



Crown-Indigenous Relations
and Northern Affairs Canada

Relations Couronne-Autochtones
et Affaires du Nord Canada

JERICO DIAMOND MINE SITE STABILIZATION PROJECT

NUNAVUT IMPACT REVIEW BOARD FILE #16UN058 SUPPLEMENTAL 2017 ANNUAL REPORT

February 21, 2019

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The Proponent shall submit a comprehensive annual report to the Nunavut Impact Review Board at the end of each year of permitted activities, and before December 31st of each year. It is expected that reporting requirements under NIRB File No. 16UN058 will be coordinated with existing reporting requirements associated with INAC's ongoing site management and monitoring functions related to the Jericho Diamond Mine Project (NIRB File No. 00MN059) as approved to proceed under Project Certificate No. 002. The Board expects to receive the first such report on or before December 31, 2017.

The annual report must contain, but not limited to, the following information:

a) A summary of activities undertaken for the year, including:

- **a map and associated details pertaining to remediation activities and site operations conducted to-date;**

The activities that took place during the year included:

- Mobilization via aircraft;
- Breaching of the West Dam and Divider Dyke A;
- Capping of fine tailings with coarse tailings to prevent erosion;
- Cleaning and decommissioning of above ground fuel tanks;
- Consolidation, packaging and transport off-site of hazardous materials for disposal at licenced facilities;
- Consolidation of all hydrocarbon contaminated soil into a lined storage cell;
- Removal and plugging of the C1 Diversion to re-route water into the open pit (eventual creation of a pit lake);
- Construction of an outflow for the pit lake; and
- Demobilization via aircraft

See Appendix A for maps of the site showing all work areas.

- **a map detailing the locations of all fuel storage areas illustrating all containment structures, accompanied with a description of all containment measures implemented;**

See Appendix A, Figure 3. Current fuel storage is limited to drummed fuel located within the Truck Shop Building. This building has an in-ground sump to contain any fuel spills.

Prior to the 2017 field season there was fuel stored on-site in above ground storage tanks (mostly residual amounts) located mainly in the Tank Farm but also in other areas around the site. There was also drummed fuel storage near the heli-pad and the airstrip camp. During the site stabilization work all fuel tanks and drums (except for the ones currently stored in the Truck Shop) were cleaned

and decommissioned and the fuel was used in heavy equipment, flared, or shipped off-site for proper disposal.

- **a description of local hires and employee training initiatives;**

The contract for site stabilization was awarded to Rowe's Outcome Joint Venture (ROJV) and guaranteed an Inuit Employment level of 63% (for on-site work) and that 50% of the sub-contracting dollars will be spent with Inuit owned businesses. ROJV was unable to meet their target levels and ended up with an Inuit Employment level of 47% and an Inuit Sub-Contracting level of 16%. In total, 32 Inuit employees were hired, mainly from Kugluktuk, and over \$2.1 million was spent with Inuit owned companies. Due to the fact that ROJV missed their target levels they are subject to a financial penalty.

During the project Inuit employees received 835 hours of training in areas such as wildlife and water safety, fire and spill response, and hazardous waste operations.

- **details on transportation activities undertaken including:**
 1. **aircraft flight frequency, approximate flight routes, and altitudes;**

This project was completed as a fly-in/out project starting from Yellowknife. Mobilization took place in June and demobilization was in October. The aircraft used included a C-130 Hercules aircraft for the large equipment (~10 trips in/out) supported by smaller aircraft. During operations there were weekly resupply and crew change flights between Yellowknife/Kugluktuk and the site.

2. **finalized winter road routing and vehicle traffic information (number of return trips, types of vehicles);**

Initially, the project was to be completed via winter road. However, due to contracting timelines this was not possible. No winter road was used or constructed during this project.

- **site photos illustrating site conditions and areas of remediation works;**

See Appendix B, which contains the community consultation presentation from January 2018. The presentation contains photos showing the remedial works.

- **a summary of wastes disposed on-site as well those transported for disposal offsite, including locations and any required mitigation during transportation;**

The wastes that were disposed of on-site were:

- Residual fuels and waste oils were burned in equipment (170,000 L) and the remainder was incinerated (305,000 L);
- Sewage: porta toilets were used and the bags were incinerated daily;
- Greywater: was stored in sumps and treated prior to discharge; and
- Camp and other non-hazardous waste: was incinerated daily. Ash from the incinerator was packaged and transported off-site for disposal

The hazardous wastes were consolidated and packaged as per the requirements of the Transportation of Dangerous Goods Act, then transported to KBL Environmental in Yellowknife for proper disposal. The hazardous wastes from the site included:

- Batteries ~3,207 kg
- Antifreeze ~15,257 kg
- Acids/Alcohols ~ 3,136 kg
- Aerosol Cans ~120 kg
- Miscellaneous ~277 kg
- Florescent lights ~600kg
- Oil Filters ~ 10,000 kg

b) An updated work plan for the following year including an approximate work schedule;

The Jericho Diamond Mine Site Stabilization Project has been completed and all equipment and materials that were brought into the site have been removed. There is a minor amount of warranty work planned for this summer, filling some potholes in the tailings cover and repairing a fold in the liner of the hydrocarbon containment cell, this is expected to take about 1 week to complete in July/August.

The project is now in long-term Operation, Maintenance and Surveillance (OMS), 2018 is the first year and the current plan involves 3 years of monitoring the effectiveness of the site stabilization work. This monitoring is taking place in June. Further OMS will be defined by the results of the initial 3 year program.

c) A summary of community consultations undertaken throughout the year, providing copy of materials presented to community members, a description of issues and concerns raised, discussions with community members and advice offered to the Proponent, as well as any follow-up actions that were required or taken to resolve any concerns expressed about the project;

Two community consultations took place during this year:

1. Pre-Construction Meeting on June 1, 2017 in Kugluktuk. A copy of the presentation is provided in Appendix B.
2. Post-Construction Meeting on January 31, 2018 in Kugluktuk. A copy of the presentation is provided in Appendix B.

No significant issues or concerns were raised during these meetings.

d) A log of instances in which community residents occupied or transited through the project area for the purpose of traditional land use or harvesting. This log should include the location and number of people encountered, activity being undertaken (e.g., berry picking, fishing, hunting, camping, etc.), date and time; and any mitigation measures or adaptive management undertaken to prevent disturbance;

There were no instances where community residents occupied or transited through the project area during the 2017 field season (May to October).

e) A brief summary of wildlife mitigation and monitoring results as well as any mitigation actions undertaken. In addition, the Proponent shall maintain a record of wildlife observations while operating within the project area and include it as part of the summary report. The summary report should include the following:

Below is a copy of the wildlife log from the 2017 field season:

Date	Time	Description	Coordinates	Notes/ Preventative Measures
24-Jun-17	23:00	10 Caribou spotted running south at airstrip	N65.99128, W111.50113	No work being completed when sighted
	15:00	7 Caribou walking north over Cell A	N65.98742, W111.49919	No work being completed in area
Jul-3-17	13:00	3 Caribou spotted on tailings	N65.98771, W111.49803	No work being completed in area
05-Jul-17	07:30	3 Caribou spotted on tailings near tires	N65.98771, W111.49803	No work being completed in area
05-Jul-17	20:30	2 Caribou spotted immediately west of camp	N65.99776, W111.48631	Site work already finished for day
06-Jul-17	08:45	Wolf spotted east side of Pit moving east	N66.01591, W111.47128	No work in area
15-Jul-17	11:00	Grizzly bear spotted around North of airstrip	N65.99128, W111.50113	No work in the area
22-Jul-17	09:00	Grizzly bear spotted around North of airstrip	N65.99128, W111.50113	No work in the area
24-Jul-17	20:00	Grizzly bear spotted west of west dam	N65.99043, W111.52659	Site work already finished for day
25-Jul-17	21:00	Grizzly Spotted South of Camp		Site work already finished for day
26-Jul-17	20:00	Grizzly Spotted Airstrip		Site work already finished for day
2-Aug-17	14:00	Wolf east side of pit, ran east	N66.01591, W111.47128	No work in Area
Jul 20 - Aug 4	Various	Intermittent sightings of mother fox and cubs	N66.01591, W111.47128	Likely a fox den on east side of pit in debris, daily viewings of fox in area
09-Aug-17		1 Red Fox		Seen near rocks quarry (waste rocks by tanks)
10-Aug-17		1 Musk-ox		Carat lake

Date	Time	Description	Coordinates	Notes/ Preventative Measures
13-Aug-17	08:15	1 Caribou		West side dam
15-Aug-17	09:00	1 Caribou spotted west dam		No work in the area
20-Aug-17		1 Musk-ox		South end camp
15-Sep-17		Caribous & sandhill cranes		Airstrip area
17-Sep-17		1 Red fox		West side of air strip
23-Sep-17		1 Bull Caribou		North end of air strip
24-Sep-17		7 Arctic hair		On the way to airport
26-Sep-17		1 Grizzly Bear		Camp incinerator
		1 Red Fox		Phase 4 area
28-Sep-17		1 White Wolf		Carat lake pump house
		1 Bald Eagle		Carat lake pump house
29-Sep-17		2 Grizzly bears - mother & cub		North end of runway
30-Sep-17		1 White Wolf		On the way to Phase 4

- **Locations (i.e., latitude and longitude) and species of wildlife observed on-site including number of animals, a description of the animal activity, and a description of the gender and age of animals if possible; Prior to conducting project activities, the Proponent should map the location of any sensitive wildlife sites such as denning sites, calving areas, caribou crossing sites, and raptor nests in the project area, and identify the timing of critical life history events (i.e., calving, mating, denning and nesting);**

See wildlife log above.

- **The Proponent should indicate potential impacts from the project, and ensure that operational activities are managed and modified to avoid impacts on wildlife and sensitive sites;**

See wildlife log above. There were minimal impacts to wildlife.

- **A summary of the effectiveness of mitigation measures for wildlife impacts; and**

The mitigation measures on-site included a bear fence and full time wildlife monitors. When a bear was spotted multiple times this was discussed at daily tailgate meetings and the need for proper camp waste management was stressed.

These measures were effective in managing the majority of wildlife at the site.

- **If mitigation measures are observed to be ineffective or not achieving the expected outcomes, a discussion of issues**

interfering with the mitigation and alternative plans to reduce impacts to the wildlife in the vicinity of the project;

There was one problem grizzly bear spotted near the camp multiple times in July. The Wildlife Monitors stayed on top of the situation and used non-lethal deterrents to scare the bear away. However, the bear kept returning and the local Wildlife Officer in Kugluktuk was contacted for advice. We were instructed to destroy the bear and given specific instructions on how to handle the carcass. Project staff were still reluctant to destroy the bear and thankfully it did not return so no further action was needed.

f) A summary of any heritage sites encountered during the exploration activities, any follow-up action or reporting required as a result, and how project activities were modified to mitigate impacts on the heritage sites;

No heritage sites were encountered during the site stabilization activities. All work completed took place in areas that were previously disturbed during the construction and operation of the mine by the former owner/operator.

g) A summary of its knowledge of Inuit land use in/near the project area and how project activities were modified to mitigate impacts on Inuit land use; and

Inuit land use in/near the project area is limited and mostly consists of winter access (via snowmobile) to Contwoyto Lake. There was no need to alter project activities to mitigate impacts on Inuit land use due to the fact that:

- the main area of use, Contwoyto Lake, is over 3 kilometres from the main part of the Jericho site; and
- project activities took place between May and October, when snowmobile access is not possible

h) A summary of how the Proponent has complied with conditions contained within the Screening Decision Report, and all conditions as required by other authorizations associated with the project proposal.

The Proponent has complied with the Screening Decision Report and all other Permits, Licences and Authorizations throughout the completion of the site stabilization work. Compliance was achieved by:

- discussing all regulatory requirements during the pre-construction and all other project meetings;
- copies of all regulatory documents were provided to the contractor;
- copies of all regulatory documents were posted at the work site as required;
- the contractor's Site Superintendent responsibilities included ensuring regulatory compliance;

- the Crown employed Departmental Representatives and had them on-site during all activities to ensure compliance with the contract and regulatory authorizations; and
- Inspectors were given access to the site in order to complete compliance inspections.

Supplemental Questions

The Nunavut Impact Review Board issued Board Recommendations with the *2016-2017 Annual Monitoring Report for the Jericho Diamond Mine Project* on November 27, 2017. Below are the recommendations and responses:

By way of a motion carried during its regular meeting held in November 2017, Board via Recommendation #5 requests that Indigenous and Northern Affairs Canada (INAC) requests that Indigenous and Northern Affairs Canada provide the NIRB with a detailed report of the stabilization works undertaken at the Jericho site under NIRB File No. 16UN058. The report should include details related to all activities conducted, results of the work, expected short and long-term management requirements, community consultation conducted or to be conducted, and an outline of the expected monitoring and management program. The Board requests that the report include, but not be limited to, the following information in addition to what is required by the Screening Decision Report for 16UN058. This report should be provided as part of the annual report to be submitted to the NIRB on or before December 31st of each year:

a) Details related to water monitoring, sampling, treatment, and discharge activities conducted during the reporting year;

Details on water monitoring, sampling, treatment and discharge activities are provided in the *Jericho Mine Site Stabilization 2017 Completion Report – Final*, provided in Appendix C.

Water for camp operations is discussed in Sections 4.3.6 Potable Water, 4.3.7 Wastewater, with some further information on greywater in Section 3.2 Regulatory Items.

Water use during site stabilization activities are discussed in Section 5.2.2 Cleaning and Decommissioning of Drums and ASTs, and Section 5.3 Water Sampling (Pit Lake).

A summary of water sampling and associated laboratory analyses can be found in Appendix H Water Quality Monitoring Records of the *Jericho Mine Site Stabilization 2017 Completion Report – Final*.

b) Details related to earthworks conducted during the reporting year including modifications to water management structures, berms, dykes, and pads;

Earthworks completed during site stabilization activities included the following work:

- Processed Kimberlite Containment Area (PKCA) Cover
- West Dam Breach
- Dyke A Breach
- C1 Diversion Breach
- Open Pit Outfall
- Phase 1 Petroleum Hydrocarbon (PHC) Contaminated Soils Cell Cover

Details on these activities can be found in Section 5.0 Completion of Stabilization Activities and Appendix E As-built Records of the *Jericho Mine Site Stabilization 2017 Completion Report – Final* which is provided in Appendix C.

c) Details related to stabilization activities in the open pit area;

Stabilization work related to the open pit were the C1 Diversion Breach and the Open Pit Outfall. Details on these activities can be found in Sections 5.1.1.4, 5.1.1.5, and Appendix E As-built Records of the *Jericho Mine Site Stabilization 2017 Completion Report – Final* which is provided in Appendix C.

d) Details related to the covering of the Processed Kimberlite Containment Area;

Details on the covering of the Processed Kimberlite Containment Area (PKCA) are provided in Section 5.1.1.1 and Appendix E As-built Records of the *Jericho Mine Site Stabilization 2017 Completion Report – Final* which is provided in Appendix C.

e) Details related to the collection and disposal of hazardous wastes;

Details related to the collection and disposal of hazardous materials are provided in Section 5.2.4 Management of Hazardous Material Wastes and Appendix G Hazardous Materials Records of the *Jericho Mine Site Stabilization 2017 Completion Report – Final* which is provided in Appendix C.

f) Details related to the collection, treatment/disposal of contaminated soils;

Details related to the collection, treatment/ disposal of contaminated soils are provided in Section 5.1.1.6, 5.2.1, and Appendix F PHC Soil Clean-up Records of the *Jericho Mine Site Stabilization 2017 Completion Report – Final* which is provided in Appendix C.

g) Plans to manage deteriorating structures on-site;

A long-term Operation, Maintenance and Surveillance (OMS) Plan has been drafted for the site. The OMS Plan outlines the surveillance activities to be conducted to ensure the stabilization actions completed (e.g. West Dam Breach, PKCA Cover) are meeting their design intent.

With respect to the buildings, tanks, and camp, all hazardous materials have been removed and disposed of off-site. There are currently no plans to manage these structures as their deterioration is considered a low risk to human and environmental health.

h) Details related to any other remediation activities undertaken and any additional hazards identified;

Details related to all remediation and support activities are provided in the *Jericho Mine Site Stabilization 2017 Completion Report – Final* which is provided in Appendix C.

No additional hazards were identified during the site stabilization activities.

i) Community consultation summaries; and

No additional community consultations have been conducted beyond those provided in answer c) of the original annual report, see page 5 of this report.

j) Monitoring and management plans to ensure the environmental stability of the site and to ensure the effectiveness of the stabilization activities undertaken.

A long-term Operation, Maintenance and Surveillance (OMS) Plan has been drafted for the site. The OMS Plan outlines the surveillance activities to be conducted to ensure the stabilization actions completed (e.g. West Dam Breach, PKCA Cover) are meeting their design intent. A copy of the draft OMS Plan is provided in Appendix D.

Year 1 of OMS was conducted during the summer of 2018 and the results are being used to revise and plan OMS activities going forward.

**APPENDIX A:
JERICHO DIAMOND MINE SITE STABILIZATION PROJECT
SITE MAPS**



Figure 1: Site Overview

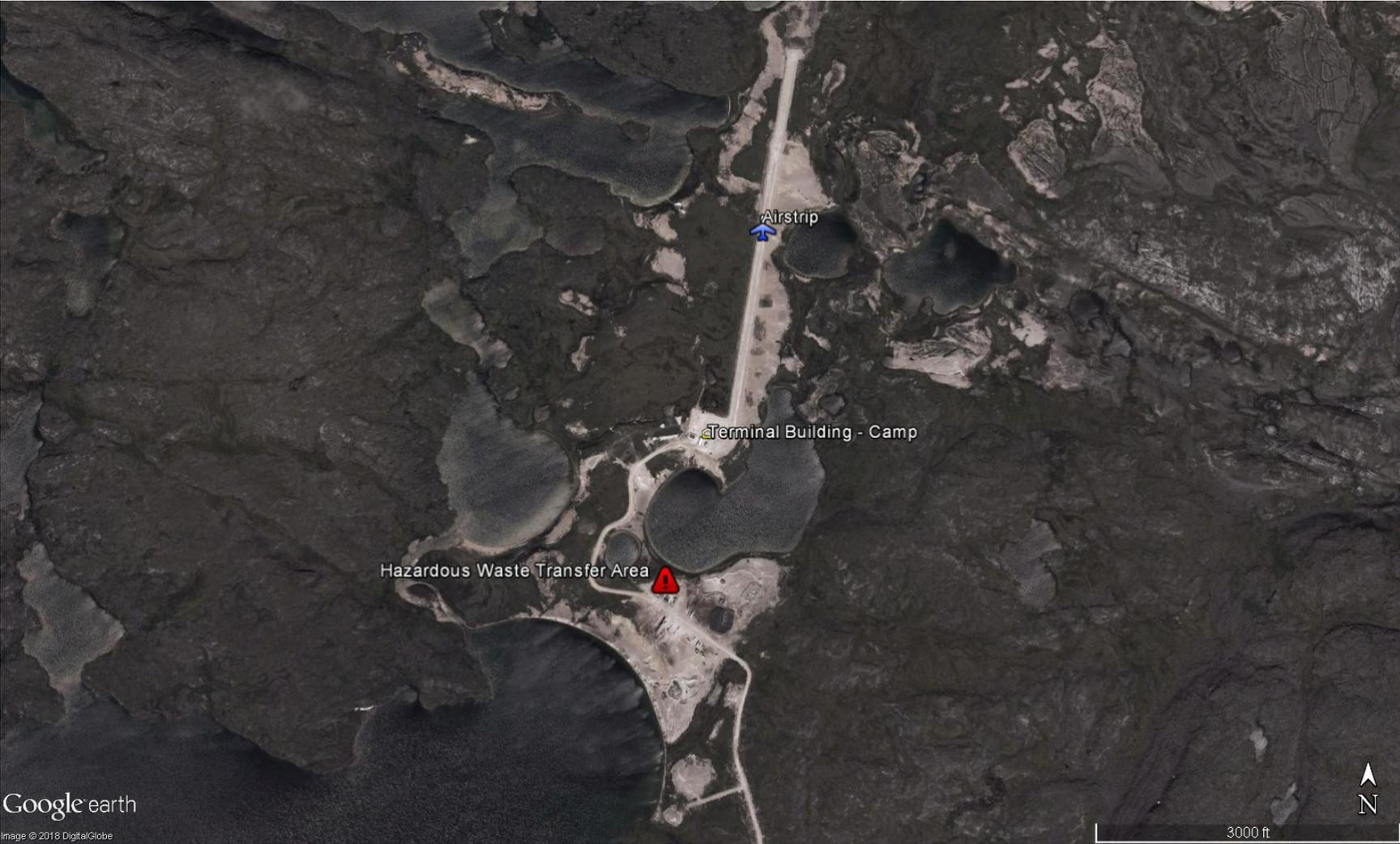


Figure 2: North End of Site – Showing Airstrip, Terminal Building and Hazmat Storage Area



Figure 3: South End of Site – Showing Open Pit, Camp, Process Plant, PKCA and West Dam

**APPENDIX B:
JERICO DIAMOND MINE SITE STABILIZATION PROJECT
COMMUNITY CONSULTATION PRESENTATIONS
PRE- CONSTRUCTION ON JUNE 1, 2017
POST CONSTRUCTION ON JANUARY 31, 2018**

Community Meeting

Jericho Mine Site Stabilization Project

June 1, 2017
Kugluktuk Heritage Centre
21 Kugluktuk Drive, Kugluktuk, NU

Presented By:
Jonathan Markiewicz, Senior Project Manager - Outcome Consultants Inc.
John Weigel, Site Superintendent – Rowe's Construction



Outline

- Introducing the team and project partners
- Mining and Project History
- Stabilization Goals
- Overall Project Schedule (Summer 2017)
- Description of Work Activities
- EHS Promotion and Monitoring
- Employment and Training Opportunities
- Q&A's



Jericho Mine (JER) Site Stabilization Project Team

- Project is managed by the following organizations:
 - Custodian and Project Proponent: Indigenous and Northern Affairs Canada (INAC) is accountable for the project on behalf of Canada
 - Project Manager: Public Services & Procurement Canada (PSPC) manages the remediation project on behalf of INAC
 - Constructor: Rowe's Outcome Joint Venture (ROJV) is responsible to implement the project in accordance with its contract with PWGSC

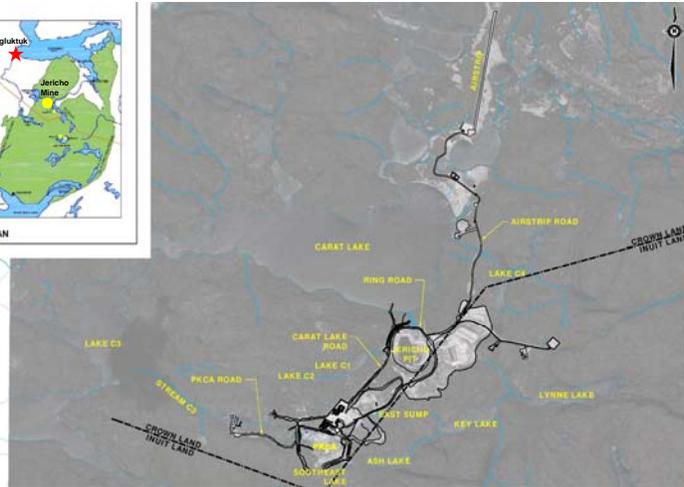


Jericho Mine (JER) Site Stabilization Project Partners

- We would like to acknowledge the community partners and stakeholders that have contributed toward the consultation activities leading up to this remediation project.



JER Project – Site Location



Mining History

Jericho Mine

- Open Pit Diamond Mine from 2006 – 2008
- Inactive or operated under Care and Maintenance 2008 - 2012
- INAC providing environmental protection since 2013
- Airstrip to the North



Project History – Recent Events

- Since 2013 INAC has been carrying out basic environmental protection efforts including freshet monitoring (spring thaw) as well as building, tank and dam inspections.
- This focus has ensured that the materials and facilities left behind did not cause problems to the environment.



JER Project Remedial Goals

The main remedial goal is to safely stabilize the site, while meeting all regulatory requirements by:

- ensuring the health and safety of human activity within the contaminated areas.
- stabilizing the site to avoid further disruption to the environment.
- returning the water flow (creeks, etc.) to its original state as much as practical.
- building local training, employment and economic opportunities.



Description of JER Project Work

- Aircraft Mobilization and Demobilization
- Removal of Fuel and cleaning of Tanks and Drums
- Disposal of Hazardous materials Off Site
- Collection of soils where fuel spills have occurred and placing it in a Temporary Storage Cell and covering it
- Covering of the fine grained tailings
- Lowering the top of four man-made dams or dykes to restore the original surface water flow



Overall Project Schedule (Summer 2017)

- June – Mobilization by Aircraft
- July – Tank cleaning, Hazardous materials collection, Lowering dams
- August – Soil with fuel placed in cell, Continue with lowering dams, and Place cover on fine tailings
- September – Demobilization by Aircraft



Description of Work – Mobilization

- Mobilization to the site from Yellowknife using a Hercules Aircraft and several small planes
- Transport camps, equipment, support facilities and materials to complete work, via Aircraft (June 2017)



Description of Work- Fuel Tanks and Drums

- Diesel fuel left on-site will be used to run the equipment and camp generators.
- Other fuels or waste oils will be burned in an Incinerator.
- Tanks and drums will be cleaned and the wash water treated.



Description of Work – Waste Removal

- All Hazardous Materials (Liquid or Solid) will be collected, consolidated, containerized, transported and disposed of off site at a Designated Hazardous Waste Disposal Facility.



Description of Work – Contaminated Soils

- Soil stained with fuel will be excavated from across the site and placed in an existing lined tank farm.
- The soils will then be covered with a liner and gravel



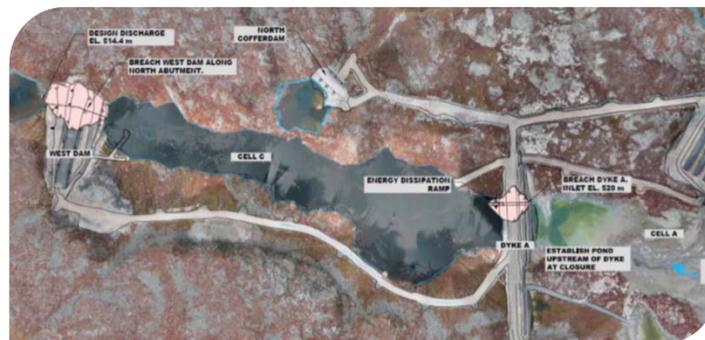
Description of Work – Tailings Cover

- Grade the existing tailings in Cell A to allow water to flow in its original direction (west).
- Cover the fine grained tailings with larger, coarse grained aggregate to prevent dusts being transported by wind



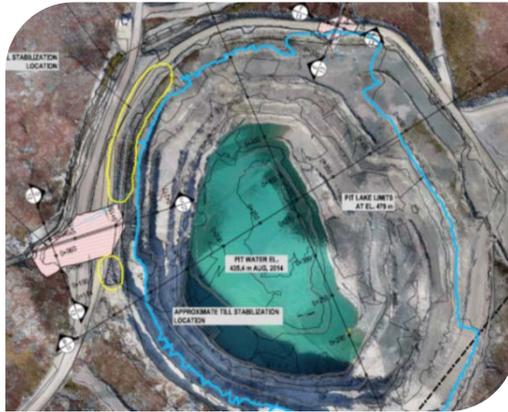
Description of Work – PKCA Breaches

- lower the top of Dyke A and West Dam to restore the original natural flow of surface water



Description of Work – Open Pit Breaches

- Breach the Open Pit side wall to allow the Open Pit to fill with water (2-3 years) and to restore the original natural flow of surface water.



Environment, Health & Safety (EHS) Promotion and Monitoring

- A Health & Safety Plan has been prepared and all workers will receive comprehensive training prior to starting to work on the project
- A safety tailgate meeting will occur each day to ensure all workers understand how to carry out each work task safely that day



Environment, Health & Safety (EHS) Promotion and Monitoring

- As part of the land use permit conditions, a comprehensive Sediment & Erosion Control Plan and Spill Contingency Plan will be submitted for approval prior to construction
- Rowe's Outcome JV will ensure that all work is carried in accordance to these plans
- Environmental protection, health & safety, and local employment statistics will be reported to INAC regularly



jweigel91@gmail.com

Employment Opportunities

- The following positions are required for this work:

On-site Position	Anticipated Employees Required
Environmental Compliance and Controls Officer Trainee	1
Wildlife Monitors (Needs a FAC license)	3
Equipment Operators and Rock Truck Drivers	4-5
Labourers	8-12
Camp Helpers	2

- For employment opportunities, please speak to John Weigel at the meeting or by email:

– John Weigel: jweigel91@gmail.com



Training Opportunities

- Significant training is planned to ensure all workers are prepared to carry out the work safely and so that they gain skills for this and future projects
- Examples of training:
 - worker orientation training,
 - health & safety training, and
 - On-the-job training
- As part of its contract, ROJV will track and report on training hours and participants will receive certificates



Example of Training Opportunities

Both classroom training..



..and On-the-job Training



Thank you for your time.

Questions?



Community Meeting

Jericho Mine Site Stabilization Project

January 31, 2018
Kugluktuk Recreation Centre
Kugluktuk Drive, Kugluktuk, NU

Presented By:
Jonathan Markiewicz, Senior Project Manager - Outcome Consultants Inc.
John Weigel, Site Superintendent – Rowe's Construction



Outline

- Introducing the team and project partners
- Mining and Project History
- Stabilization Goals Achieved
- Description of Work Activities Completed
- Employment Statistics
- Community Thanks
- Q&A's



Jericho Mine (JER) Site Stabilization Project Team

- Project was managed by the following organizations:
 - Custodian and Project Proponent: Indigenous and Northern Affairs Canada (INAC) was accountable for the project on behalf of Canada (Mark Yetman)
 - Project Manager: Public Services & Procurement Canada (PSPC) (Michael Bernardin) managed the remediation project on behalf of INAC and retained DXB for on-site supervision (Henry Wong)
 - Constructor: Rowe's Outcome Joint Venture (ROJV) was responsible to implement the project in accordance with its contract with PSPC (Jack Rowe, John Weigel, Jonathan Markiewicz)



Jericho Mine (JER) Site Stabilization Project Partners

- We would like to acknowledge the community partners and stakeholders that contributed toward the consultation activities leading up to this remediation project and assisted us throughout implementation:
 - Kitikmeot Inuit Association
 - Hamlet of Kugluktuk
 - Kikiak Construction



Project History – Recent Events

- Since 2013 INAC has been carrying out basic environmental protection efforts including freshet monitoring (spring thaw) as well as building, tank and dam inspections.
- This focus has ensured that the materials and facilities left behind did not cause problems to the environment.



JER Project Remedial Goals Achieved

The main remedial goal was to safely stabilize the site, while meeting all regulatory requirements by:

- ✓ ensuring the health and safety of human activity within the contaminated areas.
- ✓ stabilizing the site to avoid further disruption to the environment.
- ✓ returning the water flow (creeks, etc.) to its original state as much as practical.
- ✓ building local training, employment and economic opportunities.



Description of JER Project Work

- Aircraft Mobilization and Demobilization
- Removal of Fuel and cleaning of Tanks and Drums
- Disposal of Hazardous materials Off Site
- Collection of soils where fuel spills have occurred and placing it in a Storage Cell and covering it
- Covering of the fine grained tailings
- Lowering the top of four man-made dams or dykes to restore the original surface water flow



Description of Work – Mobilization

- Mobilization to the site from Yellowknife using a Hercules Aircraft and several small planes
- Transport camps, equipment, support facilities and materials to complete work, via Aircraft (June 2017)



Description of Work- Fuel Tanks and Drums

- 170,000-L of Diesel fuel left on-site was used to run the equipment and camp generators.



Description of Work- Fuel Tanks and Drums

- 305,000-L of other fuels or waste oils were burned in two Incinerators.



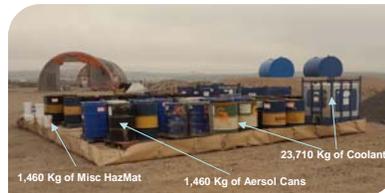
Description of Work- Fuel Tanks and Drums

- Tanks and drums were cleaned and the wash water treated or disposed of off-site.



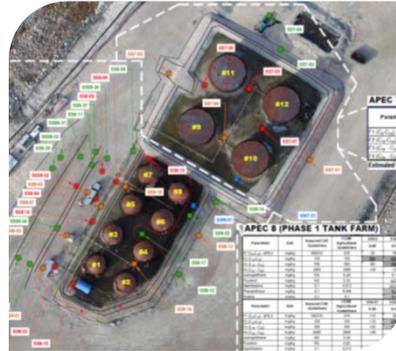
Description of Work – Waste Removal

- All Hazardous Materials (Liquid or Solid) was collected, consolidated, containerized, transported and disposed of off site at a Designated Hazardous Waste Disposal Facility.



Description of Work – Contaminated Soils

- 165 Truck Loads of Soil stained with fuel was excavated from across the site and placed in an existing lined tank farm.



Description of Work – Contaminated Soils

- The soils were then covered with a liner and gravel



Description of Work – Water Management

- 291,500,000-L of clean water from Cell A and Cell C was tested, pumped and discharged down stream



Description of Work – Water Management

- Water that was impacted from being in contact with hydrocarbon stained soil, or from washing ASTs/drums was treated and meet standards before release



Description of Work – Water Management

- Grey water from showers, Kitchen sinks and Laundry cleaning was treated to meet standards before release.
- During Water transfers there were three minor spills that were reported and cleaned up.



Description of Work – Tailings Cover

- Graded the existing tailings in Cell A to allow water to flow in its original direction (west).



Description of Work – Tailings Cover

- Covered the fine grained tailings with larger, coarse grained aggregate to prevent dust being transported by wind



Description of Work – PKCA Breaches

- Lowered the top of Dyke A and West Dam to restore the original natural flow of surface water



Description of Work – PKCA Breaches

- Dyke A was lowered to allow most of the water through creating a small Lake.



Description of Work – PKCA Breaches

- A ramp on the outflow side was added to reduce erosion.



Description of Work – PKCA Breaches

- Large rocks were placed all over to also prevent erosion.



Description of Work – PKCA Breaches

- The West Dam was lowered as far as possible until we hit the frozen core



Description of Work – PKCA Breaches

- After getting the right permits, we then blasted the West Dam



Description of Work – PKCA Breaches

- And then we dug and trucked some more!



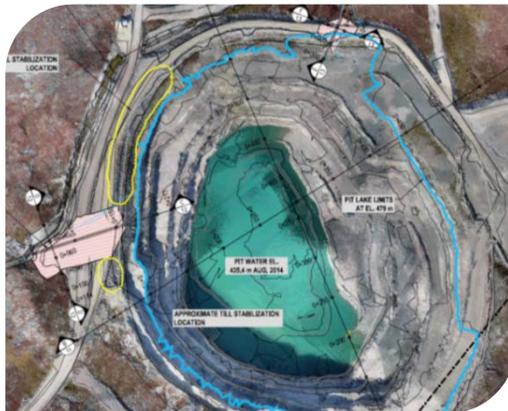
Description of Work – PKCA Breaches

- Large rocks were placed all over to prevent erosion.



Description of Work – Open Pit Breaches

- Removed the C1 Diversion
- Created an Outflow
- This will allow the Open Pit to fill with water (10-15 years) and to restore the original natural flow of surface water.



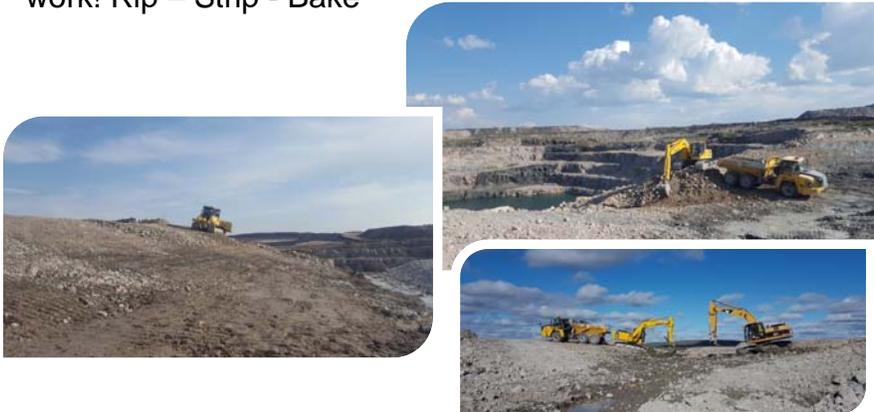
Description of Work – Open Pit Breaches

- We dug through the old Mining road to connect a stream to the Open Pit



Description of Work – Open Pit Breaches

- Again we hit frozen material, but this time the sun did the work! Rip – Strip - Bake



Description of Work – PKCA Breaches

- Large rocks were placed all over to prevent erosion.



Description of Work – Open Pit Breaches

- We dug through the Mine road again on the north side



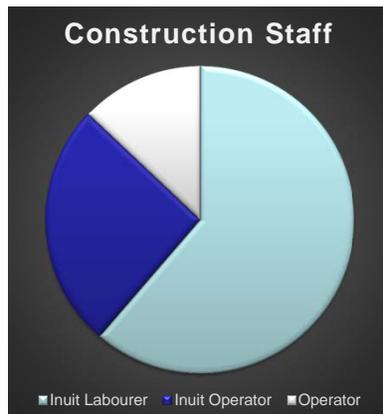
Description of Work – Open Pit Breaches

- This will allow for water to drain out from the filled pit and into Carat lake, restoring the original water flow



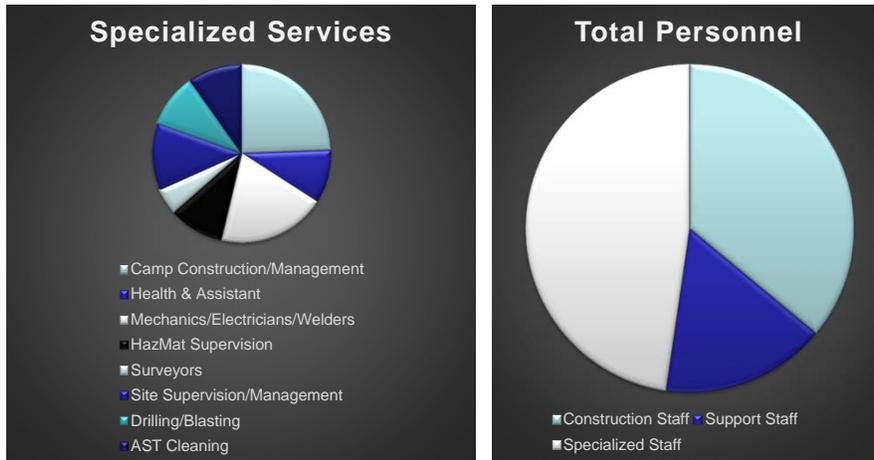
Employment Numbers

- ROJV hired 29 Kugluktuk and 2 Gjoa Haven personnel



Employment Numbers

- ROJV hired 29 Kugluktuk and 2 Gjoa Haven personnel



Employment Numbers

- ROJV's plan was to hire 63% as Inuit employees
- ROJV achieved 47% of hrs as Inuit Employees
 - Revised methods (Blasting) and equipment required less Construction personnel and more Specialized personnel
 - Other employers - Hope Bay Mine Opening
- ROJV provided over 800-hrs of training



Key Sub-Contractors

- Kikiak Contracting
 - Hazardous Materials, Mechanic, Labourers and Operators



Key Sub-Contractors

- Nunavut Expediting Services
 - Camp and Expediting Services



Key Sub-Contractors

- Kitikmeot Airways (op Buffalo Airways)



Key Sub-Contractors

- Aqsaqniq Airways (op Air Tindi)



**In Summary, ROJV had a Blast this Summer!
And we look forward to the next Kitikmeot project.**



Jericho Diamond Mine – Future Plans

- A long-term Operation, Maintenance & Surveillance (OMS) Plan is currently under development
 - Will monitor performance of Site Stabilization work going forward
 - Performance of dam breaches
 - Tailings cover



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Jericho Diamond Mine – Future Plans (continued)

- Pit water quality
- Soil containment
- Implementation of the OMS Plan to commence in 2018
- Schedule going forward TBD: Will be risk based



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Thank you for your time. Questions?



**APPENDIX C:
JERICHO MINE SITE STABILIZATION 2017
COMPLETION REPORT – FINAL**

**JERICO MINE SITE STABILIZATION 2017
COMPLETION REPORT – FINAL**

Prepared for:

Public Services and Procurement Canada

By:

DXB Projects

November 2018

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EXECUTIVE SUMMARY

A site stabilization construction program was completed for the Jericho Mine Site during the 2017 season, with minor deficiencies rectified in 2018. The project was designed to stabilize the site, which had been abandoned and under official custodial stewardship of Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) since 2014.

The funding for this project came from multiple sources, there were surety bonds (from the Water Licence and Land Use Permit) and an allocation from the Federal Infrastructure Initiative. The funding available was time sensitive and insufficient to complete full remediation of the site so the site stabilization focused on addressing high risk environmental and human health hazards.

The main focus of the site stabilization was to address the following:

- Tailings – regrade to facilitate drainage and cover to prevent off-site dust migration;
- Dams and Pit – breach the dams to facilitate drainage and expedite natural filling of the Open Pit;
- Contaminated Soil – excavate contaminated soil and consolidate in an on-site containment area to isolate the soil from the environment; and
- Hazardous Materials – collect, containerize and either incinerate or dispose of off-site, removing the hazards associated with these materials.

Public Services and Procurement Canada (PSPC) awarded a contract to Rowe’s Outcome Joint Venture (ROJV) under a Design-Bid-Build delivery approach, that included an Aboriginal Opportunities Considerations component, to ensure aboriginal involvement in the project.

ROJV successfully completed the work in 2017 and 2018 using an aircraft mobilization approach and by utilizing a significant amount of crown owned equipment that existed at the site.

ROJV completed the work within the bid price and achieved 47% On-site Inuit Labour Person Hours and 19% Inuit Sub-Contracting/ Supplier costs.

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ABBREVIATIONS

AHJ	Authority Having Jurisdiction
AMSRP	Abandoned Military Site Remediation Protocol
APEC	Area of Potential Concern
ASTs	Above ground Storage Tanks
Board	Nunavut Water Board
BOD	Biological Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
CCME	Canadian Council of Ministers of the Environment
CIRNAC	Crown-Indigenous Relations and Northern Affairs Canada
DFO	Department of Fisheries and Oceans Canada
EBA	Tetra Tech EBA
ECCC	Environment and Climate Change Canada
ESA	Environmental Site Assessment
GNU	Government of Nunavut
HWTA	Hazardous Waste Transfer Area
IBP	Inuit Benefits Plan
KitIA	Kitikmeot Inuit Association
LOD	Letter of Decision
LUP	Land-use Permit
NIRB	Nunavut Impact Review Board
Nunavut Agreement	Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada
NWB	Nunavut Water Board
O&G	Total Oil and Grease
OA	Options Analysis Report
PAH	Polycyclic Aromatic Hydrocarbons
PFAL	Water Quality Guidelines for the Protection of Freshwater Aquatic Life
PHC	Petroleum Hydrocarbons
PHC Soil	PHC contaminated soil
PKCA	Processed Kimberlite Containment Area
PSPC	Public Services and Procurement Canada
RFP	Request for Proposal
ROJV	Rowe's - Outcome Joint Venture
Shear	Shear Diamonds (Nunavut) Corp. a wholly-owned subsidiary of Shear Diamonds Ltd.
Specifications	Contract Specifications
Tahera	Tahera Diamond Mine Corporation
TOR	Terms of Reference
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids

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1.0 INTRODUCTION

A site stabilization project was undertaken in 2017 for the Jericho Mine Site. The site had been abandoned and under the custodial stewardship of Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) since 2014. Tahera Diamond Mine Corporation (Tahera) opened the mine in 2006 and operated it until early 2008 when bankruptcy proceedings were filed. In July 2010, the mine was purchased by Shear Diamonds (Nunavut) Corp. a wholly-owned subsidiary of Shear Diamonds Ltd. (Shear). Some ore re-processing and care and maintenance of the site was carried out until Shear suspended all operations in September 2012.

The objective of the 2017 Jericho Mine Site Stabilization project was to address priority human health and environmental issues that affected the site. The implementation of the project was a culmination of environmental site assessment work, development of remedial options for different clean-up scenarios, and two successive tender solicitation processes. The final scope of work for the project consisted of earthworks and hazardous material abatement to support the management of long-term surface water flow, prevention of off-site deposition of tailings dust and removal and/or stabilization of the environmental impairments at the site.

The Construction Contract was awarded to Rowe's – Outcome Joint Venture (ROJV) in May 2017, with site work started in July 2017 and the contract work substantially completed in October 2017. A corrective work item and some regulatory close-out items required action following the 2017 season and was subsequently completed by the contractor in August 2018.

This report has been prepared as a construction summary of the project and to describe the outcomes of the individual stabilization components.

1.1 SITE BACKGROUND

The Jericho Mine site is located in Nunavut, approximately 420 km northeast of Yellowknife, NT, 30 km north of the Lupin Mine in the Contwoyto-Itchen Region, and 60 km south of the Arctic Circle.

The operational history of the Jericho Diamond mine spanned over 7 years, having been opened in 2006 by Tahera and then having all activities suspended by Shear in 2012. The original mine plan was for an 8-year operating life, with kimberlite ore extracted by both open pit and underground mining methods. When the site was shut down in 2008, the open pit extraction had only reached partial design depth and no underground work was started.

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After its abandonment, basic environment protection of the site was carried out by CIRNAC beginning in summer 2013. In January 2014, the Minister took formal control of the site under Section 89 of the Nunavut Waters and Nunavut Surface Rights Tribunal Act.

1.2 FEDERAL CONTAMINATED SITE

CIRNAC's overall mandate for the Jericho Mine site has been to protect human health and the environment and undertake activities to make the most effective use of securities held by the department for its closure. Steps to assess and develop remedial options for the site were underway in 2014.

A detailed testing program was conducted by Tetra Tech EBA (EBA) in August 2014 with the results and findings were presented in their Environmental Site Assessment – Materials Survey and Geotechnical Evaluation report (ESA) (EBA, December 2014). The scope of work for the report included investigation and assessment of both full remediation, as well as limited site remediation options. Characterization and delineation of impacted soil and water, hazardous and non-hazardous materials and infrastructure, and geotechnical information all formed part of the ESA.

Following assessment of the site, remedial options were developed and evaluated in an Options Analysis report (OA) (EBA, April 2015). The OA outlined the preferred options for three (3) closure scenarios: full remediation, limited remediation and preservation of site assets. Descriptions of the remedial activities for each scenario were presented in the document.

Further to the ESA and development of the closure options, continued environmental protection of the site was being undertaken by CIRNAC. The basic environmental protection consisted of mobilizing a small work force each year to manage water levels, fuel storage facilities, and conduct tailings management.

The funding for this project came from multiple sources, there were surety bonds (from the Water Licence and Land Use Permit) and an allocation from the Federal Infrastructure Initiative. The funding available was time sensitive and insufficient to complete full remediation of the site so the site stabilization focused on addressing high risk environmental and human health hazards.

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1.3 PROJECT TEAM

Table 1-1 lists the departments and companies involved in the initiation, planning, and implementation of the project.

Table 1-1: Project Team

Role	Department/ Company	Responsible Person
Owner	Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)	Mark Yetman CIRNAC Project Manager
Departmental Representative	Public Services and Procurement Canada – Northern Contaminated Site Program	Michael Bernardin – PSPC Project Manager
Departmental Representative Authorized Personnel (DRAP) On-site Quality Assurance (2017 & 2018)	DXB Projects	Henry Wong – DRAP Andy Uyarrai – Assistant DRAP
Remediation Contractor (2017 & 2018)	Rowe’s Outcome Join Venture (ROJV)	Jack Rowe – ROJV Project Manager
Specifications and Drawings (2016)	DXB Projects	Henry Wong – Specifications Lead Dan Hewitt – Design Engineer
Options Analysis (2015)	Tetra Tech – EBA	Gary Koop
Environmental Site Assessment, Materials Survey and Geotechnical Evaluation (2014)	Tetra Tech – EBA	Gary Koop

2.0 SITE STABILIZATION PLAN

The remediation options for the various mine components of the site were presented and evaluated in the OA. The initial delineation and characterization of impacted media (soil and water) and materials were detailed in the ESA report, which also included reference to the Water Licence that was issued for the operation of the Jericho Mine in 2004, reassigned to Shear in 2010 and renewed by the Nunavut Water Board in 2011. The final clean-up criteria and objectives were developed in accordance to the findings of the ESA or amended to reflect the overall mandate of the project.

The final scope for the project was a hybrid of what was presented in the OA. The project team prioritized work items with consideration given to limited funding, time constraints and challenges with site access.

The site stabilization activities were successfully implemented by the contractor and specific objectives met. Work details are included in the next sections.

2.1 SITE STABILIZATION OF MINE COMPONENTS

The stabilization plan for the different mine components are shown in Table 2-1 (organized in reference to industry-recognized closure plan modeling).

Table 2-1: Site Stabilization of Mine Components

Mine Component	Stabilization Activity
Open Pit	<ul style="list-style-type: none"> Divert the C1 stream (back) to the Open Pit to accelerate natural filling of the pit Construct a Pit Overflow/ Outflow channel in conjunction with expediting filling of the open pit Work was not included to specifically address the Pit Lake water quality; however, adding the C1 (stream) catchment area is expected to improve the overall long-term water quality Work was not included to directly address stabilization of the till material around the Open Pit; however, excavation of the new C1 channel would remove the majority of the potentially erodible till material
Underground Mine	<ul style="list-style-type: none"> There was no underground mine component at the site

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Mine Component	Stabilization Activity
Tailings Facility	<ul style="list-style-type: none"> Grade the existing Cell A tailings surface, promoting consistent natural drainage; and construct a 300 mm thick Coarse Processed Kimberlite cover
Rock Pile	<ul style="list-style-type: none"> Leave rock pile on IOL and coarse processed kimberlite pile as-is
Buildings and Equipment	<ul style="list-style-type: none"> Re-grading of the containment berms was not included in the 2017 Contract Specifications Leave mine site waste rock pads as-is Leave site roads as is Leave airstrip as-is Leave buildings as-is Remove the tanks from the Phase 1 Tank Farm Area to build the PHC Soil containment Leave the tanks in the Phase 2 Tank Farm Area Leave equipment as-is
Chemical and Contaminated Soil Management	<ul style="list-style-type: none"> The 2017 Site Stabilization was re-focused to managing the highest priority site hazards, and for the environmental work, primary consisting of the removal and off-site disposal of hazardous materials, cleaning the Tanks and drums, incineration of the liquid organic wastes and consolidation of the PHC Soils Consolidate and contain the PHC Soils into the Phase 1 Tank Farm area, with installation of a geosynthetic liner and coarse PK cover overtop Leave blue lead-based painted ASTs intact Remove fluorescent lights for off-site disposal Depressurize Gas Cylinders and Fire Extinguishers Remove refrigerant items for off-site disposal Pressure wash/ clean residual liquids from emptied drums, tanks and piping

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Mine Component	Stabilization Activity
	<ul style="list-style-type: none"> Consolidate and incinerate the Organic Liquid Wastes or remove off-site for disposal Remove batteries for off-site disposal Remove all 'other' hazardous wastes for off-site disposal
Surface and Groundwater Management	<ul style="list-style-type: none"> The primary objective for management of the surface water was to allow natural flow out of the site facility Construct the designed breach (notch) for the Divider Dyke A Construct the designed breach for the West Dam Construct the designed breach and plug across the C1 Diversion into the Open Pit (new/ original C1 stream alignment) Leave the intake jetty/ water intake causeway as-is

2.2 ASSESSMENT CRITERIA

The characterization and delineation of concerned media and materials were based on the assessment criteria presented in Table 2-2 (organized as listed in the ESA).

Table 2-2: Summary of Assessment Criteria

Media/ Material	Parameters	Assessment Criteria
Soil	<ul style="list-style-type: none"> Benzene, toluene, ethylbenzene, and xylene (BTEX) Polycyclic aromatic hydrocarbons (PAHs) Glycols 	<p>The Canadian Environmental Quality Guidelines, Soil Quality Guidelines for the Protection of Environmental and Human Health (CCME, 2014)</p> <ul style="list-style-type: none"> Agricultural land-use <p>Environmental Guideline for Contaminated Site Remediation (GNU, 2009)</p>

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Media/ Material	Parameters	Assessment Criteria
	<ul style="list-style-type: none"> ▪ Metals 	<ul style="list-style-type: none"> ▪ Agricultural/ Wildland
	<ul style="list-style-type: none"> ▪ Petroleum Hydrocarbons (PHC) fractions F1 through F4 	<p>The Canada-Wide Standard for Petroleum Hydrocarbons in Soil (CCME, 2008)</p> <ul style="list-style-type: none"> ▪ Agricultural land-use ▪ Coarse-grained soil <p>Environmental Guideline for Contaminated Site Remediation (GNU, 2009)</p> <ul style="list-style-type: none"> ▪ Agricultural/ Wildland
Surface water	<ul style="list-style-type: none"> ▪ BTEX ▪ PAHs ▪ Glycols ▪ Routine Analysis ▪ Total and Dissolved Metals 	<p>Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (CCME, 2014)</p>
	<ul style="list-style-type: none"> ▪ PHC fractions F1 to F2 	<p>No Guidelines applied</p>
Groundwater	<ul style="list-style-type: none"> ▪ BTEX ▪ PAHs ▪ Glycols ▪ Routine Analysis 	<p>Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (CCME, 2014)</p>

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Media/ Material	Parameters	Assessment Criteria
	<ul style="list-style-type: none"> Total and Dissolved Metals 	
	<ul style="list-style-type: none"> PHC fractions F1 to F2 	No Guidelines applied
Drum Contents	<ul style="list-style-type: none"> Liquid contents 	Abandoned Military Site Remediation Protocol (CIRNAC, 2009) to classify for discharge, incineration or disposal
Lead Amended Paint	<ul style="list-style-type: none"> Leachate value or 'Rule of 20' Total Lead concentration 	Nunavut Environmental Guideline for Waste Lead and Lead Paint (GNU, 2014)

2.3 CLEAN-UP CRITERIA/ OBJECTIVES

The final site stabilization plan included the clean-up of PHC contaminated soil (PHC Soil) areas, abatement and management of hazardous wastes; as well as the continued management of site surface water. The final clean-up criteria and objectives were based on findings of the ESA and progression of the stabilization plan.

A listing of the clean-up criteria and objectives is presented in Table 2-3.

Table 2-3: Summary of Clean-up Criteria and Objectives

Media/ Material	Parameters	Clean-up Criteria/ Objective
Soil	<ul style="list-style-type: none"> PHC fractions F1 through F4 	Abandoned Military Site Remediation Protocol (CIRNAC, 2008) soil remedial objectives
Surface water	<ul style="list-style-type: none"> Effluent discharge into the environment 	Nunavut Water Board's Letter of Decision In Respect of Proposed Water Use and Waste Deposit Associated with the Jericho Mine Site Stabilization Project (June 23, 2017)

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Media/ Material	Parameters	Clean-up Criteria/ Objective
Drum Contents	<ul style="list-style-type: none"> ▪ Management of organic liquid contents 	Abandoned Military Site Remediation Protocol (CIRNAC, 2008) barrel protocol criteria and disposal summary
Storage Tank Systems	<ul style="list-style-type: none"> ▪ Decommissioning of Storage Tank Systems 	Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations (Amended 2012)
Ozone depleting substances	<ul style="list-style-type: none"> ▪ Decommissioning of Refrigeration Systems and Air-Conditioning Systems, and ▪ Fire-Extinguishing Systems 	Federal Halocarbon Regulations (Amended 2009)

3.0 REGULATORY REQUIREMENTS

The project site work was executed under the direct regulatory jurisdiction of the Nunavut Water Board (Board) and the CIRNAC Lands Administration Office.

The Jericho Mine site stabilization was initiated under the Minister’s powers to take all reasonable measures to prevent, counteract, mitigate or remedy potential adverse effects from the mine under s. 89 of the Nunavut Waters and Nunavut Surface Rights Tribunal Act, S.C. 2002, c. 10. As such, the Board did not have a defined role in the approval of specific remediation activities; however, did provide a Letter of Decision (LOD), dated June 23, 2017, further to consultation on the project. The letter stated that if the proposed uses of Water and deposits of Wastes connected to the project were undertaken in a manner consistent with the terms and conditions outlined in the Letter of Decision, the Site Stabilization project would be consistent with the objectives of the Board.

Land Use Permit (LUP) #N2016U0013, dated January 12, 2017 was issued by the Lands Administration Office for the project’s planned site work. An amendment to the permit was subsequently issued to include blasting of the West Dam as part of the project work.

Copies of the LOD, LUP and LUP amendment are include in Appendix A – Regulatory Support Documents.

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3.1 INSPECTIONS

Through the course of the project, several regulatory inspections were conducted by authorities having jurisdiction (AHJ). A list of the inspections is shown in Table 3-1.

Table 3-1: Regulatory Inspections

Date	Department	Purpose of Inspection	Outcome
August 16, 2017	CIRNAC Lands and Water Officer – B. Pederson	General project inspection	Inspection report to CIRNAC.
August 16, 2017	Alia Bigio – Geologist	Analysis of core	Documentation and securing of core shack.
August 22, 2017	NIRB – D. St.Pierre NWB – C. Ene KitIA – W.Kuliktana ECCC – R. Bams DFO – S.Wong DFO – Mark D’Aguiar	General project inspection	Correspondence re: action for items to CIRNAC.
June 6, 2018	CIRNAC Lands and Water Officer – B. Pederson	Project close-out inspection	Inspection report with action items.
June 6, 2018	NIRB – J.Ohokannoak and K. Gillard	Regulatory close-out items	Request for photos of completed actions to close-out Tank Decommissioning Halocarbon Decommissioning files.
August 3, 2018	CIRNAC Lands and Water Officer – B. Pederson	Project close-out inspection	Waiting on final photos for project close-out.

Photos 1 and 2 are from the August 22, 2017 Inspection, included at the end of text.

An on-site compliance review of the LUP was done by the Departmental Representative for June and July 2017 and have been included in Appendix A.

3.2 REGULATORY ITEMS

Three grey water spills were reported to the NU Spill Hotline. The spills were all related to water management within a constructed berm containing the Contractor's camp use grey water.

The spills were reported for:

- July 21, 2017;
- August 8, 2017; and
- August 15, 2017.

The grey water was tested at the start of the containment to check if water would meet the project's discharge criteria, as outlined in the LOD. Results from the testing indicated that the water did not meet the discharge criteria for Biological Oxygen Demand (BOD), Total Suspended Solids (TSS) and Total Oil and Grease (O&G). ROJV carried out multiple rounds of aeration and activate carbon treatment; however, follow-up testing still indicated the water was above the discharge criteria. A lab analysis of the oil and grease composition showed that the contaminants were a result of concentrated kitchen oil and grease waste, since there were only minimum other camp grey water sources.

Due to the persistence of the oil and grease in the contained grey water, ROJV's request to transfer the water into the open pit for long-term containment and natural attenuation was granted by the INAC Lands Administration Office – Mr. Baba Pedersen on September 21, 2017.

The grey water was transferred into the Open Pit starting September 22, 2017.

Photos 3 to 7 are of the Grey Water set-up and treatment system, included at the end of the text.

ROJV's Grey Water Discharge request memorandum, date September 20, 2017 has been included in Appendix A.

During the 2017 work season, a Regulatory Inspector's site tour was conducted on August 22, 2017; and a subsequent inspector's visit the following year on August 3, 2018. Further to the site inspections, Environment Canada identified deficiencies that needed to be addressed to close-out the decommissioning of the Storage Tanks and Halocarbon Equipment

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ROJV's 2018 completed work included all regulatory close-out items. A summary of the work is included in Appendix B – Project Records.

4.0 PROJECT IMPLEMENTATION

Tender documents (a Terms of Reference and general Specifications), based on the ESA and OA report, were prepared in 2016 to solicit Design/ Build proposals for the project. The Contractors were to provide design and deconstruction services for each of the work components outlined in the terms of reference (TOR) based on the scope of work which had been developed from the applicable preferred alternatives of the OA to address the priority environmental and human health concerns.

No compliant bids were received from the 2016 solicitation and the work was not awarded. Notably, it was understood that winter road construction to access the site presented significant logistical challenges resulting in budgetary constraints.

Upon failing of the initial tender, the project team took a second look at the priorities and revised the scope to enable the highest risk items to be addressed in one construction season by heavy air lift mobilization. As such the scope for the site stabilization was revised to maximum risk reduction within the existing budget using a more traditional design-bid-build approach, with the demolition work removed and the schedule shortened to one season, thereby eliminating the option to use a winter road for site access.

4.1 FINAL SITE STABILIZATION PLAN

The final site stabilization plan was developed as a progression of the remedial components and options evaluated in the OA, priority work outlined in the 2016 design-build TOR and then the final work adapted into the 2017 Contract Specifications (Specifications) and Design Drawings.

The final scope of work consisted of the following (organized as shown in the Specifications):

- Mobilization of all personnel, equipment, support facilities and materials required to complete the Work via airlift;
- Earthworks;
 - Grading the existing tailings surface across the Processed Kimberlite Containment Area (PKCA) to promote consistent natural drainage,
 - Construction of a 300 mm thick Coarse Processed Kimberlite cover over the PKCA tailings,
 - Dewatering Cell C,
 - Construction of the designed Breach for the West Dam,
 - Construction of the designed Breach for the Divider Dyke A,
 - Construction of the Open Pit Outfall at the North side of the Open Pit,
 - Construction of the excavated breach and plug across the C1 Diversion into the Open Pit,

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- Environmental Work;
 - Decommission and remove the Above Ground Storage Tanks (ASTs) from the Phase 1 Tank Farm Area to build the PHC Soil containment within the footprint
 - Excavating, placing and consolidating petroleum hydrocarbon contaminated soil (PHC Soils) into the Phase 1 Tank Farm area and place a synthetic liner and coarse PK cover over the PHC Soils,
 - Clean and/ or decommission all drums, pipelines and above-ground storage tanks (ASTs),
 - Consolidation and classification of organic liquid wastes, including oils and waste oils; on-site Incineration of the liquids meeting incineration criteria and/ or shipping off-site and disposal at a licensed disposal facility,
 - Depressurizing all gas cylinders and fire extinguishers, and staging the empty containers at a designated on-site storage area,
 - Removing all 'other' identified hazardous waste from the specified work areas, transporting off-site, shipping to and disposal at a licensed disposal facility. Other hazardous wastes, as listed in the ESA

- Demobilization of all Contractor's personnel, equipment, support facilities and materials used as part of the Work via airlift; and

- Provision of the following site support services;
 - Camp Facilities, including operation, maintenance, catering and janitorial service,
 - Provision and maintenance of Departmental Representative's Vehicles, as specified,
 - Safety, fire protection, office and medical service,
 - Transportation services for Departmental Representative and Departmental Representative's support staff from Yellowknife, NT to the Jericho Mine Site,
 - Communication services for Contractor and Departmental Representative,
 - Provision of Wildlife Monitors.

4.2 SELECTION OF REMEDIATION CONTRACTOR

PSPC, on behalf of CIRNAC, was designated as the contracting authority and solicited the Contractor through a competitive Request for Proposal (RFP) procurement process. The RFP process utilized the highest combined rating of technical merit and price. The ratio for the RFP was 50% for the technical merit (including Technical, Management and Organizational, Inuit Benefits Criteria) and 50 % for the price.

The Jericho Mine Site Stabilization project, Public Services and Procurement Canada (PSPC) Canada Contract No. EW699-171068/001/NCS, was awarded to Rowe's – Outcome, A Joint Venture (ROJV) on May 4, 2017.

4.3 CONTRACTOR IMPLEMENTATION APPROACH

The ROJV team consisted of Rowe’s Construction and Outcome Consultants. Rowe’s Construction (Rowe’s) fulfilled the role of the Prime Contractor and provided the equipment and expertise in construction and fuel management and Outcome Consultants Ltd. provided project management, environmental services and logistics planning.

4.3.1 Schedule

ROJV planned and completed the work over an approximate 15-week period from mid June through mid October to correspond to the typical construction season for the area.

4.3.2 Mobilization

ROJV executed an air mobilization of equipment, materials and supply between Yellowknife and the site from June 5th to 26th, 2017 using the following airlifts:

- 10 C-130 Hercules loads;
- 2 Electra loads;
- 3 Dash-7 loads; and
- 4 DC3 Turbo loads

The initial mobilization consisted of camp equipment and supplies, with the Hercules flights with the larger equipment occurring in the later part of the mobilization period after the airstrip was upgraded.

Photos 8 to 12 are from the air mobilization, included at the end of the text.

4.3.3 Equipment

ROJV’s proposed and executed plan was based on the restoration and use of a significant amount of the available on-site Crown equipment and the mobilization of key supplemental heavy equipment owned by Rowe’s.

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The on-site Crown equipment restored, operated and maintained as part of ROJV's project work included the following:

- CAT 950 Loader;
- CAT 980G Loader;
- CAT 322C Excavator;
- Sterling Dump Truck;
- Large Blue 8" Godwin Pump;
- Red 6" Godwin Pump;
- 4" Godwin Pump;
- 2 Light Plants;
- Ford F350 Medic Truck/ Ambulance;
- Ford F350 Van;
- 250 Bobcat Skidsteer;
- 185 Bobcat Skidsteer;
- Ford Fuel Truck tanker;
- Sterling Roll-on Roll-off Truck;
- 70 kW Cummings Generator (for camp spare); and
- Kubota Generator at airstrip.

ROJV's heavy equipment fleet consisted of the following:

- Komatsu D61 dozer;
- Komatsu HM300 Rock Truck – 1;
- Komatsu HM300 Rock Truck – 2;
- Komatsu HM300 Rock Truck – 3;
- Komatsu PC210LC Excavator;
- Komatsu D65EX-17; and
- Drill Rig

The mobilization of the heavy equipment included dedicated work, spanning over a week in Yellowknife, to disassemble sections of the equipment to meet the cargo hold dimensions of the C-130 Hercules; e.g. removal of the truck tires, tracks, equipment cabs and boom; and then full reassembly onsite. Two Komatsu mechanics were mobilized to Yellowknife and then site to complete the disassembly and reassembly for the mobilization; and the same process for demobilization.

Photos 13 to 19 show ROJV heavy equipment mobilized to site.

4.3.4 Fuel

Approximately 160,000L of existing diesel was recovered from on-site and used for heavy equipment and camp operations after filtering and other processing.

Total fuel consumption during the execution of the work was:

- Diesel – 191,205 L; and
- Gas – 1,232 L.

Photos 20 to 22 show ROJV's fuel recovery work, included at the end of the text.

4.3.5 Camp

The Camp Facilities were supplied by Nunavut Expediting Services and set-up north of and in close proximity to the existing camp compound in order to access functioning equipment (ASTs, generators, etc.). The camp consisted of the following structures:

- Sleeping tents (4 beds/tent) – 10 tents;
- Work Station/Office tent;
- First Aid tent;
- Male and Female Dry tents (washer and shower facilities);
- Kitchen/Mess tent; and
- Washroom tent (with pacto toilets).

ROJV'S commissioned and utilized the following existing facilities:

- AST #18;
- Truck Shop;
- Two Generators; and
- Camp Waste Incinerator (for domestic wastes).

ROJV's also mobilized the following:

- Bear Fencing and battery pack, with gate access;
- Communications System;
- Potable Water System (integrated with Kitchen Tent); and
- Waste Incinerator (for organic fluids).

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Photos 23 to 26 are of ROJV 2017 work camp, included at the end of the text.

4.3.6 Potable Water

ROJV obtained water from Carat Lake, transported by trailer and water totes and a potable water truck and delivered to a holding tank. Water was then treated with a water treatment plant and tested. The water treatment was integrated into the Kitchen Mess Tent Facility and after treatment, the water was directed from the treatment system to a holding tank for domestic water use during the project.

4.3.7 Wastewater

Blackwater

No blackwater was generated for the site work. Pacto toilets were used for the camp and the bagged human bio-waste was collected daily for onsite incineration.

Greywater

Greywater was directed from the various sources in the Camp Facility (kitchen, washrooms, laundry facilities and laboratory) to the existing wastewater and sewage system for treatment before containment into Open Pit.

Issues that arose with management of the grey water have been outlined in the Section 2 regulatory items.

4.3.8 Solid Waste

The management of solid waste consisted of the incineration of 16,850 kg of food wastes and similar domestic waste generated from the camp operation, which greatly reduced the waste volume and greatly reduced the potential for attracting animals to the camp. Once cooled, the incinerated wastes were packaged in sealed containers and stored in a secure location and then removed from site on one of the weekly support flights. The incinerated wastes were brought to the Yellowknife landfill facility for disposal.

4.3.9 Sub-Contractors

Sub-contractors retained by ROJV in the performance of the Work included:

- Kikiak Contracting –work crews, camp staff;
- Nunavut Expediting Services – camp services, expediting services, wildlife monitors;
- All Peace Petroleum – processing of existing fuel for use in equipment, cleaning and decommissioning of fuel drums and ASTs;
- KEL Environmental/ KBL Environmental – collection, packaging and off-site disposal of hazardous waste;
- Break-Away Drilling and Blasting – blasting to assist with excavation of West Dam Breach;
- A&A Technical Services – Geosynthetic Liner supply and installation; and
- Air Charter Companies;
 - First Air,
 - Aqsqniq Airways,
 - Kitikmeot Airways,
 - Summit Air Kitikmeot.

4.3.10 Worksite Health and Safety

ROJV retained a medic on site for the duration of the work. The medic was responsible for treatment of injuries and arrangement of transport for medical and traumatic emergencies, the main point of communications for all personnel working on site, reporting and recording of all Incidents and Spills on site, enforcement of safe work regulations, daily safety briefing for multiple staff members, coordinating secure transfer of medical records to off-site personnel. Copies of the incident reports are included in Appendix B – Project Records.

Five incidents were reported including one injury, one pollutant release and three involving damage to a vehicle or equipment. Following is brief description of each incident:

- Minor Injury: eye irritation occurred when a change of wind blew polymer into skid steer operator’s eye; the eye was washed at an eye wash station, followed by medical aid by the site medic;
- Release of Pollutant: grey water at grey water sump exceeded sump capacity; excess grey water and incoming line were transferred to a different sump and additional sump capacity was installed; the release was reported as a spill;
- Vehicle Damage: an ATV was damaged by a frontend loader; employee awareness session was conducted and a new policy was implemented;

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- Equipment Damage: broken windows in dozer when chain used to tow another dozer broke and entered the dozer's cab; reviewed Standard Work Procedure for rigging with all operators potentially towing equipment; ensured that adequate towing/rigging equipment was available; and
- Vehicle and Equipment Damage: while moving big tires with a dozer, a tire fell onto the dozer's door breaking a window; a JHA was done and a spotter was to watch for shifting tires in future.

4.4 DEPARTMENTAL REPRESENTATIVE

The DR was PSPC's representative on site for quality assurance of the contractor's work and to address any contractual issues arising. The DR attended morning crew meetings and facilitated and documented weekly and monthly meetings between on-site and off-site project team members. ROJV provided information to the DR on a daily basis, which was documented in a Daily Report consisting of:

- Daily activity and progress to date;
- Health, safety and environmental issues;
- Site personnel and visitors;
- Status of contract work items;
- Comments, concerns and correspondence;
- Safety topic at morning meeting; and
- Photographs.

A compilation of the 2017 Daily Reports, minutes of the weekly and monthly meetings and the 2018 Summary Site Report is included in Appendix C – Departmental Representative Site Reports.

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5.0 COMPLETION OF STABILIZATION ACTIVITIES

The site stabilization activities were all successfully implemented with the majority of the work having been completed during the planned 2017 season, and re-work of the Phase 1 PHC Cell cover liner in 2018.

An initial substantial work completion inspection was done on September 5, 2017. The inspection was done as a lead in to the final monthly construction meeting (September 2017), attended by ROJV, CIRNAC, PSPC and DXB representatives.

The Inspection covered the following work items (organized in general reference to the Contract pay items):

1. PHC Soil work;
2. Clean and Decommissioning of drums, pipelines and ASTs;
3. Consolidation and Incineration of Waste Organic Liquids;
4. Management of Hazardous Material Wastes;
5. PKCA Tailings Cover;
6. West Dam Breach;
7. Divider Dyke A Notch;
8. Construction of Open Pit Outfall;
9. Construction of C1 Channel; and
10. Site Cleanup and Demobilization.

The inspection detailed the status of each work item, items outstanding, deficiencies, and work scope revisions. Items 3, 4, 5, 6, 7 and 9 were marked as completed and passed inspection and “ready for use by Canada or is being used for the intended purposes”.

A final inspection for the 2017 season was conducted on October 4, 2017. All work items were completed at that time except final placement of the rip rap for the Open Pit Outfall and final site cleanup and demobilization. The placement of the rip rap was being held off to allow vehicle access across the outfall since its alignment cut off the pit perimeter road and ROJV were still hauling water from Carat Lake for camp use during the final demobilization and site shut down. All activities were completed and the last personnel were off-site on October 16, 2017.

Although completed, a deficiency was marked for the Phase 1 Containment cover in the October 4 Inspection Report. The issue was flagged at the time, and further reviewed and discussed by the project team and industry specialists in the offseason. The team concluded and instructed ROJV to correct the deficiency, as detailed in the November 27, 2017 technical memorandum. The work was completed August 2018 and described in the PHC Soil work section below.

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A copy of the October 4, 2017 Inspection Report has been included in Appendix D.

5.1 CIVIL WORK

A Civil Work As-built Report and Contractor’s As-built Drawings have been included in Appendix E. Photos of work were included in the report.

The following table summarizes the durations and quantities associated with the completion of the Major Civil Work components of the project. Details of all work components are outlined below in Section 5.1.1.

Table 5-1: Civil Work Summary

Work Component	Activity	Quantity	Start Date	End Date
Open Pit Outfall Breach	Excavation	1,040 m ³	July 9	July 18
	Rip Rap	165 m ³	Sept 11	Sept 11
Divider Dyke A	Dewater		July 6	July 12
	Excavation	3,560 m ³	July 21	July 27
	Energy Dissipation Ramp		Aug 26	Aug 27
	Rip Rap	650 m ³	Sept 3	Sept 4
C1 Diversion Breach	Excavation	13,100 m ³	July 10	Sept 2
	Rip Rap	6,150 m ³	Sept 4	Sept 8
West Dam Breach	Dewater		June 23	July 17
	Excavation	28,500 m ³	June 30	Sept 9
	Rip Rap	1,600 m ³	Sept 14	Sept 14
PKCA Cover	Pre-Grading	106,241 m ²	July 7	July 17
	Cover Placement	31,872 m ³	July 18	Sept 1
Phase 1 PHC Soil Containment	Contaminated Soil	1,320 m ³	Aug 10	Sept 21
	Existing Soil & PKC to raise grade	2,320 m ³	Aug 10	Sept 21
	Liner	3,375 m ²	Sept 10	Oct 3
	PKC Cover	1,688 m ³	Sept 10	Oct 3

5.1.1 As-built Report

This section summarizes the earthworks undertaken to cover the PKCA, construct four breaches, and cover the Phase 1 PHC Contaminated Soils Cell. Some of the challenges and unique work procedures are also described. A different approach was used at each location, which was sometimes revised as

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conditions changed during the course of the work. For example, ROJV developed site specific work procedures to excavate frozen ground at several locations.

It was anticipated that there would be larger material in portions of the structures to be breached that could be left in place as riprap. Upon excavation it was found that there was no material in any of the structures that was suitable riprap for erosion protection. A complete covering of riprap was required over the excavated surfaces and 3.4 times more riprap than estimated was required. The riprap was sourced from two existing stockpiles of esker material. The pile near the West Dam required screening while the pile near coarse PK stockpile was partially screened.

Survey control was provided by ROJV's surveyor. This included staking out excavation limits and alignments, cut depths, progress surveys, and surveys of completed work. The As-built Report in Appendix E documents the details of the completed work vis-à-vis contract specifications.

5.1.1.1 PKCA Cover

Cover material for the PKCA was borrowed from the coarse processed kimberlite (PK) stockpile. The pile was frozen to a large extent. Unfrozen material was dozed into piles on the top of the stockpile or pushed over the side of the stockpile for loading into haulage trucks. The regular dozing exposed the frozen material for solar thawing. Loaders also worked their way around the bottom of the stockpile, removing material until frozen material was encountered, then moving over to allow the exposed frozen material time to thaw.

There was an initial concern for trafficking on the PKCA, especially towards Dyke A and the eastern shore where the tailings were finer and more moist. This turned out to be a non-issue for the most part. The operators took precautions in known soft areas. Haulage roads were installed on the tailings for trucks to deliver the PK. The few times that equipment became bogged down did not result in a significant delay. Some areas received additional cover material to ensure trafficability.

When considering runoff drainage on the PKCA cover, best use was made of existing drainage paths by covering them with rock rather than PK. Runoff would tend to erode the finer PK, where the rock would not be subject to erosion.

Achieving the design thickness was initially tricky as the PK was soft and compacted significantly when driven over. As a guideline for the equipment operators, grade stakes were installed on a grid pattern throughout the PKCA. The DR examined the depth, or thickness, of the PK cover by digging a hole through the PK down to the tailings at several grade stake locations and noting the depth.

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5.1.1.2 West Dam Breach

The West Dam had a larger estimated breach volume to excavate than other breaches. Frozen ground was encountered soon into the excavation. Two working benches were established along the dam as independent work places so that a crew could be excavating on one bench while the other bench underwent solar thawing.

As part of ROJV's original proposed work plan, a controlled blast to break up the frozen material of the West Dam core had been identified as a risk response measure to expedite the excavation and removal process. Following award of the Contract to ROJV, the application process to amend the original LUP to include the blasting work was initiated and a LUP Amendment eventually issued on August 11, 2017. A copy of the application has been included in Appendix A – Regulatory Support Documents.

Based on the assessment of excavation through the dam, upon issuance of the LUP amendment, ROJV decided to implement the blasting work. Break-Away Drilling and Blasting was mobilized to site on August 16, 2017; three rounds of blasting were effectively set-up and carried out in the excavation sections. The drillers demobilized from site August 20, 2017.

When the alignment of the breach was staked for final excavation, it was apparent that the north slope was further from the channel than need be. Instead of making the slope fit the channel alignment, which would involve additional work, the channel was re-aligned to fit the slope. This field fit provided more room on the south side of the channel. Blasting had provided a flood plain where the design south slope would have been and exposed the original valley slope to serve as the channel's south slope.

Water in Cell C had been sufficiently pumped down so that there was no flow in the finished channel.

5.1.1.3 Dyke A Breach

No frozen ground was encountered while excavating the breach at Dyke A and digging was easy. An energy dissipation ramp was installed at the outlet of Dyke A as the outlet elevation was about 4 m above the normal water level in Cell C.

The inlet elevation of the channel appeared high relative to the PKCA. The elevation was checked by ROJV's surveyor and found to be correct.

A bypass road was established on the upstream side of Dyke A to allow vehicle access past the breach area. The channel side slopes were shallow enough to allowed for equipment travel across the breach should the bypass road become unusable.

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5.1.1.4 C1 Diversion Breach

Thawing of frozen ground was sped up by diverting the water pumped from Cell C into the C1 breach area. This was easily done as the discharge pipe from the pump at Cell C passed by the C1 breach area. When frozen ground prevented efficient excavation, the work crew was cycled out to give time for the ground to thaw, and cycled back in when enough ground had thawed.

The specification called for a plug in the C1 Diversion Trench. However, rather than installing a simple plug, a length of the C1 Diversion Trench was backfilled with material that was excavated for the breach. This provided a better water stop than a plug as well as significantly shortening the haulage distance to dispose of the excavated material.

To prevent inadvertent entry into the open pit, a row of large rocks was placed along the downstream edge of the channel near the pit wall and tied in with the existing safety berm on the pit perimeter road. Large rocks were also placed at the top of slope the channel to restrict access to the breach area.

5.1.1.5 Open Pit Outfall

Site inspection of the outfall area indicated that the actual level of the ground at the inlet end of the outfall was significantly lower than shown in the information provided for design. Consequently, a construction guideline was developed as an alternative approach to the specified design. The guideline was submitted to ROJV and discussed. The guideline was not properly implemented and the outflow channel can be expected to underperform in a high flow event.

The final slope of the finished channel was steeper than specified and there was a shortage of riprap in places. The final inlet of the channel was constructed 300 mm higher than specified, creating a 6% grade in comparison to the design 2.9% grade across the 20 m long path. This will not be an issue until the flood water in the pit approaches its target elevation. At that time the channel will be subject to erosion during high flows. A concern was also noted that the water may also seep through and erode the outfall and/or pit perimeter road if the final inlet elevation of the outfall was higher than sections of the perimeter road.

Following the completion of the 2017 season, the issues concerning the outfall were reviewed and a “no action at this time” selected as the option to move forward. With some potential variability in the final expected flow calculations; the design Pit Lake elevation having been based on pre-mining historical data and the current ground topography of the Open Pit perimeter not reflected in the aerial survey data used for the analysis, the impact of potential erosion was not confirmed and action for a more extensive work program not selected. As part of the team review, it was considered that the outfall would feed onto

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approximately 100 m of tundra land before connecting with Carat Lake, and that potential erosion of the mine-rock channel when the Pit Lake reached its equilibrium would be mitigated.

The area is to be monitored as part of the monitoring and surveillance program for the site.

Further to the decision of no-action, a work program was carried out on-site in 2018; and the inlet grade checked and confirmed to be the lowest point of the pit perimeter road.

The open pit outfall is located in the pre-mining flow path of water from the C1 breach area that crossed the open pit area and reported to Carat Lake. The outfall location is also on a section of the pit perimeter road which was used regularly by ROJV to take water from Carat Lake for the camp's sanitary water supply and a traffic lane across the outfall was maintained until the final days of the 2017 site work for equipment travel.

5.1.1.6 Phase 1 PHC Contaminated Soils Cell Cover

The initial preparation of the Phase 1 Tank Farm area included moving out the eight 500,000 L storage tanks. Prior to moving the tanks, they were emptied of remaining fuel, cleaned and decommissioned. The tanks were then tipped onto their side and moved out of the cell to a storage area.. A ramp into the cell was graded into place at its northeast corner and care taken not to damage the existing edges of the base liner.

ROJV scheduled the PHC Soil clean-ups following preparation of the cell. The remedial excavations were done with an excavator and dump truck, and the material was hauled and placed into the containment cell. Where the PHC Soil zones were originally within a soil berm system, the PHC Soil was removed, area confirmed clean and berms breached to avoid future water containment.

As the 2017 season progressed, the wrap-up of the PHC Soil clean-up was pending completion of activities in the Hazardous Waste Transfer Area (HWTA) and Phase 2 Tank Farm area so those areas could be excavated. Fuel consolidation and incineration and project fuel storage were being done in the HWTA and Phase 2 Tank Farm area, respectively.

To expedite the completion of the containment cell, ROJV rolled out and placed the geosynthetic liner over the cell. A large half of the PHC Soil placement was completed in the north end of the containment at that time. The protective soil cover was installed over the completed half of the cell and then the liner pulled back over the completed section; leaving half the cell open for the remaining PHC Soil.

The issue that arose to close-out the cell cover construction, was that a significant snow event occurred just prior to closing the cell, 100 to 150 mm of snow. Because of the time of year and corresponding site

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temperatures, the snow was in a solid crystal state. When ROJV went to pull the folded back liner over the open cell (with excavator, dozer and loader) the weight and drag of the snow did not allow the liner to be fully straightened out. An 's'-fold remained in the liner and a tear created from the effort.

The placement of the protective soil cover was finished to close up the cell for the season and leave for review.

As described further in Section 5.4 – Non-compliant Work, a work program was carried out in 2018 to correct the deficiency in the containment cell cover. The liner was exposed, repaired by ROJV's liner specialist sub-contractor and re-covered; to meet the design intent of the remedial work.

5.2 ENVIRONMENTAL WORK

5.2.1 PHC Soil work

The planned PHC Soil area cleanups were principally all completed. The zones of PHC Soil were excavated, soil hauled and placed into the Phase 1 containment cell; and a confirmatory sampling program conducted to verify that the clean-ups had met the project's remedial objectives.

The containment cell was capped with a geosynthetic liner and a protective soil cover placed over the liner. The final construction of the cell cover was completed in 2018 with corrective work carried out on the geosynthetic liner and soil cover.

Photos 27 to 39 are of the PHC Soil Work, included at the end of the text.

5.2.1.1 PHC Soil Clean-up

The initial delineation of the petroleum hydrocarbon impacted soil was presented in the ESA. During development of the final Stabilization Plan, the clean-up objectives for the PHC Soil were established as CIRNAC's Abandoned Military Sites Remediation Protocol (AMSRP) (2009) for the remediation of 'hydrocarbon contaminated soils'. The remedial objectives/ criteria set out in the AMSRP are commonly applied to CIRNAC northern contaminated sites remediation projects as they represent applicable site-specific conditions. The initial ESA PHC Soil areas and corresponding test results were re-assessed against the AMSRP remedial criteria.

The estimated volume of PHC Soil was re-calculated to reflect the amended remedial objectives:

- ESA delineated quantity of 7,850 m³ across 15 Areas of Potential Concern (APEC); and

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- Revised estimated quantity of 3,349 m³ across 10 APECs.

The reduction in the total impacted soil quantity reflected the AMSRP's use of arctic site-specific conditions for assessment of receptors and exposure pathways. Notably, the impacts of the protocol's non-mobile classed hydrocarbons have less restrictive clean-up criteria based on their limited direct exposure pathways.

At the start of the 2017 work season, additional testing was done by the Departmental Representative team to further delineate the PHC soil areas. A set of field-maps with mark-ups outlining the required PHC soil cleanup were given to the contractor on-site and included herein Appendix F.

The final PHC soil clean-up volume was 1,316 cu.m. A summary table, PHC Soil Clean-up Summary, of the ESA delineation, application of the AMSRP and final clean-up volume has been included in Appendix F.

The cleaned-up areas consisted of:

1. APEC 8 – outside Phase 1 Tank Farm Area (under fill piping infrastructure);
 - The PHC Soil outside the Phase 1 Tank Farm area, west berm, and along the alignment of the fill pipe infrastructure was as observed to be contained in a lined trough, specifically for the fill pipe infrastructure system,
2. APEC 13 – localized areas in the Carat Lake laydown Area, across HWTA;
3. APEC 1A – localized areas in and just outside of airport sprung/ former shop;
4. APEC 14 – spill zone within, at corner of, main camp storage Quonset;
5. APEC 10 – localized areas outside camp Shop;
6. APEC 15 – chased PHC soil zone in sandy ground of reclaimed Carat Lake camp area;
 - A stained area was newly identified in the APEC 15 reclaimed Carat Lake camp and remedial excavation chased prominently into the sandy ground,
7. APEC 1B – bedding soil within Airport fuel tank berm;
8. APEC 9 – bedding soil within camp fuel tank berm; and
9. APEC 7 – localized Phase 2 Tank Farm Area.

The nine areas were all cleaned up to the AMSRP remedial objectives.

The soil within the APEC 8 – Phase 1 Tank Farm area was left in place, as intended, and formed part of the final contained soils.

The planned clean-up of the APEC 9 – genset area was determined to be inaccessible while the generator structures and system were still in place. The impacted soil zones are underneath shipping containers that housed the generators and interconnected infrastructure.

PHC Soil was not delineated in the APEC 2 – HWTA for the 2017 work, however review of the original test results and then additional characterization testing confirmed an impacted soil zone. The stained soil based across the APEC 2 – HWTA was excavated down to the underlying liner, (approximately 100 mm deep), and hauled to the PHC containment.

All excavated areas were backfilled and/or graded with local fill to match the surrounding terrain.

5.2.1.2 Confirmatory Sampling Program

Some initial areal delineation of the PHC zones was done prior to starting the clean-up work. Confirmation testing was done following each excavation cleanup.

In accordance with the AMSRP, a systematic grid design was used for sample points to ensure uniform coverage. The grid sizes and points were a function of the excavated area of the cleanup:

- < 100 m²
 - 3 x 3 m testing grid
 - all points on the grid analysed

- > 100 m² and < 2500 m²
 - 6 x 6 m testing grid
 - 50% of perimeter grid points analysed
 - 40% of interior grid points analysed

- > 2,500 m²
 - 12 x 12 m testing grid
 - 50% of perimeter grid points analysed
 - 40% of interior grid points analysed

The collected soil samples were tested by the Departmental Representative team, on-site in the field laboratory using a PetroFLAG analyzer and Eagle 2 gas monitor. The PetroFLAG analyzers use a turbidimetric approach for determining the total amount of recoverable petroleum hydrocarbon in soil samples. The Eagle 2 monitors are configured with photo ionization detectors for detecting combustible gases, as an indicator of volatile hydrocarbons.

For quality control purposes, a total 39% of the samples field tested were submitted to ALS Laboratory for laboratory analysis.

The testing results were assessed against the project's hydrocarbon remedial objectives to confirm that the clean-up was done or that additional excavation then testing required.

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A summary of the PHC Soil confirmatory sampling information, including the following is included in Appendix F:

- APEC ID;
- Test depth;
- Sample description;
- Rationale for sample;
- Test type (PetroFlag/ Lab analysis);
- Lab results;
- Results explanation; and
- Results date.

The results of the laboratory analyses showed effective correlation with the field testing. The mid range (<2,500 ppm) of the PetroFLAG results showed a consistent and relatively slight overstatement (mean difference of 174%) of the actual total petroleum hydrocarbons (TPH) and therefore positive correlation for reaching the clean-up criteria. The higher concentrations of TPH showed more variability in the lab vs field testing results, however they were above the action level regardless.

A log of the PHC Soil samples sent to the ALS laboratory as well the Certificate of Analysis for the results are all included in Appendix F.

5.2.2 Cleaning and Decommissioning of Drums and ASTs

Drums and ASTs on site were emptied, cleaned and decommissioned. The site's registered storage tanks were identified and decommissioned in accordance with federal regulations;

- Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations (SOR/2008-197).

A processing area was established in the HWTA for emptying the drums – consolidating like-waste organic liquids, and separately washing the drums having contained liquid contents. Approximately 1000 drums were cleaned and stockpiled in the laydown area across the HWTA. Contact water from the cleaning process was hauled off-site for disposal.

Twenty-two (22) tanks on-site had been registered with Environment Canada. The tanks were decommissioned and permanently withdrawn from service. Labels were affixed to the system's as part of the 2018 work, stating that the systems were permanently out of service.

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ROJV sub-contracted All Peace Petroleum Ltd to carry out the 2017 decommissioning work. Waste liquids in the tanks were pumped out, removing as much liquids and sludge as possible prior to cleaning. The large former fuel storage tanks in the Phase 1 (eight 500,000 L tanks) and Phase 2 (four 1,500,000 L tanks) Tank Farm areas were passively vented and vapour concentrations monitored as the All-Peace crew completed entries into the tanks for the cleaning. The tank interiors were push-broomed and wiped down with rags to remove the remaining liquid and sludge.

The large tank work was done in adherence with confined space entry. Used rags were tested to meet the incineration criteria and incinerated as part of the project work.

The smaller registered tanks, nine 63,000 L tanks, were pumped down and steam washed; contact water consolidated for off-site disposal.

A summary of the decommissioned registered tanks is presented in Table 5-2.

Table 5-2: Decommissioned Registered Tank Summary

EC Tank #	Serial #	Mine #	Original Location	Vapours	Decom
EC00015828	GEM-6-052-1	T5	Phase 1 Tank Farm	*	July 2, 2017
EC00015828	GEM-6-052-2	T7	Phase 1 Tank Farm	0% LEL	July 3, 2017
EC00015828	GEM-6-052-3	T3	Phase 1 Tank Farm	0% LEL	July 3, 2017
EC00015828	GEM-6-052-4	T2	Phase 1 Tank Farm	0% LEL	July 4, 2017
EC00015828	GEM-6-052-5	T1	Phase 1 Tank Farm	0% LEL	July 4, 2017
EC00015828	GEM-6-052-6	T6	Phase 1 Tank Farm	0% LEL	July 5, 2017
EC00015828	GEM-6-052-7	T4	Phase 1 Tank Farm	0% LEL	July 5, 2017
EC00015828	GEM-6-052-8	T8	Phase 1 Tank Farm	0% LEL	July 6, 2017
EC00015828	GEM-6-005-1	T10	Phase 2 Tank Farm	0% LEL	July 2, 2017
EC00015828	GEM-6-005-2	T9	Phase 2 Tank Farm	0% LEL	October 1, 2017
EC00015828	GEM-6-005-3	T11	Phase 2 Tank Farm	0% LEL	July 1, 2017
EC00015828	GEM-6-005-4	T12	Phase 2 Tank Farm	0% LEL	June 30, 2017
EC00015828	D8778-S14	T15	Phase 1 Tank Farm	0% LEL	October 2, 2017
EC00015828	D8778-S12	T18	Next to Generators	0% LEL	October 2, 2017
EC00016023	C244056	T14	Truck Shop	0% LEL	October 2, 2017
EC00016028	D8778-S13	T21	Airstrip	0% LEL	October 2, 2017
EC00016029	D8778-S15	T20	Airstrip	0% LEL	October 3, 2017
EC00016030	D8778-S19	T19	HWTA	0% LEL	October 5, 2017
EC00016031	D8778-5	T22	HWTA	0% LEL	October 5, 2017
EC00016032	D8778-S11	T17	HWTA	0% LEL	October 4, 2017
EC00016033	D8778-6	T23	HWTA	0% LEL	October 3, 2017

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EC Tank #	Serial #	Mine #	Original Location	Vapours	Decom
EC00016034	D8778-8	T16	HWTA	0% LEL	October 4, 2017

Photos 40 to 46 are of the tank and drum clean-up, included at the end of the text.

5.2.3 Consolidation and Incineration of Waste Organic Liquids

The consolidated waste organic liquids meeting the applicable incineration criteria were incinerated on-site. Approximately 270,000 L of waste fuel and waste oils were incinerated over an eighty-two (82) day period.

ROJV set up the consolidation and incineration work in the HWTA. The organic liquids from drums and ASTs from across the site were pumped into one of the four blue ASTs, already in-place and within an existing bermed containment in the HWTA. ROJV's incinerator, a Westland Cyclonator CY-14, was set-up in the area adjacent the berm and a feed line connected directly to the tanks. The different consolidated waste liquids were sampled and confirmed to have met the project's incineration criteria prior to incinerating.

The samples were collected by ROJV and submitted the Maxxam Analytics Laboratory for analysis.

As an overview of the work, issues were observed with the inefficiency of incinerating the waste oil and separate issues with water and glycol contamination in the consolidated fuel.

A second incinerator, a TCI waste gas combustion unit was mobilized to site, when schedule forecasts continued to show that the incineration work was pushing back completion of the project.

The TCI unit was run for 31 days.

The estimated incineration volume was based on tracked hours and the stated incineration rates of the 2 units.

Photos 47 to 51 are of the organic liquid waste consolidation and incineration, included at the end of the text.

5.2.4 Management of Hazardous Material Wastes

A detailed list of hazardous (and non-hazardous) materials was prepared as part of the ESA. The total quantities from the ESA were used in the development of the 2016 Site Stabilization plan, and then reviewed and revised during the development of the Final 2017 plan. Notably, non-hazardous and non-regulated materials or materials that could be managed in non-hazardous landfills were removed from the 2017 work to prioritize the off-site disposal of hazardous materials.

The types of material not included in the 2017 plan included:

- Bentonite;
- Asbestos;
- Paraffin Wax Waste;
- Calcium Chloride;
- Silica Sand; and
- Flo Polymer.

ROJV sub-contracted KBL Environmental (KBL) to oversee the hazardous material work.

The abatement and removal of the materials and associated infrastructure were completed during the 2017 season. Identified hazardous materials were isolated and moved to central processing areas; packaged for shipping, and then demobilized off -site and disposed of at KBL’s designated disposal facilities.

Walk through inspections of all the areas identified in the ESA were done after the hazardous materials were removed. The work areas were confirmed completed and signed off by KBL and the Departmental Representative.

The final hazardous waste quantities are summarized in Table 5-3.

Table 5-3: Hazardous Material Quantities

Hazardous Materials	Estimated Contract Quantities	Actual Quantities
Fluorescent lights	600 kg	688 kg
Batteries	2,000 kg	3,634 kg
Antifreeze/coolant	18,300 kg	23,710 kg
Used oil filters	1,000 kg	1081 kg
Acids/ Alcohols	5,500 kg	3,320 kg

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Hazardous Materials	Estimated Contract Quantities	Actual Quantities
Aerosol cans	3,200 kg	676 kg
Remaining miscellaneous materials	6,500 kg	1,456 kg

The shipping of the hazardous waste packages was overseen by KBL and carried out in accordance with the Transport of Dangerous Goods regulations. A summary of the hazardous materials shipped off-site and copies of the manifests have been included in Appendix G.

Decommissioning work for the halocarbon equipment was done by ROJV’s sub-contractor Ackerman’s Refrigeration. Ackerman’s was mobilized to the site during the 2017 work season and undertook removing the refrigerants from the equipment; draining, collecting and packaging for off-site disposal. As a part of the 2018 regulatory close-out activities, ROJV confirmed that labels were affixed to all the decommissioned equipment to indicate that they have been removed from service.

The decommissioning of fire extinguishers was done by ROJV’s sub-contractor. The extinguishers were packaged and hauled off-site for decommissioning.

The compressed gas cylinders were consolidated and depressurized on-site.

During the course of work some of the hazardous material work items were marked for review. The specific materials and remedial option are listed in the table below:

Table 5-4: Hazardous Material Issues

Hazardous Materials	Concern	Remedial Work
Waste Acid Tank/ and entire room	The waste acid tank was identified in the Hazardous Material Inventory, inside the Processing Plant; however, formed part of a specific chemical fumes extraction system and would required specialized decommissioning of the entire system.	It was decided to leave the system intact as part of the Processing Plant infrastructure.
Ammonium Nitrate & gravel	Hazardous and not identified in the Inventory.	Shipped and disposed of off-site at a licensed facility.

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Hazardous Materials	Concern	Remedial Work
X-ray tube	Concern regarding if the tube was radioactive.	It was confirmed that x-ray tubes were not radioactive and the tube left as-is.

Photos 52 to 55 are of the hazmat consolidation and staging for off-site disposal.

5.3 WATER SAMPLING

The 2017 Site Stabilization project did not include specific water quality monitoring for the site; however, as part of CIRNAC's on-going environmental protection mandate for the site, water samples were collected and analysed in 2017 and 2018.

During the stabilization work timeline, water samples were collected by the Departmental Representative team at the following intervals:

- June 2017;
- September 2017;
- August 2018; and
- August 2018-2.

The samples were submitted to either ALS and Maxxam Analytical, depending on the sampling interval, for analysis; and results compared against the effluent discharge limits set-up in the LOD and CCME Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL) (CCME, 2007).

The results of the water testing showed that all the samples met the criteria set-out in the LOD; and that the water in the Open Pit exceed the PFAL. A summary of the results and lab certificate of analyses form Appendix H.

In general, the primary water quality issue that affects the site consists of Uranium concentrations in the Open Pit that exceed the PFAL. Long term monitoring for the site will include the continued monitoring of the Uranium. A summary of the Uranium results is shown in Table 5-5.

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Table 5-5: Uranium Concentrations in Open Pit

Sample Interval	Open Pit Uranium Concentration (mg/L)
CCME PFAL Guideline	0.015
June 19, 2017	0.035
September 2017	0.094
August 5, 2018	0.075
August 28, 2018	0.069

5.4 NON-COMPLIANT WORK AND FOLLOW-UP ACTIONS

5.4.1 PHC Soil Containment Cell Liner

An issue concerning the installation of the liner at the PHC Soil Containment Cell cover was identified at the time of the work, however, since it was near the end of the field season window of 2017 the work was completed and marked as deficient. The issue was discussed during the last monthly site construction meeting held on October 4, 2017 and then during the off-season, it was reviewed further, including consultation with industry specialists which resulted in decision by CIRNAC that ROJV was to correct the work deficiency. A technical memorandum dated November 27, 2017 was issued to ROJV, summarizing the issue and outlining the action required.

A small work program was conducted by ROJV from August 1-5, 2018 that included correcting the cell cover deficiency. The work was carried out by ROJV's team, including A&A Technical Services for the liner repair. The folded liner was uncovered, folded section straight cut across the cell width and extended liner material pulled to overlap the straight cut. The liner overlap, 2017 tear, and recent resultant cuts and tear from the work were welded and patched by the A&A crew. All repairs were vacuum seal tested.

The protective soil cover was re-instated and PHC Soil containment cell confirmed completed. A project record of the 2018 work was submitted by ROJV and included in Appendix B – Project Records.

The Departmental Representative's site report for 2018 in Appendix C – Departmental Representative Site Reports summarizes the work carried out by ROJV to correct the liner and close out the required regulatory items. Photos of the work are included in the report.

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5.4.2 Land Use Permit Items

An inspection report from the Land Use Inspector, Baba Pederson, dated June 21, 2018 indicated that the majority of the Land Use Permit (LUP) inspection items were cleared and closed, but that the following items were required to be addressed:

- a. Point 7 (camp) – the electrical wires found on the ground must be removed;
- b. Point 7 (camp) – 11 stained spots need to be “tested, excavated and restored”; and
- c. Point 8 (grey water lined berm sump area) – portion of liner partially exposed through the snow must be removed.

ROJV completed the following activities in response to the concerns outlined above on August 2, 2018:

- Wires from the ROJV 2017 camp removed;
- Stained areas from the ROJV 2017 camp cleaned up, restored and soil placed into the PHC containment cell during work on the cover; and
- Liner from the ROJV 2017 greywater sumps cleaned-up.

5.4.3 Environment and Climate Change Canada (ECCC)

Further to correspondence between ECCC and CIRNAC following the end of the 2017 season, and a site inspection by ECCC inspectors on June 6th, 2018; the following clarifications and action items were requested to close-out the site:

- Reconciling inconsistencies in the Environment Canada tank identification numbers and tank serial numbers found in the decommissioning records;
- Confirmation that the permanently removed tanks were purged of vapors less than 10% of the lower flammability limit;
- Attaching labels to the fill pipes of the decommissioned tanks indicating that they are permanently out of service; and
- Attaching notices to systems for which halocarbons were removed.

All the ECCC close-out items were completed by ROJV during the 2018 site work.

6.0 PARTICIPATION AND PARTNERSHIPS WITH INUIT

6.1 BENEFITS THAT APPLIED TO THE PROCUREMENT

With the remediation work being undertaken in Nunavut and subject to the Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada (Nunavut Agreement), the procurement of the Contract included processes to benefit qualified Inuit firms and businesses. The Nunavut Agreement is a comprehensive land claims agreement within the meaning of the Constitution Act and contains defined rights and benefits to the Inuit of the Nunavut Settlement Area. As referenced in the RFP, Article 24 of the Nunavut Agreement specifically addressed processes in the procurement of Government Contracts.

As part of the tendering process, bidders were incentivised to maximize involvement of local Inuit groups through an IBP in which points were awarded for making commitments towards the following:

- a) the existence of head offices, administrative offices or Other facilities in the Nunavut Settlement Area;
- b) the employment of Inuit labour, engagement of Inuit professional services,
- c) use of suppliers that are Inuit or Inuit firms in carrying out the contractors; and
- d) the undertaking of commitments, under the contract, with respect to on-the-job training or skills development for Inuit.

ROJV's contract Inuit Benefits Plan guaranteed the following:

- 63% On-site Inuit Labour Person Hours (of total on-site employee person hours); and
- 50% Inuit Sub-Contracting/ Supplier costs (of total contract value).

The final achieved totals were:

- 47% On-site Inuit Labour Person Hours; and
- 19% Inuit Sub-Contracting/ Supplier costs.

Monthly submissions of the Contractor's IBP-to-date were provided; and discussion of the likely shortfall noted as the project advanced. Ultimately the final achieved Inuit Benefits fell short of the proposed guarantees.

The achieved totals represented:

- 75% of the labour guarantee; and
- 38% of the sub-contracting/ supplier guarantees.

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In accordance with the Contract, where the Contractor fails to meet their Inuit benefits certified guarantees, an amount up to 2% of the final contract value (1% for Inuit employment guarantee not met and 1% for Inuit Sub-contracting/ Supplier guarantee not met) may be deducted from their final payment or hold back provisions.

Although the Contractor demonstrated very reasonable efforts in providing Inuit Benefits as part of sound project work, greater planning and exceptional effort would have been required to meet the proposed and certified guarantees.

Based on the provisions within the contract, a penalty was deducted from the hold back.

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7.0 SUMMARY AND CLOSE-OUT

The project work was completed as planned with substantial completion in the 2017 season and rectification of deficiencies completed in 2018. The stabilization objectives were successfully met and the final construction costs were within the project's planned budgetary framework.

Variations in the estimated contract quantities resulted in +2.46% of amendment additions and -2.67% of amendment deletions, in reference to the original Contract Price.

The AOC targets bid by ROJV were not successfully met and a penalty was applied to the contract payment, however, 47% of On-site Inuit Labour Person Hours and 19% Inuit Sub-Contracting/ Supplier costs were achieved in carrying out the work.

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8.0 REFERENCES

Canadian Council of Ministers of the Environment (CCME). 1991. National Guidelines for Decommissioning Industrial Sites.

Indian and Northern Affairs Canada (CIRNAC). 2008. Abandoned Military Site Remediation Protocol. Volume 1 – Main Report

Public Services and Procurement (PSPC). 2017. Issued for Construction – Tender Specifications for Project No: R.083349.001 – Jericho Mine Site Stabilization – Plan B.

Tetra Tech EBA Inc. (EBA). 2014. Environmental Site Assessment Materials Survey and Geotechnical Evaluation – Jericho Diamond Mine, Nunavut.

Tetra Tech EBA Inc. (EBA). 2015. Options Analysis Rev 02 – Jericho Diamond Mine, Nunavut.

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LIST OF PHOTOGRAPHS **END OF TEXT**

- Photo 1: August 22, 2017 Inspection tour – West Dam
- Photo 2: August 22, 2017 Inspection tour – Divider Dyke A
- Photo 3: ROJV Grey Water Containment Area
- Photo 4: Clean-up of Grey Water Spill
- Photo 5: Repair of Grey Water Sump Liner
- Photo 6: ROJV Aeration Treatment of Grey Water
- Photo 7: ROJV Grey Water Treatment System
- Photo 8: C-130 Hercules Air Mobilization
- Photo 9: C-130 Hercules Air Mobilization
- Photo 10: C-130 Hercules Air Mobilization
- Photo 11: Electra Air Mobilization
- Photo 12: Dash-7 Air Mobilization
- Photo 13: ROJV Mobilized Excavator
- Photo 14: ROJV Mobilized Bulldozer
- Photo 15: ROJV Mobilized Articulated Trucks
- Photo 16: ROJV Assembled Articulated Trucks
- Photo 17: ROJV Assembled Bulldozers
- Photo 18: ROJV D65ex
- Photo 19: Mobilized Drill Rig
- Photo 20: Usable Fuel Analysis
- Photo 21: Existing Fuel Inside Large Tanks
- Photo 22: ROJV Fuel Filtration System
- Photo 23: ROJV 2017 Work Camp
- Photo 24: ROJV Backup Camp Generator Set-up
- Photo 25: Set-up of ROJV Communication seacan
- Photo 26: ROJV Camp Grey Water System
- Photo 27: Preparation of Phase 1 Cell Containment
- Photo 28: Phase 1 Tanks Moved Out of Containment Cell
- Photo 29: PHC Soil Excavation adjacent Phase 1 Cell
- Photo 30: PHC Soil Excavation in Former Carat Lake Camp
- Photo 31: PHC Soil Excavation in Former Carat Lake Camp
- Photo 32: PHC Soil Excavation from Phase 2 Tank Farm Area.
- Photo 33: PHC Soil Placed into Phase 1 Cell Containment
- Photo 34: Backfill of PHC Soil Clean-up for Carat Lake Laydown Area
- Photo 35: Backfill of PHC Soil Clean-up for Former Carat Lake Camp
- Photo 36: 2017 Installation of PHC Containment Cell Cover
- Photo 37: 2017 Installation of PHC Containment Cell Cover
- Photo 38: 2017 Cell Liner Deficiency

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- Photo 39: 2017 Construction of Containment Cell Protective Soil Cover.
- Photo 40: Cleaning Set-up for Phase 2 Tank
- Photo 41: Cleaning of Phase 2 Tank
- Photo 42: Sludge Removal from Phase 2 Tank
- Photo 43: Dismantling of Tank Farm Pipe Infrastructure
- Photo 44: Drum Cleaning Set-up
- Photo 45: ROJV Drum Cleaning Area
- Photo 46: ROJV Cleaned Tanks
- Photo 47: Set-up of ROJV Incineration Area
- Photo 48: Consolidation of Organic Liquid Wastes
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- Photo 50: ROJV Incineration Area
- Photo 51: Second Incinerator Set-up
- Photo 52: ROJV Hazmat Consolidation Set-up
- Photo 53: Consolidation of Hazmat Waste for Shipping Off-site
- Photo 54: Hazmat Off-site Staging Set-up at Airport Area
- Photo 55: Hazmat Off-site Staging Set-up at Airport Area

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Photo 1: August 22, 2017 Inspection tour – West Dam



Photo 2: August 22, 2017 Inspection tour – Divider Dyke A

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Photo 3: ROJV Grey Water Containment Area



Photo 4: Clean-up of Grey Water Spill

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Photo 5: Repair of Grey Water Sump Liner



Photo 6: ROJV Aeration Treatment of Grey Water

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Photo 7: ROJV Grey Water Treatment System



Photo 8: C-130 Hercules Air Mobilization

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Photo 9: C-130 Hercules Air Mobilization

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Photo 10: C-130 Hercules Air Mobilization

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Photo 11: Electra Air Mobilization



Photo 12: Dash-7 Air Mobilization

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Photo 13: ROJV Mobilized Excavator



Photo 14: ROJV Mobilized Bulldozer

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Photo 15: ROJV Mobilized Articulated Trucks



Photo 16: ROJV Assembled Articulated Trucks

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Photo 17: ROJV Assembled Bulldozers



Photo 18: ROJV D65ex

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Photo 19: Mobilized Drill Rig

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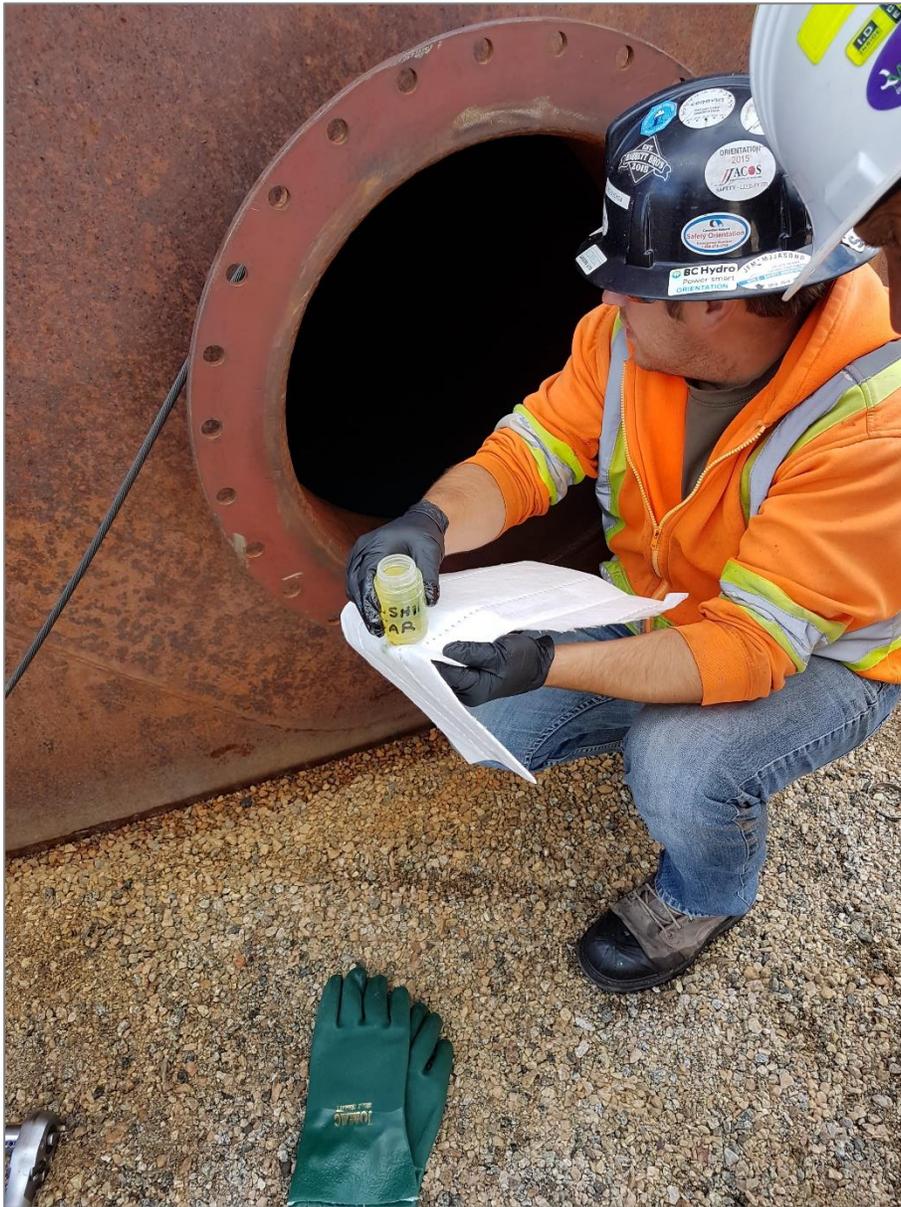


Photo 20: Usable Fuel Analysis

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Photo 21: Existing Fuel Inside Large Tanks



Photo 22: ROJV Fuel Filtration System

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Photo 23: ROJV 2017 Work Camp



Photo 24: ROJV Backup Camp Generator Set-up

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Photo 25: Set-up of ROJV Communication seacan



Photo 26: ROJV Camp Grey Water System

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Photo 27: Preparation of Phase 1 Cell Containment



Photo 28: Phase 1 Tanks Moved Out of Containment Cell

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Photo 29: PHC Soil Excavation adjacent Phase 1 Cell



Photo 30: PHC Soil Excavation in Former Carat Lake Camp

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Photo 31: PHC Soil Excavation in Former Carat Lake Camp



Photo 32: PHC Soil Excavation from Phase 2 Tank Farm Area.

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Photo 33: PHC Soil Placed into Phase 1 Cell Containment



Photo 34: Backfill of PHC Soil Clean-up for Carat Lake Laydown Area

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Photo 35: Backfill of PHC Soil Clean-up for Former Carat Lake Camp



Photo 36: 2017 Installation of PHC Containment Cell Cover

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Photo 37: 2017 Installation of PHC Containment Cell Cover



Photo 38: 2017 Cell Liner Deficiency

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Photo 39: 2017 Construction of Containment Cell Protective Soil Cover.

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Photo 40: Cleaning Set-up for Phase 2 Tank

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Photo 41: Cleaning of Phase 2 Tank

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Photo 42: Sludge Removal from Phase 2 Tank

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Photo 43: Dismantling of Tank Farm Pipe Infrastructure



Photo 44: Drum Cleaning Set-up

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Photo 45: ROJV Drum Cleaning Area



Photo 46: ROJV Cleaned Tanks

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Photo 47: Set-up of ROJV Incineration Area



Photo 48: Consolidation of Organic Liquid Wastes

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Photo 49: Consolidation of Organic Liquid Waste for Incineration

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Photo 50: ROJV Incineration Area



Photo 51: Second Incinerator Set-up

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Photo 52: ROJV Hazmat Consolidation Set-up



Photo 53: Consolidation of Hazmat Waste for Shipping Off-site

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Photo 54: Hazmat Off-site Staging Set-up at Airport Area



Photo 55: Hazmat Off-site Staging Set-up at Airport Area

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APPENDIX A

Regulatory Support Documents

- Nunavut Water Board Letter of Decision
- Land Use Permit
- Land Use Permit Amendment
- Land-Use Permit Compliance Reviews
- Request for Grey Water Transfer – ROJV Memorandum
- Controlled Blasting – LUP Amendment Application

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- Nunavut Water Board Letter of Decision



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NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYINGI
OFFICE DES EAUX DU NUNAVUT

June 23, 2017

File No: Jericho Mine Site Stabilization Project

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By Email: Mark.Yetman@aadnc-aandc.gc.ca

Re: Nunavut Water Board's Notice of Errata for the Letter of Decision In Respect of Proposed Water Use and Waste Deposit Associated with the Jericho Mine Site Stabilization Project

Dear Mr. Yetman,

This letter provides clarification and summarizes the changes made to the Nunavut Water Board's Letter of Decision in respect of the proposed use of waters and the deposit of waste associated with the Jericho Mine Site Stabilization Project. The attached "Letter of Decision", to Indigenous and Northern Affairs Canada (INAC), is issued to replace the "Letter of Direction", dated May 16, 2017.

ERRATA

The following is a list of changes in the issued "Letter of Decision", the specific modifications, corrections and changes have been underlined for clarity:

1. Replace NWB Letter, on Page 1 with the following:
 - Re: Nunavut Water Board's Letter of Decision In Respect of Proposed Water Use and Waste Deposit Associated with the Jericho Mine Site Stabilization Project.
2. Replace NWB Letter, on Page 2 with the following:
 - **BOARD DECISION**

As outlined in more detail in the sections of this Letter of Decision reviewing the Background and Procedural History associated with the Board's consideration of this matter, after

reviewing the submissions provided by the Proponent, considering the written submissions provided by interested parties and the public, and based on the NWB's own technical review of the proposed Site Stabilization Project, the NWB has determined that, if the proposed uses of Water and deposits of Wastes connected to the Site Stabilization Project are undertaken in a manner that is consistent with the terms and conditions attached to this Letter of Decision, the Site Stabilization Project will be consistent with the objects of the Board. Consequently, the Board, by way of Motion #: 2017-02-A1-04 approves the use of Water and deposit of Waste associated with INAC's proposed Site Stabilization Project when conducted in accordance with the terms and conditions that are attached to this Letter of Decision.

3. Replace in the NWB Letter, on Page 3 with the following:

- An overview of the proposed Site Stabilization Project is as follows:
 - 4) Cleaning and dismantling some of the fuel tanks;

4. Replace in Terms and Conditions, Title Page with the following:

- **Jericho Mine Site Stabilization Project**
Terms and Conditions

Attached to the Nunavut Water Board's Letter of Decision, Dated June 23, 2017

5. Replace Terms and Conditions, on Page 4, Part B, item 1.a with the following:

- The monthly and annual quantities of incinerated waste (as a weight or volume) deposited on-site;

6. Replace Terms and Conditions, on Page 5, Part C, item 1 with the following:

- The Proponent is recommended to obtain water from Carat Lake for camp purposes as described in the submitted documents. The maximum quantity of water allowed for all purposes (including camping and sampling purposes) is limited to fifteen (15) cubic metres per day.

7. Replace the table in Part D, item 6, in Terms and Conditions, on Page 6:

- Effluent discharged from the Processed Kimberlite Containment Area (PKCA) should not exceed the following discharge limits:

Parameter	Maximum Allowable Concentration
pH	6.0 to 8.8 (pH units)
Total Suspended Solids (TSS)	25 mg/L
Total Dissolved Solids (TDS)	4000 mg/L
Chloride - Cl	1000 mg/L
Total (T) - Al	3.0 mg/L
Dissolved (D)-Al	2.0 mg/L

T-As	0.1 mg/L
T-Cd	0.0024 mg/L
T-Cr	0.17 mg/L
T-Cu	0.04 mg/L
T-Pb	0.02 mg/L
T-Mo	1.5 mg/L
T-Ni	0.1 mg/L
U	1.0 mg/L
T-P	0.4 mg/L
T-Zn	0.50 mg/L
<u>NH₃-N</u>	12 mg/L
<u>T-NO₃-N</u>	<u>56 mg/L</u>
<u>T-NO₂-N</u>	<u>5 mg/L</u>
Biological Oxygen Demand (5 days) BOD ₅	25 mg/L
Oil and Grease	5.0 mg/L
Fecal Coliforms	20 mg/L
Total Extractable Hydrocarbons	6 mg/L
Benzene	370 µg/L
Ethylbenzene	90 µg/L
Toluene	2 µg/L
F1 (C6-C10)	9.8 mg/L
F1-BTEX	9.8 mg/L
<u>F2 (C10-C16)</u>	1.3 mg/L

8. Replace in Terms and Conditions, on Page 7, Part D, item 7 with the following:

- If the Effluent referred to in Part D, Items 6 exceeds the respective discharge limits, it will be considered Hazardous Waste requiring further treatment or disposal off-site at an approved facility or as otherwise approved by the Board in writing.

Any questions, please contact our office at licensing@nwb-oen.ca

Sincerely

Ida Porter
Licensing Administrator /ip



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NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYINGI
OFFICE DES EAUX DU NUNAVUT

June 23, 2017

File No: Jericho Mine Site Stabilization Project/
Re-issued Letter of Decision

Mark Yetman
Project Manager
Lands and Contaminated Sites, Nunavut Regional Office
Indigenous and Northern Affairs Canada
P.O. Box 2200
Iqaluit, NU X0A 0H0

By Email: Mark.Yetman@aadnc-aandc.gc.ca

Re: Nunavut Water Board's Letter of Decision In Respect of Proposed Water Use and Waste Deposit Associated with the Jericho Mine Site Stabilization Project

Dear Mr. Yetman,

Further to the Nunavut Water Board's (NWB or Board) correspondence of May 16, 2017, the NWB is reissuing the "Letter of Direction" as a "Letter of Decision", to Indigenous and Northern Affairs Canada (INAC). This reissued letter replaces the previous letter and includes all the changes specifically listed, for ease of reference, in the Notice of Errata.

On January 30, 2017, Indigenous and Northern Affairs Canada (INAC) submitted a letter to the Nunavut Water Board (NWB or Board) advising the Board of INAC's plans to undertake in 2017, the Jericho Mine Site Stabilization Project at the Jericho Diamond Mine (the Site Stabilization Project) under the Minister's powers to take all reasonable measures to prevent, counteract, mitigate or remedy potential adverse effects from the mine under s. 89 of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*, S.C. 2002, c. 10 (NWNSRTA) which states:

- 89 (1) *Where the Minister believes, on reasonable grounds, that*
- (a) a person has closed or abandoned, temporarily or permanently, a work related to the use of waters or the deposit of waste in Nunavut, except in a national park, and*
 - (b) either*
 - (i) the person has contravened any condition of a licence or any provision of this Part or the regulations, whether or not the condition or provision relates to the closure or abandonment, or*
 - (ii) the past operation of the work or its closure or abandonment may cause a danger to persons, property or the environment,*

the Minister may take any reasonable measures to prevent, counteract, mitigate or remedy any resulting adverse effect on persons, property or the environment and may, for that purpose, enter any place in Nunavut, other than a place that is designed to be used and is being used as a permanent or temporary private dwelling-place.

It should be noted that the NWB does not have a defined role with respect to approving the specific measures undertaken pursuant to s. 89 of the NWNSRTA, however, as INAC has noted, the *Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada* (Nunavut Agreement) provides that all water uses in the Nunavut Settlement Area are subject to some form of approval by the NWB. Given that the proposed Site Stabilization Project will involve several types of water use, the NWB has therefore reviewed and considered the proposed Site Stabilization Project to determine whether the proposed water uses are consistent with the objects of the Board as set out in s. 35 of the NWNSRTA:

35 The objects of the Board are to provide for the conservation and utilization of waters in Nunavut, except in a national park, in a manner that will provide the optimum benefit from those waters for the residents of Nunavut in particular and Canadians in general.

Accordingly, on February 15, 2017, the Board initiated a thirty (30) day comment period with respect to the use of Water and deposit of Waste aspects of the Site Stabilization Project.

BOARD DECISION

As outlined in more detail in the sections of this Letter of Decision reviewing the Background and Procedural History associated with the Board's consideration of this matter, after reviewing the submissions provided by the Proponent, considering the written submissions provided by interested parties and the public, and based on the NWB's own technical review of the proposed Site Stabilization Project, the NWB has determined that, if the proposed uses of Water and deposits of Wastes connected to the Site Stabilization Project are undertaken in a manner that is consistent with the terms and conditions attached to this Letter of Decision, the Site Stabilization Project will be consistent with the objects of the Board. Consequently, the Board, by way of Motion #: 2017-02-A1-04 approves the use of Water and deposit of Waste associated with INAC's proposed Site Stabilization Project when conducted in accordance with the terms and conditions that are attached to this Letter of Decision.

It should be noted that if, while INAC is carrying out the Site Stabilization Project, INAC is unable to meet the attached terms and conditions as recommended by the Board, the Proponent should advise the Board in writing immediately. The Board would then consider whether the term or condition can be revised in a way that would ensure compliance by INAC and that would also ensure the use of Water and deposit of Waste can continue in a manner that meet the objects of the Board. If a modification of the term or condition is not advisable, the Board would then consider whether the failure to meet the applicable term or condition would warrant the Board revisiting their conclusion that the use of Water and deposit of Waste aspects of the Site

Stabilization Project are consistent with the objects of the Board.

BACKGROUND

The Jericho Diamond Mine is located approximately 250 km southeast of Kugluktuk, Nunavut. Initially opened in 2006 by Tahera Diamond Corporation (Tahera), the mine went through bankruptcy proceedings and Shear Diamonds (Nunavut) Corp. took over the mine site in 2010. Though Shear Diamonds (Nunavut) Corp. did not actively mine, they reprocessed kimberlite stockpiles to recover diamonds from the existing stockpiles established during Tahera's tenure.

In September of 2012, Shear suspended operations. In 2012 it was determined that Shear Diamonds (Nunavut) Corp. had stopped maintaining the Mine site, at which time, under the authority of section 89 of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act S.C. 2002, c. 10* (NWNSRTA or Act), the Minister of Aboriginal Affairs and Northern Development Canada (as the Ministry was referenced then, now referred to as Indigenous and Northern Affairs Canada (INAC) decided to intervene in the Jericho Diamond Mine, determining that the site had been abandoned by Shear. Since 2012, the Northern Contaminated Sites Program (under INAC) has continued to act under the authority provided for in ss. 89 and 87 of the NWNSRTA to conduct care and maintenance activities to prevent, counteract and mitigate adverse impacts at the site.

In 2016, INAC proposed to mobilize to the mine site in May of 2017 to undertake various activities as proposed in the Jericho Mine Site Stabilization Project Proposal (Site Stabilization Project). The proposed activities are expected to be completed by October 2017, with the site demobilization scheduled for October 2018. An overview of the proposed Site Stabilization Project is as follows:

1. Creating a Pit Lake – Removing the C1 Diversion in order to increase the amount of water flowing to the open Pit. It is expected that with a flow of 328,000 m³/year, the Pit will be filled in about 11-15 years. Stabilization plans will include the construction of a channel for future water flow out of the pit and into the open environment. It is expected that the water quality will be measured periodically and treated if required, reflecting the potential risks associated with the possible presence of Uranium exceeding background levels in the water;
2. Processed Kimberlite Containment Area (PKCA) - Prevent fine tailings dispersion, due to high winds, by covering the fine tailings in Cell A with coarser tailings;
3. Prevent the build-up of water – Breach Divider Dyke A and breach the West Dam (estimated at 210,000 cubic meters) in order to prevent the build-up of water;
4. Cleaning and dismantling some of the fuel tanks;
5. Shipping metal contaminated soils off-site for disposal, and consolidate fuel contaminated soils on-site in a bermed area; and
6. Sorting, packaging, incinerating and/or shipping hazardous materials off-site for

disposal.

No work has been planned, as part of the Site Stabilization Project, for dismantling, reclamation or remediation of the Airstrip, Roads, Buildings, and Debris on site.

PROCEDURAL HISTORY

Land Use Planning and Impact Assessment Requirements

The Board notes that prior to the NWB's consideration of the Site Stabilization Project, the Project was submitted as a project proposal to the Nunavut Planning Commission (NPC) to assess conformity with existing land use plans. On September 30, 2016 the NPC determined that the project proposal was outside the area of an applicable regional land use plan (NPC File No.: 148350), and the Project Proposal was then referred to the Nunavut Impact Review Board for screening.

On December 22, 2016 the Nunavut Impact Review Board issued the Screening Decision Report (NIRB File No.: 00MN059). Consequently, the applicable conformity and project assessment requirements associated with the project under the *Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada* (Nunavut Agreement) and the *Nunavut Planning and Project Assessment Act*, S.C. 2013, c. 14, s. 2 have been completed. To ensure the Board had solicited comments from all interested members of the public and intervening parties, public notice of this project was given and interested persons were invited to make representations to the NWB about the Site Stabilization Project.

Nunavut Water Board Procedural History

The Nunavut Water Board (NWB) received the supporting information for this file, on September 9, 2016 – January 30, 2017. The submissions consisted of the following documents:

- *Crown Land Use Permit Application – Jericho Mine Site Stabilization Project dated September 9, 2016, submitted September 29, 2016*
- *Kitikmeot Inuit Association Access to Inuit Owned Land Permit-Jericho Mine Site Stabilization Project dated September 9, 2016, submitted September 29, 2016*
- *Nunavut Impact Review Board (NIRB) Part 1 and 2 Application – Jericho Mine Site Stabilization Project dated September 9, 2016, submitted September 29, 2016*
- *Nunavut Water License Application – Jericho Mine Site Stabilization Project dated September 9, 2016, submitted September 29, 2016*
- *Environmental Impacts From Winter Road Water Withdrawal dated August 4, 2016, and submitted October 17, 2016*
- *E-mail, Fwd: Jericho Mine Site Stabilization Project, October 14, 2016*
- *Jericho Stage Storage Curve-IAAE E-mail, October 17, 2016*
- *E-mail, Fwd: Jericho Mine Site Stabilization Project, October 17, 2016*
- *Fwd: Jericho Mine Site Stabilization Project - 8BC-JER---, October 24, 2017*
- *E-mail, Fwd: Jericho Mine Site Stabilization Project - 8BC-JER----, October 26, 2017*
- *E-mail, UPDATE: Jericho Mine Site Stabilization Project - 8BC-JER----, January 6,*

2017

- *Slides, Jericho Project Reference Document, January 13, 2017*
- *Letter, Jericho Diamond Mine – Site Stabilization Plan, January 30, 2017*
- *E-mail, Jericho Diamond Mine Site Stabilization Plan - Section 89 of the NWNSRTA, February 14, 2017*
- *8BC-JER---- NWB to INAC Jericho Site Stabilization, dated February 15, 2017*

Following a preliminary internal review of the submitted documents and receipt of additional information, the NWB on February 15, 2017, initiated a thirty (30) day public review and comment period with the deadline for submissions set for March 15, 2017. During the comment period submissions were received from Environment and Climate Change Canada (ECCC), Fisheries and Oceans Canada (FOC), and Indigenous and Northern Affairs Canada – Northern Water Resources Division (INAC – NWRD).

Specifically, the public and interested parties, including the Kitikmeot Inuit Association, Environment and Climate Change Canada and Fisheries and Oceans Canada were invited to provide the Board with their comments regarding but not limited to the following activities:

- The removal of the C1 Diversion, the filling of the open Pit, and subsequent discharge to the receiving environment;
- Covering the fine tailings in Cell A with coarse tailings in order to prevent dispersion by wind;
- Discharge from the tailings area;
- The breach of Dyke A and the West Dam in order to prevent the build-up of water;
- Cleaning, dismantling and disposing (within a landfill) the fuel tanks;
- Shipping metal contaminated soils off-site for disposal, and consolidate fuel contaminated soils on-site in a bermed area;
- Sorting, packaging, incinerating and/or shipping hazardous materials off-site for disposal, and
- Any other issues the parties consider relevant to the Board’s consideration of the proposed water use and deposit of waste under the Site Stabilization Plan.

In the section that follows, the NWB has, for ease of reference, provided a summary of the comments received from Environment and Climate Change Canada (ECCC), Fisheries and Oceans Canada (FOC), and Indigenous and Northern Affairs Canada, Northern Water Resource Division (INAC - NWRD). However, the NWB strongly recommends that the Proponent (Indigenous and Northern Affairs Canada - Northern Contaminated Sites Program) consult the comments received and the issues identified as stated in the submissions provided by the parties. This information is attached to this letter for consideration. Furthermore, the Board has placed all information associated with this file and received to date, on its public registry, available from the following link:

<ftp://ftp.nwb-oen.ca/registry/11%20WITHDRAWN%20RETURNED/8BC-JER----%20MSP/>

The following is a summary of the comments received:

ECCC recommended the following:

1. The Proponent should develop an Erosion and Sediment Management Plan that specifically addresses the realignment of the diversion channel for both inflow and outflow sections.
2. The Proponent should complete monitoring of the open pit water quality and should model the closure water quality early in the pit filling process in order to detect potential issues with water quality in time to develop robust treatment contingency plan, if required.
3. In advance of water release into Carat Lake, the Proponent should define acceptable water quality standards for release to Carat Lake.
4. Over a period of time, the Proponent should estimate flow volumes and use this in designing the spill way out of Cell C, through to the West Dam.
5. Sufficient armouring should be put into place, so as to prevent weathering and/or erosion for coarse kimberlite in the Processed Kimberlite Containment Area.
6. The Proponent should identify how the short and long-term recommendations made in Section 5 of the Environmental Screening Report will be addressed and identify how the effectiveness of the proposed mitigation measures will be evaluated.
7. All camp wastewater should be treated in compliance with the *Fisheries Act* 36(3), prior to disposal.
8. The Proponent should develop a Landfill Management Plan that identifies management and disposal of any liquids from the landfarm.
9. The Proponent should call the 24 Hour NWT/NU Spill Report Line rather than the Environment Canada phone number, currently listed in Section 7 of the Interim Spill Contingency Plan.

DFO recommended the following:

1. That the project should follow the DFO's procedures entitled: *Measures to Avoid Causing Harm to Fish and Fish Habitat*. These recommended mitigation measures will help prevent serious harm to fish in the receiving environment.

INAC-NWRD recommended the following:

1. That if water quality criteria are not met within the pit prior to discharge/outflow, INAC should implement active treatment of the pit water before release into the environment, rather than simply routing the outflow through shallow ponds and wetland. This measure of active treatment is recommended so as to limit the negative impacts on the receiving environment and specifically, Carat Lake

BOARD AUTHORIZATION OF THE JERICHO MINE SITE STABILIZATION PROJECT: USE OF WATER AND DEPOSIT OF WASTE

Although as noted above, the NWB does not have a defined role with respect to approving the specific measures undertaken pursuant to s. 89 of the NWNSRTA, given that the proposed Site Stabilization Project will involve several types of water use, the NWB has therefore reviewed and considered the proposed Site Stabilization Project to determine whether the proposed water uses are consistent with the objects of the Board as set out in s. 35 of the NWNSRTA.

The Board has concluded that if the Site Stabilization Project is conducted in accordance with the attached terms and conditions, the use of Water and deposit of Waste associated with the Project meets the objects of the NWNSTRA and these water uses and deposits of waste are approved by the Board.

SIGNED this 23rd day of June 2017 at Gjoa Haven, NU.

If you have any questions or require further information with respect to this matter, please contact the Board's Executive Director, Stephanie Autut by email at stephanie.autut@nwb-oen.ca or by phone at (867) 360-6338, Ext. 22.

Sincerely,

Thomas Kabloona
Nunavut Water Board
Chair

TK/ce/ip

Enclosure: Jericho Mine Stabilization Site Project, NWB Terms and Conditions

Comments – INAC, ECCC, DFO

Cc: Kitikmeot Region Distribution List
Geoff Clark, KIA
Emily Nichol, ECCC
Martyn Curtis, DFO
Public Registry



Jericho Mine Site Stabilization Project

Terms and Conditions

**Attached to the Nunavut Water Board's Letter of
Decision, Dated June 23, 2017**

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PART A: SCOPE AND DEFINITIONS

1. Scope

These terms and conditions are applicable to the use of Water and deposit of Waste at the Jericho Diamond Mine as described in the Jericho Mine Site Stabilization Project, proposed by Indigenous and Northern Affairs Canada under s. 89 of the Act, in the Kitikmeot Region, Nunavut.

- a. The use of Water and deposit of Waste associated with the Jericho Mine Site Stabilization Project is to be carried out in compliance with these terms and conditions, unless otherwise approved by the Board in writing.
- b. However, compliance with these terms and conditions does not absolve the Proponent from any additional responsibilities for compliance with the requirements of all applicable Federal, Territorial and Municipal legislation.

2. Definitions

The following are defined terms used in the terms and conditions applicable to the **Jericho Mine Site Stabilization Project**:

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

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

“**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 a mine, means when the licensee ceases production or commercial operation for an undefined period of time;

“**Commercial Operation**” with respects to a mine, means an average rate of production is equal to or greater than 25 % of the design rated capacity of the mine over a period of 90 consecutive days;

“**Construction**” means any activities undertaken to construct or build any component of, or associated with, the development of the Jericho Diamond Project, as described in the Summary Document, Appendices and Addendum information submitted to the Board throughout the regulatory process;

“**C1 Diversion**” means the engineered structures designed to divert waters and includes the C1 Diversion Dyke/Dam as described in the document titled “Site Water Management” prepared by SRK Consulting, August 2004 and illustrated in Drawing Numbers: 1CT004.06-W-2 dated July 2004 and 1CT004.06-W-3 dated July 2004;

“**Deposit**” means the placement of waste rock, Processed Kimberlite or other solids materials on land or in water;

“**Discharge**” means the release of any water or waste to the receiving environment;

“**Effluent**” means treated or untreated liquid Waste material that is discharged into the environment from a structure such as a settling pond, landfarm or a treatment plant;

“**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 Proponent no longer exerts care and/or control over the quality and/or quantity of the effluent from a treatment process;

“**Greywater**” means all liquid Wastes from showers, baths, sinks, kitchens and domestic washing facilities, but does not include toilet Wastes;

“**Ground Water**” means water that occupies pores and fractures in rock and soil below the ground surface in a liquid or frozen state;

“**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);

“**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;

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

“**Kimberlite**” refers to the Jericho Kimberlite pipe with a length of ~300m, a width of up to 100m and a depth of at least 350m that was formed from multiple emplacement events;

“**Landfarm**” means a lined, engineered area designed to contain and treat, using bioremediation, hydrocarbon impacted sediment and soil;

“**Landfill**” means a facility, designed to permanently contain inert solid waste materials;

“**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 and groundwater quality to assess impacts to the environment of an appurtenant undertaking.

“Nunavut Agreement” 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 made pursuant to that agreement;

“Pit Water” means the water that seeps into and or is collected within the open pit;

“Processed Kimberlite” means material (solid/liquid), considered to have no current value, which is rejected from the process plant after the recoverable minerals have been extracted;

“Processed Kimberlite Containment Area (PKCA)” means the containment basin and the engineered structures that are designed to contain the Fine Processed Kimberlite

“Proponent” means Indigenous and Northern Affairs Canada responsible for undertaking the Jericho Mine Site Stabilization Project;

“Receiving Environment” means both the aquatic and terrestrial environments that receive any discharge resulting from the Project;

“Regulations” means the *Nunavut Waters Regulations*, SOR 2013/669;

“Sewage” means all toilet Wastes and Greywater;

“Solid Waste” means non-hazardous Waste;

“Spill Contingency Plan” means a Plan developed to deal with unforeseen petroleum and hazardous materials events that may occur during the Jericho Mine Site Stabilization Project;

“Sump” means an excavation in impermeable soil for the purpose of catching or storing Water or Waste;

“Toilet Wastes” means all human excreta and associated products, but does not include Greywater;

“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;

“West Dam” means the embankment water retaining infrastructure utilizing a central frozen core backed by a geosynthetic clay lining.

PART B: GENERAL CONDITIONS

1. The Proponent shall file an Project Update Summary Report on the Appurtenant Undertaking with the Board no later than the 31st of March of the year following the calendar year being reported, containing the following information:
 - a. The monthly and annual quantities of incinerated waste (as a weight or volume) deposited on-site;
 - b. Details on the characterization of soils treated on-site or shipped out;
 - c. The monthly and annual quantities (in cubic metres) of any effluent discharge;
 - d. A summary of all waste backhauled to any community in Nunavut as recommended under Part D, Item 2;
 - e. The GPS co-ordinates (in degrees, minutes, and seconds of latitude and longitude) of all locations where Water used for the Project is withdrawn and any Wastes associated with the Project are deposited;
 - f. A summary of any construction work, modification and major maintenance work (including as-built drawings) carried out under the Jericho Mine Site Stabilization Project;
 - g. Tabular summaries for all data and information generated under the “Monitoring Program”;
 - h. An analysis of data collected during the “Monitoring Program” and a brief description of any future studies planned by the Proponent;
 - i. A summary of any studies requested by the Board that relate to Waste disposal, and a brief description of any future studies planned;
 - j. A list of unauthorized discharges and summary of follow-up actions taken;
 - k. If applicable, a description of any trenches and sumps excavated, including but not limited to the following: GPS coordinates, dimensions, depth below active layer, and secondary containment features;
 - l. A public consultation/participation report describing any consultation with local organizations and the residents of the nearby communities;
 - m. An executive summary in English and in Inuktitut of all plans, reports, or studies conducted under Jericho Mine Site Stabilization Project; and
 - n. Any other details on the use of Water or Waste disposal requested by the Board by the 1st of November of the year being reported.

2. The Proponent can review and modify, if necessary, the Plans originally provided as part of the Jericho Mine Site Stabilization Project, if changes in operation, implementation and/or technology are required. However, the Proponent shall notify the NWB of any changes in operating plans or conditions associated with this Project at least thirty (30) days prior to any such changes.

3. A summary of revisions to the Plans or changes to the Project conditions should also be included with the Update Summary Report required under Part B, Item 1.
4. The Proponent is recommended to ensure that a copy of these terms and conditions is kept at the site of operations at all times. Any communication with respect to these terms and conditions is recommended to be made in writing to the attention of:

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

5. The Proponent is recommended to submit one paper copy and an electronic copy of all reports, studies, and plans to the Board. Reports or studies submitted to the Board by the Proponent should include a detailed executive summary in Inuktitut.
6. The Proponent should ensure that any document(s) or correspondence submitted by the Proponent to the NWB is received and acknowledged by the Manager of Licensing.

PART C: CONDITIONS APPLYING TO THE USE OF WATER AND WATER MANAGEMENT

1. The Proponent is recommended to obtain water from Carat Lake for camp purposes as described in the submitted documents. The maximum quantity of water allowed for all purposes (including camping and sampling purposes) is limited to fifteen (15) cubic metres per day.
2. In accordance with these terms and conditions, the Proponent is authorized to use water during the removal of the C1 Diversion, for the purpose of filling of the open Pit, and eventual subsequent discharge to the receiving environment.
3. The Proponent is required to determine and record the GPS co-ordinates (in degrees, minutes and seconds of latitude and longitude) of all locations where water is used and include this information in the Project Update Summary Report as set out under Part B, Item 1(e).
4. The Proponent is recommended to install flow meters or other such devices, or implement suitable methods for measuring volumes of water. These measures may include providing water volume calculations based on water level.
5. The Proponent is required to measure and record in cubic metres, the daily quantities of Water used.

6. The Proponent should equip all water intake hoses with a screen of an appropriate mesh size to ensure that there is no entrainment of fish and to withdraw water at a rate such that fish do not become impinged on the screen.
7. The Proponent should not remove any material from below the ordinary high water mark of any water body unless authorized.
8. If the Proponent requires water in sufficient volume that the source water body may be drawn down, the Proponent is required to submit to the Board (for approval in writing), at least thirty (30) days prior to commencement of the use of water, the following: 1) volume required; 2) hydrological overview of the water body; 3) details of impacts; and 4) proposed mitigation measures.
9. Sediment and erosion control measures should be implemented prior to and maintained during the undertaking to prevent entry of sediment into water.

PART D: CONDITIONS APPLYING TO THE DEPOSIT OF WASTE AND WASTE MANAGEMENT

1. Treated Effluents should be discharged as described in Part D, Items 6, and all subsequent areas designated for Waste disposal should be located 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.
2. The Proponent is recommended to provide to the Board, for the Board's records, documented authorization from any community in Nunavut receiving backhauled wastes from the Jericho Mine Site Stabilization Project.
3. The Proponent is recommended to maintain records of all Waste backhauled and records of confirmation of proper disposal of backhauled Waste and include this information within the Project Update Summary Report required under Part B, Item 1.
4. The Proponent is recommended to provide notice to an Inspector at least ten (10) days prior to initiating any decant or discharge of any waste.
5. The Proponent may consolidate and treat Petroleum Hydrocarbon Contaminated Soil in a bermed area or as otherwise approved by the Board in writing.
6. Effluent discharged from the Processed Kimberlite Containment Area (PKCA) should not exceed the following discharge limits:

Parameter	Maximum Allowable Concentration
pH	6.0 to 8.8 (pH units)
Total Suspended Solids (TSS)	25 mg/L

Total Dissolved Solids (TDS)	4000 mg/L
Chloride - Cl	1000 mg/L
Total (T) - Al	3.0 mg/L
Dissolved (D)-Al	2.0 mg/L
T-As	0.1 mg/L
T-Cd	0.0024 mg/L
T-Cr	0.17 mg/L
T-Cu	0.04 mg/L
T-Pb	0.02 mg/L
T-Mo	1.5 mg/L
T-Ni	0.1 mg/L
U	1.0 mg/L
T-P	0.4 mg/L
T-Zn	0.50 mg/L
NH ₃ -N	12 mg/L
T-NO ₃ -N	56 mg/L
T-NO ₂ -N	5 mg/L
Biological Oxygen Demand (5 days) BOD ₅	25 mg/L
Oil and Grease	5.0 mg/L
Fecal Coliforms	20 mg/L
Total Extractable Hydrocarbons	6 mg/L
Benzene	370 µg/L
Ethylbenzene	90 µg/L
Toluene	2 µg/L
F1 (C6-C10)	9.8 mg/L
F1-BTEX	9.8 mg/L
F2 (C10-C16)	1.3 mg/L

7. If the Effluent referred to in Part D, Items 6 exceeds the respective discharge limits, it will be considered Hazardous Waste requiring further treatment or disposal off-site at an approved facility or as otherwise approved by the Board in writing.
8. The Proponent shall provide for the proper storage, treatment, and/or disposal at an approved facility, of any Hazardous Waste generated by the Project, unless otherwise approved by the Board in writing.
9. The Proponent shall dispose of any material coated with Polychlorinated Biphenyl (PCB) amended paints, hazardous materials and soils containing contaminants in excess of *Canadian Environmental Protection Act (CEPA) Guidelines*, with the exception of asbestos, off site at an approved treatment facility.

PART E: CONDITIONS APPLYING TO THE UNDERTAKING

1. The Proponent shall obtain all borrow materials used in construction from sources clean and free of contaminants, including metal leaching and acid generating potential.
2. Should any constructed facilities fail, the Proponent shall repair such facilities immediately to the appropriate standards as recommended by an Engineer.
3. The Proponent should develop and implement an Erosion and Sediment Management Plan that minimizes disturbance to terrain, permafrost and drainage during extraction of granular material, development of the water diversions, dyke breaching, and bermed waste containment.
4. The Proponent shall design and construct all stream crossings to minimize erosion and/or deposition of Waste into Water.
5. The Proponent is recommended to ensure that existing creek channels are maintained at their normal width and depth to the extent possible, during and after site remediation.
6. Granular materials and rock rip-rap used for any temporary stream crossings, approaches or as may be recommended for bank stabilization must be clean and free of contaminants. Such material is not to be removed or gathered from below the ordinary High Water Mark of any Water body.

PART F: CONDITIONS FOR CAMP, ACCESS INFRASTRUCTURE AND OPERATION

1. The Proponent is to conduct all activities in such a way as to minimize impacts on surface drainage and will immediately undertake any corrective measures in the event of any impacts on surface drainage.
2. Winter lake and stream crossings, including ice bridges, are to be constructed entirely of Water, ice or snow, and are to be removed prior to spring break-up.
3. With respect to access road, pad construction, demolition or other earthworks, the deposition of debris or sediment into any Water body is prohibited. These materials are to be disposed of above the ordinary High Water Mark in such a fashion that they do not enter the Water.

PART G: CONDITIONS APPLYING TO DRILLING OPERATIONS

1. The Proponent may drill for the purposes of installing monitoring instrumentation, including monitoring wells and thermistors.

2. The Proponent should not conduct any land-based drilling within thirty-one (31) metres of the ordinary High Water Mark of any Water body, unless otherwise approved by the Board in writing.
3. All drill Waste, including Water, chips, muds and salts (CaCl₂) in any quantity or concentration, from land-based drilling, should be disposed of in a properly constructed sump or an appropriate natural depression located at a distance of at least thirty-one (31) metres from the ordinary High Water Mark of any adjacent water body, where direct flow into a water body is not possible and no additional impacts are created.

PART H: CONDITIONS APPLYING TO SPILL CONTINGENCY PLANNING

1. The *Jericho Mine Site Stabilization Interim Spill Contingency Plan* should be revised to include updated site specific information, and submitted to the Board prior to commencing on site work.
2. The Proponent shall conduct activities in a manner that prevents any chemicals, petroleum products or Wastes associated with the project from entering Water. All sumps and fuel caches are to be located a minimum distance of thirty-one (31) metres from the ordinary High Water Mark of any water body and inspected on a regular basis. The Proponent is encouraged to use secondary containment for fuel and chemical storage facilities associated with this undertaking.
3. The Proponent should conduct equipment maintenance and servicing in designated areas and take all reasonable measures to contain potential spills, such as the use of drip pans to manage motor fluids and other Waste.
4. While undertaking the Jericho Mine Site Stabilization Project, where an unauthorized discharge of Waste occurs, or if such a discharge is foreseeable, the Proponent shall:
 - a. Report the spill immediately to the 24-Hour Spill Line at (867) 920-8130 and to the Inspector at (867) 975-4295; and
 - b. For each spill occurrence, submit to the Inspector and the NWB, 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.

PART I: CONDITIONS APPLYING TO ABANDONMENT AND RESTORATION

1. The Proponent should complete all restoration work for the temporary camp facilities and all the Water diversion or Waste disposal activities prior to leaving site.
2. The Proponent is recommended to backfill and restore all sumps to the pre-existing natural contours of the land.
3. All disturbed areas are to be stabilized and revegetated as required, upon completion of work, and restored to the extent practicable, to a pre-disturbed state.

PART J: CONDITIONS APPLYING TO MONITORING

1. The Proponent should establish a Monitoring Program and maintain Monitoring Program Stations for adequate monitoring and assessment of site activities. Part B, item 1 of these terms and conditions sets out the recommended reporting components of the Monitoring Program.
2. The Proponent is required to measure and record in cubic metres, the daily quantities of Effluent discharged.
3. The Proponent shall determine the GPS co-ordinates (in degrees, minutes and seconds of latitude and longitude) of all locations where Wastes associated with the camp operations are deposited.
4. The Proponent shall monitor compliance with the Effluent discharge limits set out in Part D, Item 6 by collecting representative composite samples and/or utilizing continuous online monitoring equipment for the appropriate monitoring of the volume released from the Final Discharge Point.
5. The Proponent shall sample Monitoring Program Stations and analyze for the following parameters:

Sulphate	pH*
Total Alkalinity	Nitrate – Nitrite*
Potassium	Chloride*
Total Phenols	Total Copper *
Total Hardness	Ammonia Nitrogen*
Sodium	Oil and Grease (visual)*
Magnesium	Total Copper *
Conductivity	Total Zinc*
Calcium	Total Aluminum *
Total Iron	Dissolved Aluminum*
Total Mercury	Total Cadmium*
Total Manganese	Total Chromium*
Uranium	Total Lead*
Total Cobalt	Total Nickel*
Total Petroleum Hydrocarbons (TPH)	Total Phosphorous*
Polycyclic Aromatic Hydrocarbons (PAH)	Total Arsenic*
Total Molybdenum	Total Suspended Solids*
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)	BOD ₅ (if sewage is being discharged)
	Total Coliform (if sewage is being discharged)

** if deemed necessary depending on the undertaking and on-site parameters*

6. All sampling, sample preservation and analysis should 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.

7. The Proponent shall submit to the Board, a Monitoring Plan that addresses monitoring as well as the Quality Assurance / Quality Control (QA/QC) requirements for the site.
8. The Proponent is recommended to include in the Project Update Summary Report required under Part B, Item 1, all data, monitoring results and information recommended by this Part.

Date	November 2018
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- Land Use Permit



Land Administration
P.O. Box 100
IQALUIT, NU X0A 0H0
Phone: 867-975-4283
FAX: 867-975-6445
Email: landsmining@aandc.gc.ca

January 12, 2017

Indigenous and Northern Affairs Canada
10th Floor, 25 Eddy Street
Gatineau, QC
K1A 0H4

Dear Mark Yetman:

Re: Land Use Permit #N2016U0013
Type of Operation: Site Remediation
Location: Contwoyto Lake Area, Kitikmeot, NU, NTS 76E, 76L

Enclosed is your copy of Land Use permit number N2016U0013 authorizing your project as described in your application dated September 9, 2016.

Your application has received a wide distribution to other Federal departments, Government of the Nunavut departments, communities in the area of your operation and concerned Inuit groups. In distributing your application the Nunavut Impact Review Board (NIRB) sought comments from these various agencies based on their area of expertise that will help ensure minimum negative impact on the environment. The issuance of this permit indicates that as a result of the NIRB environmental screening process it was decided that the potentially adverse environmental effects that may be caused by your proposal are mitigable with known technology and are not significant. The terms and conditions in the permit will, in our opinion, provide the necessary protection to the environment.

Please ensure that you adhere to the operating conditions, including all reporting requirements, annexed to your permit. Should you have any questions regarding any conditions of this permit, please contact Isa Qamaniq-Mason at 867-975-4566, or email landsmining@inac.gc.ca.

Our office would like to ensure that you are aware of the land use planning process that is currently underway in Nunavut. The Nunavut Planning Commission, under the authority of the *Nunavut Planning and Project Assessment Act*, is working to develop a land use plan that would apply throughout the Nunavut Settlement Area and the Outer Land Fast Ice Zones, as those terms are defined in the *Nunavut Land Claims Agreement*.



-2-

A new land use plan has the potential to affect both your existing activities and your plans for future activities. Therefore, we encourage you to become familiar with the *Nunavut Planning and Project Assessment*, the Commission's planning process, and to review the draft Nunavut Land Use Plan and other documentation available through the Nunavut Planning Commission to ensure you are aware of how the proposed plan might affect you. A revised version of the Nunavut Planning Commission's Draft Nunavut Land Use Plan is available at <http://nunavut.ca>. Also on that website you will find notices from the Commission about the planning process and other important information, including how to get involved.

Two regional land use plans, the Keewatin and North Baffin Regional Land Use Plans, remain in effect. Under the Act, there can be only one plan applicable in a planning region. Therefore, in the event a territory-wide land use plan is approved the two regional plans would be repealed.

If you have questions or comments about the land use plan, please do not hesitate to contact Tracey McCaie, Manager, Land Administration at (867)975-4280. For information about the land use planning process and how to get involved, please contact the Nunavut Planning Commission.

Sincerely,

Karen McIntyre
Land Administration Specialist

cc: Manager, Field Operations
RMO - Kitikmeot



LAND USE PERMIT
NORTHERN AFFAIRS PROGRAM

PERMIS D'UTILISATION DES TERRES
PROGRAMME DES AFFAIRES DU NORD

Permit Class - Permis Catégorie	Permit No - NE de permis
A	N2016U0013

Subject to the Territorial Land Use Regulations and the terms and conditions in this permit, authority is hereby granted to:

Sous réserve du Règlement sur l'utilisation des terres territoriales et des conditions de ce permis:

INAC Contaminated Sites

Permittee - Détenteur de permis

To proceed with the land use operation described in the application of:

Est autorisé à entreprendre les travaux d'exploitation des terres décrits dans la demande de permis du:

Signature	Date
Mark Yetman	January 12th, 2017
Type of Land Use Operation - Genre de travaux d'exploitation des terres	
Site Remediation	
Location - Emplacement	
Contwoyto Lake Area, Kitikmeot, NU, NTS 76E, 76L	

The conditions attached to this permit are incorporated into and form an integral part of the permit.

Les conditions attachées à ce permis en font partie intégrante.

This permit may be assigned, extended, discontinued, suspended or cancelled pursuant to the Territorial Land Use Regulations.

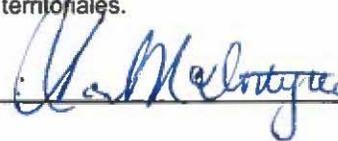
Ce permis peut faire l'objet d'une cession, d'une prolongation d'une cessation d'une suspension ou d'une annulation, en vertu du Règlement sur l'utilisation des terres territoriales.

Dated at

Engineer

Date a Iqaluit

Ingénieur



This

Day of

Ce 19th jour de June , 2015 .

Commencement Date

Expiry Date

Date du début des travaux January 12th, 2015

Date d'achèvement January 11th, 2022

NOTE

REMARQUE

IT IS A CONDITION OF THIS PERMIT THAT THE PERMITTEE COMPLY WITH ANY OTHER APPLICABLE ACT, REGULATION, ORDINANCE BY - LAW OR ORDER DEFAULT HEREOF MAY RESULT IN SUSPENSION OR CANCELLATION OF THIS PERMIT.

LE DÉTENTEUR DU PRÉSENT PERMIS DOIT SE CONFORMER À TOUT AUTRE RÈGLEMENT, LOI, DÉCRET RÈGLEMENT MUNICIPAL OU ARRÊTÉ APPLICABLE. LE MANQUEMENT À CETTE OBLIGATION POURRAIT DONNER LIEU À LA SUSPENSION OU À L'ANNULATION DU PERMIS.



Canada

Canada 

**CONDITIONS ANNEXED TO AND FORMING PART
OF LAND USE PERMIT NUMBER N2016U0013
INAC Contaminated Sites Jericho Site Stabilization**

Failure to comply with any term and condition issued as part of this permit is an offence under the Territorial Lands Act. ~~Every person who commits an offence is liable, on summary conviction, for a first offence, to a fine not exceeding \$100 000, and for a second or subsequent offence, to a fine not exceeding \$200 000. Please note that an offence that is committed on more than one day constitutes a separate offence for each day on which it is committed or continued.~~

31 (1) (a) - Location and Area

1.	The Permittee shall not conduct this land use operation on any lands not designated in the accepted application, unless otherwise authorized in writing by the Engineer.	PLANS
2.	The Permittee shall remove from Territorial Lands, all scrap metal, discarded machinery and parts, barrels and kegs, buildings and building materials, to an approved landfill or disposal facility.	REMOVE WASTE MATERIAL
3.	The Permittee shall not erect camps or store/stage material on the surface of frozen streams or lakes including the immediate banks except what is for immediate use.	STORAGE ON ICE
4.	The Permittee shall locate all camps on gravel, sand or other durable land.	CAMP LOCATION
5.	The Permittee shall notify a Land Use Inspector, within 10 days of the Camp being set up, of the exact GPS Co-ordinates of the Camp's Location.	CAMP LOCATION

31 (1) (b) – Time

6.	The Permittee's Field Supervisor shall contact or meet with a Land Use Inspector at the Kugluktuk, NU office of the Department of Indian Affairs and Northern Development, phone number (867) 982-4306, at least 48 hours prior to the commencement of this land use operation.	CONTACT INSPECTOR
7.	The Permittee's Field Supervisor shall provide notification of commencement of the land use operation within 10 days, to the Engineer at the Iqaluit office of the Department of Indigenous and Northern Affairs Canada either by emailing landsmining@aandc.gc.ca or by telephone at (867) 975-4283.	NOTICE TO ENGINEER
8.	The Permittee shall provide in writing to the Engineer, at least forty-eight (48) hours prior to commencement of this land use operation, the following information: <ul style="list-style-type: none"> a) person, or persons, in charge of the field operation to whom notices, orders, and reports may be served, b) alternates, c) all the indirect methods for contacting the above person(s). 	IDENTIFY AGENT

9.	The Permittee shall provide updated locations of the following activities, if applicable, related to this project to the Inspector and Engineer within 10 days of establishment : a) Campsite b) Fuel caches c) Airstrip d) Drift laydown area e) Quarry locations All coordinates must be provided in degree/min/sec format in NAD 83.	UPDATE LOCATIONS
10.	The Permittee shall submit an annual report to the Engineer by March 30 of each year of permitted activities. The annual report must contain, but not limited to, the following information: a) a technical summary of the activities undertaken for the year, b) a table and map showing the following items, if applicable, with exact coordinates in degree/min/sec format, in NAD 83: i. All camp locations ii. Air strip and landing location iii. All drilling locations iv. All fuel caches v. Any other locations where activities were conducted vi. All active and backfilled sumps, c) a work plan for the following year, d) any progressive reclamation work undertaken.	ANNUAL REPORTING
11.	The Permittee shall notify the Engineer within 10 days, of seasonal closure of the land use area.	SEASONAL SHUTDOWN
12.	The Permittee shall advise a Land Use Inspector at least 10 days prior to the completion of the land use operation of ; a) his plan for removal or storage of equipment and materials, and b) when final clean-up and restoration of the lands used will be completed.	REPORTS BEFORE REMOVAL
13.	The Permittee shall complete all clean-up and restoration of the lands used prior to the expiry date of this permit.	CLEAN-UP
14.	The Engineer reserves the right to impose closure to any area to the Permittee in periods when dangers to natural resources are severe.	CLOSURE

31 (1) (c) - Equipment

15.	The Permittee shall not use any equipment except of the type, size and number that is listed in the accepted application, unless otherwise authorized in writing by the Land Use Inspector.	ONLY APPROVED EQUIPMENT
16.	The Permittee shall use a forced-air fuel-fired incinerator to incinerate all combustible garbage and debris.	INCINERATORS
17.	The Permittee shall burn all combustible garbage and debris in a container acceptable to a Land Use Inspector.	INCINERATION

18.	The Permittee shall keep all garbage and debris in a covered container until disposed of at an approved facility. Garbage must be stored in such a manner as to prevent access by wildlife.	GARBAGE CONTAINERS
19.	The Permittee shall use portable ramps during loading or unloading ships or barges.	PORTABLE RAMPS
20.	The Permittee shall not place dirt or debris into streams to serve as ramps for loading or unloading ships or barges, unless authorized in writing by a Land Use Inspector.	DIRT RAMPS
21.	The Permittee shall, in camps of more than five (5) personnel, maintain the following fire-fighting equipment in the base camp and in active readiness: (a) Four (4) backpack bags or cans complete with hand pumps. (b) A minimum of two pieces of each of the following; pulaskis, axes, shovels	FIRE FIGHTING EQUIPMENT
22.	The Permittee shall ensure that appropriate spill response equipment and clean-up materials (e.g. shovels, pumps, barrels, drip pans, and absorbents) must be readily available during any transfer of fuel or hazardous substances, as well as at fuel caches and drill sites. All activities should be conducted according to the approved Spill Response Plan.	SPILL RESPONSE KIT

31 (1) (e) - Type, Location, Capacity and Operation of Facilities

23.	The Permittee shall not locate any sump within thirty one (31) metres of the normal high water mark of any water body. Sumps and areas designated for waste disposal shall be sufficiently bermed or otherwise contained to ensure that substances do not enter a waterway unless otherwise authorized.	SUMPS FROM WATER
24.	The Permittee shall not move any equipment or vehicles without prior testing of the thickness of the ice to ensure the lake is in a state capable of fully supporting the equipment or vehicles.	TESTING OF ICE THICKNESS
25.	The Permittee shall backfill and restore all sumps prior to the expiry date of this permit or immediately following completion of activity.	BACKFILL SUMPS
26.	The Permittee shall: a) backfill sumps with sufficient material to ensure that no hollows or cavities result from settling of the material; b) overlap the replaced material a minimum of one (1) metre beyond the edges of the existing sump wall.	BACKFILL SUMP OVERLAP
27.	The Permittee shall ensure that the land use area is kept clean and tidy at all times.	CLEAN WORK AREA

28.	The Permittee shall only treat petroleum and hydrocarbon contaminated soils at the landfarm facility. Materials contaminated with other substances must not be stored at the land farm and must be disposed of at an authorized facility.	LANDFARM OPERATIONS
29.	The Permittee shall ensure that all equipment used for aeration in the landfarm operation has been cleaned off within the landfarm facilities prior to exiting.	LANDFARM EQUIPMENT
30.	The Permittee shall ensure that the land use area is kept clean and tidy at all times.	CLEAN WORK AREA
31.	The Permittee shall select a winter route that maximizes the use of frozen water bodies.	WINTER TRAIL & ICE ROAD ROUTE

31 (1) (f) - Control or Prevention of Flooding, Erosion and Subsidence of Land

32.	The Permittee shall remove any obstruction to natural drainage caused by any part of this land use operation.	NATURAL DRAINAGE
33.	The Permittee shall not cut any stream bank unless authorized in writing by a Land Use Inspector.	STREAM BANKS
34.	The Permittee shall install erosion and sediment mitigation measures on disturbed areas before, during and after construction and as the land use operation progresses.	EROSION CONTROL
35.	The Permittee shall ensure that bank disturbances are avoided and no mechanized clearing carried out immediately adjacent to any watercourse.	AVOID BANK DISTURBANCES
36.	The Permittee shall ensure that stream crossings and/or temporary crossings constructed from ice and snow, which may cause jams, flooding, or impede fish passage and/or water flow are removed or notched prior to Spring break-up.	STREAM CROSSINGS
37.	The Permittee shall not move any equipment or vehicles unless the ground surface is in a state capable of fully supporting the equipment or vehicles without rutting or gouging.	VEHICLE MOVEMENT FREEZE-UP
38.	The Permittee shall not construct interceptor or off-shoot drainage ditches unless approved in writing by the Land Use Inspector.	DITCHES
39.	The Permittee shall prepare the site in such a manner as to prevent rutting of the ground surface.	PREVENTION OF RUTTING
40.	The Permittee shall avoid disturbance on slopes prone to natural erosion, and alternative locations shall be utilized.	DISTURBANCE TO SLOPES

31 (1) (g) - Use, Storage, Handling and Disposal of Chemical or Toxic Material

41.	The Permittee shall not use chemicals in connection with the land use operation without the prior approval of the Engineer.	APPROVAL OF CHEMICALS
42.	The Permittee shall not use the following materials during the drilling operation without the prior written approval of the Engineer. Chlorinated phenols (Dowicide B, etc.) Compounds composed primarily of heavy metals Asbestos	PROHIBITED CHEMICALS
43.	The Permittee shall deposit all sewage into a sump.	SEWAGE DISPOSAL
44.	(a) The Permittee shall treat all sewage in a treatment plant capable of extracting eighty-five to ninety (85-90%) per cent of the biodegradable solids. (b) The Permittee shall place all remaining solids in a sump.	SEWAGE DISPOSAL
45.	The Permittee shall incinerate all combustible wastes daily and remove ash from incineration activities.	GARBAGE DISPOSAL
46.	The Permittee shall remove all non-combustible garbage and debris from the land use area to a disposal site approved in writing by a Land Use Inspector.	REMOVE GARBAGE
47.	The Permittee shall dispose of all combustible waste petroleum products by removal.	WASTE PETROLEUM DISPOSAL
48.	The Permittee shall dispose of all toxic or persistent substances in a manner as approved in writing by the Engineer.	WASTE CHEMICAL DISPOSAL
49.	The Permittee shall store all hazardous chemicals in such a manner as to prevent access by wildlife.	HAZARDOUS CHEMICAL STORAGE
50.	The Permittee shall report all spills immediately in accordance with instructions contained in "Spill Report" form NWT 1752(05/93). Twenty four (24) hour spill report line (867)920-8130.	REPORT CHEMICAL AND PETROLEUM SPILLS
51.	The Permittee prior to the discharge of fluids from any sump, shall carry out an analysis of the fluids in a manner prescribed by the Engineer and obtain his written approval to discharge.	SUMP DISCHARGE

31 (1) (h) - Wildlife and Fisheries Habitat

52.	The Permittee shall not unnecessarily damage wildlife habitat in	HABITAT DAMAGE
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	conducting this land use operation.	
53.	The Permittee shall not harass wildlife. This includes persistently worrying, chasing, or disturbing large groups of animals.	HARASSMENT OF WILDLIFE
54.	The Permittee shall not disturb or destroy the nests or eggs of any birds. If nests are encountered and/or identified, the Permittee shall take precaution to avoid further interaction and/or disturbance (e.g. a 100 meter buffer around the nests). If active nests are discovered (i.e. with eggs or young) the Permittee shall avoid these areas until nesting is complete and the young have left the nest.	WILDLIFE SENSITIVITY
55.	During the period of May 1st to July 15th, when caribou are observed within 1 km of project operations, the Permittee shall suspend all operations, including low-level flights, blasting, and use of snowmobiles and overland vehicles outside the immediate vicinity of the camps. During the period following July 15th, if caribou cows or calves are observed within 1 km of project operations, the Permittee shall also suspend operations in the vicinity, including low-level over flights and use of all-terrain vehicles, until caribou are no longer in the immediate area.	WILDLIFE SENSITIVITY
56.	The Permittee shall cease activities that may interfere with migration or calving of caribou or muskox, such as airborne geophysical surveys, drilling, or movement of equipment of personnel until such a time that the caribou or muskox have passed.	CARIBOU/MUSKOX CALVING AND MIGRATION
57.	The Permittee shall not block or cause any diversion to caribou migration, and shall cease activities likely to interfere with migration such as airborne geophysics surveys, drilling, or movement of equipment or personnel until such time as the caribou have passed.	CARIBOU MIGRATION
58.	Your operation is in an area where bears may be encountered. Proper food handling and garbage disposal procedures will lessen the likelihood of bears being attracted to your operation. Information about the latest bear detection and deterrent techniques can be obtained from the Department of Renewable Resources at 867-982-7450.	BEAR/MAN CONFLICT

31 (1) (i) - Objects and Places of Recreational, Scenic and Ecological Value

59.	The Permittee shall not feed wildlife.	NO FEEDING WILDLIFE
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31 (1) (k) - Petroleum Fuel Storage

60.	The Permittee shall report in writing to a Land Use Inspector the exact GPS location and quantity of all petroleum fuel caches within ten (10) days after the establishment.	REPORT FUEL LOCATION
61.	The Permittee shall not place any petroleum fuel storage containers within thirty one (31) metres of the normal high water mark of any stream.	FUEL BY STREAM

62.	The Permittee shall use adequate secondary containment or a surface liner (e.g. self-supporting insta-berms and fold-a-tanks), when storing barrelled fuel and chemicals at all locations as well as re-fuelling stations. The volume of the berm area shall be 10% greater than the capacity of the largest fuel container placed therein.	SECONDARY CONTAINMENT
63.	The Permittee shall not allow petroleum products to spread to surrounding lands or into water bodies.	FUEL CONTAINMENT
64.	The Permittee shall have one extra fuel storage container on site equal to, or greater than, the size of the largest fuel container.	FUEL EXTRA CONTAINER
65.	The Permittee shall construct a dyke around each stationary fuel container or group of stationary fuel containers where any one container has a capacity exceeding 4,000 litres.	DYKE FUEL CONTAINERS
66.	The Permittee shall line the dyke and area enclosed by the dyke with a type of plastic film liner approved by the Engineer.	LINE DYKE
67.	The volume of the dyked area shall be 10% greater than the capacity of the largest fuel container placed therein.	CAPACITY
68.	The Permittee shall ensure that the dyke and the area enclosed by the dyke shall be impermeable to petroleum products at all times	IMPERMEABLE DYKE
69.	The Permittee shall: <ul style="list-style-type: none"> a) examine all fuel storage containers for leaks a minimum of once every seven (7) days during operations; b) repair all leaks immediately; c) examine all fuel storage containers for leaks immediately upon delivery. 	CHECK FOR LEAKS
70.	The Permittee shall ensure that re-fuelling of equipment occur a minimum of thirty-one (31) metres away from the high water mark of any water body, at a designated area. All re-fuelling and bulk fuel transfers must be conducted over a drip tray or secondary containment.	RE-FUELLING
71.	The Permittee shall mark all stationary petroleum products storage facilities with flags, posts or similar devices so that they are at all times plainly visible to local vehicle travel.	MARK FUEL LOCATION
72.	The Permittee shall remove and treat hydrocarbon contaminated soils on site or transport them to an approved disposal site for treatment.	CONTAMINATED SOIL

31 (1) (m) - Matters Not Inconsistent with the Regulations

73.	The Permittee shall display a copy of this permit in a conspicuous place	DISPLAY PERMIT
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	in each campsite established to carry out this land use operation.	
74.	The Permittee shall keep on hand, at all times during this land use operation, a copy of the Land Use Permit.	COPY OF PERMIT
75.	The Permittee shall provide in writing to the Engineer, at least forty-eight (48) hours prior to commencement of this land use operation, the following information: <ul style="list-style-type: none"> a) person, or persons, in charge of the field operation to whom notices, orders, and reports may be served; b) alternates; c) all the indirect methods for contacting the above person(s). 	IDENTIFY AGENT
76.	The Permittee shall conspicuously display the land use permit number on all vehicles and equipment.	DISPLAY PERMIT NUMBER
77.	Part 1 - In this Permit: "sump" means a man-made pit, trench hollow or cavity in the earth's surface used for the purpose of depositing waste material therein.	DEFINITIONS
78.	The Permittee shall abide by and comply with all applicable lawful rules, acts, regulations, and by-laws of Canada, Nunavut, any Municipal or regulatory body or authority having jurisdiction, the Nunavut Land Claim Agreement, and all other agreements, permits, licenses, and other instruments whatsoever related to the project.	ADHERENCE TO LAWFUL RULES, ACTS, REGS & BYLAWS
ARCHAEOLOGICAL & PALEONTOLOGICAL TERMS AND CONDITIONS		
79.	"archaeological site" means a place where an archaeological artifact is found. "archaeological artifact" means any tangible evidence of human activity that is more than 50 years old and in respect of which an unbroken chain of possession or regular pattern of usage cannot be demonstrated, and includes a Denesuline archaeological specimen referred to in section 40.4.9 of the Nunavut Land Claims Agreement. "paleontological site" means a site where a fossil is found. "fossil" includes: <ul style="list-style-type: none"> (a) natural casts (b) Preserved tracks, coprolites and plant remains; and (c) the preserved shells and exoskeletons of invertebrates and the eggs, teeth and bones of vertebrates. 	DEFINITIONS
80.	The Permittee shall avoid any known or suspected archaeological and/or paleontological sites.	AVOIDANCE OF ARCHAEOLOGICAL AND/OR

		PALEONTOLOGICAL SITES
81.	The Permittee shall not remove, disturb, or displace any archaeological artifact or site, or any paleontological site or fossil.	DISTURBANCE OF ARCHAEOLOGICAL AND/OR PALEONTOLOGICAL SITE
82.	<p>The Permittee shall immediately cease any activity should a suspected archaeological, paleontological, or burial site be discovered during the course of a land use operation. The Permittee is required to immediately contact the Land Administration division at Indigenous and Northern Affairs Canada at (867) 975-4283 or (867) 975-4285 or (867) 975-4280 as well as the Department of Culture, Language, elders and Youth at (867) 934-2046 or (867) 975-5500 or 1 (866) 934-2035.</p> <p>Permission to resume land use operation must be obtained from the engineer. At such time the Engineer may, at his/her discretion, require that you have an archaeologist or palaeontologist perform the following functions:</p> <ul style="list-style-type: none"> a) Survey b) Inventory and documentation of the archaeological or c) paleontological resources of the land use area d) Assessment of potential for damage to archaeological or paleontological sites e) Mitigation f) Making boundaries of archaeological or paleontological sites g) Site restoration 	CEASE OPERATION OF LAND USE ACTIVITY
83.	The Permittee shall ensure that all persons working under the authority of the permit are aware of these conditions pertaining to archaeological sites and artifacts as well as paleontological sites and fossils.	KNOWLEDGE OF ARCHAEOLOGICAL AND PALEONTOLOGICAL TERMS AND CONDITIONS

Species At Risk in Nunavut

This list includes species listed on one of the Schedules of SARA (*Species at Risk Act*) and under consideration for listing on Schedule 1 of SARA. These species have been designated as at risk by COSEWIC (Committee on the Status of Endangered Wildlife in Canada). This list may not include all species identified as at risk by the Territorial Government.

- a) Schedule 1 is the official legal list of Species at Risk for SARA. SARA applies to all species on Schedule 1. The term “listed” species refers to species on Schedule 1.
- b) Schedule 2 and 3 of SARA identify species that were designated at risk by the COSEWIC prior to October 1999 and must be reassessed using revised criteria before they can be considered for addition to Schedule 1.
- c) Some species identified at risk by COSEWIC are “pending” addition to Schedule 1 of SARA. These species are under consideration for addition to Schedule 1, subject to further consultation or assessment.

Schedules of SARA are amended on a regular basis so it is important to periodically check the SARA registry (www.sararegistry.gc.ca) to get the current status of a species.

Terrestrial Species at Risk	COSEWIC Designation	Schedule of SARA	Government Organization with Lead Management Responsibility
Eskimo Curlew	Endangered	Schedule 1	EC
Ivory Gull	Endangered	Schedule 1	EC
Ross's Gull	Threatened	Schedule 1	EC
Harlequin Duck (Eastern population)	Special Concern	Schedule 1	EC
Rusty Blackbird	Special Concern	Schedule 1	Government of Nunavut
Felt-leaf Willow	Special Concern	Schedule 1	Government of Nunavut
Peregrine Falcon	Special Concern (<i>anatum-tundrius</i> complex)	Schedule 1 (<i>anatum</i>) Schedule 3 (<i>tundrius</i>)	Government of Nunavut
Short-eared Owl	Special Concern	Schedule 3	Government of Nunavut
Peary Caribou	Endangered	Schedule 1	Government of Nunavut
Barren-ground Caribou (Dolphin and Union population)	Special Concern	Schedule 1	Government of Nunavut
Polar Bear	Special Concern	Schedule 1	Government of Nunavut
Red Knot (<i>rufa</i> subspecies)	Endangered	Pending	EC
Red Knot (<i>islandica</i> subspecies)	Special Concern	Pending	EC
Porsild's Bryum	Threatened	Pending	GN
Horned Grebe (Western Population)	Special Concern	Pending	EC
Grizzly Bear	Special Concern	Pending	Government of Nunavut
Wolverine (Western Population)	Special Concern	Pending	Government of Nunavut
Atlantic Cod, Arctic Lakes	Special Concern	No Schedule	DFO
Atlantic Walrus	Special Concern	Pending	DFO
Beluga Whale (Cumberland Sound population)	Threatened	Pending	DFO
Beluga Whale (Eastern Hudson Bay population)	Endangered	Pending	DFO

Beluga Whale (Western Hudson Bay population)	Special Concern	Pending	DFO
Beluga Whale (Eastern High Arctic – Baffin Bay population)	Special Concern	Pending	DFO
Bowhead Whale (Eastern Canada – West Greenland population)	Special Concern	Pending	DFO
Killer Whale (Northwest Atlantic / Eastern Arctic populations)	Special Concern	Pending	DFO
Narwhal	Special Concern	Pending	DFO

Updated: January 2012

Date	November 2018
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- Land Use Permit Amendment



Indigenous and
Northern Affairs Canada

Affaires autochtones
et du Nord Canada

Land Administration
P.O. Box 100
IQALUIT, NU X0A 0H0
Phone: 867-975-4283
FAX: 867-975-4286
Email: landsmining@aandc.gc.ca

August 11, 2017

Indigenous and Northern Affairs Canada
Contaminated Sites Program
10th Floor, 25 Eddy Street
Gatineau, QC
K1A 0H4

Dear Mark Yetman,

Re: Land Use Permit #N2016U0013
Type of Operation: Site Remediation
Location: Contwoyto Lake Area, Kitikmeot, NU, NTS 76E, 76L

The above mentioned land use permit is hereby amended to include the work outlined in your request.

All conditions annexed to land use permit N2016U0013 will apply to this amendment.

This amendment is only valid for those activities located on Crown land.

Sincerely,

Tracey McCaie
Manager, Land Administration

cc: Manager, Field Operations
RMO - Kitikmeot

Date	November 2018
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- Land-Use Permit Compliance Reviews

Henry 1, 2017-06-24

Project	Jericho Mine Site Stabilization
Created	2017-06-24 23:53:54 UTC by Henry Wong
Updated	2017-06-26 12:26:53 UTC by Andy Uyarrai

Land Use Permit - Compliance review

Reviewer and Title	Henry 1
Date	2017-06-24
Day	Saturday
Land Use Permit	Class A - N2016U0013
Location	Contwoyto Lake Area, Kitikmeot, NU, NTS 76E 76L
Project Name	Jericho Mine Site Stabilization
Remediation Contractor	Rowe's-Outcome Joint Venture

* 31 (1) (a) Location and Area

1. The Permittee shall not conduct this land use operation on any lands not designated in the accepted application, unless otherwise authorized in writing by the engineer. - PLANS

Compliance_1	OK
Notes_1	Continue to check.

2. Remove from Territorial Lands, all scrap metal, discarded machinery and parts, barrels and kegs, buildings and building materials, to an approved landfill or disposal facility. - REMOVE WASTE MATERIAL

Compliance_2	Not Applicable
Notes_2	No debris removal planned as part of contract work.

3. The Permittee shall not erect camps or store/stage material on the surface of frozen streams or lakes including the immediate banks except what is for immediate use. - STORAGE ON ICE

Compliance_3	Not Applicable
Notes_3	No camp or storage planned on ice.

4. Locate all camps on gravel, sand or other durable land. - CAMP LOCATION

Compliance_4	OK, CLOSED
Notes_4	Camp located on mine rock

Photos_4





Camp ground



Camp area

5. Notify a Land Use Inspector, within 10 days of the Camp being set up, of the exact GPS Co-ordinates of the Camp's Location. - **CAMP LOCATION**

Compliance_5

Waiting to be done

Notes_5

Send email with GPS coordinates when camp communications complete

* 31 (1) (b) Time

6. The Permittee's Field Supervisor shall contact or meet with a Land Use Inspector at the Kugluktuk, NU office of the Department of Indian Affairs and Northern Development, phone number (867) 982-4306, at least 48 hours prior to the commencement of this land use operation. - **CONTACT INSPECTOR**

Compliance_6	OK, CLOSED
Notes_6	Email sent to inspector June 1st

7. The Permittee's Field Supervisor shall provide notification of commencement of the land use operation within 10 days, to the Engineer at the Iqaluit office of the Department of Indigenous and Northern Affairs Canada either by emailing landsmining@aandc.gc.ca or by telephone at (867) 975-4283. - NOTICE TO ENGINEER

Compliance_7	Action Required
Notes_7	HW to confirm if separate notice is required to NU 'Engineer'.
Date first-time Action required_7	2017-06-24
Due Date for Action_7	2017-06-26

8. The Permittee shall provide in writing to the Engineer, at least forty-eight (48) hours prior to commencement of this land use operation, the following information: a) person, or persons, in charge of the field operation to whom notices, orders, and reports may be served, b) alternates, c) all the indirect methods for contacting the above person(s). - IDENTIFY AGENT

Compliance_8	Action Required
Notes_8	HW to confirm if separate notice is required to NU 'Engineer'.
Date first-time Action required_8	2017-06-24
Due Date for Action_8	2017-06-26

9. The Permittee shall provide updated locations of the following activities, if applicable, related to this project to the Inspector and Engineer within 10 days of establishment : a) Campsite b) Fuel caches c) Airstrip d) Drill laydown area e) Quarry locations All coordinates must be provided in degree/min/sec format in NAD 83. - UPDATE LOCATIONS

Compliance_9	Waiting to be done, Action Required
Notes_9	ROJV to send location of campsite and final fuel caches when site is setup complete.
Date first-time Action required_9	2017-06-24
Due Date for Action_9	2017-07-01

10. Submit an annual report to the Engineer by March 30 of each year of permitted activities. - ANNUAL REPORTING

Compliance_10	Waiting to be done
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11. Notify the Engineer within 10 days, of seasonal closure of the land use area. - SEASONAL SHUTDOWN

Compliance_11	Waiting to be done
Notes_11	Waiting for Seasonal Shutdown

12. Advise a Land Use Inspector at least 10 days prior to the completion of the land use operation of; a) his plan for removal or storage of equipment and materials, and b) when final clean-up and restoration of the lands used will be completed. - REPORTS BEFORE REMOVAL

Compliance_12	Waiting to be done
Notes_12	Waiting for 10 days prior to completion of Project.

13. Complete all clean-up and restoration of the lands used prior to the expiry date of this permit. - CLEAN-UP

Compliance_13	Waiting to be done
Notes_13	On-going until completion of project.

14. The Permittee reserves the right to impose closure to any area to the Permittee in periods when dangers to natural resources are severe. - CLOSURE

Compliance_14	OK
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*** 31 (1) (c) Equipment**

15. The Permittee shall not use any equipment except of the type, size and number that is listed in the accepted application, unless otherwise authorized in writing by the Land Use Inspector. - ONLY APPROVED EQUIPMENT

Compliance_15	OK
Notes_15	Continue to review equipment on-site, and update as require.

16. The Permittee shall use a forced-air fuel-fired incinerator to incinerate all combustible garbage and debris. - INCINERATORS

Compliance_16	OK, CLOSED
Notes_16	Forced air fuel fired incinerate being used to burn camp garbage.
Photos_16	





blower up top and fuel on lower



instruction to burn



incinerator

17. The Permittee shall burn all combustible garbage and debris in a container acceptable to a Land Use Inspector. - INCINERATION

Compliance_17	OK, CLOSED
Notes_17	Forced air fuel fired incinerate being used to burn camp garbage; as per former mine operation.

18. The Permittee shall keep all garbage and debris in a covered container until disposed of at an approved facility. Garbage must be stored in such a manner as to prevent access by wildlife. - GARBAGE CONTAINERS

Compliance_18	OK
Notes_18	Continue to check that garbage receptacles are used and garbage properly stored.

19. The Permittee shall use portable ramps during loading or unloading ships or barges. - PORTABLE RAMPS

Compliance_19	Not Applicable
Notes_19	No unloading of ships or barges planned.

20. The Permittee shall not place dirt or debris into streams to serve as ramps for loading or unloading ships or barges, unless authorized in writing by a Land Use Inspector. - DIRT RAMPS

Compliance_20	Not Applicable
Notes_20	No unloading of ships or barges planned.

21. The Permittee shall, in camps of more than five (5) personnel, maintain the following fire-fighting

equipment in the base camp and in active readiness: (a) Four (4) backpack bags or cans complete with hand pumps. (b) A minimum of two pieces of each of the following; pulaskis, axes, shovels - FIRE FIGHTING EQUIPMENT

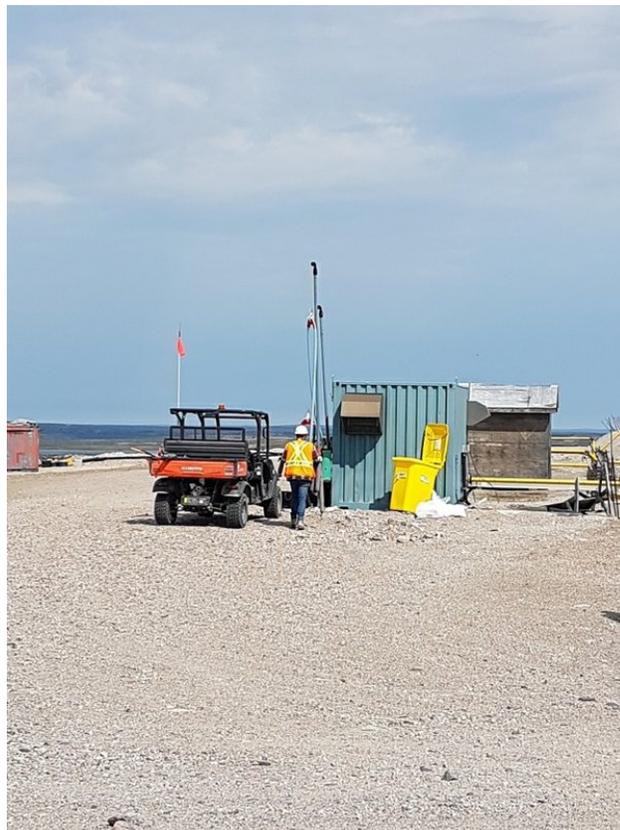
Compliance_21	Action Required
Notes_21	ROJV reviewing and checking fire fighting equipment.
Date first-time Action required_21	2017-06-24
Due Date for Action_21	2017-07-01

22. The Permittee shall ensure that appropriate spill response equipment and clean-up materials (e.g. shovels, pumps, barrels, drip pans, and absorbents) must be readily available during any transfer of fuel or hazardous substances, as well as at fuel caches and drill sites. All activities should be conducted according to the approved Spill Response Plan. - SPILL RESPONSE KIT

Compliance_22	OK, Action Required
Notes_22	Spill kit placed at Tank Farm work area on Jun24-2017, CS confirming spill kit is complete. Continue to maintain spill response kits in refuelling or appropriate work areas.
Date first-time Action required_22	2017-06-24
Due Date for Action_22	2017-06-26



spill kit in tank farm area



spill kit outside berm area

*** 31 (1) (e) Type, Location, Capacity and Operation of Facilities**

23. The Permittee shall not locate any sump within thirty one (31) metres of the normal high water mark of any water body. Sumps and areas designated for waste disposal shall be sufficiently bermed

or otherwise authorized. - SUMPS FROM WATER

Compliance_23	Waiting to be done
Notes_23	Sump set-up at Rock Crushing area. CS to get coordinates.
Date first-time Action required_23	2017-06-24
Due Date for Action_23	2017-06-26

24. The Permittee shall not move any equipment or vehicles without prior testing of the thickness of the ice to ensure the lake is in a state capable of fully supporting the equipment or vehicles. - TESTING OF ICE THICKNESS

Compliance_24	Not Applicable
Notes_24	No traffic or work on ice planned.

25. The Permittee shall backfill and restore all sumps prior to the expiry date of this permit or immediately following completion of activity. - BACKFILL SUMPS

Compliance_25	Waiting to be done
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26. The Permittee shall: ~ a) backfill sumps with sufficient material to ensure that no hollows or cavities result from settling of the material; b) overlap the replaced material a minimum of one (1) metre beyond the edges of the existing sump wall. - BACKFILL SUMP OVERLAP

Compliance_26	Waiting to be done
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27. The Permittee shall ensure that the land use area is kept clean and tidy at all times. - CLEAN WORK AREA

Compliance_27	OK
Notes_27	Continue to check work area is clean.

28. The Permittee shall only treat petroleum and hydrocarbon contaminated soils at the landfarm facility. Materials contaminated with other substances must not be stored at the land farm and must be disposed of at an authorized facility. - LANDFARM OPERATIONS

Compliance_28	Not Applicable
Notes_28	No treatment of petroleum hydrocarbon planned as part of Jericho Mine Site Stabilization -B (2017).

29. The Permittee shall ensure that all equipment used for aeration in the landfarm operation has been cleaned off within the landfarm facilities prior to exiting. - LANDFARM EQUIPMENT

Compliance_29	Not Applicable
Notes_29	No treatment of petroleum hydrocarbon planned as part of Jericho Mine Site Stabilization -B (2017).

30. The Permittee shall ensure that the land use area is kept clean and tidy at all times. - CLEAN WORK AREA

Compliance_30	OK
Notes_30	Continue to check work area is clean.

31. The Permittee shall select a winter route that maximizes the use of frozen water bodies. - WINTER TRAIL & ICE ROAD ROUTE

Compliance_31	Not Applicable
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Notes_31

No winter road work planned.

*** 31 (1) (f) - Control or Prevention of Flooding, Erosion and Subsidence of Land**

32. The Permittee shall remove any obstruction to natural drainage caused by any part of this land use operation. - NATURAL DRAINAGE

Compliance_32

OK

33. The Permittee shall not cut any stream bank unless authorized in writing by a Land Use Inspector. - STREAM BANKS

Compliance_33

OK

34. The Permittee shall install erosion and sediment mitigation measures on disturbed areas before, during and after construction and as the land use operation progresses. - EROSION CONTROL

Compliance_34

OK, **Action Required**

Notes_34

The discharge from the Cell C line is being directed up and onto a metal plate to dissipate water energy.

Continue to monitor Cell C discharge area for erosion.

Photos_34



cell-C pipe discharge



discharge onto metal plate



discharge cell c

35. The Permittee shall ensure that bank disturbances are avoided and no mechanized clearing carried out immediately adjacent to any watercourse. - AVOID BACK DISTURBANCES

Compliance_35

OK

36. The Permittee shall ensure that stream crossings and/or temporary crossings constructed from ice and snow, which may cause jams, flooding, or impede fish passage and/or water flow are removed or notched prior to Spring break-up. - STREAM CROSSINGS

Compliance_36

Not Applicable

Notes_36

No snow and ice stream crossings planned.

37. The Permittee shall not move any equipment or vehicles unless the ground surface is in a state capable of fully supporting the equipment or vehicles without rutting or gouging. - VEHICLE MOVEMENT FREEZE-UP

Compliance_37

Not Applicable

Notes_37

No site work planned during freeze-up season.

38. The Permittee shall not construct interceptor or off-shoot drainage ditches unless approved in writing by the Land Use Inspector. - DITCHES

Compliance_38

OK

39. The Permittee shall prepare the site in such a manner as to prevent rutting of the ground surface. - PREVENTION OF RUTTING

Compliance_39

OK

Notes_39

Continue to check.

40. The Permittee shall avoid disturbance on slopes prone to natural erosion, and alternative locations shall be utilized. - DISTURBANCE TO SLOPES

Compliance_40

OK

Notes_40

Continue to check.

*** 31 (1) (g)- Use, Storage, Handling and Disposal of Chemical or Toxic Material**

41. The Permittee shall not use chemicals in connection with the land use operation without the prior approval of the Engineer. - APPROVAL OF CHEMICALS

Compliance_41

OK

42. The Permittee shall not use the following materials during the drilling operation without the prior written approval of the Engineer. Chlorinated phenols (Dowicide B, etc.) Compounds composed primarily of heavy metals Asbestos - PROHIBITED CHEMICALS

Compliance_42

Not Applicable

Notes_42

No planned use of specified chemicals.

43. The Permittee shall deposit all sewage into a sump. - SEWAGE DISPOSAL

Compliance_43

OK

Notes_43

Pacto toilets are being used for black water and grey water is being drained to a sump system.

44. (a) The Permittee shall treat all sewage in a treatment plant capable of extracting eighty-five to ninety (85-90%) per cent of the biodegradable solids. (b) The Permittee shall place all remaining solids in a sump. - SEWAGE DISPOSAL

Compliance_44	OK
Notes_44	Pacto toilets are being used for black water and grey water is being drained to a sump system.

45. The Permittee shall incinerate all combustible wastes daily and remove ash from incineration activities. - GARBAGE DISPOSAL

Compliance_45	OK
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46. The Permittee shall remove all non-combustible garbage and debris from the land use area to a disposal site approved in writing by a Land Use Inspector. - REMOVE GARBAGE

Compliance_46	Waiting to be done, Action Required
Notes_46	ROJV to confirm disposal site for non-combustible garbage.
Date first-time Action required_46	2017-06-24
Due Date for Action_46	2017-06-26

47. The Permittee shall dispose of all combustible waste petroleum products by removal. - WASTE PETROLEUM DISPOSAL

Compliance_47	Action Required
Notes_47	HW to confirm with Inspector that the Contract work describes the incineration of waste petroleum products that meet incinerating criteria.
Date first-time Action required_47	2017-06-24
Due Date for Action_47	2017-06-26

48. The Permittee shall dispose of all toxic or persistent substances in a manner as approved in writing by the Engineer. - WASTE CHEMICAL DISPOSAL

Compliance_48	Action Required
Notes_48	HW to confirm off-site disposal of hazardous materials process with NU 'Engineer'.
Date first-time Action required_48	2017-06-24
Due Date for Action_48	2017-06-26

49. The Permittee shall store all hazardous chemicals in such a manner as to prevent access by wildlife. - HAZARDOUS CHEMICAL STORAGE

Compliance_49	OK
Notes_49	Continue to check.

50. The Permittee shall report all spills immediately in accordance with instructions contained in "Spill Report" form NWT 1752(05/93). Twenty four (24) hour spill report line (867)920-8130. - REPORT CHEMICAL AND PETROLEUM SPILLS

Compliance_50	OK
Notes_50	Continue to check.

51. The Permittee prior to the discharge of fluids from any sump, shall carry out an analysis of the fluids in a manner prescribed by the Engineer and obtain his written approval to discharge. - SUMP DISCHARGE

Compliance_51	Waiting to be done, Action Required
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Notes_51	HW to confirm if communication with both Engineer and Inspector is required for discharge.
Date first-time Action required_51	2017-06-24
Due Date for Action_51	2017-06-26

*** 31 (1) (h)- Wildlife and Fisheries Habitat**

52. The Permittee shall not unnecessarily damage wildlife habitat in conducting this land use operation. - HABITAT DAMAGE

Compliance_52	OK
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53. The Permittee shall not harass wildlife. This includes persistently worrying, chasing, or disturbing large groups of animals. - HARASSMENT OF WILDLIFE

Compliance_53	OK
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54. The Permittee shall not disturb or destroy the nests or eggs of any birds. If nests are encountered and/or identified, the Permittee shall take precaution to avoid further interaction and/or disturbance (e.g, a 100 meter buffer around the nests). If active nests are discovered (i.e. with eggs or young) the Permittee shall avoid these areas until nesting is complete and the young have left the nest. - WILDLIFE SENSITIVITY

Compliance_54	OK
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Notes_54	Continue to check.
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55. During the period of May 1st to July 15th, when caribou are observed within 1 km or project operations, the Permittee shall suspend all operations, including low-level flights, blasting, and use of snowmobiles and overland vehicles outside the immediate vicinity of the camps. During the period following July 15th, if caribou cows or calves are observed within 1 km of project operations, the Permittee shall also suspend operations in the vicinity, including low-level over flights and use of all-terrain vehicles, until caribou are no longer in the immediate area. - WILDLIFE SENSITIVITY

Compliance_55	OK
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Notes_55	Continue to check.
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56. The Permittee shall cease activities that may interfere with migration or calving of caribou or muskox, such as airborne geophysical surveys, drilling, or movement of equipment of personnel until such a time that the caribou or muskox have passed. - CARIBOU/MUSKOX CALVING AND MIGRATION

Compliance_56	OK
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Notes_56	Continue to check.
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57. The Permittee shall not block or cause any diversion to caribou migration, and shall cease activities likely to interfere with migration such as airborne geophysics surveys, drilling, or movement of equipment or personnel until such time as the caribou have passed. - CARIBOU MIGRATION

Compliance_57	OK
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Notes_57	Continue to check.
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58. Your operation is in an area where bears may be encountered. Proper food handling and garbage disposal procedures will lessen the likelihood of bears being attracted to your operation. Information about the latest bear detection and deterrent techniques can be obtained from the Department of Renewable Resources at 867-982-7450. - BEAR/ MAN CONFLICT

Compliance_58 OK

*** 31 (1) (i)-Objects and Places of Recreational, Scenic and Ecological Value**

59. The Permittee shall not feed wildlife. - NO FEEDING WILDLIFE

Compliance_59 OK

Notes_59 Continue to check.

*** 31 (1) (k)- Petroleum Fuel Storage**

60. The Permittee shall report in writing to a Land Use Inspector the exact GPS location and quantity of all petroleum fuel caches within ten (10) days after the establishment. - REPORT FUEL LOCATION

Compliance_60 Waiting to be done, **Action Required**

Notes_60 Waiting on ROJV to setup final Fuel Caches.

61. The Permittee shall not place any petroleum fuel storage containers within thirty one (31) metres of the normal high water mark of any stream. - FUEL BY STREAM

Compliance_61 OK

62. The Permittee shall use adequate secondary containment or a surface liner (e.g. self-supporting insta-berms and fold-a-tanks), when storing barrelled fuel and chemicals at all locations as well as re-fuelling stations. The volume of the berm area shall be 10% greater than the capacity of the largest fuel container placed therein. - SECONDARY CONTAINMENT

Compliance_62 OK

Notes_62 Continue to check.

63. The Permittee shall not allow petroleum products to spread to surrounding lands or into water bodies. - FUEL CONTAINMENT

Compliance_63 OK

Notes_63 Continue to check.

64. The Permittee shall have one extra fuel storage container on site equal to, or greater than, the size of the largest fuel container. - FUEL EXTRA CONTAINER

Compliance_64 OK

Notes_64 Note Tank 9 being used as fuel storage; x3 other 1.5M litre tanks will be available during project work (although tanks will be cleaned for decommissioning).

Continue to check.

Photos_64



Fuel transfer from tank 11 to tank 9



Fuel transfer

65. The Permittee shall construct a dyke around each stationary fuel container or group of stationary fuel containers where any one container has a capacity exceeding 4,000 litres. - DYKE FUEL CONTAINERS

Compliance_65

OK

Notes_65

Tank 9 sits in existing lined and bermed Tank Farm Area.

Continue to check.

66. The Permittee shall line the dyke and area enclosed by the dyke with a type of plastic film liner approved by the Engineer. - LINE DYKE

Compliance_66	OK
Notes_66	Tank 9 sits in existing lined and bermed Tank Farm Area. . Continue to check.

67. The volume of the dyked area shall be 10% greater than the capacity of the largest fuel container placed therein. - CAPACITY

Compliance_67	OK
Notes_67	Tank 9 sits in existing lined and bermed Tank Farm Area.

68. The Permittee shall ensure that the dyke and the area enclosed by the dyke shall be impermeable to petroleum products at all times - IMPERMEABLE DYKE

Compliance_68	OK
Notes_68	Tank 9 sits in existing lined and bermed Tank Farm Area. . Continue to check.

69. The Permittee shall: a) examine all fuel storage containers for leaks a minimum of once every seven (7) days during operations; b) repair all leaks immediately; c) examine all fuel storage containers for leaks immediately upon delivery. - CHECK FOR LEAKS

Compliance_69	OK, Action Required
Notes_69	ROJV to inspect weekly. Continue to check.

70. The Permittee shall ensure that re-fuelling of equipment occur a minimum of thirty-one (31) metres away from the high water mark of any water body, at a designated area. All re-fuelling and bulk fuel transfers must be conducted over a drip tray or secondary containment. - RE-FUELLING

Compliance_70	OK, Action Required
Notes_70	Continue to check refuelling at proper distance from water body. Note: HW to check with Inspector regarding 6" pump upstream of West Dam. The pump is located adjacent water, not mobile and therefore re-fueled daily adjacent water. The Fuel Truck has a portable drip tray that will be used for all refuelling. Confirm with Inspector if any addition measures are required.

71. The Permittee shall mark all stationary petroleum products storage facilities with flags, posts or similar devices so that they are at all times plainly visible to local vehicle travel. - MARK FUEL LOCATION

Compliance_71	Waiting to be done, Action Required
Notes_71	ROJV to mark final locations.

72. The Permittee shall remove and treat hydrocarbon contaminated soils on site or transport them to an approved disposal site for treatment. - CONTAMINATED SOIL

Compliance_72	Action Required
Notes_72	HW to confirm if update is required to Inspector and Engineer that PHC Soil will remain on-site.
Date first-time Action required_72	2017-06-24

*** 31 (1) (m)- Matters Not Inconsistent with the Regulations**

73. The Permittee shall display a copy of this permit in a conspicuous place in each campsite established to carry out this land use operation. - DISPLAY PERMIT

Compliance_73

Action Required

Notes_73

CS to have copy of LUP in Camp office.

Date first-time Action required_73

2017-06-24

Due Date for Action_73

2017-06-26

74. The Permittee shall keep on hand, at all times during this land use operation, a copy of the Land Use Permit. - COPY OF PERMIT

Compliance_74

OK

75. The Permittee shall provide in writing to the Engineer, at least forty-eight (48) hours prior to commencement of this land use operation, the following information: a) person, or persons, in charge of the field operation to whom notices, orders, and reports may be served; b) alternates; c) all the indirect methods for contacting the above person(s). - IDENTIFY AGENT

Compliance_75

Action Required

Notes_75

HW to confirm if separate notice is required for NU 'Engineer'.

Date first-time Action required_75

2017-06-24

Due Date for Action_75

2017-06-26

76. The Permittee shall conspicuously display the land use permit number on all vehicles and equipment. - DISPLAY PERMIT NUMBER

Compliance_76

Action Required

Notes_76

ROJV to place labels with permit number in vehicles.

Date first-time Action required_76

2017-06-24

Due Date for Action_76

2017-07-01

77. Part 1 -In this Permit: "sump" means a man-made pit, trench hollow or cavity in the earth's surface used for the purpose of depositing waste material therein. - DEFINITIONS

Compliance_77

OK

78. The Permittee shall abide by and comply with all applicable lawful rules, acts, regulations, and by-laws of Canada, Nunavut, any Municipal or regulatory body or authority having jurisdiction, the Nunavut Land Claim Agreement, and all other agreements, permits, licenses, and other instruments whatsoever related to the project. - ADHERENCE TO LAWFUL RULES, ACTS, REGS & BYLAWS

Compliance_78

OK

*** ARCHAEOLOGICAL & PALEONTOLOGICAL TERMS AND CONDITIONS**

79. "archaeological site" means a place where an archaeological artifact is found. "archaeological artifact" means any tangible evidence of human activity that is more than 50 years old and in respect of which an unbroken chain of possession or regular pattern of usage cannot be demonstrated, and includes a Denesuline archaeological specimen referred to in section 40.4.9 of the Nunavut Land Claims Agreement. "paleontological site" means a site where a fossil is found. "fossil" includes: (a)

natural casts (b) Preserved tracks, coprolites and plant remains; and (c) the preserved shells and exoskeletons of invertebrates and the eggs, teeth and bones of vertebrates. - DEFINITIONS

Compliance_79	OK
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80. The Permittee shall avoid any known or suspected archaeological and/or paleontological sites. - AVOIDANCE OF ARCHAEOLOGICAL AND/OR PALEONTOLOGICAL SITES

Compliance_80	OK
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Notes_80	Continue to check.
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81. The Permittee shall not remove, disturb, or displace any archaeological artifact or site, or any paleontological site or fossil. - DISTURBANCE OF ARCHAEOLOGICAL AND/ OR PALEONTOLOGICAL SITE

Compliance_81	OK
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Notes_81	Continue to check.
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82. The Permittee shall immediately cease any activity should a suspected archaeological, paleontological, or burial site be discovered during the course of a land use operation. The Permittee is required to immediately contact the Land Administration division at Indigenous and Northern Affairs Canada at (867) 975-4283 or (867) 975-4285 or (867) 975-4280 as well as the Department of Culture, Language, elders and Youth at (867) 934-2046 or (867) 975-5500 or I (866) 934-2035. Permission to resume land use operation must be obtained from the engineer. At such time the Engineer may, at his/her discretion, require that you have an archaeologist or palaeontologist perform the following functions: a) Survey b) Inventory and documentation of the archaeological or c) paleontological resources of the land use area d) Assessment of potential for damage to archaeological or paleontological sites e) Mitigation f) Making boundaries of archaeological or paleontological sites g) Site restoration - CEASE OPERATION OF LAND USE ACTIVITY

Compliance_82	OK
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Notes_82	Continue to check.
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83. The Permittee shall ensure that all persons working under the authority of the permit! are aware of these conditions pertaining to archaeological sites and artifacts as well as paleontological sites and fossils. - KNOWLEDGE OF ARCHAEOLOGICAL AND PALEONTOLOGICAL TERMS AND CONDITIONS

Compliance_83	Action Required
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Notes_83	ROJV to include information re: Arch and Paleo terms and conditions in Worker Orientation Seminar..
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Date first-time Action required_83	2017-06-24
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Due Date for Action_83	2017-07-01
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Henry2, 2017-07-12

Project	Jericho Mine Site Stabilization
Created	2017-07-12 16:48:18 EDT by Henry Wong
Updated	2017-07-12 17:55:21 EDT by Henry Wong

Land Use Permit - Compliance review

Reviewer and Title	Henry2
Date	2017-07-12
Day	Wednesday
Land Use Permit	Class A - N2016U0013
Location	Contwoyto Lake Area, Kitikmeot, NU, NTS 76E 76L
Project Name	Jericho Mine Site Stabilization
Remediation Contractor	Rowe's-Outcome Joint Venture

* 31 (1) (a) Location and Area

1. The Permittee shall not conduct this land use operation on any lands not designated in the accepted application, unless otherwise authorized in writing by the engineer. - PLANS

Compliance_1	OK
Notes_1	Work being done in planned area.

2. Remove from Territorial Lands, all scrap metal, discarded machinery and parts, barrels and kegs, buildings and building materials, to an approved landfill or disposal facility. - REMOVE WASTE MATERIAL

Compliance_2	Not Applicable
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3. The Permittee shall not erect camps or store/stage material on the surface of frozen streams or lakes including the immediate banks except what is for immediate use. - STORAGE ON ICE

Compliance_3	Not Applicable
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4. Locate all camps on gravel, sand or other durable land. - CAMP LOCATION

Compliance_4	OK, CLOSED
Notes_4	Camp located on mine rock

5. Notify a Land Use Inspector, within 10 days of the Camp being set up, of the exact GPS Co-ordinates of the Camp's Location. - CAMP LOCATION

Compliance_5	OK, Action Required
Notes_5	Coordinates as per ROJV Jun26-2016; N 65° 59' 27.28" W 111° 30' 0.36" HW to confirm coordinates with Inspector.
Date first-time Action required_5	2017-07-12
Due Date for Action_5	2017-07-12



*** 31 (1) (b) Time**

6. The Permittee's Field Supervisor shall contact or meet with a Land Use Inspector at the Kugluktuk, NU office of the Department of Indian Affairs and Northern Development, phone number (867) 982-4306, at least 48 hours prior to the commencement of this land use operation. - CONTACT INSPECTOR

Compliance_6	OK, CLOSED
Notes_6	Email sent to inspector June 1st

7. The Permittee's Field Supervisor shall provide notification of commencement of the land use operation within 10 days, to the Engineer at the Iqaluit office of the Department of Indigenous and Northern Affairs Canada either by emailing landsmining@aandc.gc.ca or by telephone at (867) 975-4283. - NOTICE TO ENGINEER

Compliance_7	OK, CLOSED
Notes_7	Confirmed with INAC that notification to Inspector and Nunavut Lands meets communication requirements.

8. The Permittee shall provide in writing to the Engineer, at least forty-eight (48) hours prior to commencement of this land use operation, the following information: a) person, or persons, in charge of the field operation to whom notices, orders, and reports may be served, b) alternates, c) all the indirect methods for contacting the above person(s). - IDENTIFY AGENT

Compliance_8	OK, CLOSED
Notes_8	Confirmed with INAC that notification to Inspector and Nunavut Lands meets communication requirements.

9. The Permittee shall provide updated locations of the following activities, if applicable, related to this project to the Inspector and Engineer within 10 days of establishment : a) Campsite b) Fuel caches c) Airstrip d) Drill laydown area e) Quarry locations All coordinates must be provided in degree/min/sec format in NAD 83. - UPDATE LOCATIONS

Compliance_9	OK
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Update as required going forward.

10. Submit an annual report to the Engineer by March 30 of each year of permitted activities. - ANNUAL REPORTING

Compliance_10	Waiting to be done
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11. Notify the Engineer within 10 days, of seasonal closure of the land use area. - SEASONAL SHUTDOWN

Compliance_11	Waiting to be done
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12. Advise a Land Use Inspector at least 10 days prior to the completion of the land use operation of; a) his plan for removal or storage of equipment and materials, and b) when final clean-up and restoration of the lands used will be completed. - REPORTS BEFORE REMOVAL

Compliance_12	Waiting to be done
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13. Complete all clean-up and restoration of the lands used prior to the expiry date of this permit. - CLEAN-UP

Compliance_13	Waiting to be done
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14. The Engineer reserves the right to impose closure to any area to the Permittee in periods when dangers to natural resources are severe. - CLOSURE

Compliance_14	OK
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Notes_14	Noted.
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*** 31 (1) (c) Equipment**

15. The Permittee shall not use any equipment except of the type, size and number that is listed in the accepted application, unless otherwise authorized in writing by the Land Use Inspector. - ONLY APPROVED EQUIPMENT

Compliance_15	OK
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Notes_15	As confirmation, equipment list forwarded to Inspector on Jul12-2017.
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16. The Permittee shall use a forced-air fuel-fired incinerator to incinerate all combustible garbage and debris. - INCINERATORS

Compliance_16	OK
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17. The Permittee shall burn all combustible garbage and debris in a container acceptable to a Land Use Inspector. - INCINERATION

Compliance_17	OK
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18. The Permittee shall keep all garbage and debris in a covered container until disposed of at an approved facility. Garbage must be stored in such a manner as to prevent access by wildlife. - GARBAGE CONTAINERS

Compliance_18	OK
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Notes_18	Continue to check camp housekeeping in good order.
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19. The Permittee shall use portable ramps during loading or unloading ships or barges. - PORTABLE

RAMPS

Compliance_19	Not Applicable
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20. The Permittee shall not place dirt or debris into streams to serve as ramps for loading or unloading ships or barges, unless authorized in writing by a Land Use Inspector. - DIRT RAMPS

Compliance_20	Not Applicable
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21. The Permittee shall, in camps of more than five (5) personnel, maintain the following fire-fighting equipment in the base camp and in active readiness: (a) Four (4) backpack bags or cans complete with hand pumps. (b) A minimum of two pieces of each of the following; pulaskis, axes, shovels - FIRE FIGHTING EQUIPMENT

Compliance_21	Action Required
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Notes_21	ROJV has pulaskis axes and shovels set out and designated for fire fighting; however, still waiting on delivery of backpack bags.
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Date first-time Action required_21	2017-06-24
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Due Date for Action_21	2017-07-19
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22. The Permittee shall ensure that appropriate spill response equipment and clean-up materials (e.g. shovels, pumps, barrels, drip pans, and absorbents) must be readily available during any transfer of fuel or hazardous substances, as well as at fuel caches and drill sites. All activities should be conducted according to the approved Spill Response Plan. - SPILL RESPONSE KIT

Compliance_22	OK
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Notes_22	Spill kits at main work areas and in most equipment. Continue to monitor equipment in good condition and ready for use.
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* 31 (1) (e) Type, Location, Capacity and Operation of Facilities

23. The Permittee shall not locate any sump within thirty one (31) metres of the normal high water mark of any water body. Sumps and areas designated for waste disposal shall be sufficiently bermed or otherwise authorized. - SUMPS FROM WATER

Compliance_23	OK, Waiting to be done
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Notes_23	Three sumps excavated for holding grey water.
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24. The Permittee shall not move any equipment or vehicles without prior testing of the thickness of the ice to ensure the lake is in a state capable of fully supporting the equipment or vehicles. - TESTING OF ICE THICKNESS

Compliance_24

Not Applicable

25. The Permittee shall backfill and restore all sumps prior to the expiry date of this permit or immediately following completion of activity. - BACKFILL SUMPS

Compliance_25

Waiting to be done

26. The Permittee shall: ~ a) backfill sumps with sufficient material to ensure that no hollows or cavities result from settling of the material; b) overlap the replaced material a minimum of one (1) metre beyond the edges of the existing sump wall. - BACKFILL SUMP OVERLAP

Compliance_26

Waiting to be done

27. The Permittee shall ensure that the land use area is kept clean and tidy at all times. - CLEAN WORK AREA

Compliance_27

OK

Notes_27

Continue to check on and note proper housekeeping practices.

28. The Permittee shall only treat petroleum and hydrocarbon contaminated soils at the landfarm facility. Materials contaminated with other substances must not be stored at the land farm and must be disposed of at an authorized facility. - LANDFARM OPERATIONS

Compliance_28

Not Applicable

29. The Permittee shall ensure that all equipment used for aeration in the landfarm operation has been cleaned off within the landfarm facilities prior to exiting. - LANDFARM EQUIPMENT

Compliance_29

Not Applicable

30. The Permittee shall ensure that the land use area is kept clean and tidy at all times. - CLEAN WORK AREA

Compliance_30

OK

31. The Permittee shall select a winter route that maximizes the use of frozen water bodies. - WINTER TRAIL & ICE ROAD ROUTE

Compliance_31

Not Applicable

*** 31 (1) (f) - Control or Prevention of Flooding, Erosion and Subsidence of Land**

32. The Permittee shall remove any obstruction to natural drainage caused by any part of this land use operation. - NATURAL DRAINAGE

Compliance_32

OK

Notes_32

Continue to monitor.

33. The Permittee shall not cut any stream bank unless authorized in writing by a Land Use Inspector. - STREAM BANKS

Compliance_33

OK

34. The Permittee shall install erosion and sediment mitigation measures on disturbed areas before, during and after construction and as the land use operation progresses. - EROSION CONTROL

Compliance_34

OK

Notes_34

Continue to check Cell C Discharge point for erosion

35. The Permittee shall ensure that bank disturbances are avoided and no mechanized clearing carried out immediately adjacent to any watercourse. - AVOID BANK DISTURBANCES

Compliance_35

OK

Notes_35

With exception to contract earthworks to manage long term water course flow.

36. The Permittee shall ensure that stream crossings and/or temporary crossings constructed from ice and snow, which may cause jams, flooding, or impede fish passage and/or water flow are removed or notched prior to Spring break-up. - STREAM CROSSINGS

Compliance_36

Not Applicable

37. The Permittee shall not move any equipment or vehicles unless the ground surface is in a state capable of fully supporting the equipment or vehicles without rutting or gouging. - VEHICLE MOVEMENT FREEZE-UP

Compliance_37 Not Applicable

38. The Permittee shall not construct interceptor or off-shoot drainage ditches unless approved in writing by the Land Use Inspector. - DITCHES

Compliance_38 OK

39. The Permittee shall prepare the site in such a manner as to prevent rutting of the ground surface. - PREVENTION OF RUTTING

Compliance_39 OK

Notes_39 Continue to monitor activities for rutting.

40. The Permittee shall avoid disturbance on slopes prone to natural erosion, and alternative locations shall be utilized. - DISTURBANCE TO SLOPES

Compliance_40 OK

Notes_40 Continue to check and monitor during earthworks.

*** 31 (1) (g)- Use, Storage, Handling and Disposal of Chemical or Toxic Material**

41. The Permittee shall not use chemicals in connection with the land use operation without the prior approval of the Engineer. - APPROVAL OF CHEMICALS

Compliance_41 OK

42. The Permittee shall not use the following materials during the drilling operation without the prior written approval of the Engineer. Chlorinated phenols (Dowicide B, etc.) Compounds composed primarily of heavy metals Asbestos - PROHIBITED CHEMICALS

Compliance_42 Not Applicable

43. The Permittee shall deposit all sewage into a sump. - SEWAGE DISPOSAL

Compliance_43 OK

Notes_43 Pacto toilets and grey water to sump.

44. (a) The Permittee shall treat all sewage in a treatment plant capable of extracting eighty-five to ninety (85-90%) per cent of the biodegradable solids. (b) The Permittee shall place all remaining solids in a sump. - SEWAGE DISPOSAL

Compliance_44 OK

Notes_44 Pacto toilets and grey water to sump.

45. The Permittee shall incinerate all combustible wastes daily and remove ash from incineration activities. - GARBAGE DISPOSAL

Compliance_45 OK

Notes_45 Camp waste incineration ongoing.

46. The Permittee shall remove all non-combustible garbage and debris from the land use area to a disposal site approved in writing by a Land Use Inspector. - REMOVE GARBAGE

Compliance_46 OK

47. The Permittee shall dispose of all combustible waste petroleum products by removal. - WASTE PETROLEUM DISPOSAL

Compliance_47

OK

Notes_47

Incineration of organic liquids, as per contract work, confirmed with Inspector Jul12-2017.

48. The Permittee shall dispose of all toxic or persistent substances in a manner as approved in writing by the Engineer. - WASTE CHEMICAL DISPOSAL

Compliance_48

OK

49. The Permittee shall store all hazardous chemicals in such a manner as to prevent access by wildlife. - HAZARDOUS CHEMICAL STORAGE

Compliance_49

OK

50. The Permittee shall report all spills immediately in accordance with instructions contained in "Spill Report" form NWT 1752(05/93). Twenty four (24) hour spill report line (867)920-8130. - REPORT CHEMICAL AND PETROLEUM SPILLS

Compliance_50

OK

51. The Permittee prior to the discharge of fluids from any sump, shall carry out an analysis of the fluids in a manner prescribed by the Engineer and obtain his written approval to discharge. - SUMP DISCHARGE

Compliance_51

Action Required

Notes_51

ROJV waiting on final results for grey water.

Date first-time Action required_51

2017-07-12

Due Date for Action_51

2017-07-19

*** 31 (1) (h)- Wildlife and Fisheries Habitat**

52. The Permittee shall not unnecessarily damage wildlife habitat in conducting this land use operation. - HABITAT DAMAGE

Compliance_52

OK

53. The Permittee shall not harass wildlife. This includes persistently worrying, chasing, or disturbing large groups of animals. - HARASSMENT OF WILDLIFE

Compliance_53

OK

54. The Permittee shall not disturb or destroy the nests or eggs of any birds. If nests are encountered and/or identified, the Permittee shall take precaution to avoid further interaction and/or disturbance (e.g, a 100 meter buffer around the nests). If active nests are discovered (i.e. with eggs or young) the Permittee shall avoid these areas until nesting is complete and the young have left the nest. - WILDLIFE SENSITIVITY

Compliance_54

OK

55. During the period of May 1st to July 15th, when caribou are observed within 1 km or project operations, the Permittee shall suspend all operations, including low-level flights, blasting, and use of snowmobiles and overland vehicles outside the immediate vicinity of the camps. During the period

following July 15th, if caribou cows or calves are observed within 1 km of project operations, the Permittee shall also suspend operations in the vicinity, including low-level over flights and use of all-terrain vehicles, until caribou are no longer in the immediate area. - WILDLIFE SENSITIVITY

Compliance_55

OK

56. The Permittee shall cease activities that may interfere with migration or calving of caribou or muskox, such as airborne geophysical surveys, drilling, or movement of equipment of personnel until such a time that the caribou or muskox have passed. - CARIBOU/MUSKOX CALVING AND MIGRATION

Compliance_56

OK

57. The Permittee shall not block or cause any diversion to caribou migration, and shall cease activities likely to interfere with migration such as airborne geophysics surveys, drilling, or movement of equipment or personnel until such time as the caribou have passed. - CARIBOU MIGRATION

Compliance_57

OK

58. Your operation is in an area where bears may be encountered. Proper food handling and garbage disposal procedures will lessen the likelihood of bears being attracted to your operation. Information about the latest bear detection and deterrent techniques can be obtained from the Department of Renewable Resources at 867-982-7450. - BEAR/ MAN CONFLICT

Compliance_58

OK

*** 31 (1) (i)-Objects and Places of Recreational, Scenic and Ecological Value**

59. The Permittee shall not feed wildlife. - NO FEEDING WILDLIFE

Compliance_59

OK

*** 31 (1) (k)- Petroleum Fuel Storage**

60. The Permittee shall report in writing to a Land Use Inspector the exact GPS location and quantity of all petroleum fuel caches within ten (10) days after the establishment. - REPORT FUEL LOCATION

Compliance_60

OK, Action Required

Notes_60

HW to forward coordinates to INAC.

3 fuel locations:

X6 drums of diesel at airport

N 66° 01' 12.83"

W 111° 38' 03.68"

X2 drums of gasoline at shop

N 65° 59' 26.66"

W 111° 29' 03.42"

Tank 9 in Phase 2 tank farm area

N 65° 59' 31.49"

W 111° 29' 55.56"

Photos_60

Compliance_61	OK
Notes_61	Continue to monitor.
62. The Permittee shall use adequate secondary containment or a surface liner (e.g. self-supporting insta-berms and fold-a-tanks), when storing barrelled fuel and chemicals at all locations as well as re-fuelling stations. The volume of the berm area shall be 10% greater than the capacity of the largest fuel container placed therein. - SECONDARY CONTAINMENT	
Compliance_62	OK
63. The Permittee shall not allow petroleum products to spread to surrounding lands or into water bodies. - FUEL CONTAINMENT	
Compliance_63	OK
Notes_63	Continue to monitor good fuel practices.
64. The Permittee shall have one extra fuel storage container on site equal to, or greater than, the size of the largest fuel container. - FUEL EXTRA CONTAINER	
Compliance_64	OK
65. The Permittee shall construct a dyke around each stationary fuel container or group of stationary fuel containers where any one container has a capacity exceeding 4,000 litres. - DYKE FUEL CONTAINERS	
Compliance_65	OK
66. The Permittee shall line the dyke and area enclosed by the dyke with a type of plastic film liner approved by the Engineer. - LINE DYKE	
Compliance_66	OK
67. The volume of the dyked area shall be 10% greater than the capacity of the largest fuel container placed therein. - CAPACITY	
Compliance_67	OK
68. The Permittee shall ensure that the dyke and the area enclosed by the dyke shall be impermeable to petroleum products at all times - IMPERMEABLE DYKE	
Compliance_68	OK
69. The Permittee shall: a) examine all fuel storage containers for leaks a minimum of once every seven (7) days during operations; b) repair all leaks immediately; c) examine all fuel storage containers for leaks immediately upon delivery. - CHECK FOR LEAKS	
Compliance_69	OK, Action Required
Notes_69	ROJV to conduct weekly inspections and report to DR.
Date first-time Action required_69	2017-07-12
Due Date for Action_69	2017-07-19
70. The Permittee shall ensure that re-fuelling of equipment occur a minimum of thirty-one (31) metres away from the high water mark of any water body, at a designated area. All re-fuelling and bulk fuel transfers must be conducted over a drip tray or secondary containment. - RE-FUELLING	
Compliance_70	OK

Ongoing monitoring of good fuelling practice.

71. The Permittee shall mark all stationary petroleum products storage facilities with flags, posts or similar devices so that they are at all times plainly visible to local vehicle travel. - MARK FUEL LOCATION

Compliance_71	Action Required
Notes_71	ROJV to mark corners of fuel locations.
Date first-time Action required_71	2017-07-12
Due Date for Action_71	2017-07-19

72. The Permittee shall remove and treat hydrocarbon contaminated soils on site or transport them to an approved disposal site for treatment. - CONTAMINATED SOIL

Compliance_72	OK
Notes_72	Confirmed with Inspector on Jul11-2017 incineration of waste organic liquids.

*** 31 (1) (m)- Matters Not Inconsistent with the Regulations**

73. The Permittee shall display a copy of this permit in a conspicuous place in each campsite established to carry out this land use operation. - DISPLAY PERMIT

Compliance_73	OK, CLOSED
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74. The Permittee shall keep on hand, at all times during this land use operation, a copy of the Land Use Permit. - COPY OF PERMIT

Compliance_74	OK
---------------	----

75. The Permittee shall provide in writing to the Engineer, at least forty-eight (48) hours prior to commencement of this land use operation, the following information: a) person, or persons, in charge of the field operation to whom notices, orders, and reports may be served; b) alternates; c) all the indirect methods for contacting the above person(s). - IDENTIFY AGENT

Compliance_75	OK, CLOSED
---------------	------------

76. The Permittee shall conspicuously display the land use permit number on all vehicles and equipment. - DISPLAY PERMIT NUMBER

Compliance_76	OK
---------------	----

77. Part 1 -In this Permit: "sump" means a man-made pit, trench hollow or cavity in the earth's surface used for the purpose of depositing waste material therein. - DEFINITIONS

Compliance_77	OK
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78. The Permittee shall abide by and comply with all applicable lawful rules, acts, regulations, and by-laws of Canada, Nunavut, any Municipal or regulatory body or authority having jurisdiction, the Nunavut Land Claim Agreement, and all other agreements, permits, licenses, and other instruments whatsoever related to the project. - ADHERENCE TO LAWFUL RULES, ACTS, REGS & BYLAWS

Compliance_78	OK
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*** ARCHAEOLOGICAL & PALEONTOLOGICAL TERMS AND CONDITIONS**

79. "archaeological site" means a place where an archaeological artifact is found. "archaeological artifact" means any tangible evidence of human activity that is more than 50 years old and in respect of which an unbroken chain of possession or regular pattern of usage cannot be demonstrated, and includes a Denesuline archaeological specimen referred to in section 40.4.9 of the Nunavut Land Claims Agreement. "paleontological site" means a site where a fossil is found. "fossil" includes: (a) natural casts (b) Preserved tracks, coprolites and plant remains; and (c) the preserved shells and exoskeletons of invertebrates and the eggs, teeth and bones of vertebrates. - DEFINITIONS

Compliance_79

OK

80. The Permittee shall avoid any known or suspected archaeological and/or paleontological sites. - AVOIDANCE OF ARCHAEOLOGICAL AND/OR PALEONTOLOGICAL SITES

Compliance_80

OK

81. The Permittee shall not remove, disturb, or displace any archaeological artifact or site, or any paleontological site or fossil. - DISTURBANCE OF ARCHAEOLOGICAL AND/ OR PALEONTOLOGICAL SITE

Compliance_81

OK

82. The Permittee shall immediately cease any activity should a suspected archaeological, paleontological, or burial site be discovered during the course of a land use operation. The Permittee is required to immediately contact the Land Administration division at Indigenous and Northern Affairs Canada at (867) 975-4283 or (867) 975-4285 or (867) 975-4280 as well as the Department of Culture, Language, elders and Youth at (867) 934-2046 or (867) 975-5500 or I (866) 934-2035. Permission to resume land use operation must be obtained from the engineer. At such time the Engineer may, at his/her discretion, require that you have an archaeologist or palaeontologist perform the following functions: a) Survey b) Inventory and documentation of the archaeological or c) paleontological resources of the land use area d) Assessment of potential for damage to archaeological or paleontological sites e) Mitigation f) Making boundaries of archaeological or paleontological sites g) Site restoration - CEASE OPERATION OF LAND USE ACTIVITY

Compliance_82

OK

83. The Permittee shall ensure that all persons working under the authority of the permit! are aware of these conditions pertaining to archaeological sites and artifacts as well as paleontological sites and fossils. - KNOWLEDGE OF ARCHAEOLOGICAL AND PALEONTOLOGICAL TERMS AND CONDITIONS

Compliance_83

OK, CLOSED

Notes_83

ROJV included information in worker orientation re: archaeological awareness.

Date	November 2018
------	---------------

- Request for Grey Water Transfer – ROJV Memorandum

Memorandum

Date: September 20, 2017

To: Michael Bernardin, PSPC
Henry Wong, DXB Projects

From: Jonathan Markiewicz, Outcome Consultants Inc,

CC: Jack Rowe, Rowe's Construction
Michael Billowits, Outcome

Re: Greywater Discharge Request
PSPC Contract EW699-171068/001/NCS ("Contract")

1.0 Purpose

The purpose of this memo is to provide notification to Authorities Having Jurisdiction that the Camp Greywater which was generated by Rowe's Outcome JV ("ROJV") during the Contract has been treated and ROJV is requesting authorization to discharge.

2.0 Generated Wastewater and Treatment

Throughout the course of the works ROJV has utilized a soft-shell tent camp, "Weather Havens", equipped with Pacto Toilets allowing the Greywater (Kitchen, Laundry, Showers) to be managed completely separate from sewage. ROJV has been tracking the wash water consumption by way of tracking the volume of Greywater pumped into a Vacuum Truck from a storage bin at the Camp and displaced into temporary sumps, or berms, located north of the Laydown Area.

Commencing July 25, 2017, ROJV started to treat the Greywater using a treatment system consisting of a Granular Activated Carbon (GAC) media and bag filters to reduce TOG and TSS concentrations. On August Then on August 15, 2017 a closed-loop fountain was installed and rotated between treated cells to periodically aerate the treated Greywater to further reduce BOD concentrations was also implemented.

3.0 Effluent Quality

The following tabulates the treated Greywater analytical results with the treatment system running at approximately 5-Gal/min (2" pump running at near idle) with periods of aeration;

and compares them against the “Decision” discharge criteria of the June 23, 2017 Letter of Decision and a “Typical” water license, as stated in the Contract Specifications (SS 01 35 15 – 1.4.2.2)

Contaminants of Concern			BOD ₅ (mg/L)	TSS (mg/L)	pH	TOG (mg/L)	F.C. (CFU/dl)
“Decision” Criteria			25	25	6 to 9	5	10,000
“Typical” Criteria			80	100	6 to 8.8	5.0	20 mg/L
Sample ID	Sample Location	Date					
GRY- WGS-07	Berm 5	Aug-4-17	49	32	6.6	5.0	>10*
GW Post Treatment	GAC Effluent	Aug-4-17	25	25	6.7	2.7	2420
GRY- WGS-S5	Berm 5		na	na	na	1.1	na
GRY- WGS-08	Berm 6	Y	49	49	6.3	11	2420**
GRY- WGS-S6	Berm 6	Y	na	na	na	1.2	na
GRY- WGS-09	Berm 7	Y	54	45	7.3	7	INF
GRY- WGS-S7	Berm 7		na	na	na	1.8	na
Treated Average			44	38	6.7	4.3	2420

Notes:

na - Not Analyzed

INF – Matrix interference that prevented from the Laboratory to report a concentration

* –Insufficient sample to run a Dilution to raise detection limit above 10 CFU/dl

** - GRY-WGS-08 was errantly submitted for Total Coliforms, which were still below the criteria and would represent a worst case for Fecal Coliforms.

Based on the above, tabulated results of the treated Greywater ROJV has observed the following:

- 1- pH has been within the acceptable range for all samples submitted.
- 2- Fecal Coliforms have been below both criteria for all quantifiable samples.
- 3- TOG has an average concentration below both criteria .
- 4- TSS and BOD₅ have been below the “Typical” water license criteria included in the Specifications, but are slightly elevated above the “Decision” criteria.

4.0 Additional TOG Results

One of the concerns raised by the Departmental Representative (DR) throughout the treatment process was the source of Total Oil and Greases. As such, ROJV further investigated the likely causes of the TOG concentrations. No visible oily sheen, film or ‘scum’ has been observed in the treated Greywater effluent or storage berms. ROJV collected greywater grab samples from

each of the 7 berms on September 7, 2017 and submitted the samples for a Laboratory analytical breakdown of Total Oil and Grease (TOG), Mineral Oil and Grease (MOG) and Vegetable/Animal Oil and Grease (VAOG) to identify the potential source and environmental implications of the elevated TOG in the greywater samples. These samples are representative of the total stored volume of Greywater in each berm and the following tabulates the results.

Sample ID	Sample Location	Treated (Y/N)	MOG	VAOG	TOG	VAOG/TOG
GRY-WGS-S1	Berm 1	N	2.5	25	27	92.6%
GRY- WGS-S2	Berm 2	N	3.0	34	37	91.9%
GRY- WGS-S3	Berm 3	N	0.6	5.7	6.3	90.5%
GRY- WGS-S4	Berm 4	Y	ND	1.3	1.3	100%
GRY- WGS-S5	Berm 5	Y	ND	1.1	1.1	100%
GRY- WGS-S6	Berm 6	Y	ND	1.2	1.2	100%
GRY- WGS-S7	Berm 7	Y	ND	1.8	1.8	100%

The above tabulated results indicate that the following

- 1- TOG levels (untreated or treated) is >90% natural oils and greases generated from the Camp Kitchen.
- 2- MOG concentrations in all Greywater berms were all below both criteria.

5.0 Greywater Discharge Plan

Based on the above interpretation of the analytical results it is ROJV’s intent to discharge the treated Greywater from berms 5, 6 and 7 at the earliest possible to a man-made unnatural feature that is not directly connected to the Tundra, nor Carat Lake. This location will be selected in coordination with the DR.

In keeping with INAC-NWRD review comments the discharge location will be completely isolated from both the Tundra and Carat Lake and alleviates the concerns raised by INAC-NWRD about “negative impacts on the receiving environment, specifically Carat Lake”.

Immediately following the evacuation of a treated Greywater berm, any untreated Greywater from berms 1 to 4 as well as the remaining minor amount of greywater (<10,000 litres) generated during the final days of camp operation while a small crew is on-site to support the demobilization. This greywater will be treated at approximately 5-Gal/min (2” pump running at near idle) with periods of aeration. Once a berm is filled and Aerated for 24-hrs it will also be discharged.

6.0 Summary Remarks

ROJV trusts that this memo satisfies the rationale for the plan to commence the discharge of treated greywater as soon as possible to facilitate the demobilization from the site as planned in September 2017.

If you require any further information or clarification, please do not hesitate to contact the writer.

Regards,



Jonathan Markiewicz, P-Geo.
Senior Project Manager

Attachment No. 1 – Treated Greywater Analytical Results

Your Project #: 17-018
Your C.O.C. #: M057357

Attention: JONATHAN MARKIEWICZ

OUTCOME CONSULTANTS INC.
151 HOLLAND AVENUE
SUITE 200
OTTAWA, ON
CANADA K1Y 0Y2

Report Date: 2017/08/11
Report #: R2426991
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B765969

Received: 2017/08/04, 13:12

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Biochemical Oxygen Demand	1	2017/08/06	2017/08/11	AB SOP-00017	SM 22 5210 B m
Oil and Grease (Gravimetric, n-Hexane)	1	2017/08/09	2017/08/09	EENVSOP-00093	SM 22 5520 B m
pH @25°C (1)	1	N/A	2017/08/06	AB SOP-00005	SM 22 4500 H+ B m
Total Suspended Solids (NFR)	1	2017/08/09	2017/08/11	AB SOP-00061	SM 22 2540 D m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Maxxam endeavours to analyze samples as soon as possible after receipt.

Your Project #: 17-018
Your C.O.C. #: M057357

Attention: JONATHAN MARKIEWICZ

OUTCOME CONSULTANTS INC.
151 HOLLAND AVENUE
SUITE 200
OTTAWA, ON
CANADA K1Y 0Y2

Report Date: 2017/08/11
Report #: R2426991
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B765969
Received: 2017/08/04, 13:12

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Customer Service Alberta, Customer Service Alberta
Email: CSAlberta@maxxam.ca
Phone# (780) 577-7100

=====
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Maxxam Job #: B765969
Report Date: 2017/08/11

OUTCOME CONSULTANTS INC.
Client Project #: 17-018
Sampler Initials: JSM

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		RR2767		
Sampling Date		2017/08/04 09:35		
COC Number		M057357		
	UNITS	GRY-WGS-007	RDL	QC Batch
Demand Parameters				
Biochemical Oxygen Demand	mg/L	49 (1)	10	8718405
Misc. Inorganics				
pH	pH	6.64	N/A	8718500
Total Suspended Solids	mg/L	32	1.0	8720158
Misc. Organics				
Extractable (n-Hex.) Oil and grease	mg/L	5.0	2.0	8720507
RDL = Reportable Detection Limit N/A = Not Applicable (1) Detection limit raised based on sample volume used for analysis.				

Maxxam Job #: B765969
Report Date: 2017/08/11

OUTCOME CONSULTANTS INC.
Client Project #: 17-018
Sampler Initials: JSM

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	9.3°C
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Results relate only to the items tested.

Maxxam Job #: B765969
Report Date: 2017/08/11

OUTCOME CONSULTANTS INC.
Client Project #: 17-018
Sampler Initials: JSM

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8718405	SSW	Spiked Blank	Biochemical Oxygen Demand	2017/08/11		103	%	85 - 115
8718405	SSW	Method Blank	Biochemical Oxygen Demand	2017/08/11	<2.0		mg/L	
8718405	SSW	RPD [RR2767-02]	Biochemical Oxygen Demand	2017/08/11	5.0		%	20
8718500	MA4	Spiked Blank	pH	2017/08/06		100	%	97 - 103
8718500	MA4	RPD	pH	2017/08/06	0.029		%	N/A
8720158	KPG	Matrix Spike	Total Suspended Solids	2017/08/11		95	%	80 - 120
8720158	KPG	Spiked Blank	Total Suspended Solids	2017/08/11		93	%	80 - 120
8720158	KPG	Method Blank	Total Suspended Solids	2017/08/11	<1.0		mg/L	
8720158	KPG	RPD	Total Suspended Solids	2017/08/11	0		%	20
8720507	OO1	Spiked Blank	Extractable (n-Hex.) Oil and grease	2017/08/09		105	%	70 - 130
8720507	OO1	Method Blank	Extractable (n-Hex.) Oil and grease	2017/08/09	<2.0		mg/L	

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

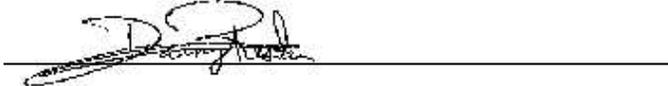
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Maxxam Job #: B765969
Report Date: 2017/08/11

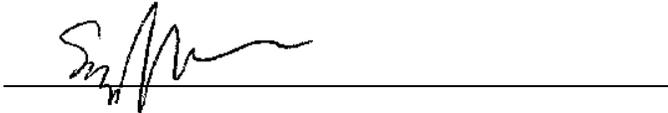
OUTCOME CONSULTANTS INC.
Client Project #: 17-018
Sampler Initials: JSM

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Daniel Reslan, cCT, QP, Organics Supervisor



Sandy Yuan, M.Sc., Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Invoice Information	Report Information (if differs from invoice)	Project Information	Turnaround Time (TAT) Required
Company: <u>Outcome Consultants</u>	Company: _____	Quotation #: _____	<input checked="" type="checkbox"/> 5 - 7 Days Regular (Most analyses)
Contact Name: <u>Jonathan Markiewicz</u>	Contact Name: _____	P.O. #/ AFE#: _____	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: <u>151 Holland Ave Ottawa, ON</u>	Address: _____	Project #: <u>17-018</u>	Rush TAT (Surcharges will be applied)
Phone: <u>514-984-6405</u>	Phone: _____	Site Location: _____	<input type="checkbox"/> Same Day <input type="checkbox"/> 2 Days
Email: <u>jmarkiewicz@outcomeinc.ca</u>	Email: _____	Site #: _____	<input type="checkbox"/> 1 Day <input type="checkbox"/> 3-4 Days
Copies: <u>Csodler@outcomeinc.ca</u>	Copies: _____	Site #: _____	Date Required: _____
		Sampled By: <u>JSM</u>	Rush Confirmation #: _____

Laboratory Use Only				Analysis Requested												Regulatory Criteria										
Seal Present	YES	NO	Cooler ID	<p>RECEIVED IN YELLOW KNIFE BY: <u>Alissa MEBL</u> 2017-08-04 13:12 ice yes seal no Temp: <u>8, 9, 11</u></p>												<input type="checkbox"/> AT1 <input type="checkbox"/> CCME <input type="checkbox"/> Drinking Water <input type="checkbox"/> D50 (Drilling Waste) <input type="checkbox"/> Saskatchewan <input type="checkbox"/> Other:										
Seal Intact			Temp																							
Cooling Media																										
Cooling Media																										
Seal Present	YES	NO	Cooler ID	# of containers	BTEX F1	VOC	BTEX F1-F2	BTEX F1-F4	Routine Water	Regulated Metals	Tot	Diss	Mercury	Total	Dissolved	Salinity 4	Sieve (75 micron)	Texture (% Sand, Silt, Clay)	Basic Class II Landfill	155	PH	BOB	0.15 GPR 58	HOLD - DO NOT ANALYZE	Special Instructions	
Seal Intact			Temp																							
Cooling Media																										
Seal Present	YES	NO	Cooler ID																							
Seal Intact			Temp																							
Cooling Media																										
Sample Identification				Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix																			
1	<u>GRY-WGS-007</u>				<u>201708/04</u>	<u>9:35</u>	<u>Water</u>																			
2	<u>GRY-WGS-008</u>				<u>11</u>	<u>11</u>																				
3	<u>GRY-WGS-009</u>				<u>11</u>	<u>11</u>																				
4	<u>GRY-WGS-010</u>				<u>11</u>	<u>11</u>																				
5																										
6																										
7																										
8																										
9																										
10																										

Please indicate Filtered, Preserved or Both (F, P, F/P)

Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Maxxam Job #
<u>Coleman Diller / Coleman Siller</u>	<u>2017/08/04</u>	<u>9:35</u>	<u>Nicholas W</u>	<u>2017/08/05</u>	<u>11:49</u>	<u>B765969</u>

Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Maxxam's standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgment and acceptance of our terms which are available for viewing at www.maxxam.ca/terms



Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:
170683

- FINAL REPORT -

Prepared For: Rowe's Outcome Joint Venture

Address: 151 Holland Ave
Ottawa, ON
A1Y 0Y2

Attn: Jonathan Markiewicz

Facsimile:

Final report has been reviewed and approved by:

Glen Hudy
Quality Assurance Officer

NOTES:

- Test methods and data are validated by the laboratory's Quality Assurance Program. Taiga Environmental Laboratory is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) to ISO/IEC 17025 as a testing laboratory for specific tests registered with CALA.
- Routine methods are based on recognized procedures from sources such as
 - Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF;
 - Environment Canada
 - USEPA
- Samples shall be kept for thirty (30) days after the final report is issued. All microbiological samples shall be disposed of immediately upon completion of analysis to minimize biohazardous risks to laboratory personnel. Please contact the laboratory if you have any special requirements.
- Final results are based on the specific tests at the time of analysis and do not represent the conditions during sampling.

ReportDate: Tuesday, August 08, 2017

Print Date: *Wednesday, August 09, 2017*



Taiga Environmental Laboratory

4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9

Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:
170683

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **GRY-WGS-007**

Taiga Sample ID: **001**

Client Project: 17-018

Sample Type: Wastewater

Received Date: 04-Aug-17

Sampling Date: 04-Aug-17

Sampling Time: 9:35

Location: Jericho Mine

Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Microbiology						
Coliforms, Fecal	tntc	10	CFU/100mL	04-Aug-17	SM9222:D	86

ReportDate: Tuesday, August 08, 2017

Print Date: **Wednesday, August 09, 2017**

Page 2 of 3



Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:
170683

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **GRY-WGS-007**

Taiga Sample ID: **001**

- DATA QUALIFIERS -

Data Qualifier Descriptions:

86 *Too numerous to count. Unable to repeat analysis at higher dilution. Holding time exceeded.*

*** Taiga analytical methods are based on the following standard analytical methods**

SM - Standard Methods for the Examination of Water and Wastewater

EPA - United States Environmental Protection Agency

ReportDate: Tuesday, August 08, 2017

Print Date: **Wednesday, August 09, 2017**

Page 3 of 3

Your Project #: 17-018
Your C.O.C. #: M057355

Attention: JONATHAN MARKIEWICZ

OUTCOME CONSULTANTS INC.
151 HOLLAND AVENUE
SUITE 200
OTTAWA, ON
CANADA K1Y 0Y2

Report Date: 2017/09/13
Report #: R2443572
Version: 4 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B772718

Received: 2017/08/24, 10:50

Sample Matrix: Hydrocarbon
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
ICP Scan - Petroleum Products (D5185) (1)	1	N/A	2017/08/31	PTC SOP-00206	ASTM D5185
Flash Point (Closed Cup), ASTM D93 (1)	1	N/A	2017/08/31	PTC SOP-00082	ASTM D93
Oil and Grease by IR (2)	1	2017/09/05	2017/09/08	CAL SOP-00096	EPA 3540C R3 m
Polychlorinated Biphenyls (2)	1	N/A	2017/09/09	CAL SOP-00149	EPA 8082A R1 m
pH @25C (3)	1	N/A	2017/08/31	AB SOP-00006	SM 22 4500 H+ B m
Chloride Concentration, SLM (mg/kg) (1)	1	2017/09/01	2017/09/01	PTC SOP-00119	Syncrude Method

Sample Matrix: Oil
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total Suspended Solids (NFR)	1	2017/08/30	2017/08/30	AB SOP-00061	SM 22 2540 D m

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Oil and Grease (Gravimetric, n-Hexane)	1	2017/08/28	2017/08/28	EENV SOP-00093	SM 22 5520 B m
pH @25°C (3)	1	N/A	2017/08/26	AB SOP-00005	SM 22 4500 H+ B m
Total Suspended Solids (NFR)	1	2017/08/28	2017/08/30	AB SOP-00061	SM 22 2540 D m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report.

Your Project #: 17-018
Your C.O.C. #: M057355

Attention: JONATHAN MARKIEWICZ

OUTCOME CONSULTANTS INC.
151 HOLLAND AVENUE
SUITE 200
OTTAWA, ON
CANADA K1Y 0Y2

Report Date: 2017/09/13
Report #: R2443572
Version: 4 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B772718

Received: 2017/08/24, 10:50

Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Maxxam Edmonton Petroleum

(2) This test was performed by Maxxam Calgary Environmental

(3) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Maxxam endeavours to analyze samples as soon as possible after receipt.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Customer Service Alberta, Customer Service Alberta

Email: CSAlberta@maxxam.ca

Phone# (780) 577-7100

=====

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Maxxam Job #: B772718
Report Date: 2017/09/13

OUTCOME CONSULTANTS INC.
Client Project #: 17-018

RESULTS OF CHEMICAL ANALYSES OF HYDROCARBON

Maxxam ID		RV3832		
Sampling Date		2017/08/23 09:30		
COC Number		M057355		
	UNITS	JER-C2	RDL	QC Batch
Elemental Analysis				
Chloride by Titration	mg/kg	82.08	10	8745904
Misc. Inorganics				
pH	pH	8.00	N/A	8744296
Dissolved Metals by ICP				
Dissolved Aluminum (Al)	mg/kg	3	1	8743957
Dissolved Barium (Ba)	mg/kg	<1	1	8743957
Dissolved Beryllium (Be)	mg/kg	<1	1	8743957
Dissolved Boron (B)	mg/kg	5	1	8743957
Dissolved Cadmium (Cd)	mg/kg	<1	1	8743957
Dissolved Calcium (Ca)	mg/kg	1150	1	8743957
Dissolved Chromium (Cr)	mg/kg	<1	1	8743957
Dissolved Cobalt (Co)	mg/kg	<1	1	8743957
Dissolved Copper (Cu)	mg/kg	2	1	8743957
Dissolved Iron (Fe)	mg/kg	8.1	0.5	8743957
Dissolved Lead (Pb)	mg/kg	<1	1	8743957
Dissolved Lithium (Li)	mg/kg	<1	1	8743957
Dissolved Magnesium (Mg)	mg/kg	10	1	8743957
Dissolved Manganese (Mn)	mg/kg	<1	1	8743957
Dissolved Molybdenum (Mo)	mg/kg	<1	1	8743957
Dissolved Nickel (Ni)	mg/kg	<0.5	0.5	8743957
Dissolved Phosphorus (P)	mg/kg	884	0.5	8743957
Dissolved Potassium (K)	mg/kg	5	1	8743957
Dissolved Silicon (Si)	mg/kg	5.0	0.5	8743957
Dissolved Silver (Ag)	mg/kg	2	1	8743957
Dissolved Sodium (Na)	mg/kg	6	1	8743957
Dissolved Strontium (Sr)	mg/kg	<1	1	8743957
Dissolved Tin (Sn)	mg/kg	<1	1	8743957
Dissolved Titanium (Ti)	mg/kg	<1	1	8743957
Dissolved Vanadium (V)	mg/kg	<0.5	0.5	8743957
Dissolved Zinc (Zn)	mg/kg	471	1	8743957
RDL = Reportable Detection Limit N/A = Not Applicable				

Maxxam Job #: B772718
Report Date: 2017/09/13

OUTCOME CONSULTANTS INC.
Client Project #: 17-018

RESULTS OF CHEMICAL ANALYSES OF HYDROCARBON

Maxxam ID		RV3832		
Sampling Date		2017/08/23 09:30		
COC Number		M057355		
	UNITS	JER-C2	RDL	QC Batch
Misc. Organics				
Oil and grease	mg/kg	1000000 (1)	50000	8747390
Physical Properties				
Closed Cup Flash Point	°C	142.0		8741843
RDL = Reportable Detection Limit (1) Sample is oil product. Detection limits raised due to dilution to bring analyte within the calibrated range.				

Maxxam Job #: B772718
Report Date: 2017/09/13

OUTCOME CONSULTANTS INC.
Client Project #: 17-018

POLYCHLORINATED BIPHENYLS BY GC-ECD (HYDROCARBON)

Maxxam ID		RV3832		
Sampling Date		2017/08/23 09:30		
COC Number		M057355		
	UNITS	JER-C2	RDL	QC Batch
Polychlorinated Biphenyls				
Aroclor 1016	mg/kg	<0.70	0.70	8751695
Aroclor 1221	mg/kg	<0.70	0.70	8751695
Aroclor 1232	mg/kg	<0.70	0.70	8751695
Aroclor 1242	mg/kg	<0.70	0.70	8751695
Aroclor 1248	mg/kg	<0.70	0.70	8751695
Aroclor 1254	mg/kg	<0.70	0.70	8751695
Aroclor 1260	mg/kg	<0.70	0.70	8751695
Aroclor 1268	mg/kg	<0.70	0.70	8751695
Total Aroclors	mg/kg	<0.70	0.70	8751695
Surrogate Recovery (%)				
NONACHLOROBIPHENYL (sur.)	%	102		8751695
RDL = Reportable Detection Limit				

Maxxam Job #: B772718
Report Date: 2017/09/13

OUTCOME CONSULTANTS INC.
Client Project #: 17-018

RESULTS OF CHEMICAL ANALYSES OF OIL

Maxxam ID		RV3832		
Sampling Date		2017/08/23 09:30		
COC Number		M057355		
	UNITS	JER-C2	RDL	QC Batch
Misc. Inorganics				
Total Suspended Solids	mg/L	18000 (1)	15	8742902
RDL = Reportable Detection Limit (1) Detection limit raised based on sample volume used for analysis.				

Maxxam Job #: B772718
Report Date: 2017/09/13

OUTCOME CONSULTANTS INC.
Client Project #: 17-018

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		RU9619		
Sampling Date		2017/08/23 13:55		
COC Number		M057355		
	UNITS	GRY-GWS-008	RDL	QC Batch
Misc. Inorganics				
pH	pH	6.34	N/A	8739163
Total Suspended Solids	mg/L	49	1.0	8740469
Misc. Organics				
Extractable (n-Hex.) Oil and grease	mg/L	11	2.0	8740487
RDL = Reportable Detection Limit N/A = Not Applicable				

Maxxam Job #: B772718
Report Date: 2017/09/13

OUTCOME CONSULTANTS INC.
Client Project #: 17-018

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	1.7°C
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Results relate only to the items tested.

Maxxam Job #: B772718
Report Date: 2017/09/13

OUTCOME CONSULTANTS INC.
Client Project #: 17-018

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8739163	CH7	Spiked Blank	pH	2017/08/26		100	%	97 - 103
8739163	CH7	RPD	pH	2017/08/26	1.1		%	N/A
8740469	KPG	Matrix Spike	Total Suspended Solids	2017/08/30		90	%	80 - 120
8740469	KPG	Spiked Blank	Total Suspended Solids	2017/08/30		102	%	80 - 120
8740469	KPG	Method Blank	Total Suspended Solids	2017/08/30	<1.0		mg/L	
8740469	KPG	RPD	Total Suspended Solids	2017/08/30	NC		%	20
8740487	OO1	Spiked Blank	Extractable (n-Hex.) Oil and grease	2017/08/28		102	%	70 - 130
8740487	OO1	Method Blank	Extractable (n-Hex.) Oil and grease	2017/08/28	<2.0		mg/L	
8742902	LCA	Matrix Spike	Total Suspended Solids	2017/08/30		90	%	80 - 120
8742902	LCA	Spiked Blank	Total Suspended Solids	2017/08/30		100	%	80 - 120
8742902	LCA	Method Blank	Total Suspended Solids	2017/08/30	<1.0		mg/L	
8742902	LCA	RPD	Total Suspended Solids	2017/08/30	0		%	20
8743957	BGK	RPD	Dissolved Iron (Fe)	2017/08/31	NC		%	20
			Dissolved Nickel (Ni)	2017/08/31	NC		%	20
			Dissolved Vanadium (V)	2017/08/31	NC		%	20
8744296	MA4	Spiked Blank	pH	2017/08/31		100	%	97 - 103
8744296	MA4	RPD	pH	2017/08/31	0.42		%	N/A
8747390	SAW	QC Standard	Oil and grease	2017/09/08		89	%	N/A
8747390	SAW	Spiked Blank	Oil and grease	2017/09/08		96	%	70 - 130
8747390	SAW	Method Blank	Oil and grease	2017/09/08	<50		mg/kg	
8747390	SAW	RPD [RV3832-01]	Oil and grease	2017/09/08	0		%	50
8751695	NK3	Matrix Spike [RV3832-01]	Aroclor 1260	2017/09/09		89	%	50 - 130
			NONACHLOROBIPHENYL (sur.)	2017/09/09		102	%	50 - 130
8751695	NK3	Spiked Blank	Aroclor 1260	2017/09/09		83	%	50 - 130
			NONACHLOROBIPHENYL (sur.)	2017/09/09		100	%	50 - 130
8751695	NK3	Method Blank	Aroclor 1016	2017/09/09	<0.70		mg/kg	
			Aroclor 1221	2017/09/09	<0.70		mg/kg	
			Aroclor 1232	2017/09/09	<0.70		mg/kg	
			Aroclor 1242	2017/09/09	<0.70		mg/kg	
			Aroclor 1248	2017/09/09	<0.70		mg/kg	
			Aroclor 1254	2017/09/09	<0.70		mg/kg	
			Aroclor 1260	2017/09/09	<0.70		mg/kg	
			Aroclor 1268	2017/09/09	<0.70		mg/kg	
			NONACHLOROBIPHENYL (sur.)	2017/09/09		88	%	50 - 130
			Total Aroclors	2017/09/09	<0.70		mg/kg	
8751695	NK3	RPD [RV3832-01]	Aroclor 1016	2017/09/09	NC		%	50
			Aroclor 1221	2017/09/09	NC		%	50
			Aroclor 1232	2017/09/09	NC		%	50
			Aroclor 1242	2017/09/09	NC		%	50
			Aroclor 1248	2017/09/09	NC		%	50
			Aroclor 1254	2017/09/09	NC		%	50
			Aroclor 1260	2017/09/09	NC		%	50
			Aroclor 1268	2017/09/09	NC		%	50

Maxxam Job #: B772718
Report Date: 2017/09/13

OUTCOME CONSULTANTS INC.
Client Project #: 17-018

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
				Total Aroclors	2017/09/09	NC		%	50
<p>N/A = Not Applicable</p> <p>Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.</p> <p>Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.</p> <p>QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.</p> <p>Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.</p> <p>Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.</p> <p>Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.</p> <p>NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).</p>									

Maxxam Job #: B772718
Report Date: 2017/09/13

OUTCOME CONSULTANTS INC.
Client Project #: 17-018

VALIDATION SIGNATURE PAGE

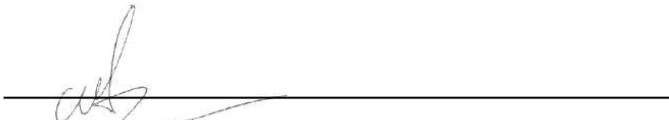
The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Daniel Reslan, cCT, QP, Organics Supervisor



Janet Gao, B.Sc., QP, Supervisor, Organics



Maria Magdalena Florescu, Ph.D., P.Chem., QP, Inorganics Senior Analyst



Maria Vidal-Pascual, Senior Analyst



Suwan Fock, B.Sc., QP, Inorganics Senior Analyst



Samuel Mendida, Analyst I



Veronica Falk, B.Sc., P.Chem., QP, Scientific Specialist, Organics

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Invoice Information		Report Information (if differs from invoice)				Project Information				Turnaround Time (TAT) Required																											
Company: <u>ROJV</u>		Company:				Quotation #:				<input type="checkbox"/> 5 - 7 Days Regular (Most analyses)																											
Contact Name: <u>Garricks Elechi</u>		Contact Name:				P.O. #/ AFE#:				PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS																											
Address: <u>151 Holland Av.</u>		Address:				Project #: <u>17-018</u>				Rush TAT (Surcharges will be applied)																											
<u>#200, Ottawa</u>						Site Location: <u>P4 Oil Totes (18)</u>				<input type="checkbox"/> Same Day <input type="checkbox"/> 2 Days																											
Phone: <u>ON, K1Y 0Y2</u>		Phone:				Site #:				<input type="checkbox"/> 1 Day <input type="checkbox"/> 3-4 Days																											
Email: <u>gelechi@outcomeinc.ca</u>		Email:				Site #:				Date Required: _____																											
Copies: <u>Jmagkie Wicz@outcomeinc.ca</u>		Copies:				Sampled By: <u>CS</u>				Rush Confirmation #: _____																											
Laboratory Use Only					Analysis Requested										Regulatory Criteria																						
Seal Present	<input checked="" type="checkbox"/>	<input type="checkbox"/>	NO	Cooler ID	<table border="1"> <thead> <tr> <th colspan="4">Depot Reception</th> <th rowspan="2"># of containers</th> <th rowspan="2">BTEX F1 <input type="checkbox"/></th></tr></thead></table>										Depot Reception				# of containers	BTEX F1 <input type="checkbox"/>	BTEX F1-F2 <input type="checkbox"/> <th rowspan="2">BTEX F1-F4 <input type="checkbox"/> <th rowspan="2">Routine Water <th rowspan="2">Regulated Metals Tot <input type="checkbox"/> <th rowspan="2">Diss <input type="checkbox"/> <th rowspan="2">Mercury Total <input type="checkbox"/> <th rowspan="2">Salinity 4 <th rowspan="2">Sieve (75 micron) <th rowspan="2">Texture (% Sand, Silt, Clay) <th rowspan="2">Basic Class II Landfill <th rowspan="2">Cd, Cr, Cu, Pb <th rowspan="2">Flush paint <th rowspan="2">PCBS <th rowspan="2">TOTAL OIL & GREASE <th rowspan="2">PH <th rowspan="2">LTSS <th rowspan="2">HOLD - DO NOT ANALYZE</th> </th></th></th></th></th></th></th></th></th></th></th></th></th></th></th>	BTEX F1-F4 <input type="checkbox"/> <th rowspan="2">Routine Water <th rowspan="2">Regulated Metals Tot <input type="checkbox"/> <th rowspan="2">Diss <input type="checkbox"/> <th rowspan="2">Mercury Total <input type="checkbox"/> <th rowspan="2">Salinity 4 <th rowspan="2">Sieve (75 micron) <th rowspan="2">Texture (% Sand, Silt, Clay) <th rowspan="2">Basic Class II Landfill <th rowspan="2">Cd, Cr, Cu, Pb <th rowspan="2">Flush paint <th rowspan="2">PCBS <th rowspan="2">TOTAL OIL & GREASE <th rowspan="2">PH <th rowspan="2">LTSS <th rowspan="2">HOLD - 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Depot Reception				# of containers											BTEX F1 <input type="checkbox"/>																						
Seal Present	Seal Intact	Cooling Media	Temp																																		
Seal Present	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Temp																																	
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Seal Intact	<input type="checkbox"/>	<input type="checkbox"/>		Temp																																	
Cooling Media	<input type="checkbox"/>	<input type="checkbox"/>		Temp																																	

 AT1 CCME Drinking Water D50 (Drilling Waste) Saskatchewan Other: | || Sample Identification | | | | | Depth (Unit) | Date Sampled (YYYY/MM/DD) | Time Sampled (HH:MM) | Matrix | Special Instructions | | | | | | | | | | | | | |
1	~~GRY-GWS-005~~								RECEIVED IN YELLOWKNIFE By: Parvinder Vank 2017-08-24 Temp: 4, 5, 5													
2	GRY-GWS-008					2017/08/23	13:30	Water														
3	SER-C2					2017/08/23	09:30	Oil														
4																						
5																						
6																						
7																						
8																						
9																						
10																						
Please indicate Filtered, Preserved or Both (F, P, F/P)																						
Relinquished by: (Signature/ Print)					DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)					DATE (YYYY/MM/DD)	Time (HH:MM)	Maxxam Job #								
							Danielle Boisvert					20170825	10:50	B772718								

Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Maxxam's standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgment and acceptance of our terms which are available for viewing at www.maxxam.ca/terms



Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:
170798

- FINAL REPORT -

Prepared For: Rowe's Outcome Joint Venture

Address: 151 Holland Ave
Ottawa, ON
A1Y 0Y2

Attn: Jonathan Markiewicz

Facsimile:

Final report has been reviewed and approved by:

A handwritten signature in black ink, appearing to read "Glen Hudy".

Glen Hudy
Quality Assurance Officer

NOTES:

- Test methods and data are validated by the laboratory's Quality Assurance Program. Taiga Environmental Laboratory is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) to ISO/IEC 17025 as a testing laboratory for specific tests registered with CALA.
- Routine methods are based on recognized procedures from sources such as
 - Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF;
 - Environment Canada
 - USEPA
- Samples shall be kept for thirty (30) days after the final report is issued. All microbiological samples shall be disposed of immediately upon completion of analysis to minimize biohazardous risks to laboratory personnel. Please contact the laboratory if you have any special requirements.
- Final results are based on the specific tests at the time of analysis and do not represent the conditions during sampling.

ReportDate: Thursday, August 31, 2017

Print Date: *Thursday, August 31, 2017*

Page 1 of 3



Taiga Environmental Laboratory

4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9

Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:
170798

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **GRY-GWS-008**

Taiga Sample ID: **001**

Client Project: 17-018

Sample Type: Grey Water

Received Date: 24-Aug-17

Sampling Date: 23-Aug-17

Sampling Time: 13:35

Location: Jericho Mine

Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<u>Inorganics - Nutrients</u>						
Biochemical Oxygen Demand	49	2	mg/L	24-Aug-17	SM5210:B	
<u>Microbiology</u>						
Coliforms, Total	>2419.6	100	MPN/100mL	24-Aug-17	SM9223:B	

ReportDate: Thursday, August 31, 2017

Print Date: **Thursday, August 31, 2017**

Page 2 of 3



Taiga Environmental Laboratory

4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9

Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:

170798

- CERTIFICATE OF ANALYSIS -

Client Sample ID: GRY-GWS-008

Taiga Sample ID: 001

*** Taiga analytical methods are based on the following standard analytical methods**

SM - Standard Methods for the Examination of Water and Wastewater

EPA - United States Environmental Protection Agency

ReportDate: Thursday, August 31, 2017

Print Date: *Thursday, August 31, 2017*

Page 3 of 3

Your Project #: 17-018
 Site Location: GW SUMP #5
 Your C.O.C. #: M057632

Attention: JONATHAN MARKIEWICZ

OUTCOME CONSULTANTS INC.
 151 HOLLAND AVENUE
 SUITE 200
 OTTAWA, ON
 CANADA K1Y 0Y2

Report Date: 2017/09/05
 Report #: R2439043
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B774514

Received: 2017/08/30, 08:30

Sample Matrix: Water
 # Samples Received: 1

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Biochemical Oxygen Demand	1	2017/08/31	2017/09/05	AB SOP-00017	SM 22 5210 B m
Oil and Grease (Gravimetric, n-Hexane)	1	2017/09/01	2017/09/01	EENSOP-00093	SM 22 5520 B m
pH @25°C (1)	1	N/A	2017/09/01	AB SOP-00005	SM 22 4500 H+ B m
Total Suspended Solids (NFR)	1	2017/09/01	2017/09/01	AB SOP-00061	SM 22 2540 D m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Maxxam endeavours to analyze samples as soon as possible after receipt.

Your Project #: 17-018
Site Location: GW SUMP #5
Your C.O.C. #: M057632

Attention: JONATHAN MARKIEWICZ

OUTCOME CONSULTANTS INC.
151 HOLLAND AVENUE
SUITE 200
OTTAWA, ON
CANADA K1Y 0Y2

Report Date: 2017/09/05
Report #: R2439043
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B774514
Received: 2017/08/30, 08:30

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Customer Service Alberta, Customer Service Alberta
Email: CSAlberta@maxxam.ca
Phone# (780) 577-7100

=====

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B774514
Report Date: 2017/09/05

OUTCOME CONSULTANTS INC.
Client Project #: 17-018
Site Location: GW SUMP #5
Sampler Initials: CS

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		RW0689		
Sampling Date		2017/08/29		
COC Number		M057632		
	UNITS	GRY-WGS-009	RDL	QC Batch
Demand Parameters				
Biochemical Oxygen Demand	mg/L	54 (1)	40	8743717
Misc. Inorganics				
pH	pH	7.25	N/A	8745380
Total Suspended Solids	mg/L	45 (1)	1.5	8745533
Misc. Organics				
Extractable (n-Hex.) Oil and grease	mg/L	7.0	2.0	8745610
RDL = Reportable Detection Limit N/A = Not Applicable (1) Detection limit raised based on sample volume used for analysis.				

Maxxam Job #: B774514
Report Date: 2017/09/05

OUTCOME CONSULTANTS INC.
Client Project #: 17-018
Site Location: GW SUMP #5
Sampler Initials: CS

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	3.3°C
-----------	-------

Results relate only to the items tested.

Maxxam Job #: B774514
Report Date: 2017/09/05

OUTCOME CONSULTANTS INC.
Client Project #: 17-018
Site Location: GW SUMP #5
Sampler Initials: CS

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8743717	MHD	Spiked Blank	Biochemical Oxygen Demand	2017/09/05		102	%	85 - 115
8743717	MHD	Method Blank	Biochemical Oxygen Demand	2017/09/05	<2.0		mg/L	
8743717	MHD	RPD	Biochemical Oxygen Demand	2017/09/05	NC		%	20
8745380	MA4	Spiked Blank	pH	2017/09/01		100	%	97 - 103
8745380	MA4	RPD	pH	2017/09/01	0.25		%	N/A
8745533	KPG	Matrix Spike	Total Suspended Solids	2017/09/01		103	%	80 - 120
8745533	KPG	Spiked Blank	Total Suspended Solids	2017/09/01		97	%	80 - 120
8745533	KPG	Method Blank	Total Suspended Solids	2017/09/01	<1.0		mg/L	
8745533	KPG	RPD	Total Suspended Solids	2017/09/01	0		%	20
8745610	OO1	Spiked Blank	Extractable (n-Hex.) Oil and grease	2017/09/01		103	%	70 - 130
8745610	OO1	Method Blank	Extractable (n-Hex.) Oil and grease	2017/09/01	<2.0		mg/L	

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

Maxxam Job #: B774514
Report Date: 2017/09/05

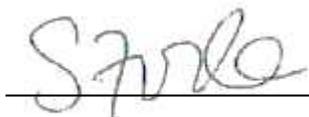
OUTCOME CONSULTANTS INC.
Client Project #: 17-018
Site Location: GW SUMP #5
Sampler Initials: CS

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Justin Geisel, B.Sc., Organics Supervisor



Suwan Fock, B.Sc., QP, Inorganics Senior Analyst

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

1689

CHAIN OF CUSTODY RECORD

M 057632

Invoice Information	Report Information (if differs from invoice)	Project Information	Turnaround Time (TAT) Required
Company: <u>Outcome Consultants</u>	Company:	Quotation #:	<input type="checkbox"/> 5 - 7 Days Regular (Most analyses)
Contact Name: <u>Jonathan Markiewicz</u>	Contact Name:	P.O. #/ AFE#:	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: <u>151 Holland Ave Ottawa, ON</u>	Address:	Project #: <u>17-018</u>	Rush TAT (Surcharges will be applied)
Phone: <u>514-984-6405</u>	Phone:	Site Location: <u>GW Sump #5</u>	<input type="checkbox"/> Same Day <input checked="" type="checkbox"/> 2 Days
Email: <u>jmarkiewicz@outcomeinc.ca</u>	Email:	Site #:	<input type="checkbox"/> 1 Day <input type="checkbox"/> 3-4 Days
Copies: <u>csadler@outcomeinc.ca</u>	Copies:	Sampled By: <u>CS</u>	Date Required: _____
			Rush Confirmation #: _____

Laboratory Use Only				Analysis Requested												Regulatory Criteria											
Seal Present <input checked="" type="checkbox"/>	Seal Intact <input checked="" type="checkbox"/>	Cooling Media <input checked="" type="checkbox"/>	Temp: <u>5 6 5</u>	<p>RECEIVED IN YELLOW KNIFE By: <u>J. LIART</u> 2017-08-30 0830 Temp: <u>4 / 4 / 2</u></p>												<input type="checkbox"/> AT1 <input type="checkbox"/> CCME <input type="checkbox"/> Drinking Water <input type="checkbox"/> D50 (Drilling Waste) <input type="checkbox"/> Saskatchewan <input type="checkbox"/> Other:											
Seal Present <input type="checkbox"/>	Seal Intact <input type="checkbox"/>	Cooling Media <input type="checkbox"/>	Temp:																								
Seal Present <input type="checkbox"/>	Seal Intact <input type="checkbox"/>	Cooling Media <input type="checkbox"/>	Temp:																								
Seal Present <input type="checkbox"/>	Seal Intact <input type="checkbox"/>	Cooling Media <input type="checkbox"/>	Temp:																								
Sample Identification				Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1 <input type="checkbox"/>	VOC <input type="checkbox"/>	BTEX F1-F2	BTEX F1-F4	Routine Water	Regulated Metals Tot <input type="checkbox"/>	Diss <input type="checkbox"/>	Mercury Total <input type="checkbox"/>	Salinity 4	Sieve (75 micron)	Texture (% Sand, Silt, Clay)	Basic Class II Landfill	Oil & Grease	pH	fss	BOD	HOLD - DO NOT ANALYZE	Special Instructions	
1	<u>WGS-GAY-009</u>	<u>2017/08/29</u>	<u>1:30pm</u>																								
2	<u>GRY-WGS-009</u>	<u>2017/08/29</u>																									
3																											
4																											
5																											
6																											
7																											
8																											
9																											
10																											

Please indicate Filtered, Preserved or Both (F, P, F/P)

Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Maxxam Job #
<u>Coleman Sadler / Coleman Sadler</u>	<u>2017/08/29</u>	<u>3:30pm</u>	<u>Kyle Van Thrumart</u>	<u>2017/08/31</u>	<u>12:00</u>	<u>B774514</u>

Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Maxxam's standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgment and acceptance of our terms which are available for viewing at www.maxxam.ca/terms



Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:
170834

- FINAL REPORT -

Prepared For: Rowe's Outcome Joint Venture

Address: 151 Holland Ave
Ottawa, ON
A1Y 0Y2

Attn: Jonathan Markiewicz

Facsimile:

Final report has been reviewed and approved by:

Glen Hudy
Quality Assurance Officer

NOTES:

- Test methods and data are validated by the laboratory's Quality Assurance Program. Taiga Environmental Laboratory is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) to ISO/IEC 17025 as a testing laboratory for specific tests registered with CALA.
- Routine methods are based on recognized procedures from sources such as
 - Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF;
 - Environment Canada
 - USEPA
- Samples shall be kept for thirty (30) days after the final report is issued. All microbiological samples shall be disposed of immediately upon completion of analysis to minimize biohazardous risks to laboratory personnel. Please contact the laboratory if you have any special requirements.
- Final results are based on the specific tests at the time of analysis and do not represent the conditions during sampling.

ReportDate: Wednesday, September 06, 2017

Print Date: *Wednesday, September 06, 2017*

Page 1 of 3



Taiga Environmental Laboratory

4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9

Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:
170834

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **GRY-WCS-009**

Taiga Sample ID: **001**

Client Project: 17-018

Sample Type: Water

Received Date: 30-Aug-17

Sampling Date: 29-Aug-17

Sampling Time: 13:30

Location: Berm GW #5

Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Microbiology						
Coliforms, Fecal		100	CFU/100mL	30-Aug-17	SM9222:D	15

ReportDate: Wednesday, September 06, 2017

Print Date: **Wednesday, September 06, 2017**

Page 2 of 3



Taiga Environmental Laboratory

4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9

Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:

170834

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **GRY-WCS-009**

Taiga Sample ID: **001**

- DATA QUALIFIERS -

Data Qualifier Descriptions:

15 *Matrix interference, unable to report value.*

*** Taiga analytical methods are based on the following standard analytical methods**

SM - Standard Methods for the Examination of Water and Wastewater

EPA - United States Environmental Protection Agency

ReportDate: Wednesday, September 06, 2017

Print Date: *Wednesday, September 06, 2017*

Page 3 of 3

Your P.O. #: N/A
Your Project #: B777044
Your C.O.C. #: n/a

Attention:Customer Service Alberta

Maxxam Analytics
Edmonton - Environmental
9331 48th St
Edmonton, AB
T6B 2R4

Report Date: 2017/09/12
Report #: R4695825
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7J6302
Received: 2017/09/09, 10:54

Sample Matrix: Water
Samples Received: 7

Analyses	Quantity	Date	Date	Laboratory Method	Reference
		Extracted	Analyzed		
Animal and Vegetable Oil & Grease	7	N/A	2017/09/12	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	7	2017/09/12	2017/09/12	CAM SOP-00326	EPA1664B m,SM5520A m
TPH (Heavy Oil) (1)	7	2017/09/12	2017/09/12	CAM SOP-00326	EPA1664B m,SM5520F m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

Your P.O. #: N/A
Your Project #: B777044
Your C.O.C. #: n/a

Attention:Customer Service Alberta

Maxxam Analytics
Edmonton - Environmental
9331 48th St
Edmonton, AB
T6B 2R4

Report Date: 2017/09/12
Report #: R4695825
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7J6302
Received: 2017/09/09, 10:54

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Nazeema Rahaman, Project Manager
Email: NRahaman@maxxam.ca
Phone# (905) 817-5700

=====
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

OIL & GREASE - A/V/M/T (WATER)

Maxxam ID		FCB716	FCB717	FCB718		
Sampling Date		2017/09/07 11:30	2017/09/07 11:32	2017/09/07 11:35		
COC Number		n/a	n/a	n/a		
	UNITS	RX5853-01R\GRY-WGS-S1	RX5854-01R\GRY-WGS-S2	RX5855-01R\GRY-WGS-S3	RDL	QC Batch

Calculated Parameters						
Animal/Vegetable Oil and Grease	mg/L	25	34	5.7	0.50	5156927
Petroleum Hydrocarbons						
Oil & Grease	mg/L	27	37	6.3	0.50	5159462
Oil & Grease Mineral/Synthetic	mg/L	2.5	3.0	0.60	0.50	5159465
RDL = Reportable Detection Limit QC Batch = Quality Control Batch						

Maxxam ID		FCB719	FCB720	FCB721		
Sampling Date		2017/09/07 11:36	2017/09/07 11:38	2017/09/07 11:41		
COC Number		n/a	n/a	n/a		
	UNITS	RX5856-01R\GRY-WGS-S4	RX5857-01R\GRY-WGS-S5	RX5858-01R\GRY-WGS-S6	RDL	QC Batch

Calculated Parameters						
Animal/Vegetable Oil and Grease	mg/L	1.3	1.1	1.2	0.50	5156927
Petroleum Hydrocarbons						
Oil & Grease	mg/L	1.3	1.1	1.2	0.50	5159462
Oil & Grease Mineral/Synthetic	mg/L	<0.50	<0.50	<0.50	0.50	5159465
RDL = Reportable Detection Limit QC Batch = Quality Control Batch						

Maxxam ID		FCB722		
Sampling Date		2017/09/07 11:45		
COC Number		n/a		
	UNITS	RX5859-01R\GRY-WGS-S7	RDL	QC Batch

Calculated Parameters				
Animal/Vegetable Oil and Grease	mg/L	1.8	0.50	5156927
Petroleum Hydrocarbons				
Oil & Grease	mg/L	1.8	0.50	5159462
Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	5159465
RDL = Reportable Detection Limit QC Batch = Quality Control Batch				

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	7.3°C
-----------	-------

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5159462	Oil & Grease	2017/09/12	98	85 - 115	<0.50	mg/L	3.3	25
5159465	Oil & Grease Mineral/Synthetic	2017/09/12	95	85 - 115	<0.50	mg/L	1.7	25

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Cristina Carriere

Cristina Carriere, Scientific Service Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

MAXXAM ANALYTICS
 9331 - 48th Street
 Edmonton, Alberta, T6B 2R4
 (780) 577-7100
 (780) 450-4187



OUTCOME CONSULTANTS INC.
 Maxxam PM Customer Service Alberta

SUBCONTRACTING REQUEST FORM

To: Maxxam Ontario (From Edmonton)

RUSH

Job# B777044

- Yes No International Sample/BioHazard (if yes, add copy of Movement Cert., heat treat is required prior to disposal)
 Yes No Special Protocol (if yes, Protocol _____)

Sample ID	Matrix	Test(s) Required	Container	Date Sampled	Date Required
RX5853-01R\GRY-WGS-S1	W	O&G - An/Min/Veg/Total (Water)	1-AMGP	2017/09/07 11:30	2017/09/12
RX5854-01R\GRY-WGS-S2	W	O&G - An/Min/Veg/Total (Water)	1-AMGP	2017/09/07 11:32	2017/09/12
RX5855-01R\GRY-WGS-S3	W	O&G - An/Min/Veg/Total (Water)	1-AMGP	2017/09/07 11:35	2017/09/12
RX5856-01R\GRY-WGS-S4	W	O&G - An/Min/Veg/Total (Water)	1-AMGP*	2017/09/07 11:36	2017/09/12
RX5857-01R\GRY-WGS-S5	W	O&G - An/Min/Veg/Total (Water)	1-AMGP	2017/09/07 11:38	2017/09/12
RX5858-01R\GRY-WGS-S6	W	O&G - An/Min/Veg/Total (Water)	1-AMGP	2017/09/07 11:41	2017/09/12
RX5859-01R\GRY-WGS-S7	W	O&G - An/Min/Veg/Total (Water)	1-AMGP	2017/09/07 11:45	2017/09/12

	Temp. 1	Temp. 2	Temp. 3		YES	NO
Cooler #1	9	6	7	Custody Seal Present	YES	NO
				Custody Seal Intact	YES	NO
				Ice Present Upon Receipt	YES	NO
Cooler #2				Custody Seal Present	YES	NO
				Custody Seal Intact	YES	NO
				Ice Present Upon Receipt	YES	NO
Cooler #3				Custody Seal Present	YES	NO
				Custody Seal Intact	YES	NO
				Ice Present Upon Receipt	YES	NO

7, 11 A
AND

Receiving Maxxam Location: Maxxam Ontario (From Edmonton)

JOB #

Relinquished by (Sign) *Ch Kelly* (print) *Cherie Kelly*

Date and Time ¹⁹¹⁰ 20170908

Received by (Sign) *Ashita Sukuman* (print) *ASHITA SUKUMAN*

Date and Time 2017/09/09

NOTES:

- 1) Please call us if due date cannot be met. Please reference Sample ID on your report.
- 2) Include copy of this completed form, Client COC & signed final report to

10:54

Reporting Requirements:

National:

Regional:

09-Sep-17 10:54

Nazeema Rahaman



B7J6302

PS4 ENV-583

Date	November 2018
------	---------------

- Controlled Blasting – LUP Amendment Application



May 15, 2017

Northern Contaminated Sites Program Branch, Project Technical Office
Indigenous and Northern Affairs Canada
25 Eddy Street
Gatineau, Quebec K1A 0H4

Attention: Mr. Michael Westlake, Project Analyst

Subject: Update to Land Use Permit #N2016U0013

Dear Mr. Westlake,

On January 12, 2017 Indigenous and Northern Affairs Canada – Land Administration (INAC-Land Administration) granted a Land Use Permit (LUP) for Site Remediation in the Contwoyto Lake Area (N2016U0013) pursuant to an application submitted by Indigenous and Northern Affairs Canada – Northern Contaminated Sites Program Branch (INAC-NCS) on September 9, 2016.

Rowe's Outcome Joint Venture (ROJV) was awarded PWGSC Contract No. EW699-171068/001/NCS ("Contract") on May 4, 2017 to implement the remediation project at the former Jericho mine as outlined in the LUP. The proposed methodology of ROJV contains a contingency element not anticipated in the LUP application: a controlled blast to assist with the removal of the West Dam frozen core fill materials. The purpose of this letter is to provide the necessary information such that INAC-NCS may submit an application to amend the LUP to permit this planned use of explosives.

Background

As part of the Contract, the frozen core West Dam must be partially removed to allow for drawdown of the Processed Kimberlite Containment Area. According to previous reports, the core material of the dam is material frozen year-round to prevent water seepage from upgradient sources. The frozen

saturated gravel and clay that make up the dam are expected to be time-consuming and difficult to excavate.

In the proposal for the work, ROJV planned a minor controlled blast to break up the the dam core as a contingency measure to facilitate the excavation and removal process. ROJV plans to subcontract Break-Away Drilling and Blasting Ltd. (Break-Away) to carry out the controlled blast work. This will involve advancing boreholes within the frozen core dam and placing a robust, booster sensitive explosive and nonelectric initiation system within each hole. In this fashion, Break-Away will safely break up the frozen material such that it can be excavated and removed by ROJV.

Updated Land Use Permit Submission

The following narrative provides the information that is deemed necessary for submission to Nunavut Impact Review Board (NIRB) for referral to INAC-Land Administration for an update to the LUP. For convenience, the information below has been organized in the same way as that contained in the original LUP application submitted by INAC-NCS.

Personnel

On behalf of Indigenous and Northern Affairs Canada – Northern Contaminated Sites Program Branch (INAC-NCS), Public Works and Government Services Canada (PWGSC) awarded a contract on May 4, 2017 to Rowe's-Outcome Joint Venture (ROJV) for the Jericho Mine Site Stabilization project. ROJV will retain Break-Away Drilling and Blasting Ltd. as a specialist subcontractor to carry out the controlled blasting work. Break-Away Drilling will established a controlled work area within which a seven man crew will carry out the work.

Qualifications

As in the original submission, INAC's eligibility for a Land Use Permit is under Section 21 (c) of the *Territorial Land Use Regulations* (C.R.C., c. 1524).

Summary of New Operations

The West Dam is a frozen core dam that must be partially removed to allow for drawdown of the Processed Kimberlite Containment Area. The core material of the dam is frozen year-round to prevent water seepage from upgradient sources. Excavation of the frozen saturated gravel and clay liner may not be practical with heavy equipment alone within the project constraints.

As a contingency measure, ROJV has proposed a controlled blast to assist with the removal of the West Dam frozen core fill materials. The controlled blast itself will not physically displace the West Dam fill materials. Instead, it will break up the frozen clay and gravel to allow for safe and efficient excavation and removal to meet the final design grade elevations of the Contract.

The controlled blasting will be completed by Break-Away and will be facilitated by placing and igniting explosives within boreholes advanced for this purpose. A track mounted drill rig will advance boreholes over the surface area of the West Dam (on a grid with each borehole approximately 3.6m apart) where excavation is necessary to achieve the final design grade elevations. The boreholes will be drilled to a depth of 1-m greater than the final engineered channel base elevation (based on the design drawings of the Contract). Each borehole will be surveyed and included within the project record.

Pre-packaged emulsion explosives will be transported to the site via aircraft in heavy duty corrugated cardboard containers on pallets. When the aircraft arrives at the site, the pallets will be transported immediately to the work area, and the explosive material will be removed from the containers and placed in boreholes. The explosives will be under constant supervision of the installation team during placement, which is expected to take approximately 48 hours.

The blasting contractor will connect the explosives to a nonelectric initiation system. The trigger system will be located outside of a 400 metre diameter safe work area, from which all personnel will be excluded during the blasting event in accordance with Break-Away's strict safe work procedure (SWP).

The preparatory activities for the placement of the explosives will be carried out continuously over approximately 48 hours. The explosives will be delivered to site immediately before the materials are required for placement.

After the controlled blasting is complete, excavation of the West Dam will be conducted as originally planned.

Updated Summary of Potential Environmental and Resource Impacts

ROJV provides the following update on potential environmental and resource impacts for controlled blasting. Categories are based on those submitted in the Environmental Screening Report¹ (ESR) prepared for the initial Land Use Plan.

Impacts on Air Quality

ROJV does not anticipate any changes in air quality impacts or mitigations for the blasting program.

Impacts on Hydrology and Hydrogeology

ROJV does not anticipate any changes with respect to hydrology or hydrogeology impacts or mitigations for the blasting program.

¹ *Environmental Screening Report, Jericho Mine Site Stabilization Plan*. Matrix Solutions Inc. August, 2016.

Impacts on Aquatic Ecology

As noted in the ESR, breaching the West Dam could result in increased runoff and surface erosion contributing to sediment loading of the watercourses and water bodies at the site. In order to mitigate this impact, ROJV and its subcontractor will install erosion and sediment control measures around areas that have the potential to drain into surrounding water bodies and watercourses.

Impacts on Soils and Terrain

As noted in the ESR, a positive impact to terrain is expected from breaching the West Dam and directing water along the original flow path. No changes are anticipated from using the controlled blasting methodology described herein.

Impacts on Vegetation

No changes to impacts or mitigations for vegetation are anticipated. The West Dam will be removed, allowing for natural drainage to be restored, fostering natural revegetation.

Impacts on Wildlife

The original Environmental Effects Assessment (EEA) of the Jericho mine² included information on the presence of wildlife at the site. According to the EEA, “[h]igh densities of caribou are probable for short durations (less than 24 hours) several times per year.”

The EEA notes that caribou are likely present at the site “continuously during spring migration for most of May. They should also be expected in large numbers for very brief periods any time from late June through to mid-August (post-calving period, and late summer).” In order to minimize impacts on the caribou herd, this proposed amendment to the LUP requests permission for blasting only for the period August 15 through September 30, 2017.

The mitigation plans included in the ESR submitted with the original LUP application will be updated as follows:

- Wildlife Monitors will be on-site and will advise ROJV and Break-Away if caribou are in the vicinity and, and if so, blasting will not occur until they have migrated further than 1000 m of the West Dam location;
- The drill rig and other equipment will be maintained in good working condition, turned off when not in use, and mufflers will be used to reduce noise;
- All explosives will be under visual guard 24 hours a day while on site;

² *Jericho Diamond Project, Environmental Effects Assessment on Wildlife*. Hubert and Associates Ltd. November, 2002.

- To minimize the duration, preparation for blasting will be conducted in a very short period due to the continuous operation approach and the actual blast event is instantaneous; and
- As part of the safety orientation training provided to all workers, Wildlife Awareness training is included for dealing with wildlife.

Update to Proposed Restoration Plans

Restoration plans are unchanged from the initial application.

Additional Licenses and Permits

ROJV has consulted with both Natural Resources Canada and the Workers' Safety and Compensation Commission of Nunavut (WSCC). It has been determined that WSCC has the authority to regulate the storage, handling and use of explosives under the *Mine Health and Safety Act* (SNWT (Nu) 1994, c 25) and the *Consolidation of Explosives Use Act* (RSNWT 1988,c.E-10).

According to the *Mine Health and Safety Regulations* (NWT Reg (Nu) 125-95), Section 14.11 (5), "[w]here explosives loading operations are conducted continuously over successive shifts, the quantity of explosives required for the completion of the operation may be stored near the loading site without a permit." As such, no permit for storage of explosives will be required as part of the planned new operations described herein.

Transport of explosives and initiation system to the site will be in accordance with federal and territorial Transportation of Dangerous Goods Regulations.

Additional Disposal Required

No additional disposal will be required for the proposed additional work. Any material remaining after the program is complete will be removed from the site for future use.

Additional Equipment Required

The additional work proposed will require the use of a track-mounted CME 850 drill rig.

Period of Operation for Additional Work

If necessary, the additional work will be conducted between August 15, 2017 and September 30, 2017. This is within the currently-planned period of work at the site.

Period of Permit

No changes are proposed to the period of the permit.

Location of Activities

No changes are proposed to the location of activities at the site.

Closure

If you have any questions on the information presented herein, please do not hesitate to contact Michael Billowits who can be reached at 613.729.2402 or mbillowits@outcomeinc.ca or Jack Rowe who can be reached at 867.874.3243 or jrowe@rowes.ca.

Respectfully,



Jack Rowe
President, Rowe's Construction Ltd.



Michael Billowits, M.Sc.(Eng.), P.Eng.
President, Outcome Consultants Inc.

Date	November 2018
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APPENDIX B

Project Records

- ROJV 2018 Work Summary
- Incident Reports (**Note: these have been removed to protect the privacy of employees**)

Date	November 2018
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- ROJV 2018 Work Summary

Memorandum

Date: October 11, 2018

To: Michael Bernardin, PSPC
Henry Wong, DXB Projects

From: Jonathan Markiewicz, Outcome Consultants Inc,

CC: Jack Rowe, Rowe's Construction
Michael Billowits, Outcome

Re: Summer 2018 Work
PSPC Contract EW699-171068/001/NCS ("Contract")

1.0 Purpose

The purpose of this memo is to provide a summary of works completed at the Jericho Mine Site to carry out the necessary liner repairs to the Phase 1 Tank Farm PHC Containment Cell, and to close out several inspection items required by Rowe's Outcome JV ("ROJV") during the Contract.

2.0 Scope of Work

Based on the current status of the site and the information requested by various Authorities Having Jurisdiction (AHJ) ROJV understands that the current scope of work includes the following:

- 1- Establish a safe and secure Camp utilizing the existing Airstrip Camp, Crown equipment and a ROJV Satellite phone (phone #: 1- 403-799-5302).
- 2- Excavate the soils associated with the 11 stained spots, place the impacted soils in the Phase 1 Tank Farm PHC Containment Cell, sample the open excavation for Petroleum Hydrocarbons (PHCs F1-F4) and compare the analyses against the Abandoned Military Site Remediation Protocol (AMSRP) to substantiate that the area has been remediated, and finally backfill/grade the area.
- 3- Uncover the LLDPE liner used to cover the PHC Containment Cell located in the Phase 1 Tank Farm such that the S-fold can be cut out and that the liner can be repaired providing a flat top surface. The liner to be recovered with the removed aggregates.
- 4- Collect, containerize and remove off-site any wastes (wires, tarps, etc.) associated with the Camp operations. Take before and after photographs of the remaining wastes to be managed.

- 5- Observe and record the current state of the 22 ASTs and update any records, labels or signage associated with their decommissioning. Take photographs of any existing or newly affixed labels/signs.
- 6- Observe and record the current state of the Halocarbon equipment and update any records, labels or signage associated with their decommissioning. Take photographs of any existing or newly affixed labels/signs.

3.0 Means and Methods

ROJV travelled to the Jericho Mine Site on July 31, 2018 and carried out the following activities:

- 1- **11 Stained Spots** – On August 1, 2018 and using the crown owned CAT 320 ROJV excavated a single trench will be excavated to a depth of 50-cm and a width of 1-m, the entire length of the 11 stained spots, approximated at 18 metres in length, with a 5-m northern section. This trench excavated all 11-spots and the potentially impacted soils beneath them.

The excavated soils were be transported from the work area to the Phase 1 containment cell using the crown owned CAT 950. The soils were temporarily stored on a poly liner until the Phase 1 LLDPE liner was cleared and opened.

Jonathan Markiewicz, P.Geo. collected soil grab samples every 2-3 m along each side wall and along the excavation floor; twenty-one (21) in total. Using a RKI combustible carbon gas detector (CCGD) and photo-ionization device (PID) screened each soil grab sample to identify the best location for sampling. Mr. Markiewicz then returned to the soil grab sample locations with the highest CCGD/PID readings and collected confirmatory samples from the trench consisting of 6 side wall and 2 floor samples. The sample density is consistent with the 9m² sample grid density described in section 6.1.2 of the AMSRP as well as Protocol 3 – Soil Sampling Procedures at Contaminated Sites Environment Yukon (March 2011) section 3.0 which requires confirmatory samples collected from “each excavation face, one sample should be taken for each 10 metres running length”. In total, 9 samples were collected, including a duplicate sample (FL SGS 3 duplicate of FL SGS 2), and were submitted to Maxxam Analytics in Edmonton, Alberta for laboratory analyses of PHCs F1 to F4. The analytical results, included as Attachment #1, indicate that each was less than the method detection limit and confirms that no impacted soils remain in the vicinity of the 11-spotted stains.

The excavated trench was then back filled with coarse PK aggregates to reinstate the surface to a useable road/parking surface.

Photographs of the excavation and final state of the site have been included in Attachment #2.

- 2- **Liner Repair** - ROJV used the CAT 320 excavator to carefully uncover the LLDPE liner located above the PHC contaminated soils in the Phase 1 Tank Farm. ROJV retrofitted the flat clean-out blade of the excavator bucket with a 20-cm wide, 2-cm thick dense rubber track. This

enabled ROJV to gently uncover the coarse PK cover. ROJV also used hand shovels and brooms to fully expose a 6-m wide section of the liner.

Once cleared of the surface cover A&A Technical Services carried-out the liner repairs and QA tests, as follows:

- a. The liner was cut
- b. Any excess aggregates cleared out of the way to prepare a flat surface, free of sharp protrusions with positive drainage to match the rest of the Phase 1 containment cell.
- c. The liner was then overlapped and any excess or damaged materials were cut away and discarded.
- d. A&A then cleaned the liner using water and cotton cloth.
- e. A&A carried out quality control tests of the welding equipment to establish the required temperature and seaming rates. A&A then tested the qualification welds so they are exceeding minimum International Association of Geosynthetic installers (IAGI) peel and shear tests for 30mil LLDPE.
- f. A&A then wedge welded the two liner pieces together. A&A then took a destruct sample of the in place weld
- g. Large damaged areas, including the tear created during the 2017 installation were covered with a LLDPE patch and sealed with extrusion welding. Similarly A&A qualified the extrusion welds prior to carrying out the repairs
- h. After the welds were completed A&A conducted vacuum tests along the entire seam length and each of the patch seams.

The liner was then photographed and inspected by the PSPC Departmental Representative. Attachment #2 includes photographs taken throughout the repair activities and Attachment #3 includes the quality reports provided by A&A following their repairs.

After field approval of the liner repairs, ROJV then covered the LLDPE liner with 0.5m of coarse PK aggregate and graded the top surface to uniformly match the remainder of the containment cell. Any excess coarse PK aggregates were placed and graded along the western side of the containment cell.

- 3- **Waste Management** – ROJV collected the remaining buried and partially buried electrical and data lines associated with the temporary camp that could not be removed in 2017 due to frozen soil conditions. The lines were transported off-site for either re-use (extension cords in good condition) or disposal.

The tarp associated with the greywater sumps was rolled and also removed from site and transported to Hay River, NT for re-use.

Before and after photographs are provided in Attachment #2

- 4- **AST Decommissioning** – On August 3, 2018 ROJV observed 20 of the 22 ASTs to confirm their state of decommissioning, the final 2 ASTs were observed on August 5, 2018.

ROJV noted the Tank ID #, serial numbers, original and final locations. The Tank IDs were then confirmed with the DR and included as AST Decommissioning Summary Table in Attachment #4.

The attached AST Decommissioning Summary Table was reconciled, in order of precedence, using on-site serial number and mine tank ID verifications (including photographic records), database information from INAC's FIRSTs registration, and All-Peace's decommissioning reports. The information provided in Attachment #4 is an accurate record of what was observed on each AST Manufacturer's Plate (serial number, capacity, etc.).

Using a RKI Eagle II combustible gas meter, ROJV collected ambient air readings from inside each of the ASTs and these value, all 0% LEL, were recorded in the summary table. Only AST # T5 (GEM-6-052-1) was unable to get a reading due to the fact that all AST openings were inaccessible.

ROJV placed new labels on all 22 ASTs stating the date of decommissioning and that they have been removed from service.

ROJV took before and after photographs, which are provided in Attachment #2.

- 5- **Halocarbon Decommissioning** – On August 2, 2018 ROJV observed the equipment that were decommissioned during the 2017 field program. In total, 18 units were observed and confirmed to have been decommissioned, new labels were affixed to each unit.

ROJV took photographs of the decommissioned units after the labels were affixed.

- 6- **Camp Closure** – Through-out the Summer 2018 works ROJV consumed Diesel and propane that was stored in the Hazardous Materials Storage area. Any diesel that was not used during operations was used to refill operational ASTs (Airstrip Camp Generator Tank, Garage Generator Tank and Incinerator Tank). All emptied drums were deheaded, cleaned and stacked sideways with the drums cleaned in 2017. Washwater was removed from site and disposed of at KBL Environmental. Unused propane was vented from the tanks and the vessels, once emptied, were stored on the stable platform with the other propane tanks northeast of the Hazardous Materials area. ROJV secured 2 propane bottles to the airstrip camp for future use and at the DRs request left a single 30-L Jerry can of gasoline in the seacan near the airstrip camp.

All camp waste was incinerated using the existing Mine Site incinerator, except for the final garbage which was brought off-site for disposal. All greywater was transferred to the Open Pit.

All waterlines were bled dry and valves left partially open. All P-traps in the sinks and shower were filled with RV antifreeze.

All crown used equipment was parked inside the Maintenance garage with the exception of a light tower, the ambulance truck and white van. They were all confirmed to be

operational and left with fuel in the tanks. Master switches in the engine compartments were turned off, or the battery leads disconnected.

ROJV demobilized from the site in the late afternoon on August 5, 2018.

4.0 Closure

ROJV trusts that this summary report adequately describes the work completed in the Summer of 2018 and assists PSPC/INAC in closing off several regulatory and construction items at the former Jericho Mine site.

If you require any further information or clarification, please do not hesitate to contact the writer.

Regards,



Jonathan Markiewicz, P-Geo.
Senior Project Manager

Attachment 1 – Laboratory Certificates of Analysis

Attachment 2 – Photographs

Attachment 3- Liner Repair QA/QC Report

Attachment 4 – AST Inventory

Attachment 1 – Laboratory Certificates of Analysis

Your Project #: P2017-01
Your C.O.C. #: A058394

Attention: JONATHAN MARKIEWICZ

OUTCOME CONSULTANTS INC.
151 HOLLAND AVENUE
SUITE 200
OTTAWA, ON
CANADA K1Y 0Y2

Report Date: 2018/08/04
Report #: R2599895
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B865009

Received: 2018/08/02, 10:50

Sample Matrix: Soil
Samples Received: 9

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
BTEX/F1 by HS GC/MS/FID (MeOH extract) (1)	9	N/A	2018/08/03	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	9	N/A	2018/08/04	AB SOP-00039	Auto Calc
CCME Hydrocarbons (F2-F4 in soil) (2)	9	2018/08/03	2018/08/03	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS m
Moisture	9	N/A	2018/08/03	AB SOP-00002	CCME PHC-CWS m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is date sampled unless otherwise stated.

(2) All CCME results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil, Validation of Performance-Based Alternative Methods September 2003. Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Your Project #: P2017-01
Your C.O.C. #: A058394

Attention: JONATHAN MARKIEWICZ

OUTCOME CONSULTANTS INC.
151 HOLLAND AVENUE
SUITE 200
OTTAWA, ON
CANADA K1Y 0Y2

Report Date: 2018/08/04
Report #: R2599895
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B865009

Received: 2018/08/02, 10:50

Encryption Key



Linsay Sunderman
Senior Project Manager
04 Aug 2018 17:19:58

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Cynny Hagen, Project Manager
Email: CHagen@maxxam.ca
Phone# (403)735-2273

=====
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B865009
Report Date: 2018/08/04

OUTCOME CONSULTANTS INC.
Client Project #: P2017-01

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Maxxam ID		TZ8559	TZ8560	TZ8561	TZ8562	TZ8563		
Sampling Date		2018/08/01 16:30	2018/08/01 16:05	2018/08/01 16:21	2018/08/01 16:27	2018/08/01 16:16		
COC Number		A058394	A058394	A058394	A058394	A058394		
	UNITS	NW SGS 1@0.1	SW SGS 1@0.1	EW SGS 1@0.1	EW SGS 2@0.1	WW SGS 1@0.1	RDL	QC Batch
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	<10	<10	<10	10	9087475
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	<50	<50	<50	<50	50	9087475
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	<50	<50	<50	50	9087475
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	Yes		9087475
Physical Properties								
Moisture	%	3.7	3.9	2.6	6.6	3.8	0.30	9090661
Volatiles								
Xylenes (Total)	mg/kg	<0.045	<0.045	<0.045	<0.045	<0.045	0.045	9090071
F1 (C6-C10) - BTEX	mg/kg	<10	<10	<10	<10	<10	10	9090071
Field Preserved Volatiles								
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9090627
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9090627
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9090627
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	9090627
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9090627
F1 (C6-C10)	mg/kg	<10	<10	<10	<10	<10	10	9090627
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	102	101	102	102	105		9090627
4-Bromofluorobenzene (sur.)	%	94	92	92	94	93		9090627
D10-o-Xylene (sur.)	%	95	91	99	102	96		9090627
D4-1,2-Dichloroethane (sur.)	%	84	84	84	84	86		9090627
O-TERPHENYL (sur.)	%	90	90	88	88	87		9087475
RDL = Reportable Detection Limit								

Maxxam Job #: B865009
Report Date: 2018/08/04

OUTCOME CONSULTANTS INC.
Client Project #: P2017-01

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Maxxam ID		TZ8564	TZ8565	TZ8566		TZ8567		
Sampling Date		2018/08/01 16:24	2018/08/01 16:11	2018/08/01 16:35		2018/08/01 16:37		
COC Number		A058394	A058394	A058394		A058394		
	UNITS	WW SGS 2@0.1	FL SGS 1 @ 0.3	FL SGS 2 @ 0.3	QC Batch	FL SGS 3 @ 0.3	RDL	QC Batch
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	<10	9087475	<10	10	9077664
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	<50	<50	9087475	<50	50	9077664
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	<50	9087475	<50	50	9077664
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	9087475	Yes		9077664
Physical Properties								
Moisture	%	3.7	4.5	3.4	9090661	3.4	0.30	9090661
Volatiles								
Xylenes (Total)	mg/kg	<0.045	<0.045	<0.045	9090071	<0.045	0.045	9090071
F1 (C6-C10) - BTEX	mg/kg	<10	<10	<10	9090071	<10	10	9090071
Field Preserved Volatiles								
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	9090627	<0.0050	0.0050	9090627
Toluene	mg/kg	<0.020	<0.020	<0.020	9090627	<0.020	0.020	9090627
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	9090627	<0.010	0.010	9090627
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	9090627	<0.040	0.040	9090627
o-Xylene	mg/kg	<0.020	<0.020	<0.020	9090627	<0.020	0.020	9090627
F1 (C6-C10)	mg/kg	<10	<10	<10	9090627	<10	10	9090627
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	102	101	101	9090627	101		9090627
4-Bromofluorobenzene (sur.)	%	92	91	92	9090627	92		9090627
D10-o-Xylene (sur.)	%	104	92	96	9090627	95		9090627
D4-1,2-Dichloroethane (sur.)	%	83	84	84	9090627	84		9090627
O-TERPHENYL (sur.)	%	88	87	92	9087475	85		9077664
RDL = Reportable Detection Limit								

Maxxam Job #: B865009
Report Date: 2018/08/04

OUTCOME CONSULTANTS INC.
Client Project #: P2017-01

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	3.3°C
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Results relate only to the items tested.

Maxxam Job #: B865009
Report Date: 2018/08/04

OUTCOME CONSULTANTS INC.
Client Project #: P2017-01

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9077664	JR1	Matrix Spike	O-TERPHENYL (sur.)	2018/07/28		90	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/07/28		91	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2018/07/28		94	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2018/07/28		97	%	60 - 140
9077664	JR1	Spiked Blank	O-TERPHENYL (sur.)	2018/07/28		91	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/07/28		91	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2018/07/28		90	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2018/07/28		88	%	60 - 140
9077664	JR1	Method Blank	O-TERPHENYL (sur.)	2018/07/28		105	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/07/28	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2018/07/28	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2018/07/28	<50		mg/kg	
9077664	JR1	RPD	F2 (C10-C16 Hydrocarbons)	2018/07/28	NC		%	40
			F3 (C16-C34 Hydrocarbons)	2018/07/28	NC		%	40
			F4 (C34-C50 Hydrocarbons)	2018/07/28	NC		%	40
9087475	JR1	Matrix Spike	O-TERPHENYL (sur.)	2018/08/03		95	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/08/03		101	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2018/08/03		93	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2018/08/03		90	%	60 - 140
9087475	JR1	Spiked Blank	O-TERPHENYL (sur.)	2018/08/03		91	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/08/03		96	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2018/08/03		90	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2018/08/03		84	%	60 - 140
9087475	JR1	Method Blank	O-TERPHENYL (sur.)	2018/08/03		103	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/08/03	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2018/08/03	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2018/08/03	<50		mg/kg	
9087475	JR1	RPD	F2 (C10-C16 Hydrocarbons)	2018/08/03	NC		%	40
			F3 (C16-C34 Hydrocarbons)	2018/08/03	NC		%	40
			F4 (C34-C50 Hydrocarbons)	2018/08/03	NC		%	40
9090627	AMJ	Matrix Spike [TZ8560-02]	1,4-Difluorobenzene (sur.)	2018/08/03		98	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/08/03		94	%	50 - 140
			D10-o-Xylene (sur.)	2018/08/03		100	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/08/03		80	%	50 - 140
			Benzene	2018/08/03		97	%	50 - 140
			Toluene	2018/08/03		92	%	50 - 140
			Ethylbenzene	2018/08/03		100	%	50 - 140
			m & p-Xylene	2018/08/03		102	%	50 - 140
			o-Xylene	2018/08/03		99	%	50 - 140
			F1 (C6-C10)	2018/08/03		74	%	60 - 140
9090627	AMJ	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/08/03		101	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/08/03		95	%	50 - 140
			D10-o-Xylene (sur.)	2018/08/03		96	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/08/03		83	%	50 - 140
			Benzene	2018/08/03		100	%	60 - 130
			Toluene	2018/08/03		101	%	60 - 130
			Ethylbenzene	2018/08/03		102	%	60 - 130
			m & p-Xylene	2018/08/03		106	%	60 - 130
			o-Xylene	2018/08/03		100	%	60 - 130
			F1 (C6-C10)	2018/08/03		109	%	60 - 140
9090627	AMJ	Method Blank	1,4-Difluorobenzene (sur.)	2018/08/03		103	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/08/03		92	%	50 - 140
			D10-o-Xylene (sur.)	2018/08/03		95	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/08/03		83	%	50 - 140
			Benzene	2018/08/03	<0.0050		mg/kg	

Maxxam Job #: B865009
Report Date: 2018/08/04

OUTCOME CONSULTANTS INC.
Client Project #: P2017-01

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9090627	AMJ	RPD [TZ8560-02]	Toluene	2018/08/03	<0.020		mg/kg	
			Ethylbenzene	2018/08/03	<0.010		mg/kg	
			m & p-Xylene	2018/08/03	<0.040		mg/kg	
			o-Xylene	2018/08/03	<0.020		mg/kg	
			F1 (C6-C10)	2018/08/03	<10		mg/kg	
			Benzene	2018/08/03	NC		%	50
			Toluene	2018/08/03	NC		%	50
			Ethylbenzene	2018/08/03	NC		%	50
			m & p-Xylene	2018/08/03	NC		%	50
			o-Xylene	2018/08/03	NC		%	50
9090661	HKG	Method Blank	F1 (C6-C10)	2018/08/03	NC		%	30
			Moisture	2018/08/03	<0.30		%	
9090661	HKG	RPD	Moisture	2018/08/03	2.1		%	20

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

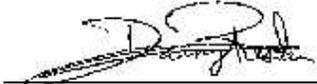
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

Maxxam Job #: B865009
Report Date: 2018/08/04

OUTCOME CONSULTANTS INC.
Client Project #: P2017-01

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Daniel Reslan, cCT, QP, Organics Manager

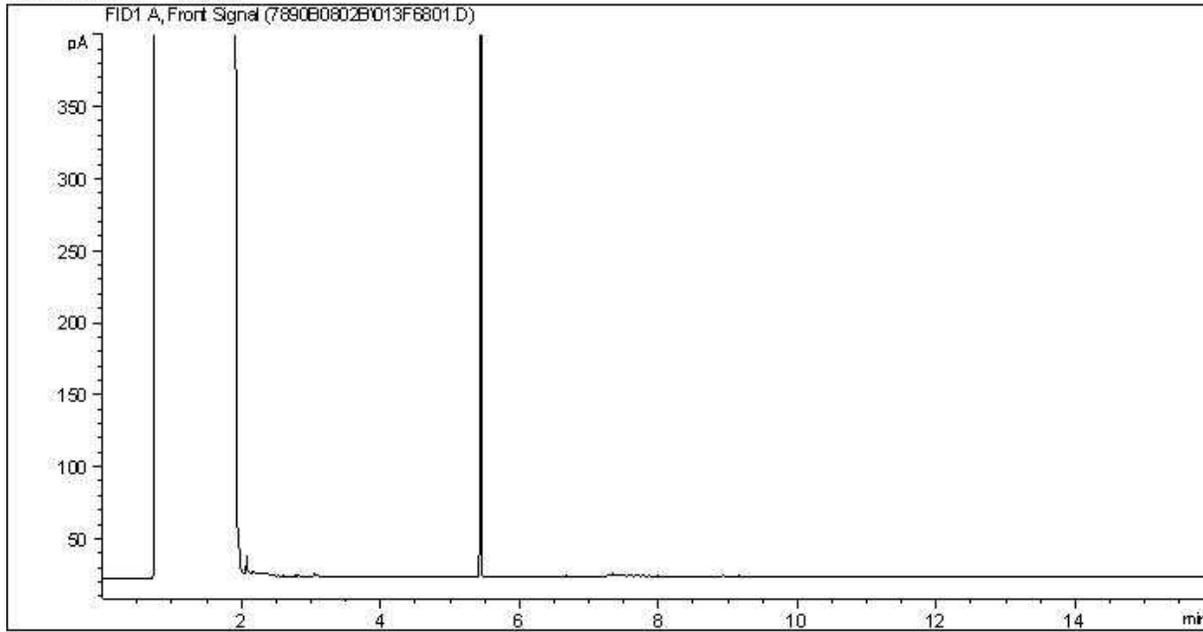


Pamela Kimmerly, Chem. Tech., Team Lead

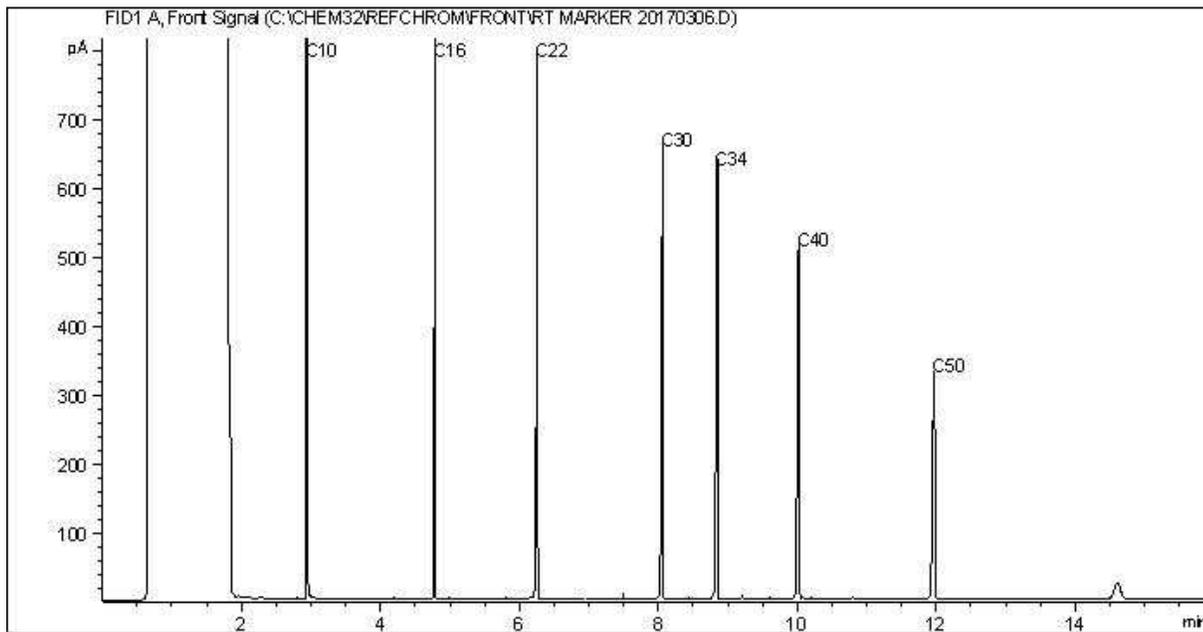
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



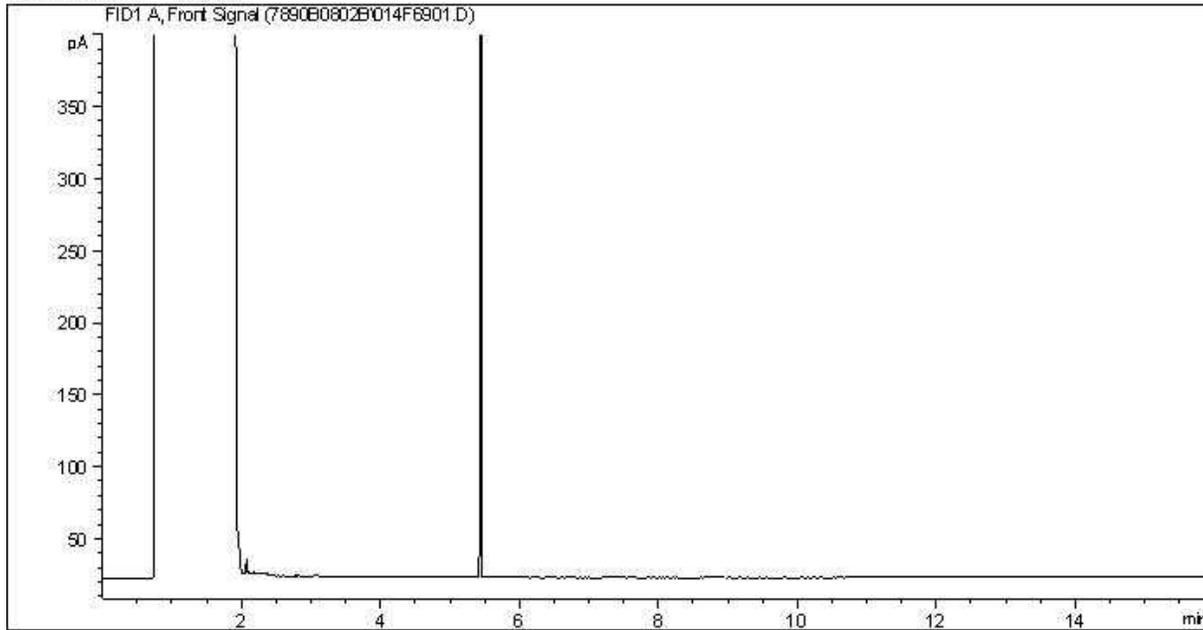
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

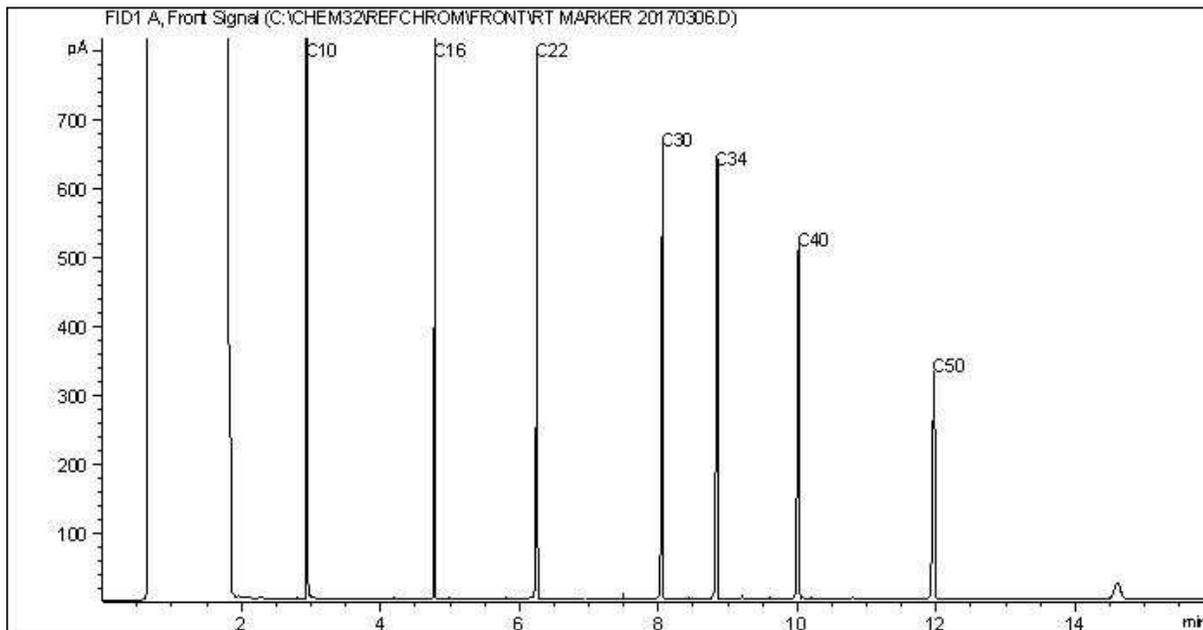
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



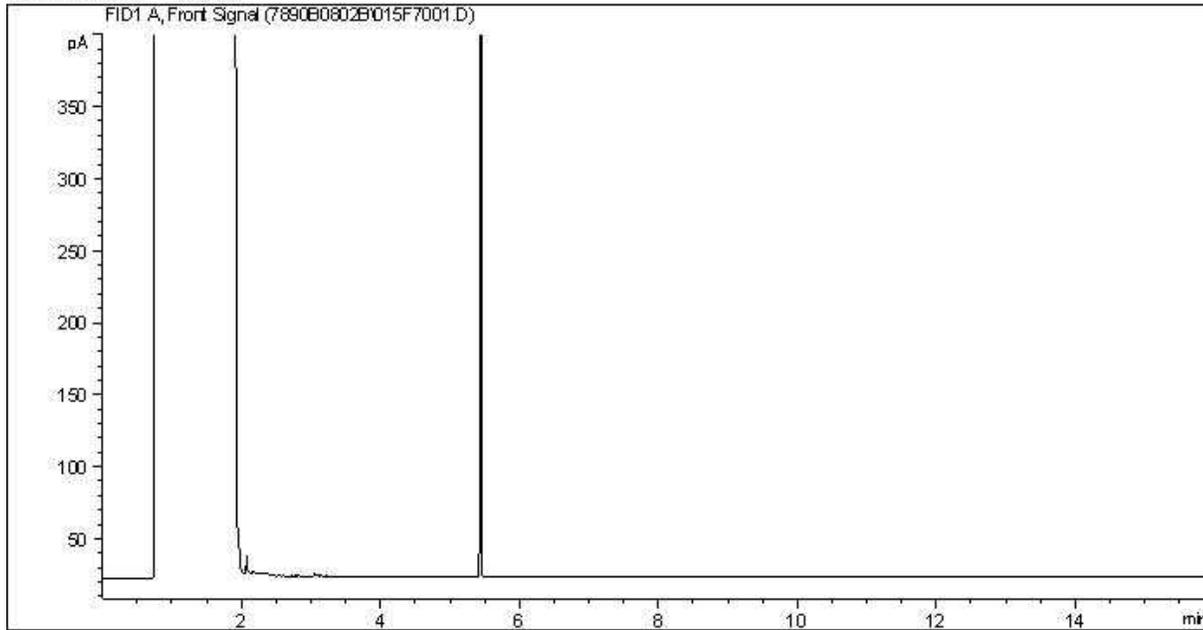
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

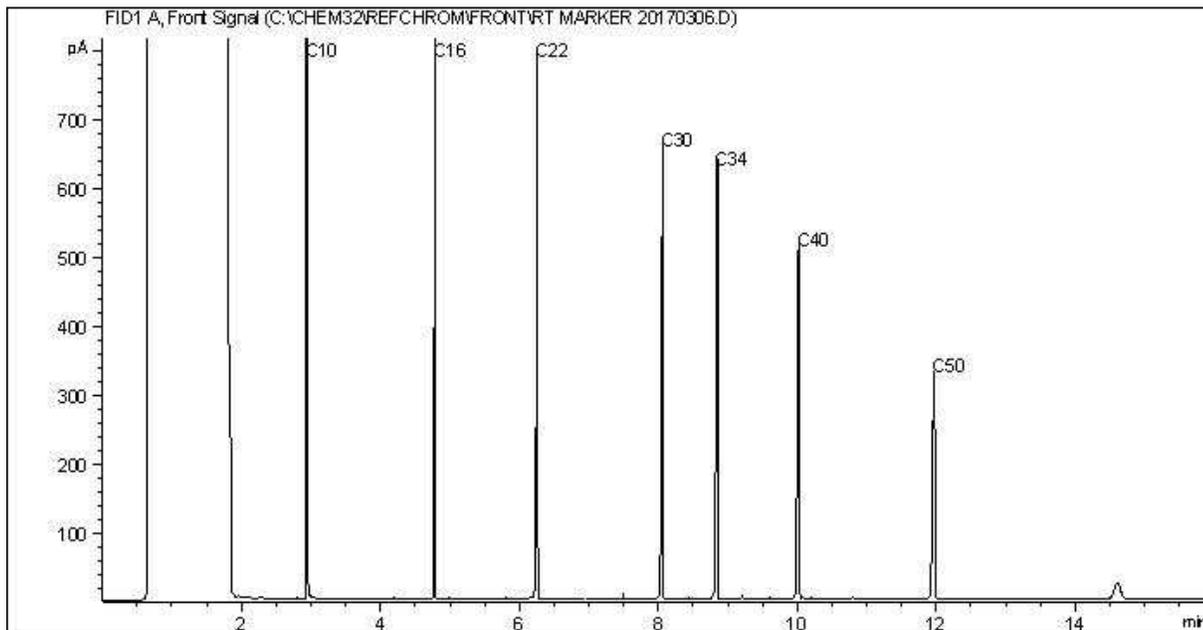
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



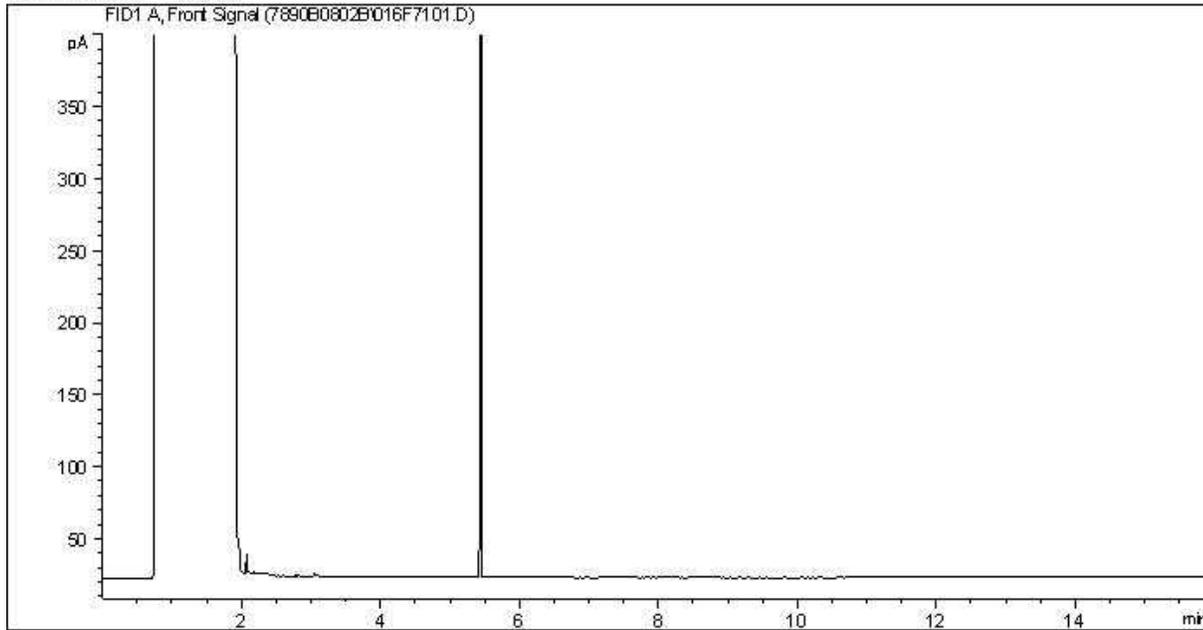
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

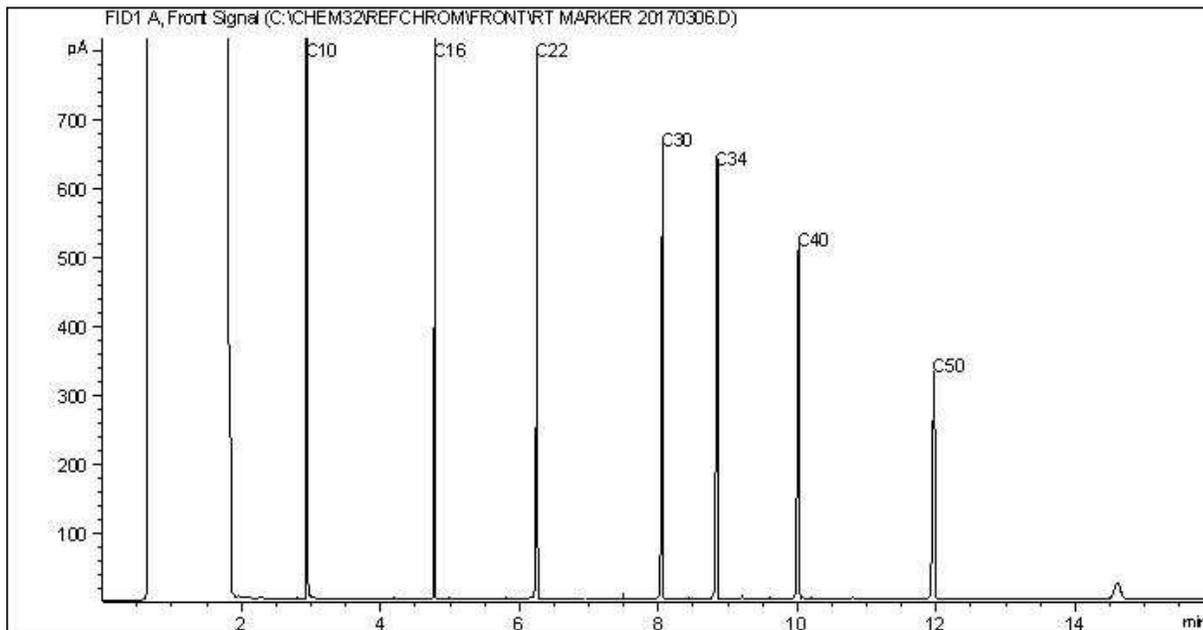
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



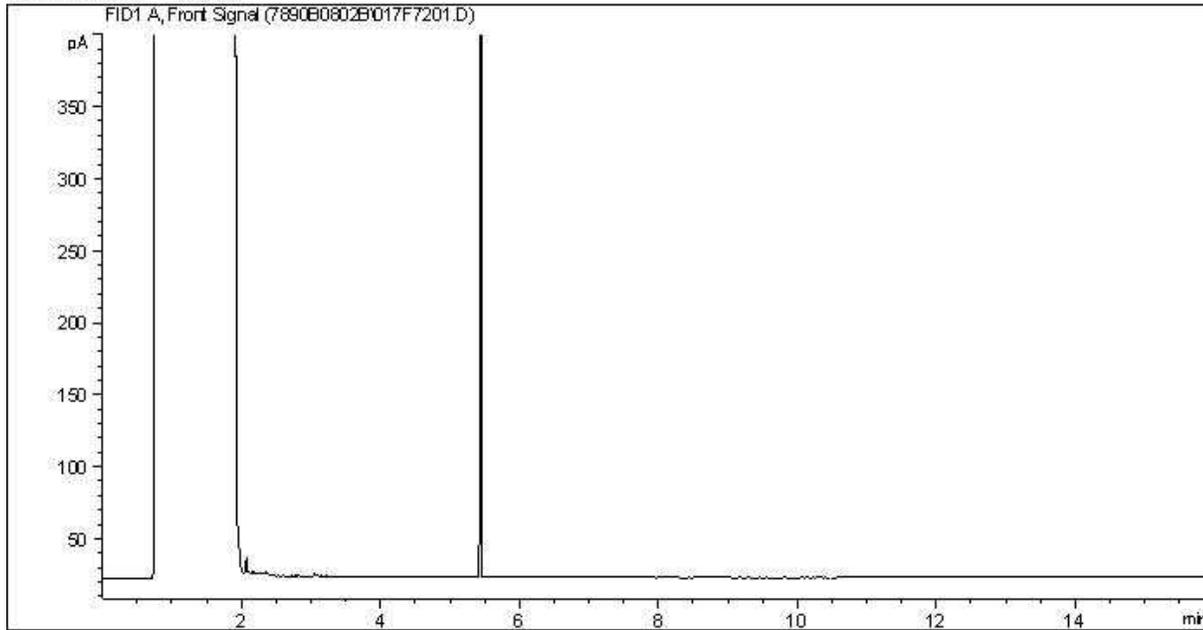
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

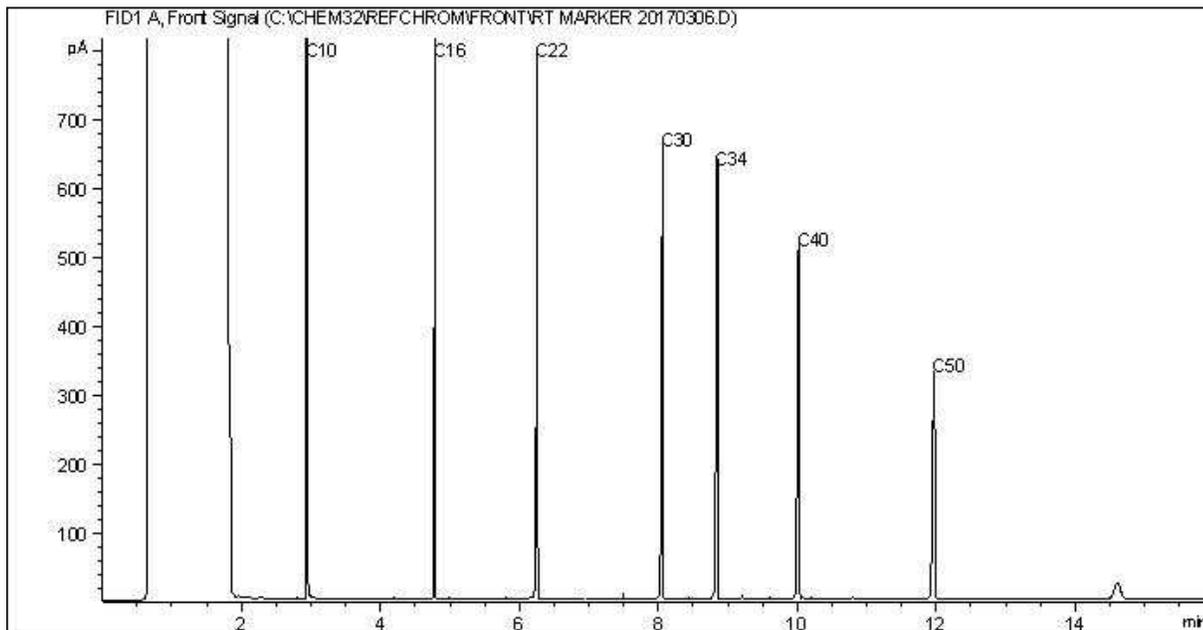
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



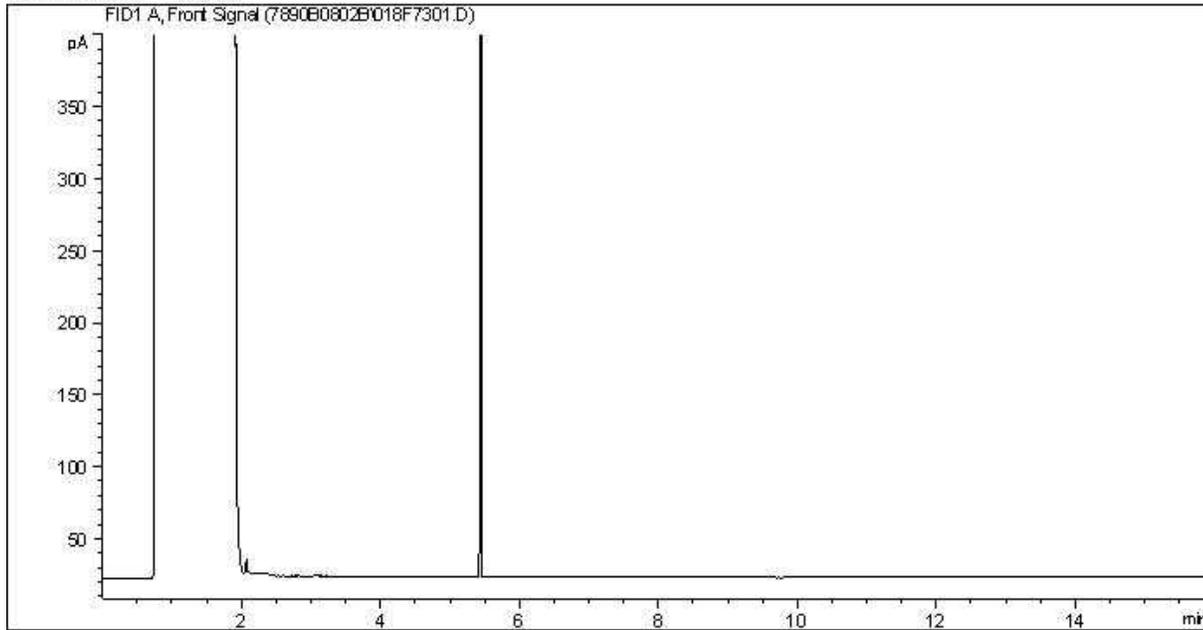
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

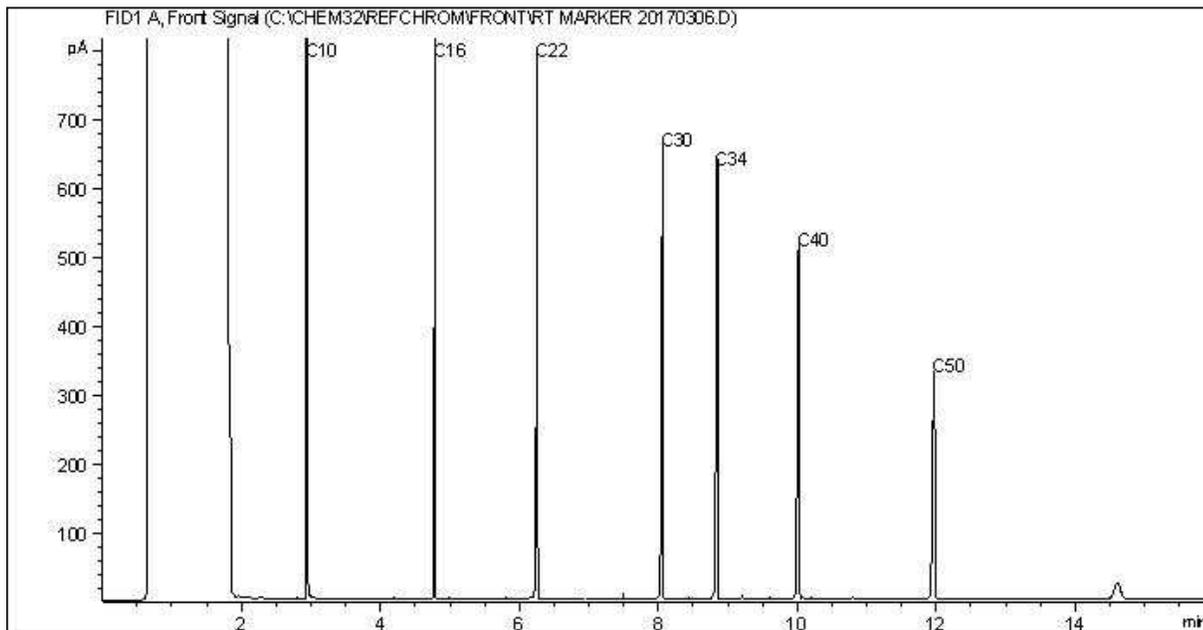
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



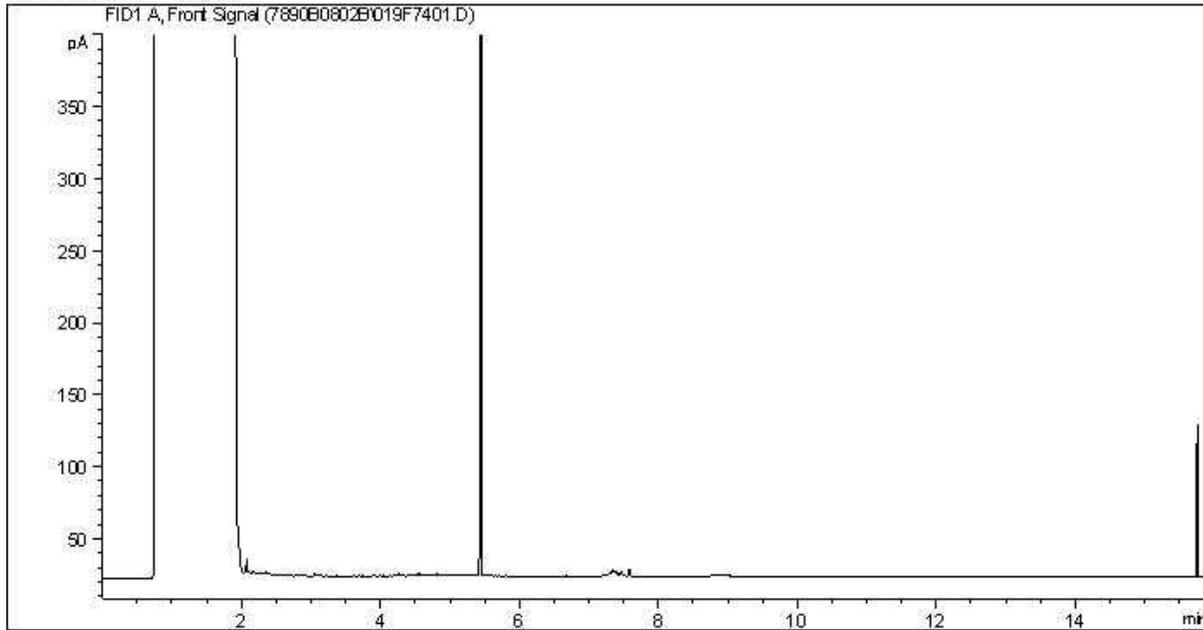
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

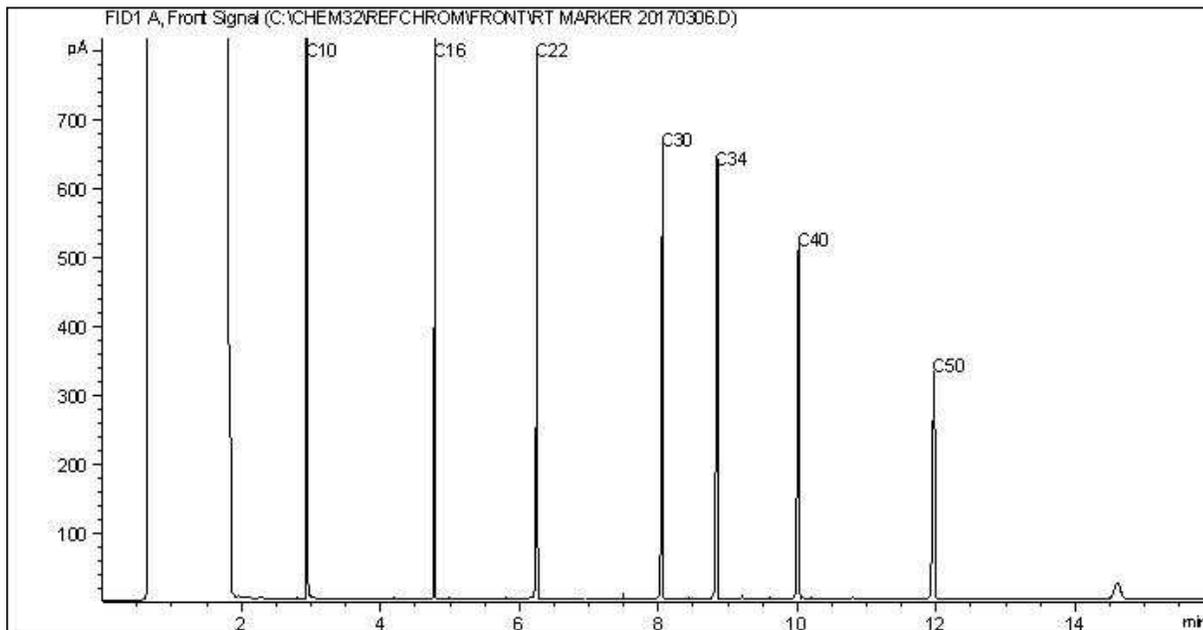
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



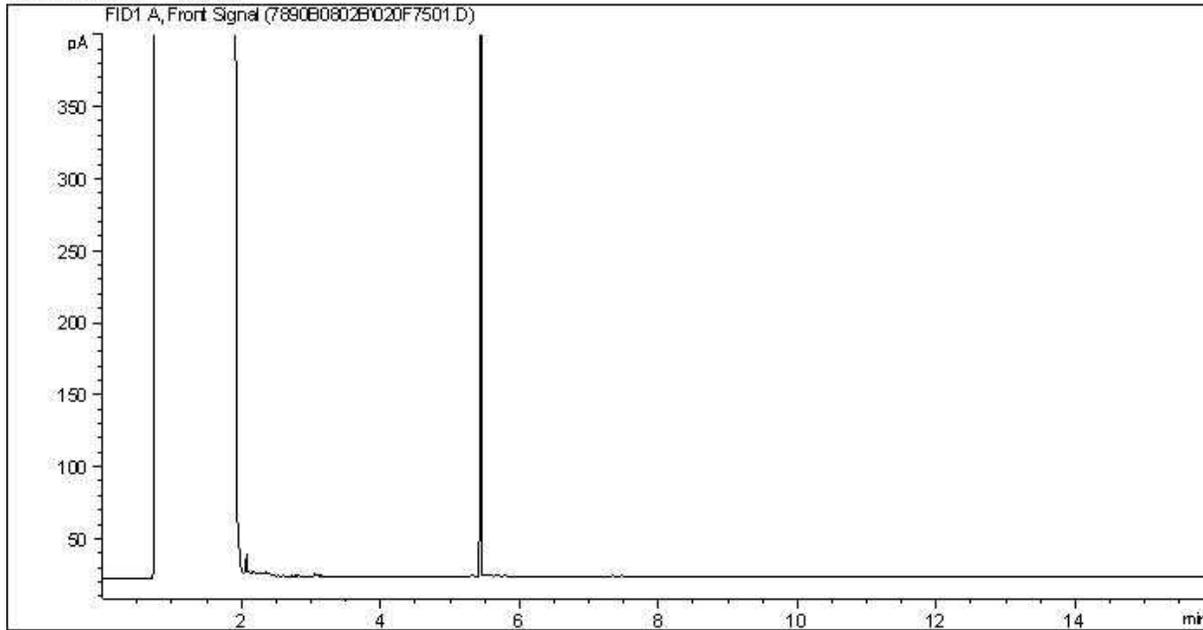
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

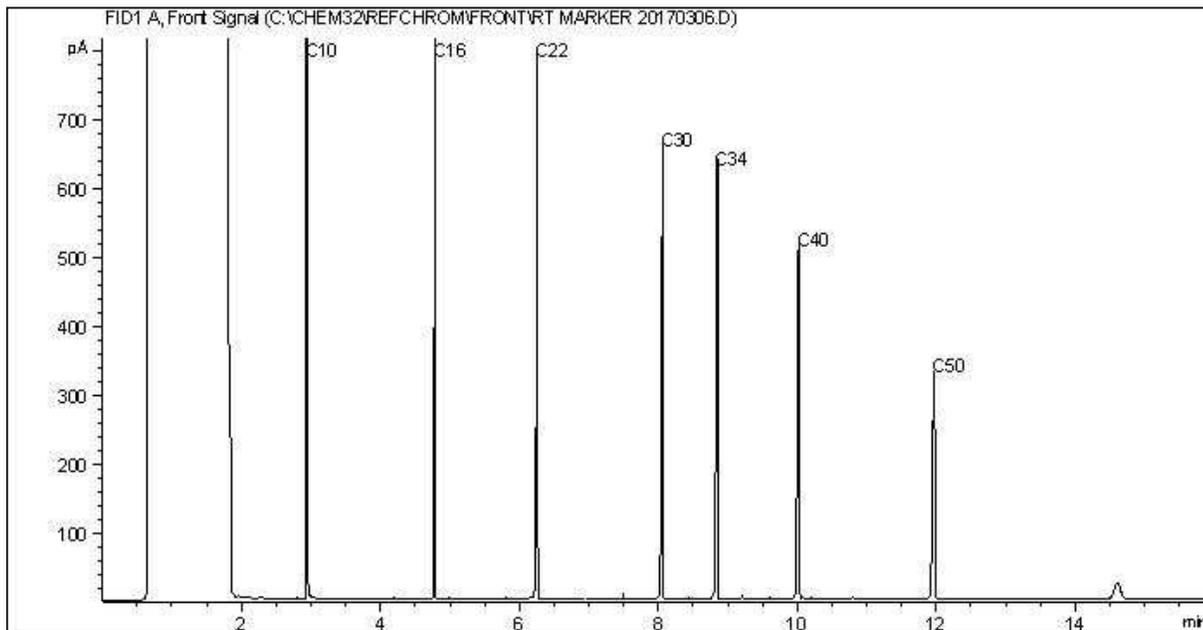
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



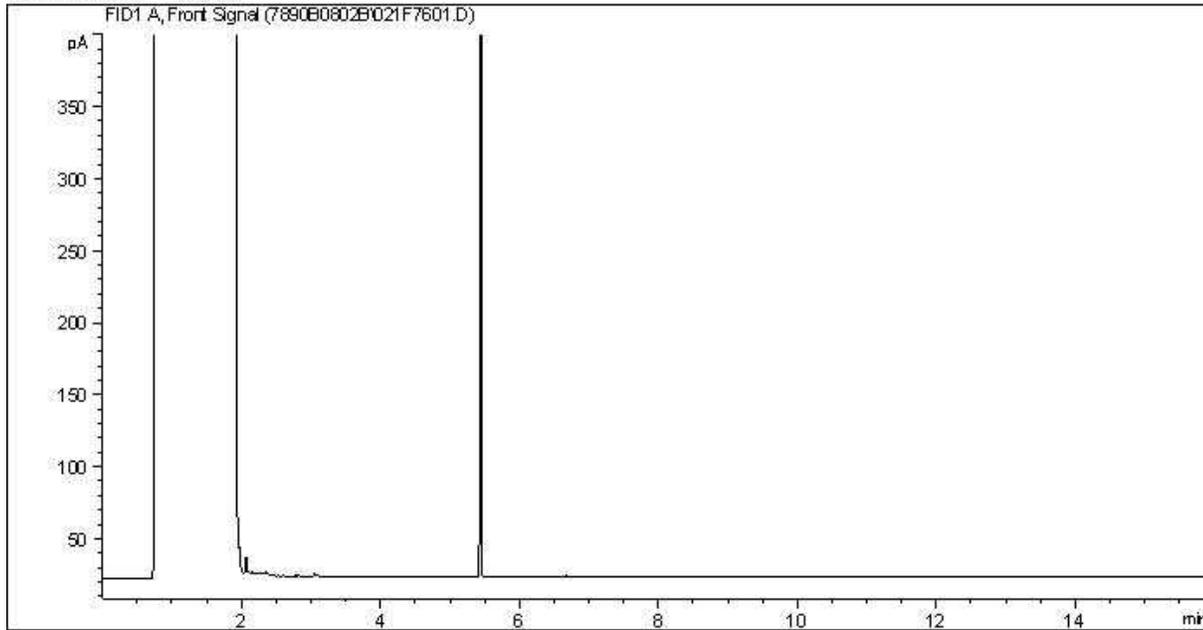
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

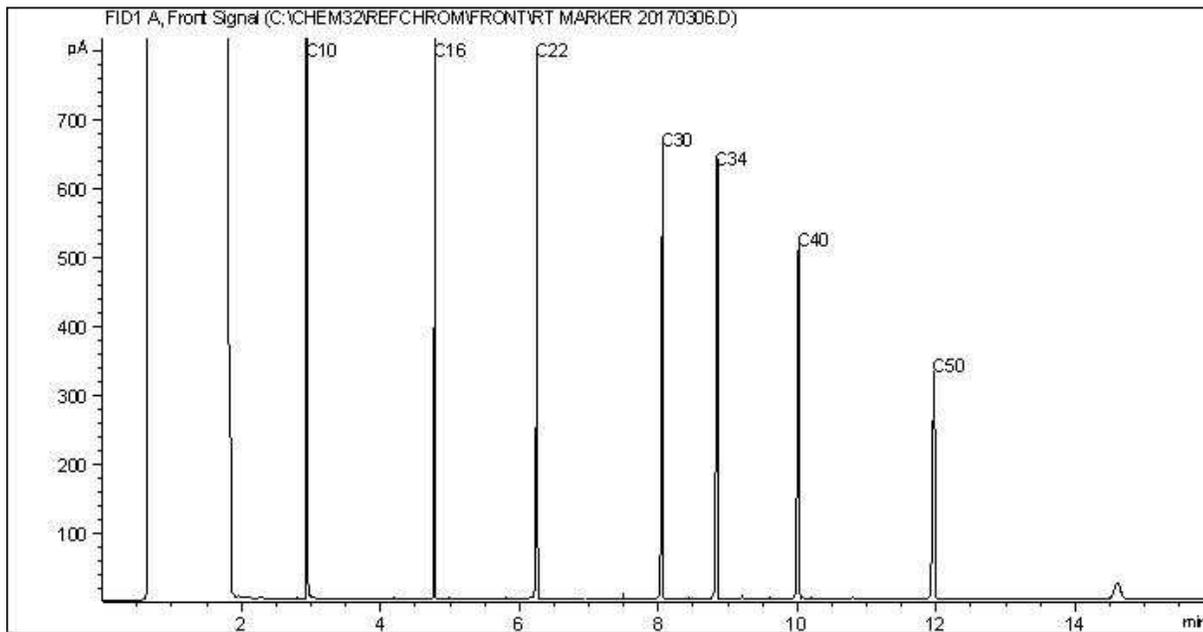
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Attachment 2 – Photographs

Photo Log

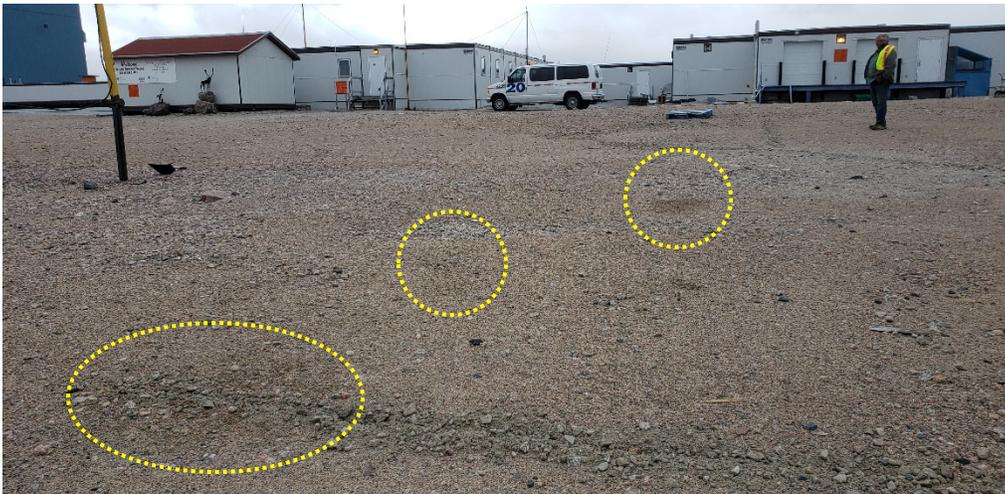


Photo 1

Date
August 1, 2018

Description
Surface staining
observed in Spring 2018
near Main Camp.

Viewing Direction
SE



Photo 2

Date
August 1, 2018

Description
Excavation of the stained
area near the Main
Camp.

Viewing Direction SE



Photo 3

Date
August 4, 2018

Description
Final backfilled
Excavation of the stained
area near the Main
Camp.

Viewing Direction
SE



Photo 4

Date

August 4, 2018

Description

Uncovered Phase 1 Liner.

Viewing Direction

W



Photo 5

Date

August 4, 2018

Description

Liner pulled back to place the stained soils.

Viewing Direction

W



Photo 6

Date

August 4, 2018

Description

Liner cut and cleaned in preparation of seam seals..

Viewing Direction

NE



Photo 7

Date

August 4, 2018

Description

Seam Sealing completed by A&A Technical Services.

Viewing Direction

SE



Photo 8

Date

August 5, 2018

Description

Extrusion seams on patches covering small tears

Viewing Direction

N



Photo 9

Date

August 5, 2018

Description

Vacuum testing the seams

Viewing Direction

SE



Photo 10

Date
August 5, 2018

Description
Final sealed liner.

Viewing Direction
W



Photo 11

Date
August 5, 2018

Description
Final Coarse PK cover replaced and graded

Viewing Direction
SE



Photo 12

Date
August 1, 2018

Description
Camp Waste (wires and greywater liner) staged for off-site removal.

Viewing Direction
N



Photo 13

Date
August 4, 2018

Description
2017 Camp area cleared
of wires.

Viewing Direction
W



Photo 14

Date
August 1, 2018

Description
Greywater Sump area
cleared of liner.

Viewing Direction
W



Photo 15

Date
August 3, 2018

Description
AST T5 – GEM-6-052-1

Viewing Direction
E



Photo 16

Date
August 3, 2018

Description
Label on AST T5 – GEM-6-052-1

Viewing Direction
E

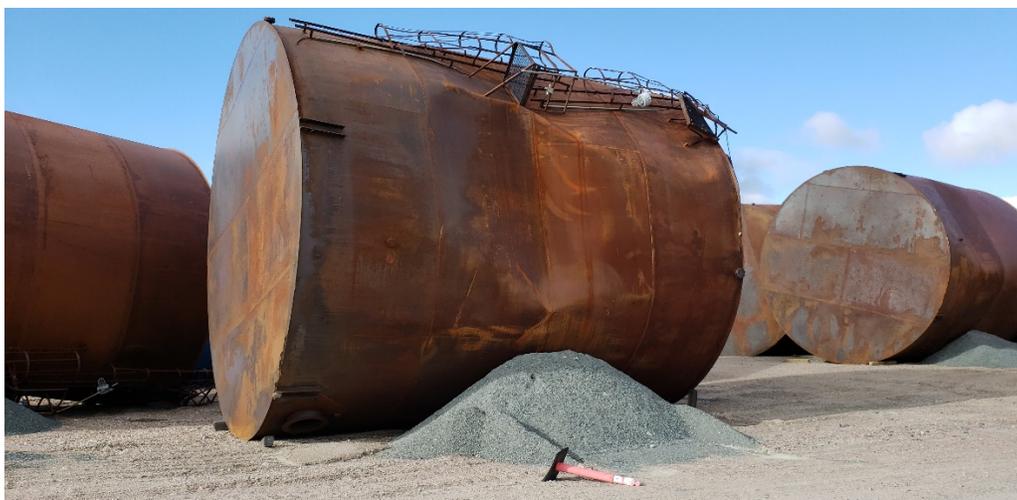


Photo 17

Date
August 3, 2018

Description
AST T7 – GEM-6-052-2

Viewing Direction
W



Photo 18

Date
August 3, 2018

Description
Label on AST T7 – GEM-6-052-2

Viewing Direction
W



Photo 19

Date
August 3, 2018

Description
AST T3 – GEM-6-052-3

Viewing Direction
E



Photo 20

Date
August 3, 2018

Description
Label on AST T3 – GEM-6-052-3 (bottom right corner)

Viewing Direction
W



Photo 21

Date
August 3, 2018

Description
AST T2 – GEM-6-052-4

Viewing Direction
NE

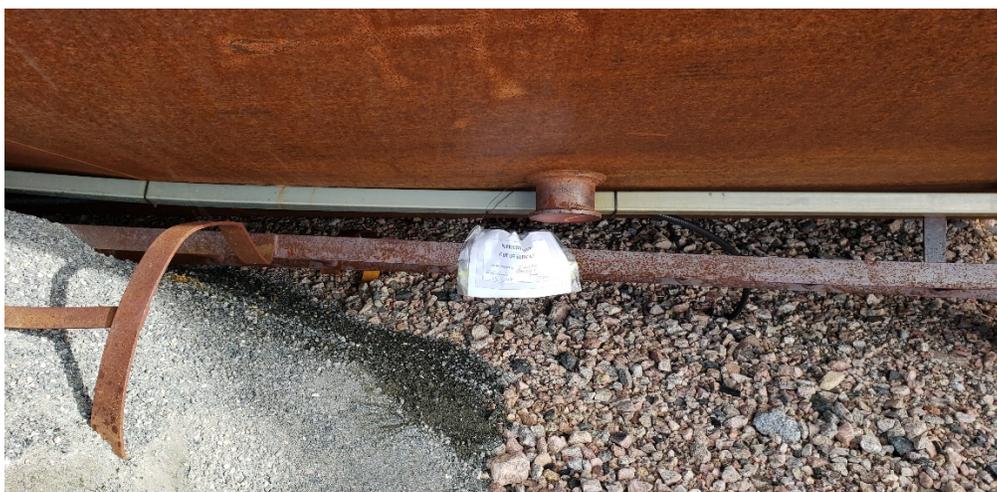


Photo 22

Date
August 3, 2018

Description
Label on AST T2 – GEM-6-052-4

Viewing Direction
NE



Photo 23

Date
August 3, 2018

Description
AST T1 – GEM-6-052-5

Viewing Direction
E



Photo 24

Date
August 3, 2018

Description
Label on AST T1 – GEM-6-052-5

Viewing Direction
E



Photo 25

Date
August 3, 2018

Description
AST T6 – GEM-6-052-6

Viewing Direction
SE



Photo 26

Date
August 3, 2018

Description
Label on AST T6 – GEM-6-052-6

Viewing Direction
SE



Photo 27

Date
August 3, 2018

Description
AST T4 – GEM-6-052-7

Viewing Direction
NW



Photo 28

Date
August 3, 2018

Description
Label on AST T4 – GEM-6-052-7

Viewing Direction
E



Photo 29

Date
August 3, 2018

Description
AST T8 – GEM-6-052-8

Viewing Direction
N



Photo 30

Date
August 3, 2018

Description
Label on AST T8 – GEM-6-052-8

Viewing Direction
E



Photo 31

Date
August 3, 2018

Description
AST T10 – GEM-6-005-1

Viewing Direction
NE



Photo 32

Date
August 3, 2018

Description
Label on AST T10 – GEM-6-005-1

Viewing Direction
NE



Photo 33

Date
August 13, 2018

Description
AST T9 – GEM-6-005-2

Viewing Direction
SW



Photo 34

Date
August 3, 2018

Description
Label on AST T9 – GEM-6-005-2

Viewing Direction
S



Photo 35

Date
August 3, 2018

Description
AST T11 – GEM-6-005-3

Viewing Direction
SW



Photo 36

Date
August 3, 2018

Description
Label on AST T11 – GEM-6-005-3

Viewing Direction
E

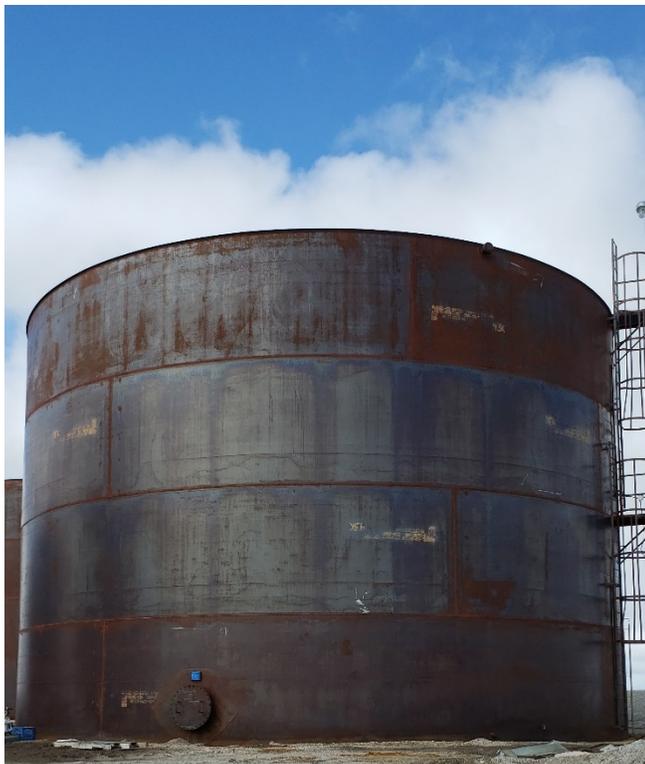


Photo 37

Date

August 3, 2018

Description

AST T12 – GEM-6-005-4

Viewing Direction

SW



Photo 38

Date

August 3, 2018

Description

Label on AST T12 – GEM-6-005-4

Viewing Direction

N



Photo 39

Date
August 3, 2018

Description
AST T18 – D8778-S12

Viewing Direction
N



Photo 40

Date
August 3, 2018

Description
Label on AST T18 –
D8778-S12

Viewing Direction
N



Photo 41

Date
August 3, 2018

Description
AST T15 – D8778-S14

Viewing Direction
N



Photo 42

Date
August 11, 2017

Description
Label on AST T15 –
D8778-S14

Viewing Direction
N



Photo 43

Date
August 3, 2018

Description
AST T14 – C244056

Viewing Direction
W



Photo 44

Date
August 3, 2018

Description
label on AST T14 –
C244056

Viewing Direction
S



Photo 45

Date
August 5, 2018

Description
AST T21 – D8778-S13

Viewing Direction
N

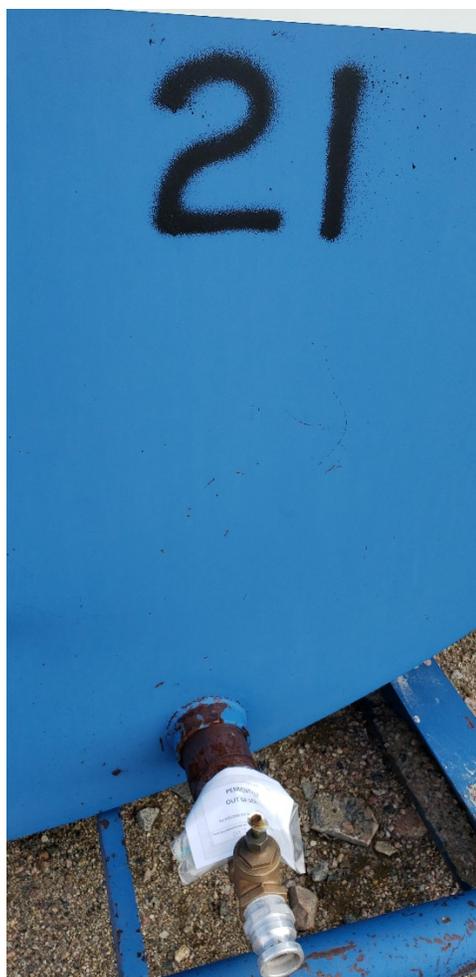


Photo 46

Date
August 5, 2018

Description
Label on AST T21 –
D8778-S13

Viewing Direction
N



Photo 47

Date
August 5, 2018

Description
AST T20 – D8778-S15

Viewing Direction
N



Photo 48

Date
August 5, 2018

Description
Label on AST T20 – D8778-S15

Viewing Direction
N



Photo 49

Date

August 11, 2017

Description

AST T19 – D8778-S19

Viewing Direction

W



Photo 50

Date

August 3, 2018

Description

Label on AST T19 – D8778-S19

Viewing Direction

W



Photo 51

Date

August 3, 2018

Description

AST T22 – D8778-5

Viewing Direction

N



Photo 52

Date

August 3, 2018

Description

Label on AST T22 – D8778-5

Viewing Direction

N



Photo 53

Date

August 3, 2018

Description

AST T17 – D8778-11

Viewing Direction

W



Photo 54

Date

August 3, 2018

Description

Label on AST T17 – D8778-11

Viewing Direction

W



Photo 55

Date

August 3, 2018

Description

AST T23 – D8778-6

Viewing Direction

W

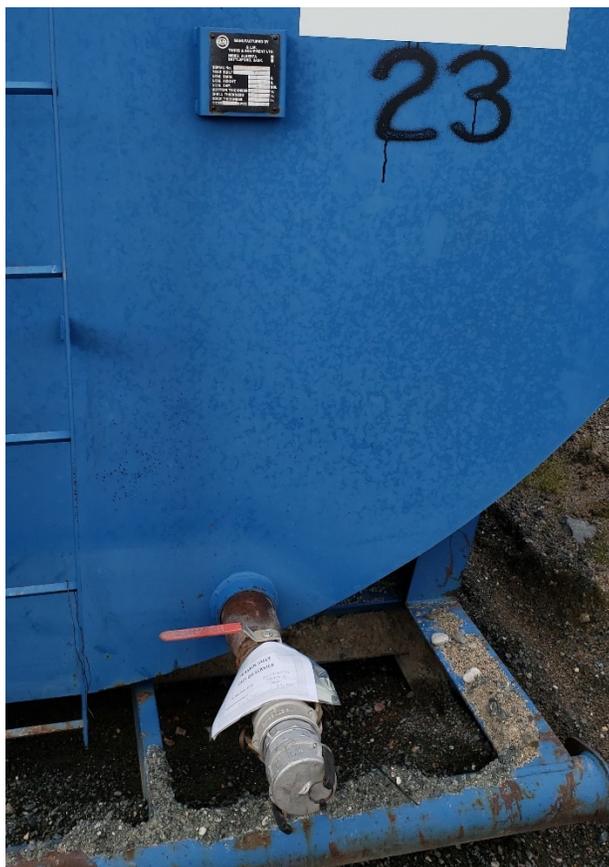


Photo 56

Date

August 3, 2018

Description

AST T23 – D8778-6

Viewing Direction

W



Photo 57

Date

August 3, 2018

Description

AST T16 – D8778-8

Viewing Direction

W



Photo 58

Date

August 3, 2018

Description

Label on AST T16 – D8778-8

Viewing Direction

W



Photo 59 / 60

Date
August 2, 2018

Description
Salad Bar



Photo 61 / 62

Date
August 2, 2018

Description
White Fridge #1



Photo 63 / 64

Date
August 2, 2018

Description
Ice Maker



Photo 65 / 66

Date
August 2, 2018

Description
Coke Fridge



Photo 67 / 68

Date
August 2, 2018

Description
Water Cooler #1



Photo 69 / 70

Date
August 2, 2018

Description
Slushie Machine



Photo 71 / 72

Date
August 2, 2018

Description
Milk Cooler



Photo 73 / 74

Date
August 2, 2018

Description
Pop Machine



Photo 75 / 76

Date
August 2, 2018

Description
Glass Door Fridge #1



Photo 77 / 78

Date
August 2, 2018

Description
Glass Door Fridge #2



Photo 79 / 80

Date
August 2, 2018

Description
Sample Freezer



Photo 81 / 82

Date
August 2, 2018

Description
Walk In Fridge #1



Photo 83 / 84

Date
August 2, 2018

Description
Walk In Fridge #2



Photo 85 / 86

Date
August 2, 2018

Description
White Fridge # 2