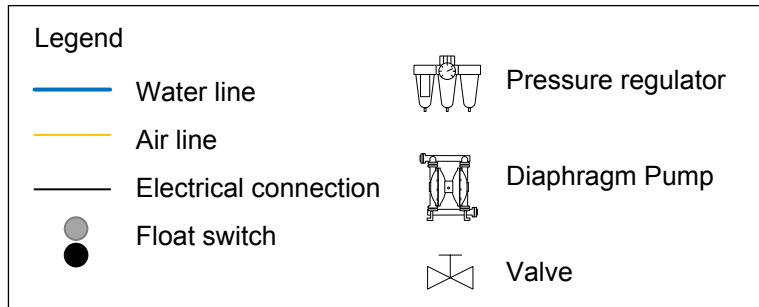
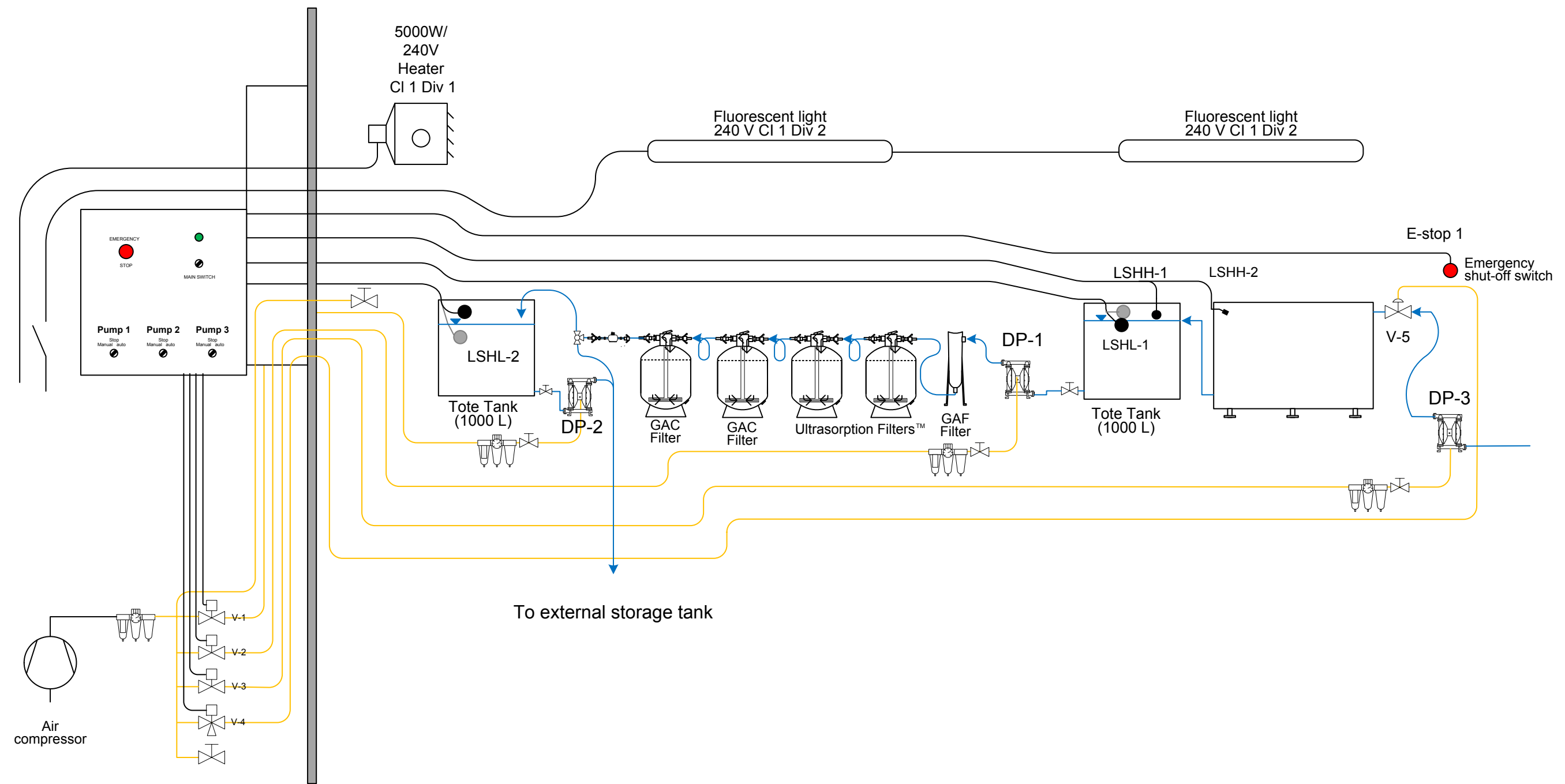
Legend

 Water line

 Diaphragm pump

Presented to: <div>   </div>	Title: <p>Figure 5</p> <p>Water Treatment Facility Layout</p>		Scale: <p>No scale</p>	Design date: <p>2015-03-25</p>	Revision date: <p>2016-02-17</p>
	Project: <p>WATER TREATMENT FACILITY</p> <p>1571 Kakivak Court, Iqaluit</p>		Drawn by: <p>É. Leblanc</p>	Verified by: <p>O. Simard</p>	Approved by: <p>G. Johnson</p>
			Project n°: <p>QE15-102-2</p>	Drawing n°: <p>QE15-102-2-02.vsd</p>	Layout: <p>A</p>





Title: Figure 6 Water Treatment Facility Flow Diagram		
Project: WATER TREATMENT FACILITY <i>1571 Kakivak Court, Iqaluit</i>		
Scale: No scale	Design date: 2015-03-25	Revision date: 2016-02-17
Drawn by: É. Leblanc	Verified by: O. Simard	Approved by: G. Johnson
Project n°: QE15-102-2	Drawing n°: QE15-102-2-01.vsd	Layout: A

Presented to:

Presented by:

APPENDIX C

ACTIVE PERMITS AND LAND USE AUTHORIZATIONS



August 14th, 2015

Oliver Simard
P.O. Box 1228,
Iqaluit, NU
X0A 0H0

-Sent by email – osimard@qenv.ca -

NOTICE OF DECISION – 15-024

Re: Development Permit Application No. 15-024 (Plan 1673, Block 0, Lot 666)

I am pleased to inform you that your application for a Development Permit 15-014 to permit a Water Treatment Facility on Plan 1673, Block 0, Lot 666 (Parcels O and Q of SK-IQAL-001-2015) has been conditionally approved. The conditionally approved site work is shown on the Site Plan dated August 10th, 2015, received by the City August 11th, 2015.

Construction shall not begin until a Development Permit is issued. The following needs to be completed prior to issuance of the Development Permit:

DECISION APPEAL PERIOD

The decision on Application 15-024 is subject to a fourteen (14) days appeal period. Any person claiming to be affected by the decision has fourteen (14) days from the date the notice is posted to appeal the decision.

If there are no appeals filed with the City at the end of the 14 days, and if all the relevant conditions of the permit are met the Development Permit will be issued by the City.

The Notice of Decision will be posted on the property on August 14th, 2015. The appeal period will complete on August 28th, 2015.

A draft copy of the Development Permit conditions is attached to this letter for reference.

Should you have any questions, please do not hesitate to contact the planning department at 979-6363 ext. 227.

Yours truly,

Mélodie Simard
Development Officer
City of Iqaluit

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ᐅᓐᓕᓄᓐᓂᓐ (867) 979-5600

ᐱᓐᓇᓂᓐ (867) 979-5922

City of Iqaluit

Box 460

Iqaluit, Nunavut

X0A 0H0

Phone (867) 979-5600

Fax (867) 979-5922

Ville d'Iqaluit

C.P. 460

Iqaluit, Nunavut

X0A 0H0

Tél. (867) 979-5600

Télécop. (867) 979-5922

admin@city.iqaluit.nu.ca

www.iqaluit.nu.ca

SPECIAL CONDITIONS

Future Development

- 1)The Developer/Lessee shall submit revised drawings and amend the Development Permit prior to any development, except for site grading, on the areas identified as "Future Development" on the Site Plan.

Subject to an Airport Lease

- 2)The Developer/Lessee shall obtain the approval from GN Airports Division of the final plans submitted with the Development Permit application, prior to the City issuing the Development Permit. The approval shall be in letter format and shall reference the application number and identify the name and dates of the plans approved for development.

Drainage

- 3)The Developer/Lessee will be responsible for ensuring drainage functions as proposed on the Site Plan and that there is no impact on adjacent properties. Any required remedial works required on-site or off-site that result from the relocated drainage patterns shall be at the cost of the Developer.

Culverts

- 4)The Developer/Lessee shall place a minimum 450mm diameter culvert across the driveway accesses in accordance with the Iqaluit Municipal Design Guidelines (January 2005).

STANDARD CONDITIONS

Damage to City Property

- 1.The Developer shall reinstate at its expense and to the satisfaction of the Development Officer, any City property including but not limited to roads, service vaults and signage, which may be damaged as a result of this development.

Grading & Drainage

- 2.All surface drainage where fill is introduced shall be contained within the limits of the lot and directed to a municipal drainage ditch in the adjacent road allowance.

Servicing

- 3.Water fill and sewage pump out connections, associated overflow vents, and the water tank level indicator shall be installed in accordance with the City of Iqaluit Municipal Design Guidelines and shall remain clear of obstructions at all times.
- 4.Water use shall not exceed 2,000 litres per day.
- 5.The Developer/Lessee shall install a water meter to the approval of the Superintendent of Public Works.

Fire Marshal

- 6.The Developer/Lessee shall meet all the requirements of the GN Fire Marshal prior to issuance of a Building Permit.

Signs

7.The Developer/Lessee shall erect signs, as may be required by the Development Officer.

Building Permit (if applicable)

8.The Developer/Lessee shall obtain a Building Permit prior to commencement of construction.

Lot Development Standards

9.The Developer shall install and maintain the following water-saving devices throughout the building:

- a. All toilets to be water-saver or ultra-low flush toilet units using 6 litres/flush (1.3 imp. Gal./flush) or less.
- b. All showerheads to be low-flow showerheads using 9.8 litres/min (2.2 imp. gal./min) or less when tested at 551 kPa (80 psi).
- c. All washroom and kitchen faucets to use 8.3 litres/min (1.8 imp. gal./min.) or less when tested at 413 kPa (60 psi).

10.All exterior lighting installed on the lot or attached to a building will face downward and not illuminate beyond the boundary of the lot.

11.The Developer shall ensure that a construction waste bin is on the lot during construction to contain debris.



August 7, 2015

Qikiqtaaluk Environmental Inc.
P.O. Box 1228
Iqaluit, NU
X0A 0H0

Re: Application for Lease Land – Iqaluit International Airport

I have reviewed the application for land on Lot 666, Play 1673 which has been labelled lots Q and O for the purposes of surveying.

You have received conditional approval for the lease, however in order to prepare the documentation we will need the following:

1. Finalized survey from the City of Iqaluit, once it has been completed. In the interim, we will utilize the information on Sketch number SK-IQAL-001-2015 Map 2;
2. A workplan which identifies:
 - a. the type of work that will be done on the lot;
 - b. the equipment that will be used;
 - c. the dates of the phasing of the work;
 - d. the permits from the City or other parties if you will be impacting on roads, utilities or areas leased by other tenants;
 - e. any other pertinent details which may impact upon the airport, roadway, or surrounding lands.
3. Confirmation from you in writing that any storage building constructed on site will need to be reviewed at the planning and design stage, and then reviewed and approval issued from the GN Office of the Fire Marshall, as well as the Iqaluit International Airport prior to construction.
4. Documentation from the City of Iqaluit approving of the development in principle, and then once completed, a copy of the actual development permit;
5. A copy of your Environmental Protection plan for the development.

The current market rate for this land is \$1.26 per square meter. Development and preparation of the lot will be at the cost of the tenant. Tying into all utilities and services is also the cost of the tenant.

If you have questions about the above requirements, or any of the other requirements throughout the process of finalizing the lease, please contact me at 867-877-1970.

Yours truly,

Kathleen Henderson
Associate Services Director

[illegible]

Section 2 – Continued

Attach a complete description of the proposed facility, safety measures, equipment and management processes to be used. Include engineered drawing where applicable.

Section 3 - Waste Management Information

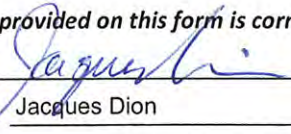
Type of Business (check all that apply) Receiver of Waste ☒ Manage Self-generated Waste ☐
Type of Activity (check all that apply) Collect and Store ☒ Transfer ☒
Treat ☒ Recycle ☐ Dispose ☐
Hazardous Waste Generator(s) Used Quilic Energy Corporation, City of Iqaluit, Uqsuq Oil, small businesses,
garages, schools, households

Hazardous Waste Carriers(s) Used NEAS, NSSI
Veolia (Quebec), Solva-Rec (Quebec)


Do you have an approved Emergency Response and Spill Contingency Plan? Yes ☐ (attach copy) No ☒

Section 4 - Certification

I certify that the information provided on this form is correct, accurate and complete.

Signature of Contact Person  Date (dd/mm/yy) 15/08/11
Print Name of Contact Person Jacques Dion Title Vice President
Phone 514-940-3332 Email jdion@qenv.ca

For Department Use Only

Management Facility Number NUF# 400006 Approved by  Date 2011-08-23

GN DoE Waste Generator and Transporter Registration
De: Eno, Robert [REno@GOV.NU.CA]
Envoyé: 31 août 2011 14:07
À: 'Karl Côté'
Objet: RE: application for waste carrier and waste generator

Hello Karl,

You registration numbers are as follows:

Generator: NUG 100045
Carrier: NUC 200011

With respect to the carrier number, you should be aware that you will be expected to consult with Transport Canada and/or the Motor Vehicles Division of Community and Government Services with respect to TDGR for road transport. DoE does not administer TDGR so I cannot speak to the requirements.

If you have any questions, please do not hesitate to get in touch with me.

Robert

Robert Eno
Director, Environmental Protection Division
Chief Environmental Protection Officer
Dept. of Environment
Gov't of Nunavut
Iqaluit, NU
867-975-7729

From: Karl Côté [mailto:kcote@sanexen.com]
Sent: Wednesday, August 31, 2011 11:18 AM
To: Eno, Robert
Subject: application for waste carrier and waste generator

Hi Robert,

Here are the 2 registration forms.

Karl



Department of Environment
Government of Nunavut

REGISTRATION FORM HAZARDOUS WASTE RECEIVER

Instructions

1. The following information must be provided in order to register as a hazardous waste receiver in Nunavut and to obtain a receiver number. Incomplete applications will be returned to the applicant.
2. A receiver who operates a commercial business for the purpose of collecting, storing, transferring, treating, recycling or disposing of hazardous waste may be required to register the facility as a hazardous waste management facility. Refer to section 3.2.2 of the *Environmental Guideline for the General Management of Hazardous Waste* for further information.
3. Completed registration forms are to be forwarded to the Manager of Pollution Control, Department of Environment, Government of Nunavut, Box 1000, Station 1360, Iqaluit, Nunavut, X0A 0H0. Electronic registration forms are preferred and may be forwarded to EnvironmentalProtection@gov.nu.ca.
4. Use additional pages to provide information as required.
5. Applicants should refer to the accompanying users' guide for further assistance on completing the receiver registration form.

Section 1 - Identification

Receiver (Legal Name) Qikiqtaaluk Environmental Inc.

Mailing Address PO Box 1228, Building 922, Niaqunngusiaq Road, Iqaluit (Nunavut)

Postal Code X0A 0H0

Principle Contact Person Harry Flaherty Title President

Phone 867-979-8406 Email hflaherty@qcorp.ca

Alternate Contact Person Jacques Dion Title Vice President

Phone 514-940-3332 Email jdion@qenv.ca

Section 2 - Description of Waste Received (provide a separate table if required)

Site Location(s) where Waste is Received Building 1571, Federal Road, corner of Kakivak Court, on Lot 3

Shipping Name (Description)	TDG Number	TDG Class	Quantity Received each Month (L or Kg)	Frequency of Acceptance
see attached list				

Attach a brief description of the proposed facility.

Section 3 - Waste Management Information

General Type of Business Environmental Contractor and Consultant
General Type of Activity Environmental site remediation and hazardous waste management
Hazardous Waste Generator(s) Used Qulliq Energy Corporation, City of Iqaluit, Uqsuq Oil, small businesses, garages, schools, households

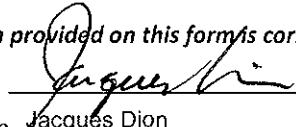
Hazardous Waste Carriers(s) Used NEAS, NSSI, Veolia (Quebec), Solva-Rec (Quebec)

Hazardous Waste Management Facilities Used Qikiqtaaluk Environmental Inc., Veolia (Quebec), Solva-Rec (Quebec)

Do you have an approved Emergency Response and Spill Contingency Plan? Yes ☐ (attach copy) No ☒

Section 4 - Certification

I certify that the information provided on this form is correct, accurate and complete.

Signature of Contact Person  Date (dd/mm/yy) 15/08/11
Print Name of Contact Person Jacques Dion Title Vice President
Phone 514-940-3332 Email jdion@qenv.ca

For Department Use Only			
Receiver Number NUR#	<u>300001</u>	Approved by <u></u>	Date <u>2011-08-23</u>



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NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYINGI
OFFICE DES EAUX DU NUNAVUT

File No.: **1BR-THI1419**

August 20, 2014

Greg Johnson, Director
C/o Qikiqtaaluk Environmental Inc.
9935 Ave Catania, Entrance 1, Suite 200
Montreal, QC J4Z 3V4

Email: gjohnson@qenv.ca

RE: NWB Water Licence No. 1BR-THI1419

Dear Mr. Johnson:

Please find attached Licence No. **1BR-THI1419** issued to Qikiqtaaluk Environmental Inc. by the Nunavut Water Board (NWB) pursuant to its authority under Article 13 of the *Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada (Nunavut Land Claims Agreement or NLCA)*. The terms and conditions of the attached Licence related to Water use and waste deposit are an integral part of this approval.

If the Licensee contemplates the renewal of this Licence, it is the responsibility of the Licensee to apply to the NWB for its renewal. The past performance of the Licensee, new documentation and information, and issues raised during a public hearing, if the NWB is required to hold one, will be used to determine the terms and conditions of the Licence renewal. Note that if the Licence expires before the NWB issues a new one, then Water use and waste disposal must cease, or the Licensee may be in contravention of the *Nunavut Land Claims Agreement* and the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*. However, the expiry or cancellation of a licence does not relieve the holder from any obligations imposed by the licence. The NWB recommends that an application for the renewal of this Licence be filed at least three (3) months prior to the Licence expiry date.

If the Licensee contemplates or requires an amendment to this licence, the NWB may decide, in the public interest, to hold a public hearing. The Licensee should submit applications for amendment as soon as possible to give the NWB sufficient time to go through the amendment process. The process and timing may vary depending on the scope of the amendment; however, a minimum of sixty (60) days is required from time of acceptance by the NWB. It is the responsibility of the Licensee to ensure that all application materials have been received and are acknowledged by the Manager of Licensing.

The NWB strongly recommends that the Licensee consult the comments received from interested persons on issues identified. This information is attached for your consideration.¹

Sincerely,



Thomas Kabloona
Nunavut Water Board
Chair

TK/sa/ri

Enclosure: Licence No. **1BR-TH1419**
Comments – AANDC

Cc: Qikiqtani Distribution List

¹ Aboriginal Affairs and Northern Development Canada (AANDC), May 27, 2014.

DECISION

LICENCE NUMBER 1BR-THI1419

This is the decision of the Nunavut Water Board (NWB) with respect to an application, dated March 15, 2014, for a new Water Licence made by:

QIKIQTAAALUK ENVIRONMENTAL INC.

to allow for the disposal of waste during the operation of a commercial Hydrocarbon Impacted Water Treatment Facility located within the City of Iqaluit, Nunavut, generally at the following geographical coordinates:

Latitude: (63° 45' 45" N) Longitude: (68° 32' 36" W)
Latitude: (63° 45' 45" N) Longitude: (68° 32' 35" W)
Latitude: (63° 45' 44" N) Longitude: (68° 32' 44" W)
Latitude: (63° 45' 44" N) Longitude: (68° 32' 41" W) (Water Treatment Facility Extents)

DECISION

After having been satisfied that the application was for a location that falls outside of an area with an approved Land Use Plan² and exempt from the requirement for screening as described within Schedule 12-1 by the Nunavut Impact Review Board³ in accordance with Article 12 of the *Nunavut Land Claim Agreement (NLCA)*, the NWB decided that the application could proceed through the regulatory process. In accordance with s.55.1 of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act (Act)* and Article 13 of the *NLCA*, public notice of the application was given and interested persons were invited to make representations to the NWB.

After reviewing the submission of the applicant and considering the representations made by interested persons, the NWB, having given due regard to the facts and circumstances, the merits of the submissions made to it and to the purpose, scope and intent of the *NLCA* and of the *Act*, waived the requirement to hold a public hearing, and determined that:

**Licence No. 1BR-THI1419 be issued subject to the terms and conditions contained therein.
(Motion #: 2014-B1-016)**

Signed this 15th day of July 2014 at Gjoa Haven, NU.



Thomas Kabloona
Nunavut Water Board, Chair
TK/sa/ri

² Nunavut Planning Commission Land, Use Conformity Determination, July 26 2013.

³ Nunavut Impact Review Board Screening Exemption Decision, April 28 2014.

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INTRODUCTION

Between September 2013 and March 2014, the Board received, from Qikiqtaaluk Environmental Inc. (the Licensee or Proponent), an application and supporting information (Application) for a Type “B” Licence to construct and operate a proposed Water Treatment Facility (WTF) for the purpose of treating hydrocarbon impacted Water generated from spills occurring within the City of Iqaluit, Nunavut.

The WTF is expected to include the following main components:

- an oil/Water separator;
- particulate filters;
- activated carbon filters;
- patented ultra-sorption filters;
- Water pumps; and
- treated effluent storage reservoirs (from which the effluent will be sampled and analyzed prior being discharge).

The waste generated from the treatment process, including oil, lubricants, sludge, waste filter, and contaminated soil, is expected to be treated and/or disposed of at an approved facility in accordance with applicable regulations.

PROCEDURAL HISTORY

The following is a list of the submissions received by the Board in support of the Application:

September 12, 2013

- General Water Licence Application;
- Abandonment and Remediation Plan, Hydrocarbon Impacted Water Treatment, dated September 2013;
- Qikiqtaaluk Environmental Inc., Certificate of Incorporation, Industry Canada;
- Hydrocarbon Impacted Water Treatment, Cost Estimate in Case of Abandonment for Security;
- Cover letter, dated on September 12, 2013, in English and Inuktitut;
- Layout of Water Treatment Unit (two drawings);
- Spill Contingency Plan Hydrocarbon Impacted Water Treatment, dated September 2013;
- Table of Contents; and
- City of Iqaluit, Topographical Map.

Received on March 17, 2014

Updated Water Licence Application, Hydrocarbon Impacted Water Treatment dated March 15, 2014, containing:

- General Water Licence (Application for a New Water Licence);
 - Figure 4: Water Treatment Unit;
 - Figure 5: Water Treatment Unit;
 - Hydrocarbon Impacted Water Treatment Cost Estimate in Case of Abandonment for Security;
 - Industry Canada, Certificate of Incorporation;
 - Executive Summary (English), dated September 12, 2013;
-

- Executive Summary, Inuktitut;
- Spill Contingency Plan Hydrocarbon Impacted Water Treatment, dated September 2013;
- Abandonment and Remediation Plan Hydrocarbon Impacted Water, dated September 2013; and
- Supplementary Information Requirements, Re: File No. 1BR-THI---, Type “B” Application by Qikiqtaaluk Environmental Inc. for a Hydrocarbon Impacted Water Treatment Project, dated March 14, 2014.

Following an internal review, the NWB distributed the Application on April 23, 2014 for a thirty (30) day public comment period with a deadline for submissions set for May 23, 2014. Due to administrative matters associated with some of the information provided, the deadline for submission was extended to May 27, 2014. On or before the extended deadline, a submission was received from Aboriginal Affairs and Northern Development Canada (AANDC). In its submission, AANDC provided comments and recommendations with respect to measures that the Proponent could implement to minimize potential impacts of the project on the receiving environment; however, it did not provide any written objections to the potential issuance of a licence.

Apart from the comments received from AANDC, the Board received the NPC Land Use Conformity Determination for the project on September 12, 2013, which states that the Project proposal is located outside the boundaries of the two currently approved land use plans. In addition, the Board received on April 28, 2014, the NIRB determination for the project, which states that the Application is exempt from screening pursuant to Schedule 12-1 of the NLCA.

Copies of the submission received as well as all documents related to this Application can be accessed through the NWB’s ftp site using the following link (**Username:** public and **Password:** registry):

<ftp://nunavutWaterboard.org/1%20PRUC%20PUBLIC%20REGISTRY/1%20INDUSTRIAL/1B/1BR%20-%20Remediation/1BR-THI----%20Qik%20Env/>.

GENERAL CONSIDERATIONS

Term of the Licence

In accordance with the Nunavut Waters and Nunavut Surface Rights Tribunal Act, s. 45, the NWB may issue a licence for a term not exceeding twenty-five (25) years. The Proponent requested in its Application a twenty five (25) year term for the licence. However, the Board has granted a five-year-term licence to the Project, which is generally granted for new licences for this type of an undertaking. AANDC also provided comments within their submission regarding a shorter term and that a five year licence term is recommended to allow an earlier opportunity to reconsider licence terms and conditions. The Board believes that the term granted will provide the Licensee with adequate opportunity to consistently demonstrate its ability to comply with the requirements in the Licence in advance of any future renewal and/or consideration of a longer term licence by the Board.

Annual Report

Under the reporting section of the Licence, Part B, Item 1, the Licensee is required to submit, on an annual basis, a report that describes the Licensee's activities as they relate to waste deposition during the preceding year. The Board makes annual reporting information available to interested persons upon request in addition to making the information available in its public registry. Public access to annual information reporting submitted by all licensees is made available through the NWB's ftp site using the following link (**Username:** public and **Password:** registry): <ftp://nunavutwaterboard.org/1%20PRUC%20PUBLIC%20REGISTRY/>.

Security

As part of its Application, the Proponent included a financial estimate of \$79,340 for potential reclamation activities that might be associated with the proposed project in the document entitled *Hydrocarbon Impacted Water Treatment, Cost Estimate in Case of Abandonment for Security*, received September 12, 2013. AANDC in its submission indicated that it believes that the cost estimate provided by the Proponent is reasonable and should be considered by the Board. While the Board welcomes the information on reclamation security provided by the Proponent, the Board has decided to exclude, at this time, requirements in the licence related to posting of reclamation security for the Project. The Board understands that reclamation security for this type of undertaking has to be examined in a holistic manner and in accordance with the type of undertaking so as to avoid a tiered approach to reclamation security requirements for similar undertakings. The Proponent is, however, required to update the security estimate provide, as needed, to reflect the scope of and operational conditions for the project over time, under Part C, Item 2 in the Licence. In addition, should the Project scope change or further reviews of subsequent applications and information provided through Annual Reports and Inspection Reports warrant the need, and the Board approach to reclamation security broaden, the requirements for providing a total reclamation security for site liability may be required.

Deposit of Waste

Details provided in the Application indicate that, in addition to the treatment of hydrocarbon contaminated Water/snow/ice and the discharge of effluent in accordance with the licence conditions and Effluent quality criteria under Part E, Item 10, the following waste types will potentially be generated by the Water Treatment Facility (WTF): waste fuel and filters; oil, lubricants and liquid sludge; contaminated Water; contaminated soil; and other hydrocarbon contaminated waste. All waste generated will require management in accordance with the terms and conditions in this licence and/or applicable legislations and guidelines for wastes generated and proposed to be removed from site to an approved hazardous waste management facility.

Under Part E, of the Licence, the Licensee is required to manage primary waste and residual waste generated from its undertaking in accordance with applicable regulations including the Government of Nunavut - Department of Environment, *Environmental Guideline for Used Oil and Waste Fuel* (June 2012). Additional conditions have been included under Part E of this Licence to address overall waste management practices.

Spill Contingency Plan

Under Part H, Item 1 of the Licence, the Board has approved the Spill Contingency Plan submitted as additional information with the Application. The Licensee is, however, required

to address and submit, with its 2014 Annual Report, a revised plan as outlined in Item 2, that addresses comments and recommendations provided by AANDC during comment period and any other revisions that may become apparent in carrying out the activities associated with the undertaking.

Abandonment and Restoration Plan

The Board has approved the Interim Abandonment and Restoration (A&R) Plan that was submitted as additional information with the Application under Part I, Item 1 in the Licence. The licensee is required to annually review the Plan and to update the A&R plan on an ongoing basis to reflect any changes in operational conditions and scope of activities associated with the project.

Monitoring

Petroleum products or petroleum hydrocarbons (PHC) is a general term used to describe mixtures of organic compounds found in or derived from substances such as oil, bitumen and coal. These products released to soil and water can lead to contaminants entering into the environment through volatilization, adsorption to solid organic matter, leaching by rainwater and dissolution into groundwater, or through contaminated surface runoff migration to oceans, lakes, rivers and streams.

Accordingly to the Application, treated water previously impacted by petroleum products, will be discharged at the Final Discharge Point, with the effluent Final Discharge Point location yet undetermined.

To ensure that effluent generated from the facility does not exceed specific criteria, the Board has included general Effluent quality limits for the treated effluent, at the point of discharge, under Part E, Item 10. Parameters not included under Part E, Item 10 but relevant to the undertaking must not exceed values set in the Canadian Council of Ministers of Environment (CCME) Canadian Water Quality Guidelines for the Protection of Aquatic Life.

Furthermore, characterization of effluent, soil and Waters at the Final Point of Discharge, in addition to the information of contaminants levels, would help on determining if the discharged effluent had an impact on the environment and, if contamination is identified, would help to determine those parameters that shall be tracked during the remediation process.

Analysis recommended for soil and water characterization where petroleum hydrocarbon contamination is suspected^{4,5} include Total Petroleum Hydrocarbon (TPH), Polycyclic Aromatic Hydrocarbons collectively referred as PHAs, benzene, toluene, ethylbenzene and xylenes collectively referred as BTEX and Canadian Wide Standards for petroleum hydrocarbon in soil fractions, CWS-PHC fractions. These contaminants are usually accompanied by heavy metals such as chromium, copper, lead, manganese, nickel and zinc that are commonly found in used lubricating oil from friction wear on engine parts.

Therefore, under Part J, Item 4 of the Licence, the Board has established a list of additional

4 Federal Guidelines for Landfarming Petroleum Hydrocarbon Contaminated Soils, Federal Contaminated Sites Action Plan (FCSAP), 2013

5 Guideline for the Dismantling and Removal of Petroleum Storage Tank Systems, Manitoba, 2007

parameters that the licensee is required to monitor for the purposes of developing site-specific effluent quality criteria and/or limits given that such criteria and limits may be more reflective of operational conditions for the treatment processes involved and the receiving environment at the final point of discharge.

And, under Part J, Item 6, the Board has included conditions that require the Licensee to submit a Monitoring Plan to the Board for approval, within sixty (60) days following the date of issuance of this Licence. To ensure that monitoring is conducted in accordance with established practices, the Board has included conditions requiring the Licensee to submit a Quality Assurance / Quality Control (QA/QC) Plan along with a cover letter from an accredited laboratory confirming acceptance of the Plan.

Operation and Maintenance Plan

To ensure that documented procedures pertaining to the operation of the facility for the undertaking are developed, the Licensee is required to submit an Operation and Maintenance (O&M) Plan for the WTF, to address the collection, treatment, and discharge of petroleum hydrocarbon impacted snow/ice/water and the handling of wastes generated from the undertaking requiring shipment off-site to an approved hazardous waste handling facility. Part G, Item 4 addresses the requirement to submit an O&M Plan within sixty (60) days from the date of issuance of this licence.



NUNAVUT WATER BOARD WATER LICENCE

Licence No. 1BR-THI1419

Pursuant to the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and the *Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada*, the Nunavut Water Board, hereinafter referred to as the Board, hereby grants to

QIKIQTAAALUK ENVIRONMENTAL INC.

(Licensee)

9935 AVE CATANIA, ENTRANCE 1, SUITE 200, MONTREAL, QC J4Z 3V4

(Mailing Address)

herein after called the Licensee, the right to alter, divert or otherwise use Water or dispose of waste for a period subject to restrictions and conditions contained within this Licence:

Licence Number/Type: 1BR-THI1419 / TYPE "B"

Water Management Area: FROBISHER BAY WATERSHED (53)

Location: CITY OF IQALUIT / QIKIQTANI REGION, NUNAVUT

Classification: INDUSTRIAL – TYPE "B"

Purpose: DEPOSIT OF WASTE

Quantity of Water use not
to Exceed: USE OF WATER NOT AUTHORIZED

Date of Licence Issuance: AUGUST 20, 2014

Expiry of Licence: AUGUST 19, 2019

This Licence issued and recorded at Gjoa Haven, Nunavut, includes and is subject to the annexed conditions.

Thomas Kabloona,
Nunavut Water Board, Chair

PART A: SCOPE, DEFINITIONS AND ENFORCEMENT

Scope

This Licence allows for the deposit of waste from an Industrial undertaking classified as *per* Schedule 1 of the *Regulations* at the Qikiqtaaluk Environmental Inc.'s Hydrocarbon Impacted Water Treatment Facility Project, located in an industrial area within the City of Iqaluit, Qikiqtani Region, Nunavut.

- a. This Licence is issued subject to the conditions contained herein with respect to the depositing of waste of any type in any Waters or in any place under any conditions where such waste or any other waste that results from the deposits of such waste may enter any Waters. Whenever new *Regulations* are made or existing *Regulations* are amended by the Governor in Council under the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*, or other statutes imposing more stringent conditions relating to the quantity or type of waste that may be so deposited or under which any such waste may be so deposited, this Licence shall be deemed, upon promulgation of such *Regulations*, to be subject to such requirements; and
- b. Compliance with the terms and conditions of this Licence does not absolve the Licensee from responsibility for compliance with the requirements of all applicable Federal, Territorial and Municipal legislation.

1. Definitions

“**Act**” means the Nunavut Waters and Nunavut Surface Rights Tribunal Act;

“**Addendum**” means the supplemental text that is added to a full plan or report usually included at the end of the document and is not intended to require a full resubmission of the revised report;

“**Amendment**” means a change to original terms and conditions of this Licence requiring correction, addition or deletion of specific terms and conditions of the Licence; modifications inconsistent with the terms of the set terms and conditions of the Licence;

“**Analyst**” means an Analyst designated by the Minister under Section 85 (1) of the Act;

“**Appurtenant Undertaking**” means an undertaking in relation to which a use of Water or a deposit of waste is permitted by a licence issued by the Board;

“**Batch Discharge**” means the controlled discharge of a discrete, contained volume of effluent from the WTF at the Final Discharge Point. The maximum volume of a batch discharge shall not exceed 21,000 m³ per batch, otherwise as permitted by an Inspector;

“**Board**” means the Nunavut Water Board established under the *Nunavut Land Claims Agreement* and the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*;

“Care and Maintenance” in respect of operation, means when the Licensee ceases production or commercial operation for an undefined period of time;

“Construction” means any activities undertaken to establish and install any or all components of the Water Treatment Facility;

“Effluent” means treated liquid waste material from the Water Treatment Facility;

“Engineer” means a professional engineer registered to practice in Nunavut in accordance with the *Consolidation of Engineers and Geoscientists Act S. Nu 2008, c.2* and the *Engineering and Geoscience Professions Act S.N.W.T. 2006, c.16 Amended by S.N.W.T. 2009, c.12*;

“Final Discharge Point” means the point at which the Licensee releases the treated water or effluent from the WTF;

“Hazardous waste” means waste classified as “hazardous” by Nunavut Territorial or Federal Legislation, or as “dangerous goods” under the Transportation of Dangerous Goods Act at the time of clean-up;

“High Water Mark” means the usual or average level to which a body of Water rises at its highest point and remains for sufficient time so as to change the characteristics of the land (ref. Department of Fisheries and Oceans Canada, Operational Statement: Mineral Exploration Activities);

“ICP Scan” means the laboratory method for determining trace metals in leachate or Water through Emission Spectroscopy using inductively coupled plasma (including from approximately 22 to 32 elements, depending on the laboratory performing the analysis);

“Inspector” means an Inspector designated by the Minister under Section 85 (1) of the *Act*;

“Licensee” means the holder of this Licence;

“Minister” means the Minister of Aboriginal Affairs and Northern Development Canada;

“Modification” means an alteration to a physical work that introduces a new structure or eliminates an existing structure and does not alter the purpose or function of the work, but does not include an expansion;

“Monitoring Program” means a program established to collect data on surface Water, groundWater, and soil quality to assess impacts to the environment of an appurtenant undertaking;

“Nunavut Land Claims Agreement (NLCA)” means the *“Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada”*,

including its preamble and schedules, and any amendments to that agreement made pursuant to it;

“Regulations” means the *Nunavut Waters Regulations* SOR/2013-69 18th April, 2013;

“Seepage” means any Water that drains through or escapes from any structure designed to contain, withhold, divert or retain Water or waste;

“Spill Contingency Plan” means a Plan developed to deal with unforeseen petroleum and hazardous materials events that may occur during the operations conducted under the Licence;

“Secondary Containment” means an impermeable structure, external to and separate from primary containment, which prevents unplanned spills of hazardous materials and provides a minimum capacity of 110% of the original vessel. Where multiple vessels are stored within the containment, it must provide a minimum capacity equal to the sum of the largest vessel and 10% of the aggregate volume of all other vessels located in the containment. This structure shall also provide containment and control of hoses and nozzles;

“Sump” is a structure or depression that collects, controls, and filters liquid waste before it is released to the environment. This structure should be designed to prevent erosion while allowing percolation of liquid waste;

“Waste” means, as defined in S.4 of the *Act*, any substance that, by itself or in combination with other substances found in Water, would have the effect of altering the quality of any Water to which the substance is added to an extent that is detrimental to its use by people or by any animal, fish or plant, or any Water that would have that effect because of the quantity or concentration of the substances contained in it or because it has been treated or changed, by heat or other means;

“Water” or “Waters” means Waters as defined in section 4 of the *Act*;

“Water Treatment Facility (WTF)” means the Water treatment facility and associated components, including the Water Treatment Unit, piping, pumps and storage tanks used to treat hydrocarbon impacted Water as described in the March 15, 2014 Application and Figure 3, Layout of treatment equipment and waste storage area; Figure 4, Water treatment unit; and Figure 5, Water treatment unit.

2. **Enforcement**

- a. Failure to comply with this Licence will be a violation of the *Act*, subjecting the Licensee to the enforcement measures and the penalties provided for in the *Act*;
 - b. All inspection and enforcement services regarding this Licence will be provided by Inspectors appointed under the *Act*; and
3. For the purpose of enforcing this Licence and with respect to the deposit or discharge of waste by the Licensee, Inspectors appointed under the *Act*, hold all powers, privileges and protections that are conferred upon them by the *Act* or by other applicable law.

PART B: GENERAL CONDITIONS

1. The Licensee shall file an Annual Report on the Appurtenant Undertaking with the Board no later than March 31 of the year following the calendar year being reported, containing the following information:
 - a. a summary report of the following activities:
 - i. quantity of Petroleum Hydrocarbon Contaminated (PHC) water/snow/ice collected for treatment through the Water Treatment Facility (WTF);
 - ii. quantity of collected soil for removal and treatment at an approved facility;
 - iii. quantity of waste generated from the undertaking including petroleum, oil, and lubricants (POL), sludge, waste filter media, and any other waste resulting from the treatment of Water at the WTF;
 - iv. an inventory of contaminated Water stored at the project site; and
 - v. an inventory of treated Water stored at the project site.
 - b. a summary of waste disposal activities:
 - i. quantity of soil sent for treatment at approved facilities;
 - ii. Effluent discharged to the receiving environment from the WTF including location and quality of Effluent discharged;
 - iii. a summary of all waste backhauled, including hazardous waste, for disposal at approved facilities under Part E, Items 12, 13 and 14;
 - c. a list of any unauthorized discharges and a summary of follow-up actions taken;
 - d. a summary of maintenance work performed on the WTF;
 - e. any revisions to the plans approved under this licence, including the Spill Contingency Plan and Abandonment and Restoration Plan, as required by Part B, Item 6. Revisions should be submitted in the form of Addenda;
 - f. a description of all progressive and or final reclamation work undertaken, including photographic records of site conditions before, during and after completion of operations;
 - g. a review of the reclamation cost estimate, as required by Part C, Item 1;
 - h. tabular summary of all information requested and results of the Monitoring Program;
 - i. an analysis of data collected during the “Monitoring Program” and a brief description of any future studies planned by the Licensee;
 - j. a public consultation/participation report describing consultation with local organizations and the residents of the nearby communities; and
 - k. any other details on water use or waste disposal requested by the Board by November 1 of the year being reported.
2. The Licensee shall notify the NWB of any normal changes in operating plans or conditions associated with this project at least thirty (30) days prior to any such change.
3. The Licensee shall install flow meters or other such devices, or implement suitable methods required for the measuring of Effluent volumes discharged into the receiving environment at the Final Discharge Point as required under Part J, Item 2 to the

satisfaction of the Inspector.

4. The Licensee shall, for all Plans submitted under this Licence, include a proposed timetable for implementation. Plans submitted cannot be undertaken without subsequent written Board approval and direction. The Board may alter or modify a Plan if necessary to achieve the legislative objectives and will notify the Licensee in writing of acceptance, rejection or alteration of the Plan.
5. The Licensee shall, for all Plans submitted under this Licence, implement the Plan as approved by the Board in writing.
6. The Licensee shall review the Plans referred to in this Licence, as required by changes in operation and/or technology, and modify the Plan accordingly. Revisions to the Plans shall be submitted in the form of Addenda to be included with the Annual Report.
7. Every Plan to be carried out pursuant to the terms and conditions of this Licence shall become a part of this Licence, and any additional terms and conditions imposed upon approval of a Plan by the Board become part of this Licence. All terms and conditions of the Licence should be contemplated in the development of a Plan where appropriate.
8. The Licensee shall ensure a copy of this Licence is maintained at the site of operations at all times. Any communication with respect to this Licence shall be made in writing to the attention of:
 - (a) **Manager of Licensing:**
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1J0
Telephone: (867) 360-6338
Fax: (867) 360-6369
Email: licensing@nwb-oen.ca
 - (b) **Inspector Contact:**
Water Resources Officer, AANDC
Nunavut District, Nunavut Region
P.O. Box 100
Iqaluit, NU X0A 0H0
Telephone: (867) 975-4295
Fax: (867) 979-6445
9. The Licensee shall submit one paper copy and one electronic copy of all reports, studies, and plans to the Board. Reports or studies submitted to the Board by the Licensee shall include a detailed executive summary in Inuktitut.
10. The Licensee shall ensure that any document(s) or correspondence submitted by the Licensee to the NWB is received and acknowledged by the Manager of Licensing.
11. This Licence is assignable as provided for in Section 44 of the *Act*.

PART C: CONDITIONS APPLYING TO SECURITY

1. The Licensee shall review, annually, the reclamation cost estimate submitted as part of the Application for this Licence. Any changes made to the estimate should be submitted to the Board for review with the Annual Report required in Part B, Item 1.
2. The Licensee shall provide a revised reclamation/closure cost estimate to the Board for approval in writing, within sixty (60) days of receiving notice, that the estimate provided under Part C, Item 1 was not acceptable to the Board.

PART D: CONDITIONS APPLYING TO WATER USE

1. The Licensee is not authorized to use Water under this Licence.

PART E: CONDITIONS APPLYING TO WASTE DISPOSAL

1. The Licensee shall provide at least fifteen (15) days' notice in writing, to an Inspector prior to any planned discharge of Effluent from the WTF. The notice shall include the volumes proposed for discharge, the analytical results for Water quality of the proposed discharge, location of discharge and an indication of any nearby Water bodies that may be impacted.
2. The Licensee shall confirm, with an Inspector, the suitable location(s) for Final Discharge Point(s) for Effluent from the WTF to be discharge prior to any discharge into the receiving environment.
3. The Licensee shall locate areas designated for waste disposal at a minimum distance of thirty-one (31) metres from the ordinary High Water Mark of any Water body such that the quality, quantity or flow of Water is not impaired, unless otherwise approved by the Board in writing.
4. The Licence shall implement appropriate measures to minimize erosion during any discharge of Effluent from the WTF into the receiving environment.
5. The Licensee shall treat all hydrocarbon-impacted Water/snow/ice at the Water Treatment Facility or as otherwise approved by the Board in writing.
6. The Licensee shall operate and maintain the WTF to the satisfaction of an Inspector and in accordance with acceptable engineering standards and the Operation and Maintenance Plan required under Part G, Item 4.
7. The License shall not combine incompatible waste types for the purpose of storage, shipment, buffering concentration of waste constituents or for any other purposes unless authorized by the Board in writing.

8. The License shall store, transport and treat all Waste generated for the undertaking in accordance with applicable regulations and best management practices and at approved facilities.
9. The Licensee shall maintain the Water treatment facility areas such that generation of dust and ponding of surface Water are minimized.
10. All Effluent discharged from Monitoring Program Station **THI -1** shall not exceed the following Effluent quality limits:

Parameter	Maximum Allowable Concentration of any Grab Sample (mg/L)
pH	6.5 to 9 (pH units)
TSS	50
Oil and Grease	15 and no visible sheen
Total Lead	0.001
Benzene	0.370
Toluene	0.002
Ethyl benzene	0.090

11. The Licensee shall establish and confirm compliance with Effluent quality limits of Part E, Item 10 prior to discharge.
12. If the Effluent referred to in Part E, Item 10 does not meet the discharge criteria, it shall be considered hazardous waste and be disposed off-site at an approved hazardous waste facility or as otherwise approved by the Board in writing.
13. The Licensee shall provide the Board with documented authorization from any community in Nunavut receiving waste from the Qikiqtaaluk Environmental Inc. Water Treatment Facility.
14. The Licensee shall maintain records of all waste stored, transported and final destinations, including details confirming proper disposal of the waste through a waste manifest. Detail related to waste backhauled should be included with the Annual Report in Part B, Item 1 and/or made available to and Inspector upon request.

PART F: CONDITIONS APPLYING TO MODIFICATIONS

1. The Licensee may, without written consent from the Board, carry out Modifications to the Water Supply Facilities and Waste Disposal Facilities provided that such Modifications are consistent with the terms of this Licence and the following requirements are met:
 - a. the Licensee has notified the Board in writing of such proposed Modifications at least sixty (60) days prior to beginning the Modifications;
 - b. such Modifications do not place the Licensee in contravention of the Licence or

- c. the Act;
 - d. such Modifications do not change the scope of the project as approved by NIRB Decision;
 - e. the Board has not, during the sixty (60) days following notification of the proposed Modifications, informed the Licensee that review of the proposal will require more than sixty (60) days; and
 - f. the Board has not rejected the proposed Modifications.
- 2. Modifications for which all of the conditions referred to in Part F, Item 1 have not been met can be carried out only with written approval from the Board.
- 3. The Licensee shall provide as-built plans and drawings of the Modifications referred to in this Licence within ninety (90) days of completion of the Modification. These plans and drawings shall be stamped by an Engineer.

PART G: CONDITIONS APPLYING TO CONSTRUCTION

1. The Licensee shall submit to the Board for review, at least sixty (60) days prior to the commencement of construction of any dams, dykes or structures intended to contain, withhold, divert or retain Water or waste, including facilities or systems for the storage and treatment of hydrocarbon contaminated Water, for-construction design drawings and plans, stamped by an Engineer.
2. The Licensee shall provide to the Board, within ninety (90) days of completion of the construction of any dams, dykes or structures intended to contain, withhold, divert or retains water or waste, including facilities or systems for the storage, treatment and disposal of hydrocarbon contaminated Water and wastes, design drawings and construction reports, including as-built drawings stamped by an Engineer, documentation of field decisions that deviate from original plans, and any data used to support these decisions.
3. The Licensee shall conduct all activities in such a manner as to minimize impacts on surface drainage and immediately undertake and implement corrective measures in the event of any impacts on surface drainage.
4. The Licensee shall submit to the Board for approval within ninety (90) days of Licence issue, an Operation and Maintenance Plan (O&M) that addresses the collection, treatment of petroleum hydrocarbon impacted snow/ice/water, and effluent discharge. The O&M shall include information related but not limited to the following:
 - a. effluent quality limits;
 - b. effluent quality monitoring requirements;
 - c. soil quality monitoring at the discharge point;
 - d. secondary containment provisions for waste storage facilities associated with the undertaking;
 - e. records confirming acceptance from the approved facility that will be treat petroleum hydrocarbon impacted soils generated from the undertaking;
 - f. details pertaining to the annual shipment of recovered petroleum hydrocarbons

- and other wastes to an approved hazardous materials disposal facility;
 - g. a map that references of the project infrastructure;
 - h. a map that references the treated effluent discharge location(s);
 - i. as-built design drawings for the secondary containment and petroleum hydrocarbon impacted Water treatment system; and
 - j. facilities and equipment maintenance and inspection plan.
- 5. The Licensee shall operate the Water Treatment Facility in accordance with the Plan required under Part G, Item 4 or as otherwise approved by the Board in writing.

PART H: CONDITIONS APPLYING TO SPILL CONTINGENCY PLANNING

1. The Board has approved the Plan entitled “Spill Contingency Plan Hydrocarbon Impacted Water Treatment” dated September 2013 that was submitted as additional information with the Application.
2. The Licensee shall submit for review of the Board, with the 2014 Annual Report, a revision of the Plan referred to in Part H, Item 1, in the format set out by the Consolidation of Spill Contingency Planning and Reporting Regulations R-068-93, to include the following:
 - a. a table of contents (index);
 - b. name, address and title of person in charge of the undertaking;
 - c. name, title and 24hr contact information of person responsible;
 - d. date of plan preparation and the effective period of the Plan;
 - e. description of the location, facility and capacity (storage capacity and types waste to be treated, and storage capacity of treated product to be released;
 - f. sec. 1.3.1 refers to assistance being obtained from the Hamlet, this should reference the local resources if available in Iqaluit;
 - g. Under sec. 1.7, a response flow chart to indicate responsibility, contact information of site personnel and initial reporting requirements;
 - h. a map of the project area showing all components of the undertaking, of suitable scale to indicate any sensitive Waters subject potential impacts from the undertaking;
 - i. a detailed description of the secondary containment systems that will be employed to prevent any spills of petroleum hydrocarbons;
 - j. contact information, Nunavut Water Board (867) 360-6338;
 - k. a copy of the NT/NU Spill Report Form and Reporting Guide as referenced;
 - l. the transport of contaminated materials (filter media, sludge, barreled petroleum hydrocarbons) to port for shipment to an approved hazardous waste management facility; and
 - m. transport of treated Waters to the discharge location.
3. The Licensee shall prevent any chemicals, petroleum products or wastes associated with the project from entering Water. All sumps and fuel caches or contaminated Water storage shall be located at a distance of at least thirty one (31) metres from the ordinary high Water mark of any adjacent Water body and inspected on a regular basis.

4. If during the term of this Licence, an unauthorized discharge of waste occurs, or if such a discharge is foreseeable, the Licensee shall:
 - a. employ the approved Spill Contingency Plan;
 - b. report the spill immediately to the 24-Hour Spill Line at (867) 920-8130 and to the Inspector at (867) 975-4295; and
 - c. for each spill occurrence, submit to the Inspector, no later than thirty (30) days after initially reporting the event, a detailed report that will include the amount and type of spilled product, the GPS location of the spill, and the measures taken to contain and clean up the spill site.
5. The Licensee shall, in addition to Part H, Item 4, regardless of the quantity of releases of harmful substances, report to the NWT/NU Spill Line if the release is near or into a Water body.
6. Spills, overfills, and storm water from product transfer areas shall be contained, and treated by the WTF to remove any residual hydrocarbons prior to being discharged.
7. The oil-water separator at the WTF shall be equipped with a spill containment device at the point of oil removal.

PART I: CONDITIONS APPLYING TO ABANDONMENT AND RESTORATION OR TEMPORARY CLOSING

1. The Board has approved the Plan entitled “Abandonment and Remediation Plan Hydrocarbon Impacted Water Treatment” dated September 2013, that was submitted as additional information with the Application.
2. The Licensee shall annually review the approved Plan in Part I, Item 1 and modify the Plan as necessary to reflect changes in personnel, operations and/or technology. Any proposed modifications to the Plan shall be submitted to the Board for review as an addendum to the original Plan.
3. The next annual review of the Plan in Part I, Item 1 shall include or address the following:
 - a. a detailed schedule for temporary abandonment as a contingency measure;
 - b. a detailed schedule for final abandonment.
4. The Licensee shall complete the restoration work within the time schedule specified in the approved Plan, or as subsequently revised and accepted by the Board in writing.
5. The Licensee shall carry out progressive reclamation for any components of the project no longer required for the Licensee’s operations.
6. The Licensee shall notify the Board of its intention to proceed with final abandonment of undertaking at least six (6) months prior to the planned dates of closure.

7. The Licensee shall backfill and restore, all temporary containment sumps, to the pre-existing natural contours of the land.
8. All disturbed areas shall be stabilized and re-vegetated as required, upon completion of work, and restored as practically as possible to a pre-disturbed state.

PART J: CONDITIONS APPLYING TO THE MONITORING PROGRAM

1. The Licensee shall establish and maintain, at a minimum, the following Monitoring Program Stations or as otherwise approved by the Board in writing:

<i>Monitoring Station ID</i>	<i>Description</i>	<i>Frequency</i>	<i>Parameters</i>
THI -1 (Water)	effluent from the WTF to be discharged at the Final Discharge Point	as per part J, Item 4	volume as per Part J, Item 2; Quality as per Part J, Item 4

2. The Licensee shall measure and record in cubic metres, the quantity of Effluent to be discharged from the Water Treatment Facility at monitoring station THI -1.
3. The Licensee shall monitor compliance with respect to Part E, Item 10, by collecting grab samples, representative of the total volume of effluent to be discharged from the Water Treatment Facility at monitoring station THI -1.
4. The Licensee shall sample at Monitoring Station THI-1, at minimum, once prior to each batch discharge event and prior to completion of discharge, and analyze for the following parameters:

pH	Conductivity
Total Suspended Solids	Ammonia Nitrogen
Nitrate – Nitrite	Oil and Grease (visual)
Total Phenols	Sulphate
Total Hardness	Total Alkalinity
Sodium	Potassium
Magnesium	Calcium
Chloride	Total Cadmium
Total Copper	Total Chromium
Total Iron	Total Lead
Total Mercury	Total Nickel
Total Zinc	Total Phosphorous
Total Aluminum	Total Manganese
Total Cobalt	Total Arsenic
Polycyclic Aromatic Hydrocarbons (PAHs)	
Total Petroleum Hydrocarbons (TPH)	
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)	

5. The Licensee shall determine, prior to discharge and upon agreement with an Inspector at any final discharge location, and record the GPS co-ordinates (in degrees, minutes and seconds of latitude and longitude) where treated effluent is discharged.
6. The Licensee shall submit to the Board for review, within sixty (60) days of issuance of this Licence, and after having confirmed the Final Discharge Point location, a Monitoring Plan. The Monitoring Plan shall include but not be limited to the following:
 - a. soil monitoring within the vicinity of the Effluent discharge at the Final Discharge Point;
 - b. monitoring of any nearby Water bodies that may be impacted for the effluent discharge at the Final Discharge Point.
7. The Monitoring Plan referred to in Part J Item 6, shall include Water and soil sampling procedures and chemical analysis and be consistent where appropriate with the Guidance Manual on Sampling, Analysis and Data Management for Contaminated Sites, Volume 1: Main Report (CCME, 1993), and Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil – Tier 1 Method (CCME, 2001).
8. Modifications/Amendments to the Monitoring Plan referred to in Part J Item 6 may be made only upon written request and approval by the Board in writing.
9. The Licensee shall conduct additional sampling and analysis by the request of an Inspector.
10. All sampling, sample preservation and analyses shall be conducted in accordance with methods prescribed in the current edition of Standard Methods for the Examination of Water and Wastewater, or by such other methods approved by the Board in writing.
11. All analyses shall be performed in a laboratory accredited according to ISO/IEC Standard 17025. The accreditation shall be current and in good standing.
12. The Licensee shall submit, within three (3) months of Licence approval, to an Analyst for approval, a Quality Assurance/ Quality Control Plan that includes requirements for independent third party sampling and analysis. This Plan shall be developed in accordance with the *1996 Quality Assurance (QA) and Quality Control (QC) Guidelines for Use by Class "A" (INAC)*.
13. If the Analyst does not approve the Plan referred to in Part J, Item 12, the Licensee shall revise the Plan and resubmit to the Analyst for approval within thirty (30) days of notification by the Analyst.
14. The Board shall be notified of the Analyst decision with respect to the QA/QC Plan referred to in Part J Item 12 and 13.
15. The Licensee shall include summaries and an interpretation of all the data and information required by the "Monitoring Program" (required under Part J) in the Annual Report as per Part B, Item 1.

16. The Licensee shall submit to the Board for approval in writing, at least sixty (60) days prior to temporary or permanent suspension of normal site activities, a Post-closure Monitoring Plan that includes information on monitoring requirements of the Water Treatment Facility and site Water management.

APPENDIX D

NPC DETERMINATION

From: Christopher Tickner [ctickner@nunavut.ca]
Sent: July 26 2013 10:15 AM
To: Philippe Simon
Cc: Brian Aglukark
Subject: RE: land use plan conformity determination

Good morning Mr. Simon,

Re: land use plan conformity determination

Thank you for your email.

The Nunavut Planning Commission (NPC) has determined that the project proposal as described below is located outside the boundaries of the two approved land use plans currently administered by the NPC.

No further review is required by the NPC at this time.

Please ensure that any change in scope of the proposed project is forwarded to the NPC so as a determination can be made as to whether a conformity review is required.

Please contact me should you have any questions.

Sincerely,

Christopher

Christopher Tickner MCIP, RPP
Senior Planner
Nunavut Planning Commission
P.O. Box 2101 Cambridge Bay, NU X0B 0C0
Phone: (867) 983-4634
Fax: (867) 983-4626
Website: www.nunavut.ca

From: Philippe Simon [<mailto:psimon@sanexen.com>]
Sent: July-25-13 9:12 AM
To: Christopher Tickner
Subject: land use plan conformity determination

Hi Christopher,

The project for which we will be applying for a water licence is for:

The treatment of hydrocarbon contaminated water resulting from fuel spill (contact water) or from the cleaning of fuel tanks. The impacted water is collected in tanks and haul to a facility located in the industrial district of Iqaluit, and then pumped through various filters and

treatment system prior to be containerize, tested, and discharge if it meet the proper parameters.

The coordinates for the project are:

NW:	Latitude: (63 °46 '21 " N)	Longitude: (68 °33 '34 " W)
NE:	Latitude: (63 °44 '10 " N)	Longitude: (68 °25 '20 " W)
SE:	Latitude: (63 °43 '18 " N)	Longitude: (68 °26 '26 " W)
SW:	Latitude: (63 °44 '27 " N)	Longitude: (68 °34 '30 " W)

Regards,

Philippe Simon, P.Eng., Ph.D.
Managing director



Iqaluit & Montreal
Toll Free: 1-866-634-6367 x 201
Tel: (514) 940-3332 x 201
Cell: (514) 779-3332
www.qenv.ca



Pensez vert, est-ce nécessaire d'imprimer ce message? Think green, is it really necessary to print this message?



November 24, 2015

Jaida Ohokannoak
Manager, Technical Administration
Nunavut Impact Review Board
P.O. Box 1360, Cambridge Bay, NU X0B 0C0
By email: info@nirb.ca

Jamessee Moulton
Pollution Prevention Specialist, Environmental
Protection
Government of Nunavut Department of
Environment
PO Box 1000, Station 1360, Iqaluit, Nu X0A 0H0
By email: Jmoulton@gov.nu.ca

Harry Flaherty, President
Olivier Simard B.SC., Project Manager,
Environment
Qikiqtaaluk Environmental Inc.
1571B, Kakivak Ct. PO Box 11443
Iqaluit (Nunavut) X0A 0H0 Canada
By email: osimard@genv.ca

Phyllis Beaulieu, Manager of Licensing
Nunavut Water Board
PO BOX 119, Gjoa Haven, NU X0B 1J0
By email: licensing@nwb-oen.ca

Dear Ms. Ohokannoak, Mr. Moulton, Mr. Flaherty, Mr. Simard, Ms. Beaulieu:

RE: NPC File # 148158 Iqaluit Land Farm (Qikiqtaaluk Environmental New Lot Development)

The Nunavut Planning Commission (NPC) has determined that this project proposal is outside the area of an applicable regional land use plan. The project proposal requires screening by the Nunavut Impact Review Board (NIRB) because it does not belong to a class of exempt works or activities set out in Schedule 12-1 of the Nunavut Land Claims Agreement (NLCA).

By way of this letter, the NPC is forwarding the project proposal to the NIRB for screening. Project materials are available at the following address:

<http://npc.strata360.com/portal/project-dashboard.php?appid=148158&sessionid=>

This decision applies only to the above noted project proposal as submitted. If there is a significant modification to the project proposal, the proponent is required to re-submit the modified project proposal to the NPC. For reference, a significant modification may include:

- Any change to the location of the work or activity;
- Any change to the type of land use;

- Any change to the timing of the work or activity (e.g. seasonal changes);
- An increase or modification in a work or activity that, for example, requires changes to a land use permit from Class B to Class A or a water licence from Type B to Type A;
- Any change that disqualifies a project proposal from a previously applicable NIRB screening exemption provided in NLCA Schedule 12-1.

This list is non-exhaustive and is simply an example of what the NPC may consider to be “significant modifications” from a land use planning perspective.

If you have any questions, please do not hesitate to contact me at (867) 857-2242.

Sincerely,

Peter Scholz
Senior Planner,
Nunavut Planning Commission

APPENDIX H

CERTIFICATE OF INCORPORATION AND BUSINESS LICENCE



Industry Canada

Industrie Canada

**Certificate
of Incorporation****Canada Business
Corporations Act****Certificat
de constitution****Loi canadienne sur
les sociétés par actions**

QIKIQTAAALUK ENVIRONMENTAL INC.

609567-4

Name of corporation-Dénomination de la société

Corporation number-Numéro de la société

I hereby certify that the above-named corporation, the articles of incorporation of which are attached, was incorporated under the *Canada Business Corporations Act*.

Je certifie que la société susmentionnée, dont les statuts constitutifs sont joints, a été constituée en société en vertu de la *Loi canadienne sur les sociétés par actions*.

Director - Directeur

May 12, 2003 / le 12 mai 2003

Date of Incorporation - Date de constitution

Canada

APPENDIX M

ABANDONMENT AND REMEDIATION PLAN



ABANDONMENT AND REMEDIATION PLAN ENVIRONMENTAL WASTE PROCESSING FACILITY

Document presented to



Manager of Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven (Nunavut) X0B 1J0
Telephone: (867) 360-6338
Fax: (867) 360-6369
Email: licensing@nunavutwaterboard.org

February 2016

O/Ref.: QE15-102-2



1. INTRODUCTION

In August 2014, Qikiqtaaluk Environmental (QE) obtained a Water Licence for the operation of a water treatment system in Iqaluit. The system manages and treats hydrocarbon impacted water, typically resulting from spills and fuel tank clean-up activities. When spills occur while snow is still present, impacted snow and ice must be containerized and properly stored, treated only once it has melted, and then discharged. Snow and water during spills must be properly managed and removed from the environment to minimize additional impacts to the soils.

A Water Licence Amendment Application and Nunavut Impact Review Board (NIRB) application are submitted to address additional activities to be undertaken at the facility in Iqaluit. These additional activities include an increase in the types of contaminants to be removed from impacted water, the construction of a water holding pond and the addition of a hydrocarbon impacted soil treatment facility. The present abandonment and restoration plan will also include any waste stored on-site to be shipped south for disposal.

2. ABANDONMENT AND REMEDIATION PLAN OBJECTIVES

The general abandonment and remediation goals of this plan are to:

- Ensure the long-term physical and chemical stability of the project area(s) so as to protect the public's health and safety;
- Enhance natural recovery of the disturbed area(s) to a state that is compatible with original conditions to allow for future use by people and wildlife;
- Ensure that the requirement for long-term maintenance and monitoring is minimized.

The purpose of the present Abandonment and Remediation (AR) Plan is to address all project-related activities.

3. PROJECT DESCRIPTION

An application for a Water Licence Amendment and NIRB Application are being submitted for the additional activities, which QE anticipates implementing as soon as the Amended License(s) are granted.

3.1 Water Treatment

The water treatment system will continue to be powered by electricity. Petroleum products recovered from water treatment are incinerated in a waste oil furnace or placed in drums, labelled and shipped to an authorized disposal facility in southern Quebec. The treated water effluent is tested for water quality parameters and disposed of at a pre-approved discharge location, following compliance with discharge criteria.

3.2 Soil Treatment

Petroleum hydrocarbon contaminated soils will be treated on-site using biological, chemical, and physical treatment techniques.

Contaminated soils will be temporarily stockpiled in a lined and bermed processing area. The processing area will also be used for the physical treatment of soils and will involve soil screening, to remove coarse materials, followed by washing of the screening rejects. Water from the washing process will be redirected to the water treatment facility.

Contaminated soils will be treated using biological degradation methods (landfarming or biopiles) in a lined and bermed treatment area. Biotreatment is effective for the elimination of PHC F1¹ and PHC F2² and to a lesser degree PHC F3³. Soil treatment by chemical oxidation using an oxygen source (e.g., hydrogen peroxide solution, sodium persulfate, sodium percarbonate) may also be carried out in the treatment area. Treatment by chemical oxidation is effective for the elimination of PHC F3.

3.3 Hazardous Waste Management

Hazardous waste management activities conducted at the waste transfer station include:

- Waste identification, segregation and consolidation;
- Volume reduction;
- Waste packaging and labelling;
- Temporary safe storage inside marine containers.

Annually, stored waste containers are shipped south to an authorized facility for final disposal.

1. Petroleum hydrocarbon Fraction 1 (C₆ to C₁₀)
2. Petroleum hydrocarbon Fraction 2 (> C₁₀ to C₁₆)
3. Petroleum hydrocarbon Fraction 3 (> C₁₆ to C₃₄)

4. FINAL ABANDONMENT

Should QE's treatment systems no longer be functional or in the event QE decides to cease these activities and/or withdraw from this market, the water and soil treatment systems will be dismantled and removed from the site.

Any spent water treatment filtration media will be containerized and shipped south for disposal in an authorized facility. If any untreated water or soils remain once the activities are ceased, they will be transferred into drums or larger containers, and shipped south for disposal in an authorized facility.

Upon final abandonment, soils at the following locations will be sampled and analyzed to assess quality and determine management options:

- Treated water discharge point;
- Area beneath the impacted soils storage and processing area;
- Area beneath the soil treatment area;
- Hazardous waste storage and processing areas;
- Sediments at the bottom of the water holding ponds.

The sediments at the bottom of the water holding ponds will be sampled and analyzed. If contaminated soils or sediments are present, they will be excavated, containerized and shipped south for disposal at an authorized facility.

All stored hazardous waste containers will be shipped south to an authorized facility for final disposal. The empty hazardous waste storage containers will be cleaned, and, if required, decontaminated prior to removal from the site.

All other structures, including trailers and containers, will also be removed from the site.

5. MONITORING

Once activities on the site have ceased and all stored waste, contaminated water and contaminated soils have been removed from the site, no further monitoring will be carried out, as there will no longer be a source of contamination on the site.

APPENDIX N

OPERATIONS MANUALS

OPERATION AND MANAGEMENT PLAN

CONTAMINATED WATER TREATMENT UNIT

Privileged and confidential document presented to



Manager of Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven (Nunavut) X0B 1J0
Telephone: 867 360-6338
Fax: 867 360-6369
Email: licensing@nunavutwaterboard.org

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February 2016

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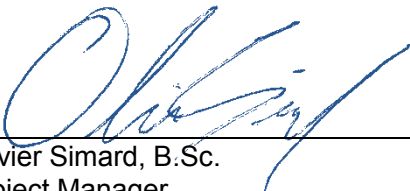


OPERATION AND MANAGEMENT PLAN CONTAMINATED WATER TREATMENT UNIT

Privileged and confidential document presented to


NUNAVUT WATER BOARD AND NUNAVUT IMPACT REVIEW BOARD

Prepared and verified by:



Olivier Simard, B.Sc.
Project Manager

Approved by:



Greg Johnson, P.Eng., M.Sc.A.
Project Director

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February 2016

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LIST OF ABBREVIATIONS

AST:	Aboveground storage tank
CALA:	Canadian Association for Laboratory Accreditation Inc.
INAC:	Indigenous and Northern Affairs Canada
NWB:	Nunavut Water Board
PHC:	Petroleum hydrocarbons
WTU:	Water treatment unit

1. OPERATION AND MANAGEMENT PLAN

1.1 General

The facility was developed based on a need arising from clients with impacted water and/or snow and ice resulting from spills from storage tanks or water from tank washing. The impacted water is transported to the facility for treatment.

The facility contains a multi-step filtration system to treat the impacted water. Water is initially passed through an oil/water separator and particulate filter to remove free product and suspended solids. Following the initial filtration, water is then circulated through Sanexen's patented ULTRASORPTION™ filters and activated carbon filters to remove organic chemicals. Inorganic contamination may be removed through precipitation or filtration through various media (e.g., ion-exchange resin). The treated water is then stored in clean tanks for sampling and analysis in a CALA certified laboratory to ensure it respects the NWB criteria prior to discharge.

The system will treat hydrocarbon impacted water (including water originating from impacted snow and ice) as well as water impacted by various inorganic (i.e., metals, pH, etc.) and organic (i.e., solvents, glycol, etc.) contaminants. The facility can treat up to a maximum of 15 m³ of water per day. The total storage capacity of impacted water before treatment, as well as for treated water awaiting analysis and discharge, is 30 m³. Berms will be constructed around the tanks storing the contaminated and treated water.

1.1.1 Location

The facility is located on a property in the western part of Iqaluit, in an area referred to as the West 40. The approximate coordinates of the centre of the property are:

Latitude: 63°44'38.22" N

Longitude: 68°32'58.59" W

1.2 Hazardous Liquids Found On-Site and Storage Capacity

No fuel or other hazardous liquids are used during the operation of the water treatment system. Hydrocarbons may be recovered from the oil/water separator, and such waste oil will either be used in a waste oil furnace, or containerized for off-site disposal. The volume of waste oil to be managed from the treatment system varies and is difficult to predict, as it is dependent on the degree of impacted snow/water.

The facility is located in an industrial area of Iqaluit and has a permit from the Government of Nunavut to operate as an authorized hazardous waste transfer station. As such,

Qikiqtaaluk Environmental Inc. (QE) already has spill response materials, additional containers, including tote tanks and overpack drums, in stock and can therefore easily manage any waste oil generated by the treatment system.

All fuel storage containers will be situated in a manner that allows easy access and removal of containers in the event of leaks or spills. Fuel caches in excess of 20 drums will be inspected daily.

For fuel transfer operations with drums of waste oil, 12-volt fuel pumps, gear pumps, diaphragm pumps and hand pumps shall be used.

1.3 Secondary Containment Systems

1.3.1 Water Storage Tanks (Impacted and Treated Water)

A secondary containment system will be constructed around both the treated and impacted water storage tanks to prevent any potential spills of contaminated water. A containment berm will be constructed around the ASTs to serve as a secondary means of containment in the event of a spill.

1.3.2 Recovered Petroleum Hydrocarbons, Liquid Sludge and Waste Filter Media

Petroleum hydrocarbons and free product recovered during water treatment operations will be containerized in closed top 205 L drums for off-site shipment and disposal. Waste filter media is packaged in Quatrex-type containers for off-site shipment and disposal.

Prior to loading on the sealift, waste liquids and filter media will be stored on-site.

1.4 PHC Impacted Soils

During remediation work following a spill, impacted soils are often excavated from affected snow/ice/water source areas. Impacted soils will either be containerized and shipped for off-site disposal at authorized facilities, or treated in the newly-constructed QE soil treatment facility.

1.5 Transport and Disposal of Contaminated Materials

Contaminated materials from treatment operations (filter media, sludge, petroleum hydrocarbons, etc.) are packaged in accordance with applicable regulations and transported by truck to the barging area for shipment and off-site disposal. The truck will be equipped with a spill kit and fire extinguisher and the operator trained in spill response.

To minimize storage time at the beach, materials will be transported to the beach barging area a maximum of one week prior to the arrival of the sealift. Whenever possible, the

fenced Coast Guard Compound will be used to temporarily store the waste prior to loading the ship.

1.6 Transport of Treated Water to Discharge Location

It is not necessary to transport treated water, as water will be discharged at an approved location on the facility property. Should transport eventually be required, based on a change in discharge location, the water will be pumped into a tank located on a roll-off platform. The water will then be transported using a roll-off truck to the discharge location. The truck will be equipped with a spill kit and the operator trained in spill response.

1.7 Treated Effluent Quality Monitoring

Based on the conditions of the water licence (No. 1BR-THI1419), a monitoring station with ID THI-1 (Water) was established to monitor the effluent from the WTU to be discharged at the Final Discharge Point.

One sample is collected at Monitoring Station THI-1 prior to each batch discharge event and prior to completion of discharge. The sample shall be analyzed for the parameters included in Table 1, below.

TABLE 1: Discharge Water Analysis Parameters

Ammonia Nitrogen	Sodium	Total Lead
BTEX ¹	Sulphate	Total Manganese
Calcium	Total Alkalinity	Total Mercury
Chloride	Total Aluminum	Total Nickel
Conductivity	Total Arsenic	Total Phenols
Magnesium	Total Cadmium	Total Phosphorous
Nitrate – Nitrite	Total Chromium	Total Suspended Solids
Oil and Grease (visual)	Total Cobalt	Total Zinc
PAH ²	Total Copper	TPH ⁴
pH ³	Total Hardness	
Potassium	Total Iron	

1. Benzene, toluene, ethylbenzene, xylene

2. Polycyclic aromatic hydrocarbons

3. Measure of acidity or alkalinity

4. Total petroleum hydrocarbons

The monitoring of the water quality in the drainage ditch located at the perimeter of the property will be carried out in accordance with the water quality monitoring program presented in the Environmental Protection Plan.

Among the parameters to be monitored, Table 2 presents the maximum allowable concentrations of any grab sample to be met before discharge.

TABLE 2: Maximum Allowable Concentrations

Parameter	Maximum Allowable Concentration of any Grab Sample (mg/L)
pH ¹	6.5 to 9 (pH units)
TSS ²	50
Oil and Grease	15 and no visible sheen
Total Lead	0.001
Benzene	0.370
Toluene	0.002
Ethyl benzene	0.090

1. Measure of acidity of basicity

2. Total suspended solids

1.8 Soil Quality Monitoring

In addition to effluent quality monitoring, yearly soil sampling will be carried out at the Final Point of Discharge to ensure that the water treatment activities are not causing a negative impact on the surrounding environment.

1.9 Operation of the Water Treatment Unit

The water treatment unit is operated as follows:

1. Water is collected in the holding tank and allowed to settle for a minimum of 24 hours;
2. Any free product floating on the surface of the tank will be pumped off into sound drums for disposal;
3. If the water has known metal contamination, then the appropriate treatment for the metal contamination is done in the holding tank, either by precipitation through pH adjustment or using an ion resin;
4. A flocculant is added to the water to remove any suspended particles;
5. An air compressor is started and the water is pumped into the oil/water separator;
6. Once the oil/water separator is filled, water is pumped into the intermediate holding tank;
7. Should the water not show any signs of free product, it is then pumped through the filters to remove the contamination, and into the treated water holding tank;
8. The water is checked for clarity and if it appears to have been properly treated, it is pumped into a clean holding tank to be tested prior to discharge;

9. At no time should the pressure in the system rise above 10 psi;
10. The system must be monitored at all times during operation until the automated shut-off system is connected and fully tested to ensure that it is operating properly;
11. Treated water is then sampled and sent to a CALA accredited laboratory for analysis. If results meet discharge criteria, then they are submitted to an INAC Water Resource Officer and permission is requested for discharge. Once permission is obtained, the water is discharged at the authorized discharge location;
12. Should water not meet the discharge criteria, it is treated until the discharge criteria are met.

OPERATION AND MANAGEMENT PLAN SOIL TREATMENT FACILITY

Document presented to:



and



FINAL

February 2016

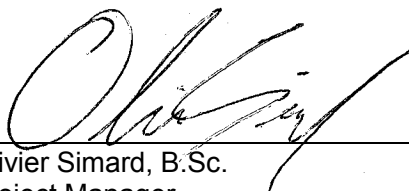
O/Ref.: QE15-102-2

OPERATION AND MANAGEMENT PLAN SOIL TREATMENT FACILITY

Document presented to:


***NUNAVUT WATER BOARD
AND
NUNAVUT IMPACT REVIEW BOARD***

Prepared by:



Olivier Simard, B.Sc.
Project Manager

Verified by:



Greg Johnson, P.Eng., M.Sc.A.
Project Director



February 2016

O/Ref.: QE15-102-2

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LIST OF ABBREVIATIONS

BTEX:	Benzene, toluene, ethylbenzene and xylenes
CO ₂ :	Carbon dioxide
HDPE:	High-density polyethylene
m.t.:	Metric tonne
MAH:	Monocyclic aromatic hydrocarbons
O ₂ :	Oxygen
PAH:	Polycyclic aromatic hydrocarbons
pH:	Measure of acidity or alkalinity
PHC:	Petroleum hydrocarbons
psi:	Pounds per square inch
psig:	Pounds per square inch gage
PVC:	Polyvinyl chloride
T:	Temperature

1. INTRODUCTION

1.1 General

This facility was developed based on a need arising from clients with hydrocarbon contaminated soils resulting mainly from heating oil spills (e.g., from storage tanks and furnaces). The impacted soils will be transported to the facility for treatment.

This manual describes the operation of a treatment facility designed to serve primarily Iqaluit, with the potential of eventually serving other smaller communities in Nunavut. The treatment facilities are designed to provide an economical solution for the management of soils contaminated by petroleum hydrocarbons.

The process brings about a permanent solution to contamination issues. The contaminants are destroyed primarily through biological mineralization; but may also be treated by chemical oxidation. Physical treatment steps (e.g., screening and rock washing) will also be used to reduce volumes of soils to biotreated.

The treatment facility will use biopiles or landfarming to effect the elimination of contaminants and improve the overall quality of soils for re-use.

The soils to be treated will arrive by truck. Upon arrival, the soils will be directed either to the treatment pad or to the interim storage area.

If a weigh scale is available for the trucks, then empty trucks will be weighed at the beginning and end of each work day (or at the beginning and end of the work) to determine an average empty weight. All the trucks carrying soils/waste will be weighed prior to entering the Site to document the tonnage of materials received and processed at the treatment facility, for the purpose of reporting to regulatory authorities and invoicing. If a weigh scale is unavailable, then the volume of the truck box will be measured and invoicing will be based on the percentage of the filled truck box.

The treatment facility design is derived from the know-how of Qikiqtaaluk Environmental Inc.'s (QE) partner Sanexen Environmental Services Inc. (Sanexen) through their 22 years of experience in the execution of biotreatment projects, and from the combined experience of its shareholders and senior employees. Sanexen has performed on-site biotreatment projects for many clients over this period and manages and operates a permanent biotreatment facility in Saint-Amable, Quebec (*Solum Environnement (2010)*).

The target contaminants are mostly PHCs, including BTEX, MAHs and PAHs.

The treatment facility design is organized for optimal production, effectiveness, and simplicity. The selection of durable, long-life materials, involving greater capital costs, is a design choice that confers many operational advantages over the mid- and long-term. Such design choices translate into assets for effective operations.

The base scenario is for a treatment capacity of 1,000 m.t. per year. The facility includes a treatment pad and a storage/processing area. The latter will also be used for pre-treatment (i.e., screening, rock washing, separation of metals and debris, etc.) if necessary.

The system is designed to be operational during the summer and early fall seasons.

1.2 Location

The facility is located on a property in northwestern Iqaluit. The approximate coordinates of the centre of the property are:

Latitude: 63°44'38.22" N

Longitude: 68°32'58.59" W

2. DESCRIPTION OF SYSTEM COMPONENTS

Air is generally withdrawn from the biopiles using a piping network connected to a water recovery and circulation system. Air (heated or not) may also be pushed into the biopiles. A circulation of air is thereby established through the soils with blowers and the piping network. The piping network is composed of secondary aeration pipes (slotted or perforated) beneath the biopiles, and of main plain pipes that direct the fluids toward the water recovery system.

The air withdrawn from the biopiles is directed to an air/water separator. The collected water is transferred to a storage pond.

An underground leachate (water leached and drained from the soil/waste) catchment basin is used to collect water from the biopiles. A submersible pump in this catchment basin directs the water to the storage pond.

2.1 System Components

Below is a list of the system's main components:

- Marine container with a blower, an electrical panel and fan for internal aeration;
- Water/air separator with automated water transfer to the storage pond;
- Submersible pumps;
- Water collection pond;
- Main plain pipe, 8" diameter with unions and caps (PVC, Schedule 40);
- Secondary pipes, plain and slotted, or perforated, with unions and caps (PVC, Schedule 40);
- Semi-permeable liners for covering the soil piles;
- Straps and anchors to hold the covering liners in place;
- Hot wire anemometer;
- Thermocouples and a digital reader.

A description is presented in the following sections.

2.1.1 Container with the Blower

The treatment of soils in biopiles requires an air circulation system that is sufficiently powerful to force the air through the semi-permeable liner, the soils and the piping. A calibration of the flowrate provided by the blowers is necessary to obtain the desired treatment performance; valves will help to adjust this flowrate according to the needs.

2.1.2 Air/Water Separator and Water Collection Pond

Some water will drain from the soils undergoing treatment and will be collected with the air withdrawn from the biopiles. More water is collected at the beginning of treatment. A cylindrical concrete catchment basin (a sewer-type concrete cylindrical manhole) is adapted to effect this task. Water is collected by gravity at the bottom, while air is drawn from an outlet at the top. A submersible pump, activated by a float, with a check valve at the discharge, periodically transfers the water to the storage pond where the water will be re-used to condition the soils. The air/water separator is positioned underground to allow gravity flow to it and to prevent freezing during cold weather operations.

A water collection pond is installed at the low point between the treatment pad and the processing/storage area. The pond is equipped with a submersible pump to direct water back onto the soil piles or to direct excess water to the water treatment unit.

2.1.3 Water Storage Pond

The water storage pond is watertight and constructed of a minimum 30 mil thick HDPE liner, or similar, covered and underlain by a protective geotextile liner. The water storage pond has a capacity of 41 m³ to store enough water in the case of major precipitation. The leachate water from the soil pile and water from the air/water separators discharges to this pond.

The biopile normally operates with a deficit of water because of the moisture entrainment by the air that is circulated through the soils. However, a sufficient buffer capacity is needed for water because:

- Soils received may occasionally be wet;
- Soils are exposed to rain when the covers are removed during mechanical handling;
- A sufficient quantity of water is needed to condition the soils.

It should be noted that the mixing soils with amendments and the additive solution is normally delayed in the event of rain. In the event of excess water in the pond, water is sprayed on the drier soils during the following days. Excess water may also be directed to the water treatment unit.

2.1.4 Secondary Air Piping

Secondary air pipes are positioned at the base of the soil pile. The 2" diameter perforated pipes have a predetermined profile and are made of PVC approved for temperatures up to 60°C. The sections are joined with synthetic rubber unions. These unions allow the desired flexibility and resilience for the assembly, particularly with respect to contraction and expansion due to temperature fluctuations. The perforation profile is designed to equalize the airflow rates across the width of the biopile.

The secondary pipes are covered with ¾" gravel that acts as a "plenum", or a transition between the soils and pipes and allow better air distribution.

2.1.5 Treatment Pad

The maximum practical height for a biopile is 2 to 3 m. Piling soils higher than 3 m will lead to a faster compaction of the soils and a loss of efficiency (because of the loss of soil permeability to air and moisture), forcing a remixing of the soils (or more frequent remixing of the soils if the treatment period is long) for bulking purposes.

The treatment pad is watertight and constructed using a minimum 30 mil thick HDPE liner or similar, covered and underlain by a protective geotextile liner and further protected by a 0.3 m thick layer of clean gravel.

The outer edge of the treatment pad will have an elevated berm around the perimeter (6" above the interior grade) to prevent soil or water loss. The base of the treatment pad is built with a slight slope toward a water collection drain. The water is collected with a corrugated plastic agricultural drain that is installed in a depression along the berm. The drain is surrounded and covered with ¾" gravel and directs the collected water/leachate toward the water collection pond.

2.1.6 Storage and Processing Area

The soil storage and processing area is used for the temporary storage and screening of soils as well as rock washing. This processing area may also be used for containerization of non-treatable soils prior to off-site shipment for disposal in authorized facilities.

The storage and processing area is also watertight and made of a minimum 30 mil thick HDPE liner, or similar, covered and underlain by a protective geotextile liner and further protected by a 0.3 m thick layer of clean gravel.

The outer edge will be composed of an elevated berm (6" above the interior grade) around the perimeter to prevent soil or water loss. The fourth side is elevated with respect to the opposite side so that leachate (water draining from the contaminated soils) flows by gravity toward the water collection pond.

The base of the pad is built with a slight slope toward a water collection drain. The water is collected with a corrugated plastic agricultural drain that is installed in a depression along the berm. The drain is surrounded and covered with $\frac{3}{4}$ " gravel and directs the collected water/leachate toward the water collection pond.

2.1.7 Covering Liners

Semi-permeable liners are used to cover the soils in treatment. One reason for using a cover is to ensure the confinement of contaminants, especially dust, that would otherwise be carried by wind erosion. The liner also acts as a vapour barrier for volatile contaminants. The pressure gradient across the liner, with the air moving downward through the interstices, prevents the loss of volatiles. Another important reason is to allow an even and appropriate diffusion, to the top of the biopiles, of air, to properly oxygenate the soils, and water, to maintain the desired moisture content in the soils.

The liners are woven to allow the infiltration of air and, as needed, a limited quantity of water for the biotreatment.

The black colour helps to absorb heat from sunlight and to maintain proper soil temperatures. The liners are also instrumental in preventing the soils from becoming too wet, which may slow or completely stop the treatment process.

2.1.8 Storage Containers

Marine containers present on-site are used to store tools, spare pipes, fittings and various equipment necessary for the proper operation of the soil treatment facility.

3. DESCRIPTION OF TREATMENT OPERATIONS

The soil treatment facility operation requires the coordination of several aspects to optimize efficiency and throughput. Soils received by road would have a transport manifest completed in compliance with the regulatory and commercial requirements for the facility. An authorization number must be issued by the site manager or his delegate prior to transportation and prior to receipt of soils at the centre. This number allows for the tracking of the origin, anticipated quantities, type(s) of contamination and other relevant information concerning the soils. The shipper should notify the treatment centre a minimum 24 hours prior to site work. This delay is important to avoid the double handling of soils upon arrival. Without an authorization, the load of soils cannot be accepted and must be held over until it is accepted or returned. The person responsible for issuing the authorization should make the necessary arrangements with the shipment supervisor to adequately plan the receipt and acceptance of future soil shipments.

Once through the gate of the treatment facility, after the vehicle has been weighed, the truck driver remits the manifest to the foreman, or his designated alternate, so that the soils can be directed to the proper location according to nature and contaminants. The truck unloads the soils; alternately a backhoe transfers the load of soils. If insufficient information is known about the soils, the load is placed in the interim storage area. The interim storage area may also be used if the treatment pads are full. In all instances, the soil is inspected upon discharge to check for the nature of the soils, the extent of the contamination, the presence of mixed waste and/or debris, and any anomalies. Representative soil samples are taken and analyzed.

If enough information is known about the soils, they are immediately conditioned with the appropriate amendments and nutrient solution. The Site supervisor will log the location where the soils are unloaded and will create space allotments for soils of a similar nature to monitor large batches.

Finally the empty truck is weighed to obtain the net quantity of soils received.

During piling, composite samples are taken for each batch¹ of soils received. This composite sample is analyzed for internal purposes to obtain an average initial concentration for the soil undergoing treatment. A duplicate is refrigerated and stored and may be further analyzed for quality control purposes.

The conditioned soils are covered with a semi-permeable cover and, if there is a sufficient quantity of soils (more than ~500 m³), the blower is started to establish the desired air circulation through the soils.

1. A batch normally represents a quantity of soils of the same origin and nature; a batch can be 10 truckloads, for example.

After a treatment period pre-determined in accordance with the concentrations and other soil characteristics, the batches are again sampled and analyzed. Depending on the results, the soils will either be sampled according to the official protocol for declassification that denotes the end of treatment, or will be subjected to further treatment.

The system has been designed to operate 24 hours per day and 7 days per week.

3.1 Installation and Commissioning

The installation of the various structures and equipment is fairly straightforward. The treatment and storage pads, as well as the water collection pond, are first constructed with proper slopes and peripheral berms. The air/water separator is positioned partly below ground, with the inlet positioned to respect the slope and orientation of the treatment pad's main air pipe.

The blower container is positioned and connected with 8" diameter main PVC piping for the processing of air. It is important to install drains at low points to prevent water accumulation and problems due to freezing. The piping is connected by screwing the threaded extremities, or the use of a union or a flange with a gasket.

The pumps and associated piping and valves are installed to direct the water to the collection pond and to circulate/pump out the water from the pond. Drains are installed at the low points of the circuit and vents at the high points of the circuit, again to empty the lines and prevent freezing, when necessary. A small air compressor may also be used to displace water from the lines, when necessary, with an air connection just downstream of the check valves.

The isolation valves, drain and vent valves, pressure and temperature gauges and tracing and insulation are installed where required.

Before system start-up, each of the components of the system is individually verified, and for each mode. A training period is also necessary with respect to health and safety at the site and to familiarize personnel with the system and the operating procedures, including spill response and other emergency response procedures. A hazop¹ study may also be conducted as part of the preparation (e.g., understanding what happens under conditions of low flow/high flow/no flow at various locations under various conditions and what problems/hazards may follow. The same can be performed for pressures, levels, concentrations, etc.).

1. Hazard and operability

3.2 Procedures for System Operation

The training program must be carried out so that operational procedures are well understood and subsequently implemented for the efficient operation of the treatment system. The system should be balanced to minimize pressure loss through the equipment train and ensure proper water drainage. System operation focuses primarily on the air blower, air/water separator, but also on the secondary piping and air control valves.

3.3 Sampling and Analytical Procedures

Typically, one representative composite sample per 250 m³ of treated soils, composed of 5 subsamples, will be collected for testing by a certified laboratory to quantify the concentrations of the target contaminants, with 10% duplicates for quality control, for acceptance of a batch of soils.

Daily or weekly sampling and testing may be performed on water and soils using on-site detectors, testing kits and other analytical instruments.

3.4 Treatment Procedures

When running a soil treatment facility, operational principles and procedures should be respected to avoid compromises and errors that may occur with repeated arrivals. Interpretation of the results, piling, mixing, treatment and re-use/disposal are all operations that require a great deal of coordination.

3.4.1 Assessment of the Results

A proper assessment of the results is key to making good treatment decisions. Biological indicators (CO₂, T, bacterial count, pH, nutrients, and moisture) should be monitored to ensure that operating conditions are optimal. Interim measurements of contaminant concentrations will help to plan if and where an additional treatment effort, such as the remixing of some soils with or without amendments, is warranted and to plan final sampling for the acceptance and removal of treated soils.

3.4.2 Pile Preparation

Piling simply consists of the reception of soils on the treatment pad, regardless of the origin of the soils. The soils are placed on a section of the pad, using the excavator, one load after another. This step is crucial for treatment and should be performed with care. The success of the treatment is largely due to the quality of piling. Taking the time to adequately place/position the contaminated soils in the pile decreases the possible requirement of repeatedly remixing the soils thereafter.

Piling is performed by section, between 2 secondary conduits. The excavator starts in one corner, on the side of the first section at the back of the treatment pad (where the 6" berm is located). The excavator fills the section up to the front of the treatment pad and continues to place another row of soil by starting at the back again.

The steps to properly set up a pile are the following:

- Prepare in advance the nutrients (powder or solution) and the pump and hose system to spray the liquid suspension on the soils;
- Place the organic amendment within reach of the excavator for a section on the pad to facilitate mixing the amendment with the soils;
- Sample a composite of the soils prior to conditioning;
- Add the nutrients. If the soils are too wet for spraying, place the solid fertilizer alongside the organic amendment for mixing into the soils; the fertilizer may be mixed beforehand with part of the organic amendment;
- Remove any large debris (metal, concrete, wood, etc.);
- Using the excavator, pick up the contaminated soils, with amendment laid on its surface, and place it in the designated area or section,
- Drop the contaminated soils from a height of approximately 3 m to fracture lumps and distribute/mix additives (amendments, nutrients);
- Pile soils to a maximum height of 3 m and flatten the top of the pile (3,2 m high because 0,2 m serves to fill depressions);
- Open the 2" valves on the secondary conduits when each 450 m³ pile of contaminated soil has been placed in position in a section;
- Repeat these operations until the end of soil reception or until all spaces on the treatment pads are occupied.

Once the soils are in place, heavy machinery must not roll over the soils so as to maintain good bulking and to prevent soil compaction (thus reducing the circulation of air and the transfer of oxygen).

3.4.3 Covering Liners

When enough soils have been placed in piles, a covering liner is installed. The liner is installed using the excavator and 2 to 3 labourers. Sand bags are placed on the liner (top and base of the pile) to secure the liner and prevent the wind from displacing or tearing it.

Installing or removing the liners when there is a strong and/or unpredictable wind may constitute a safety hazard. If a liner is loose or has folds, the risk of tears is high. It is also why the top of the biopile should be as straight and as flat as possible.

The supervisor should be aware of the direction of the strong prevailing winds. The liners should be superposed over a one-metre width and in a way such that the wind will not enter the junction and lift a liner. The liners can be knit if there is a tear and can be repaired with glue-on patches if there is a hole.

3.4.4 Treatment

3.4.4.1 *Biological Treatment*

Treatment begins when the soils are conditioned and forced aeration is initiated in the biopile. Much water is withdrawn from the soils during the first days of biotreatment. The collection pond should be maintained at approximately half level, if possible. It should not be completely emptied, as water will be needed during a dry period. If too full, there is a risk of overflow. Taking into account weather forecasts and the water inventory, it is possible to schedule the soil conditioning events so as to receive as much water as possible from the biopiles.

The soil temperature should increase significantly during the first week following conditioning. To monitor the evolution of bacteriological activity, daily temperature measurements are taken in the air withdrawn from the pile. A main goal is to increase microbial activity, associated with the growth (using hydrocarbons and nutrients) and internal metabolism (using mostly hydrocarbons) of the bacteria, so they use as many organic contaminants as possible as a source of carbon and food.

To obtain optimal treatment, the following conditions must be met:

- A constant supply of oxygen;
- Optimum moisture content;
- Ideal temperature;
- A sufficient initial population of micro-organisms; and
- A sufficient amount of nutrients (nitrate and phosphate).

The bacteria will consume the oxygen, nutrients (nitrate will also be used as an alternate oxidizer in parts of the soils that may not be sufficiently aerated) and the hydrocarbons or other contaminants to be biodegraded. The biological reaction will in turn generate additional biomass, heat and CO₂.

The presence of CO₂ is a positive sign of biological activity. A 4-Gas detector is used to take readings of O₂ and CO₂ concentrations at connections along each valve of a secondary conduit.

3.4.4.2 Chemical Treatment

Treatment of soils by chemical oxidation consists of adding and mixing an oxidizing agent (i.e., sodium persulfate) into the contaminated soil pile. The soil pile is then covered and left for a few weeks to passively treat. No air circulation is required.

3.4.5 Sampling

After the anticipated treatment period, a batch of soils is subjected to sampling for internal monitoring. The covering liner(s) are removed. Each section is sampled by collecting 5 subsamples at varying locations and depths to make up a composite sample. The composite is homogenized in a metal pan. For volatiles, grab sampling is used (no subsamples and no compositing) to avoid loss of volatiles during handling. Coarse materials should be removed as per the sampling requirements of the regulatory agency. Duplicate samples are taken during final sampling. Washing/cleaning of the sampling tools is performed as per the requirements of the regulatory agency. Surgical-type nitrile gloves are used and, if they have touched the soils, changed before proceeding to the next section.

Organoleptic indications are documented (noting the appearance and odour of the soils in terms of contamination) and a portable instrument, such as a UV photo-ionization detector, or PID, is used to check for the presence of contaminants. The samples are brought to a table where an experienced technician (ideally the same technician for any given sampling campaign), within the hour, documents the observations and the PID readings.

This interim internal sampling and testing helps to determine which sections need to be mixed and conditioned again and which sections can be subjected to the final certified sampling.

When results indicate that all sections should be remixed/reconditioned, it is carried out as soon as possible.

When the final results indicate that the soils have met the clean-up criteria, the liners are again withdrawn to remove the treated soils.

3.4.6 Soil Mixing

The methods of soil mixing are as diverse as there are operators, but some basic rules should prevail:

- Do mix each m³ of the pile, but do not mix the same m³ twice (unless it is very clayey and contaminated, in which case double handling is warranted);

- The excavator should not sit on mixed conditioned soils; if this occurs, the compacted soils should be bulked/mixed to a depth of 1 m;
- Remove significant sized debris or boulders;
- Do not mix together soils from separate soil batches;
- Do not mix together soils from different sections.

The most appropriate method for mixing and bulking the soils is for the excavator to back away from the mixed soils and onto soils that have yet to be mixed.

3.4.7 Re-use or Disposal of the Soils

When the soils reach the treatment objectives, they are directed to their site of re-use (site of origin or other) or disposal (as daily soil cover for sanitary landfill sites, for example). While the soils are loaded on trucks, a visual inspection of the soils is nevertheless performed. Undesirable materials, debris or lumps of soil with leftover contamination may be segregated at that point. Debris may be disposed of separately while soils that may require further treatment are returned to the biopile.

3.5 Waste Management

Waste materials separated from the soils (segregated through screening or otherwise, when it is possible or practicable to do so) should be characterized according to the applicable regulations and should be handled and disposed of accordingly.

Hazardous and non-hazardous waste that cannot be cost-effectively dealt with through biodegradation are shipped off-site to an authorized facility.

3.6 Maintenance and Calibration

The system components require very little maintenance. The instruments and control devices, such as the gauges (pressure, temperature, level), the 4-Gas detector, PID and anemometer should be checked and/or calibrated every year (by the supplier or by a competent technician) or as per the supplier's recommendations. Spare equipment should be available (in stock or rented) to compare readings and verify the exactness of measurements.

3.6.1 Equipment Maintenance

To maintain the efficiency and the safety of the biopile treatment system, all equipment must be inspected on a regular basis to confirm that it is in good operating condition.

The specifications, drawings and manuals pertaining to the various equipment, pumps, blowers, instruments and controls, valves, filters and so on, should be kept at the facility and at the office. Relationships must be established with critical suppliers (blowers) and subcontractors (electrician for example) to allow for rapid troubleshooting, repairs and replacement.

3.6.2 Instrument Calibration

Pressure gauges, for example, are checked against a similar instrument (the standard) whose exactness and accuracy have been verified and certified by the supplier. For example, if a reading of between 38 and 42 psig is obtained when the standard instrument indicates 40 psig, the pressure gauge is accepted for a tolerance of ± 2 psi. The zero is also verified (with the gauge disconnected). The readings obtained are recorded in the calibration log with the date and the initials or signature of the technician. An instrument is normally verified against a value that corresponds to a normal operating condition.

3.7 Monitoring and Management

The monitoring of each batch of soils is important to plan and optimize handling and to ensure conformity with the permitting requirements. Each load of soils received is recorded and monitored from the beginning to the end of processing. The records and documentation at the facility allow for the tracking of each m³ of soils according to its origin. A digital database is used to manage and document the projects (each transaction with a client), soil movement, forms used for receiving and disposal, invoicing, the certificates of analysis and the treatment timetable. The use of different forms helps to trace pertinent information and becomes more important as the transactions grow in numbers.

The traceability of soils and the quality of records are hallmarks of a professional operation and are particularly important for facilitating inspections by the regulatory agency and client audits.

3.7.1 Reception of Soils

Regardless of the origin and the mode of transportation (truck or ship) of incoming soils, the transporter should have a manifest approved by the treatment facility. This manifest indicates the authorization number necessary for the acceptance of the soils, the origin of the soils, the types of contaminants, the expected levels of contamination (according to the classification corresponding to the invoicing unit rates), the approximate quantity, the nature of the soils and waste/debris that may be present, the sample numbers corresponding to laboratory analyses and the transporter's (and/or consultant's, if applicable) identification.

The project manager or client notifies the treatment facility supervisor 24 hours in advance of the shipments to be received on a given day. Proper planning minimizes double handling and standby expenditures.

The employee at the gate records the weight of the loaded truck upon entry at the weigh scale and signs the manifest. After he is notified, the supervisor confirms the area to which the truck driver should go, according to the nature of the soils. The supervisor meets the truck driver, checks and confirms the information, documents on the manifest where the soils were unloaded and signs once unloading has been completed.

The supervisor defines batches according to the origin and nature of the soils and the contaminants and level of contamination. For example, sand contaminated by VOCs will be segregated in a different batch from clay with heavy hydrocarbons, even if the soils originate from the same site.

At the conclusion of the day, personnel will compile all manifests, verify the conformity of the information in the reception log and complete/update the log used to follow soil batches. Mistakes can easily occur when more than a hundred trucks enter and exit the site over the course of a single day.

3.7.2 Uncharacterized Soils

Soils with no analytical results can sometimes enter the facility, as in the case of a spill response requiring immediate disposal. A different reception log is used for uncharacterized soils. These soils are directed to the interim storage pad. A trained technician inspects and samples the soils in accordance with the permit requirements and applicable regulations. The samples are accumulated in different piles according to origin and nature and according to the nature and concentrations of the contaminants. Each pile is covered until the laboratory results are obtained and the destination of the materials has been confirmed.

When the analytical results are obtained, the soils are classified. Soils that do not meet the facility's acceptance criteria are sent off-site to an authorized facility for treatment or elimination. Acceptable soils are directed to the treatment pad. These soils are then entered in the log for characterized soils, the same project number being maintained for soils of a given origin.

A colour code is used to identify the different piles on the interim storage pad. Each pile is identified with a wooden stake, coloured with spray paint, and the origin of soils is written with a permanent marker. Soils that do not meet the permit requirements and/or cannot be cost-effectively treated at the facility are disposed of.

Proper management of uncharacterized soils will contribute significantly to the facility's profitability.

3.7.3 Treatment

For monitoring and treatment management, 2 important tools are the *Treatment Schedule* and the *Batch Description* forms.

The *Treatment Schedule* shows a top view of the treatment pads. Each rectangle in a treatment pad represents a section between 2 aeration conduits. In each section, the batch number, level of contamination and the colour denoting the current step in the treatment process are indicated (*undergoing treatment, to be sampled, to be conditioned, accepted and to be removed*).

Each rectangle is linked to the *Batch Description* form. This form is used to show past and present information for a given batch. Analytical results (contaminant concentrations, moisture, pH, nutrients in leachate) are given, as well as pertinent data (amendments used, nutrients and biomass added, organoleptic indications, temperature and CO₂). This information facilitates decision-making for the treatment strategy.

3.7.4 Re-use or Disposal

When it is time to remove soils that have met the desired criteria, the supervisor issues a manifest to the transporter and completes a disposal log for each outgoing shipment.

The manifest is the form that documents the return of the soils to the site of origin or to the designated site for re-use. Alternatively, it is the form used by the disposal site (for example, the sanitary landfill site that uses treated soils for daily cover over garbage). The batch number and sample identification (indicating soil acceptability) are provided on the form. Data is entered in the disposal log upon each shipment. The compilation of the data at the conclusion of each work day allows to closely monitor a given batch and to proceed with invoicing. The *Treatment Schedule* and the *Batch Description* are updated daily, establishing a good line communication between the treatment facility and the office. Monitoring of a given batch ends when all corresponding soils have been treated, accepted and transported to the re-use or disposal site.

OPERATION AND MANAGEMENT PLAN HAZARDOUS WASTE TRANSFER STATION

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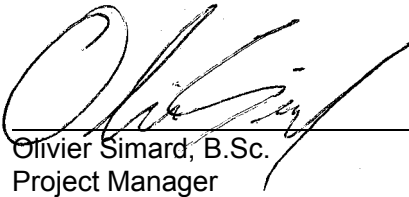


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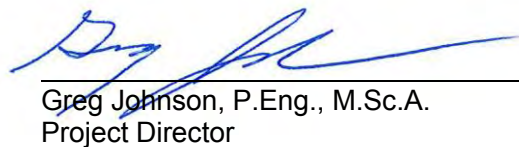
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LIST OF ABBREVIATIONS

GN:	Government of Nunavut
HAZWOPER:	Hazardous Waste Operations
HDPE:	High density polyethylene
IMDG:	International Maritime Dangerous Goods
Imp. gal.:	Imperial gallon
INAC:	Indigenous and Northern Affairs CanadaCode
N.O.S.:	Not Otherwise Specified
PCB:	Polychlorinated biphenyls
pH:	Measure of acidity or alkalinity
RCMP:	Royal Canadian Mounted Police
TDG:	Transportation of Dangerous Goods
TDGR:	Transportation of Dangerous Goods Regulation
UN:	United Nations
WHMIS:	Workplace Hazardous Materials Information System

1. OPERATION AND MANAGEMENT PLAN

1.1 General

The facility was developed based on the need arising from the generation of various types of hazardous waste by clients who are not familiar or comfortable with the regulations pertaining to the proper packaging, safe storage, and authorized disposal of said waste. The hazardous waste is transported to the facility by the client or Qikiqtaaluk Environmental (QE) for temporary storage prior to being shipped off-site to authorized disposal facilities in southern Canada.

Hazardous waste will be stored inside 20-foot marine containers installed on-site. Approximately 10 to 15 marine containers will be used for waste storage purposes.

1.2 Location

The facility is located on a property in Iqaluit. The approximate coordinates of the centre of the property are:

Latitude: 63°44'38.22" N

Longitude: 68°32'58.59" W

2. HAZARDOUS WASTE INVENTORY AND DESCRIPTION

The main types of hazardous waste generated in Iqaluit that may be encountered at and managed by the transfer station are presented in Table 1.

TABLE 1: Hazardous Waste to be Managed

Type of Waste	Composition	Quantity Generated	Treatment Method	Disposal Method
Contaminated Water	Water is tested to meet discharge criteria.	Varies depending on the source of the contaminated water. Our treatment unit can treat a maximum of 15 m ³ /24 hrs.	<ul style="list-style-type: none"> pH adjustment to precipitate metals, polymers used for flocculation; Oil/water separator; Particulate filter; ULTRASORPTION™ filter; Activated carbon filter. 	Discharge on land 30 m from a waterbody in a location approved by authorities having jurisdiction.
Waste Petroleum, Oil, and Lubricants (POL)	Hydrocarbons collected from the settling tank and oil/water separator or from other clients in Iqaluit.	Varies	<ul style="list-style-type: none"> Segregation; Consolidation; Packaging and labelling. 	Ship south for disposal in accordance with regulations or incineration on-site in a waste oil furnace.
Waste filter media from treatment units and used absorbent materials	<ul style="list-style-type: none"> ULTRASORPTION™ (shredded absorbent); Granular activated carbon; Particulate filters; and Absorbents used during spill response. 	<ul style="list-style-type: none"> Varies depending on volume of water to be treated and level of contamination; Maximum 5 m³/yr of each waste type. 	<ul style="list-style-type: none"> Segregation; Consolidation; Packaging and labelling. 	Ship south for disposal in accordance with regulations.
Sludge	Acid and or caustics used for pH adjustment, coagulating agent, metals.	<ul style="list-style-type: none"> Varies depending on volume of water to be treated, metal concentration, and process efficiency; Estimated maximum 15 m³. 	<ul style="list-style-type: none"> Dry; Segregation; Consolidation; Packaging and labelling. 	Disposal in local landfill if meet disposal criteria or ship south for disposal in accordance with regulations.
Contaminated Soils	Soils contaminated by organics and metals.	Varies, maximum 500 m ³ .	<ul style="list-style-type: none"> Soils with organic contaminants: <ul style="list-style-type: none"> treated on-site in a biopile or landfarm after volume reduction if treatment will allow the soils to meet guidelines within a reasonable period of time; 	<ul style="list-style-type: none"> Treated soils can be used as backfill or for other purposes approved by INAC and GN; All untreatable contaminated soils will be transported south for disposal in accordance with regulations.

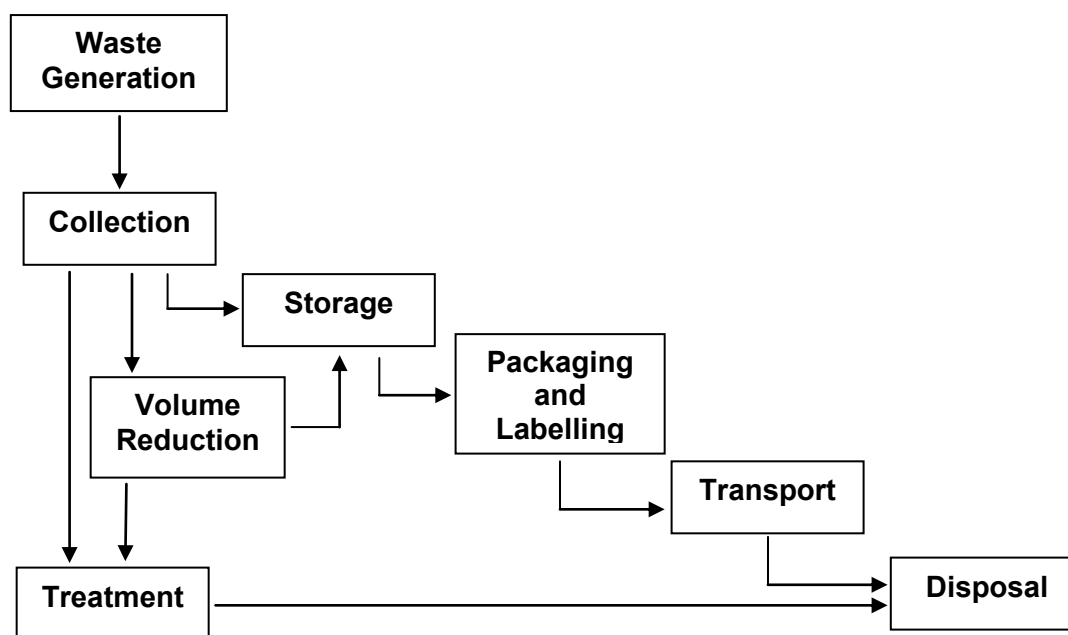
Type of Waste	Composition	Quantity Generated	Treatment Method	Disposal Method
			<ul style="list-style-type: none"> Untreatable organics (such as oil, grease creosote and PCBs): <ul style="list-style-type: none"> volume reduction, packaging and labelling; Metal soils: <ul style="list-style-type: none"> packaged and labelled. 	
Glycols	Antifreeze agents used in machinery and vehicles, as well as waste antifreeze used for de-icing purposes.	Varies according to client needs.	<ul style="list-style-type: none"> Segregation; Consolidation; Packaging and labelling. 	Ship south for disposal in accordance with regulations.
Batteries	Batteries from vehicles and other equipment.	Varies according to client needs.	<ul style="list-style-type: none"> Segregation; Consolidation; Packaging and labelling. 	Ship south for disposal in accordance with regulations.
Paint and/or paint related materials	Waste paint from building construction or demolition.	Varies according to client needs	<ul style="list-style-type: none"> Segregation; Consolidation; Packaging and labelling. 	Ship south for disposal in accordance with regulations.
Regulated Building Demolition Debris	Ballasts, light bulbs, capacitors, thermostats, asbestos.	Varies according to client needs.	<ul style="list-style-type: none"> Segregation; Consolidation; Packaging and labelling. 	Ship south for disposal in accordance with regulations.
Biohazard, medical waste	Medical sharps	Varies according to client needs.	Biohazard packaged in proper Class 8 containers at hospital or health centre.	<ul style="list-style-type: none"> Containers consolidated in a locked marine container; Ship south for disposal in accordance with regulations.

In the future, new types of waste materials may be generated in the community. These materials will need to be evaluated and analyzed to determine if they are hazardous and how they should be managed.

3. HAZARDOUS WASTE MANAGEMENT PROCEDURES

Hazardous waste management begins at the source when hazardous waste items are generated. Waste then proceeds through various steps until it is finally safely disposed of or eliminated. The steps for successful hazardous waste management can be summarized by the following flow chart.

FIGURE 1 : Hazardous Waste Management Steps



3.1 COLLECTION

3.1.1 Transfer Station

Hazardous waste is collected at the Transfer Station, which is a voluntary drop-off site. Waste materials are received by site personnel, inspected, identified (with client code and product ID), classified, segregated and placed on a temporary storage pad.

The Transfer Station will maintain flexible operating hours to allow drop-off of waste materials outside of regular business hours (9 a.m. to 5 p.m.). Waste management technicians will be available on-site to provide guidance and assistance to clients.

3.1.2 Pick-up Services

QE will also offer waste pick-up services. Transport of waste materials from client locations to the transfer station will be carried out by TDGR-trained drivers trained in vehicles equipped for the transport of such materials.

3.2 TREATMENT

The 2 types of waste that will undergo treatment at the transfer station are contaminated water and hydrocarbon contaminated soils. Treatment of water and soils are described in 2 separate Operation and Management plans.

3.3 VOLUME REDUCTION

Specialized equipment will be used to reduce the volume of aerosol cans and fluorescent tubes received at the transfer station.

An aerosol can recycling system will be used to safely puncture the cans. Residual liquid will then be drained into a drum (ready for transport) and the residual gas will be filtered through activated carbon. The 2 main types of residual liquids, flammable (e.g., paints, solvents) and corrosive (e.g., oven cleaners), are segregated and stored in separate drums. Empty aerosol cans (metal) can be further crushed and then recycled.

Fluorescent lamp crushers will be used to reduce the volume of tubes by breaking the tubes into fine glass particles inside a steel drum (ready for transport) while recovering the mercury vapour.

Spent gas filtration media will be sampled and analyzed and managed according to contaminant content. Non-hazardous spent filtration media may be disposed of at the municipal landfill site, while hazardous filtration media will be shipped south for disposal in authorized facilities.

3.4 STORAGE

Proper storage of hazardous waste is critical to ensuring the safety of users and site personnel, as well as regulatory compliance. Storage is a temporary operation that serves to accumulate waste until sufficient quantities are available for off-site shipment, and until marine transport is available (i.e., summer season). The proposed facility will be used for commercial purposes to store hazardous waste for periods that may exceed 180 days or more. Furthermore, the quantity of waste to be stored on-site will exceed the criteria set out in Appendix 8 of the *Environmental Guideline for the General Management of Hazardous Waste*¹, namely for Class 3 materials, and possibly for Class 8 materials.

As stated in the *Environmental Guideline for the General Management of Hazardous Waste*, the proposed hazardous waste transfer station will meet the following requirements:

- The facility will meet all local and territorial sitting and construction requirements and be readily accessible for firefighting and other emergency response requirements. The local Fire Chief will be advised of the storage facility and its contents for emergency planning and response purposes.
- The facility will be secure. Access will be limited to employees who have been trained in safety and emergency procedures. These procedures will be documented and a copy will be made available to employees with access to the facility.
- Containers will be placed so that each can readily and easily be inspected for signs of leaks, corrosion or deterioration. Leaking, corroded or deteriorated containers will be immediately removed and their contents transferred to a sound container.
- Drainage into and from the storage facility site will be controlled to prevent spills or leaks from leaving and run-off from entering the site.
- All waste will be stored on a firm working surface that is impervious to leaks.
- Incompatible waste will be stored in a manner that contact in the event of a spill or accidental release is not possible.
- Emergency response plans will be developed in cooperation with local emergency response personnel and emergency response equipment will be locally available in the event of a spill, fire or other emergency situation.

3.4.1 Transfer Station

Where possible, all hazardous waste received will be handled manually or with a backhoe loader for heavier items.

1. Department of Environment, Government of Nunavut, Original: April 1999, Revised: January 2002, April 2010, October 2010

Hazardous waste will be stored in sound containers approved for the type of material to be stored. The containers will be stored at a location on the site where there is minimal traffic to reduce the risk of an accidental release of the stored material resulting from contact with the storage container. The containers will be placed within the fenced storage yard. The entrance to the yard, as well as each container, will bear placards indicating the waste categories and emergency telephone numbers.

Non-hazardous solid waste, such as contaminated soils, may be stored outdoors in waste wranglers that have been palletted and secured with strapping.

During the winter months, the yard will be cleared of snow to maintain access to the storage containers.

3.5 PACKAGING AND LABELLING

Stored hazardous waste will be packaged in appropriate containers. The selection of the appropriate containers helps to prevent leaks and spills that may result in human exposure or environmental release during the handling, storage and transport of materials. Therefore, containers must be:

- Made of materials compatible with the hazardous waste;
- Filled at, or below, the maximum capacity specified by the manufacturer;
- In good condition (i.e., no excessive denting, corrosion, or wear);
- Able to withstand normal handling (i.e., to prevent spills);
- Approved for transport.

Examples of appropriate containers for hazardous waste storage and transport are listed in Table 2.

TABLE 2: Hazardous Waste Containers

Type of Waste	Container
Small propane and butane tanks	<ul style="list-style-type: none"> • Open top steel or plastic drums (45 or 75 Imp. gal.) with ventilation; • Waste wrangler (1 yd³)
Aerosol cans	<ul style="list-style-type: none"> • Open top steel or plastic drums (45 or 75 Imp. gal.) with ventilation; • Waste wrangler (1 yd³).
Small batteries	<ul style="list-style-type: none"> • Open top plastic pail with lid (5 Imp. gal.).
Paint cans	<ul style="list-style-type: none"> • Open top steel or plastic drums (45 or 75 Imp. gal.); • Waste wrangler (1 yd³).
Fluorescent tubes and light bulbs	Intact tubes: <ul style="list-style-type: none"> • Cardboard drum; • Original cardboard box;

Type of Waste	Container
	Crushed tubes and bulbs : <ul style="list-style-type: none"> • Open top plastic pail with lid (5 Imp. gal.); • Open top steel or plastic drums (45 or 75 Imp. gal.).
Cooking oil	<ul style="list-style-type: none"> • Closed top steel drums (45 Imp. gal.); • Open top plastic pail with lid and gasket (5 Imp. gal.).
Waste oil, waste antifreeze, oily water	<ul style="list-style-type: none"> • Closed top steel drums (45 Imp. gal.); • HDPE tote tanks on steel pallets (1000 L).
Flammable liquids	<ul style="list-style-type: none"> • Closed top steel drums (45 Imp. gal.).
Petroleum hydrocarbon contaminated soils	<ul style="list-style-type: none"> • Waste wrangler (1 yd³).
Vehicle batteries	<ul style="list-style-type: none"> • Waste battery wrangler (0.5 yd³).
Oil filters, other oily solids	<ul style="list-style-type: none"> • Open top steel drums (45 or 75 Imp. gal.); • Waste wrangler (1 yd³).
Gas cylinders	<ul style="list-style-type: none"> • No additional container required; however, all cylinders must have protective caps over the valves and must be secured in such a way as to remain upright at all times.

Upon reception, hazardous waste containers will be identified with a waste tracking code that includes the client ID, product type, date received, and a sequential number. If waste materials are received in inappropriate containers, they will be repackaged in compliance with the TDGR. Containers will then be properly marked and labelled in accordance with the TDGR (i.e., Proper shipping name, hazard class, label and UN number).

3.6 TRANSPORTATION

The next step in the hazardous waste management process is transportation. The transport of hazardous waste from the storage site to the southern disposal facilities will be carried out in accordance with the TDG and IMDG Regulations, as well as the *Interprovincial Movement of Hazardous Waste Regulations*. Compliance with these Regulations will reduce potential hazards to humans and the environment during the handling and transport of hazardous waste.

It should be noted that not all types of hazardous waste are regulated while in transport. As all transportation will be down within Canadian Territorial Waters and only within Canada, once on land, Canadian TDG Regulations define regulated materials that are regulated for transport and how they need to be packaged and labelled.

The main transportation requirements of the TDG Regulations are:

1. Packaging;
2. Labelling and marking of containers and road vehicles;
3. Shipping document.

Containers and packaging used for transport will be the same as those used for storage, as described in Table 2, above.

The requirements for the labelling and marking of hazardous waste regulated for transport are:

- Proper shipping name written on the container or the hazardous waste label
- UN number written on the container or the hazardous waste label
- Hazard class label(s) affixed to the container
- Hazard class placards affixed to the road vehicle

Waste items identified as non-TDG regulated do not have a UN number or hazard class.

The shipping documents for hazardous waste shipped off-site will include the following information:

- Proper shipping name;
- UN number;
- Hazard class(es);
- Packing group (PG) number;
- Flashpoint (for Class 3 products);
- Marine pollutant (for applicable products).

Other information required on shipping documents include:

- Name and address of the shipper;
- Date of the shipment;
- Number of containers, and total quantity (kg or L);
- 24-hour telephone number where the shipper can be reached.

3.7 DISPOSAL

Hazardous waste will be transported for disposal on the next available ship. The storage period for materials could be up to 9 months if storage occurs over the winter. Hazardous waste shipped out of Iqaluit will be transported by road to an authorized waste disposal facility in southern Quebec once it has arrived at the port and is ready for pick-up.

3.8 REGISTER AND RECORD-KEEPING

Hazardous waste generators are required to create, provide and maintain the records that track waste from generation to ultimate disposal. The purpose of obtaining, maintaining and preserving these documents is to ensure that waste is properly managed and regulatory compliance requirements are met. The information and documentation is also useful in determining, and avoiding, potential liability issues through the transporter or disposal facility. Contrary to minimum regulatory requirements, permanently maintaining the required records and documentation is a prudent management practice. Registers are required to maintain an inventory of the waste to be disposed and who had access to it, and who was responsible for handling it at each step.

Inspections of the facility and stored waste will be performed and recorded in the registers a minimum of once each week.

Records will be maintained and indicate the types and quantities of waste being stored along with the date, type and quantity of hazardous waste brought into or removed from the facility.

A copy of the register will be kept on-site for a period of 2 years.

4. TRAINING

Appropriate training will be provided to ensure that workers involved in hazardous waste handling, storage, and transport understand regulatory requirements and methods to minimize the hazards and risks associated with the management of hazardous waste.

This training may include:

- WHMIS - GHS;
- Transportation of Dangerous Goods (TDG and IMDG);
- Handling, packaging, and storage of hazardous waste;
- Emergency response procedures;
- Instruction in the use of fire extinguishers;
- HAZWOPER.

Federal and territorial legislation requires employers to provide WHMIS training to employees who work with controlled products (i.e., hazardous products and waste).

The Transportation of Dangerous Goods Regulations (Part 6 - Training) states that:

“A person who handles, offers for transport or transports dangerous goods must

- a) be adequately trained and hold a training certificate in accordance with this Part; or*
- b) perform those activities in the presence and under the direct supervision of a person who is adequately trained and who holds a training certificate in accordance with this Part.”*

Dangerous goods include hazardous waste. This training is required for workers responsible for the pre-transportation packaging and labelling, road transport, and completion of paperwork completion of hazardous waste. TDG training must be updated every 3 years.

Operation- and site-specific training may be developed and delivered to employees to ensure that hazardous waste is effectively and safely managed. Employees who have not received appropriate training will not work in unsupervised positions until they have completed the training requirements to do so.

5. EMERGENCY RESPONSE AND SPILL REPORTING

Risks associated with the handling of hazardous waste include releases (i.e., spills and leaks) and fire (or explosion), and are referred to as events. A spill contingency plan will be filed with the Ministry, as required by the *Spill Contingency Planning and Reporting Regulations*.

The spill contingency plan specific to the waste transfer station facilities and operations will be designed to institute methods to prevent hazardous waste events, and to safely and effectively respond to such events. Namely, keeping a minimum quantity of hazardous waste in storage, for a minimum length of time, will reduce the likelihood and magnitude of events.

The maximum volume of liquid in a single container will be 1,000 L (tote tank) for non-regulated waste (used oil and antifreeze) and 205 L for regulated waste (flammable liquids). The spill of such volumes of liquid would be relatively easy to manage. Releases of solid hazardous waste are not usually problematic and are easily recovered.

Spills of hazardous waste will be managed internally by trained waste transfer station workers. In case of fire or explosion involving hazardous waste, the fire department will be immediately called to intervene. Emergency telephone numbers are listed in Table 3.

TABLE 3: Emergency Telephone Numbers

Department	Contact Person	E-mail	Telephone
GN-DOE	Alex Brisco	mbrisco@gov.nu.ca	867 975-7726
Fire Department (General)	-	-	867 979-5655
Fire Department (Emergency)	-	-	867 979-4422
RCMP - Iqaluit	-	-	867 979-0123
Ambulance	-	-	867 979-4422

These emergency telephone numbers will be posted in prominent locations at the waste transfer station.

The waste transfer station will be equipped with:

- Telephone, mobile phone or radio capable of summoning emergency assistance;
- Portable fire extinguishers;
- Spill control equipment (i.e., spill kit).

This equipment will be kept at fixed locations to ensure availability in case of emergency. All personnel will be informed of the exact location and the appropriate use of this emergency equipment.

The Regulations state that:

“The owner or person in charge, of management or control of contaminants at the time a spill occurs shall immediately report the spill where the spill is of an amount equal to or greater than the amount set out in Schedule B.”

In the event of a hazardous waste spill, the site supervisor will immediately report the event to the NWT/Nunavut Spill Report Line at 867 920-8130.