Aboriginal Affairs and Northern Development Canada | Affaires autochtones et Développement du Nord Canada

September 09, 2016

Nunavut Impact Review Board
29 Mitik Street
P.O. Box 1360
Cambridge Bay
NU, X0B 0C0
Canada

RE: NUNAVUT IMPACT REVIEW BOARD (NIRB) PART 1 AND 2 APPLICATION- JERICHO MINE SITE STABILIZATION PROJECT

Please find enclosed a NIRB Application from Indigenous Affairs and Northern Development Canada (INAC) for the Jericho Mine Site Stabilization Project.

In addition to NIRB approvals, INAC is also applying for a Land Use Permit from INAC, a Water Licence from the Nunavut Water Board, and an Access to Inuit Owned Land Permit from the Kitikmeot Inuit Association. This application package includes:

APPENDIX	TITLE
1	Tibbitt to Contwoyto Joint Venture Winter Road Group- Right to Use and Occupy Crown Land Permit #75M11-1-1
2	INAC Land Use Permit Application
3	Nunavut Water Board Water Licence Application
4	Kitikmeot Inuit Association Access to Inuit Owned Land Permit Application
5	NIRB Part 4 Non-Technical Description (English)
6	NIRB Part 4 Non-Technical Description (Inuktitut)
7	NIRB Part 4 Non-Technical Description (INUINNAQTUN)
8	Jericho Environmental Site Assessment Phase III
9	Jericho Site Stabilization Project Terms of Reference
10	Tibbitt to Contwoyto Joint Venture Winter Road Group- Road Maps
11	Proposed Lupin to Jericho Winter Road Map
12	Jericho Waste Water Treatment Plant Operations Plan
13	Jericho Site Stabilization Project Spill Contingency Plan
14	Jericho Site Stabilization Project- Kugluktuk Community Meeting Notes
15	Jericho Site Stabilization Project- Kugluktuk Attendance Sheet
16	Letter from Kitikmeot Inuit Association
17	AMEC Winter Road Water Withdrawal Estimate
18	Jericho Site Stabilization Project – Environmental Screening Report

If you have any further questions or require additional information please contact myself at 819-934-1188 or via e-mail at mark.yetman@aandc.gc.ca.

Sincerely,

Mark Yetman
Senior Project Advisor

PART 1 FORM
PROJECT PROPOSAL INFORMATION REQUIREMENTS

To access NIRB documents, project screenings, and project reviews please visit the Nunavut Impact Review Board's ftp site http://ftp.nirb.ca/. The NIRB's website (www.nirb.ca) is currently under construction. Please contact info@nirb.ca should you have any questions or require further information.

IMPORTANT!
Please be advised that your application will not be processed until the Sections 1 - 9 are completed in their entirety, in both English and Inuktitut (+ Inuinnaqtun, if in the Kitikmeot).

SECTION 1: APPLICANT INFORMATION

1. Project Name Jericho Mine Site Stabilization, Nunavut

2. Applicant's full name and mailing address:
Indigenous and Northern Affairs Canada
10th Floor, 25 Eddy Street
Gatineau, QC
K1A 0H4

Phone:
Fax:
Email:

3. Primary contact's full name and mailing address:
Mark Yetman, Senior Project Advisor
Indigenous and Northern Affairs Canada
10th Floor, 25 Eddy Street
Gatineau, QC K1A 0H4

Phone: 819-934-1188
Fax: 819-934-9229
Email: mark.yetman@aandc.gc.ca

SECTION 2: AUTHORIZATION NEEDED

1. Indicate all authorizations associated with the project proposal:

X	Regional Inuit Association (RIA)		Canadian Launch Safety (CLS)
X	Nunavut Water Board (NWB)		Canadian Wildlife Service (CWS)
X	Nunavut Planning Commission (NPC)		Department of National Defense (DND)
	Government of Nunavut (GN)		Environment Canada (EC)
	Community Government & Services (CG&S)		Fisheries and Oceans Canada (DFO)
	Culture and Heritage (CH)		Parks Canada (PC)
	Nunavut Research Institute (NRI)		Hamlet
X	Aboriginal Affairs and Northern Development Canada (AANDC)		Other (please specify):

2. List the active permits, licenses, or other authorizations related to the project proposal, and their expiry date(s):
- Tibbit to Contwoyto Joint Venture Winter Road Group - Right to Use and Occupy Crown Land
Land Permit 75 M/11-1 (Appendix 1). Expiry 2033.

3. **List the pending* permits, licenses, or other authorizations related to the project proposal:**

- Indigenous and Northern Affairs Canada (INAC) Land Use Permit (Appendix 2)
- Nunavut Water Board Water Licence (Appendix 3)
- Kitikmeot Inuit Association (KitIA) Access to Inuit Owned Lands Permit (Appendix 4)
- Nunavut Planning Commission Conformity Review

*Please provide a copy of all applications to the NIRB.

4. **Has this project or any components of this project been previously screened or reviewed by NIRB?**

☐ **YES** ■ **NO**

If YES, indicate the previous project name and NIRB File No.

SECTION 3: PROJECT PROPOSAL DESCRIPTION

1. **Indicate the type of project proposal (check all that apply)[1,2]:**
(See Appendix A for Project Type Definitions)

1	All-Weather Road/Access Trail	☐	**9**	Site Cleanup/Remediation	■
2	Winter Road/ Winter Trail	■	**10**	Oil and Natural Gas Exploration/Activities	☐
3	Mineral Exploration	☐	**11**	Marine Based Activities	☐
4	Advanced Mineral Exploration	☐	**12**	Scientific/International Polar Year Research*	☐
5	Mine Development /Bulk Sampling	☐	**13**	Harvesting Activities*	☐
6	Pits and quarries	☐	**14**	Tourism Activities*	☐
7	Offshore Infrastructure (port, break water, dock)	☐	**15**	Other[2]:	☐
8	Seismic Survey	☐			☐

Please note:

1. All project types listed above, except those marked with an asterisk (*), will also require the Proponent to submit a **Part 2 Project Specific Information Requirement (PSIR) Form**. The NIRB application process will not be considered complete without the Part 2 PSIR Form.
2. Please be advised that in order to complete the NIRB process, the NIRB may request additional information at any time during the process.
3. If "Other" is selected, contact NIRB for direction on whether a Part 2 PSIR Form is required.

2. If Project Type 3, 4 or 5 was selected in previous question, please indicate the mineral of interest that is being extracted. Include a brief description.

- [ ] Base Metals (zinc, copper, gold, silver, etc)_____
- [ ] Diamonds
- [ ] Uranium
- [ ] Other: _____

3a. If Project Type 12, 13 or 14 was selected above, complete the table and questions below.

Transportation Type	Quantity	Proposed Use	Length of Use
E.g. Helicopter	*1*	*Site to site pick ups and drop offs*	*6 days*

3b. Describe any docks, piers, air strips or related structures that are to be used in conjunction with the proposed project activities. **Please note**: *the building of new structures may require a Part 2 Form.*

There is an existing airstrip onsite that will be used during the proposed site stabilization activities. This airstrip is in good condition and was constructed when the Jericho Mine was in operation.

3c. If a temporary camp site is to be established, describe the proposed structures in detail and indicate the type and source of power for the camp site if applicable.

Existing Jericho Mine camp infrastructure will be used for the site stabilization activities. Once the site stabilization activities are completed the camp will be demolished and landfilled. Camp power will be provided by generators that have been in place since Jericho Mine operations.

4. Personnel

Total No. of personnel on site = (A) 50

Total No. of days on-site = (B) 180

Total No. of Person days (A) × (B) = 9000 (max)

5. Timing

Period of operation: from January 2017 to March 2018

Proposed term of authorization: from January 2017 to March 2018

6a. Region (check all that apply):

- [ ] North Baffin
- [ ] South Baffin
- [ ] Kivalliq
- [ ] National Park
- [x] Kitikmeot
- [ ] Transboundary: _____

6b. Describe the location of the proposed project activities in a regional context, noting the proximity to the nearest communities and any protected areas.

This site stabilization project will take place on the abandoned Jericho Mine site which is located 260 km

southeast of Kugluktuk, NU and 30 km north of the Lupin Mine in the Contwoyto-Itchen Region.

6c. Discuss the history of the site if it has been used for any project activities in the past.

The Jericho Mine was opened in 2006 by Tahera Diamond Corporation (Tahera) who went through bankruptcy proceedings in 2008. Shear Diamonds Corp. (Shear) took over the Jericho Mine in 2010 and operated the mine under care and maintenance until September 2012 when Shear suspended operations. INAC has been undertaking basic environmental protection of the Jericho Mine since spring 2013, and assumed control of the Jericho Mine in January 2014.
The original mine plan was to construct a project with an eight-year life and extract the Kimberlite ore by using an open pit and underground mining methods. The mine work did not advance beyond the open pit extraction.

6d. Indicate if there are any known archaeological/palaeontological historical sites in the area.
Tahera in their initial permitting application indicated that they completed an Archaeological Impact Assessment. Their findings are summarized as such: “None of the 25 heritage sites identified sites during the Project EIS were determined to be of sufficient potential of significance to require avoidance by development.”

The same circumstances apply to the site stabilization work as it will not go beyond the boundaries set out by the previous mining operations and will be using the same winter road route.

7. Land Status (check all that applies):

x	Crown		Commissioners’		Municipal
x	Inuit Owned Surface Lands		Inuit Owned Sub-Surface Lands		

8a. Co-ordinates:

Min Lat (degree/minute)	65 ° 58 ’ 59.92 ” N	Min Long (degree/minute)	111 ° 25 ’ 57.53 ” W
Max Lat (degree/minute)	66 ° 02 ’ 00.81 ” N	Max Long (degree/minute)	111 ° 32 ’ 01.93 ” W

NTS Map Sheet No: 076L04; 076E13, 076L03; 076E14
(Please ensure that maps of the project are attached (1:50,000 **if available**, 1:250, 000 **Mandatory**) available from Natural Resources Canada)

8b. If the project proposal includes a **camp**, please provide the coordinates of the camp location

Min Lat (degree/minute)	65 ° 59 ’26.25” N	Min Long (degree/minute)	111 ° 30 ’08.99 ” W
Max Lat (degree/minute)	65 ° 59 ’26.25” N	Max Long (degree/minute)	111 ° 30 ’08.99 ” W

If different from above for the camp:
NTS Map Sheet No: 076L03
Please ensure that maps of the project are attached (1:50,000 **if available**, 1:250, 000 **Mandatory**) available from Natural Resources Canada

Please note that additional location information may be required in a subsequent Project Specific Information Requirement (PSIR) submission. This may take the form of a digital Geographic Information Systems (GIS) file.

SECTION 4: NON-TECHNICAL PROJECT PROPOSAL DESCRIPTION

Please include a non-technical description of the project proposal, no more than 500 words, in English and Inuktitut (+Inuinnaqtun, if in the Kitikmeot). The project description should outline the following:

- The project activities, their necessity and duration;
- Method of transportation;
- Any structures that will be erected (permanent/ temporary);
- Alternatives considered; and
- Long-term developments, the projected outcome of the development for the area and its timeline.

IMPORTANT: IF THE PROPOSED ACTIVITIES REQUIRE SUBMISSION OF A NIRB PART 2 PSIR FORM, PLEASE COMPLETE SECTION 8 ONLY, OTHERWISE CONTINUE ON WITH SECTION 5.

SECTION 5: MATERIAL USE

1. List equipment to be used (including drills, pumps, aircraft, vehicles, etc.):

Equipment type and number	Size – dimensions	Proposed use

2a. Detail fuel and hazardous material use:

Fuel	Number of Containers and Capacity of Containers	Total Amount of Fuel (in Litres)	Proposed Storage Methods
Diesel			
Gasoline			
Aviation fuel			
Propane			
Other			
Hazardous Materials and Chemicals		**Total Amount of Hazardous Materials and Chemicals (in Litres)**	

2b. Describe the proposed Spill Prevention Plan.

3a. Detail the anticipated daily water consumption rates

Daily amount (m^3)	Proposed water retrieval methods	Proposed water retrieval location

3b. Have you applied for a water License* with the Nunavut Water Board?

X YES ☐ **NO**

If yes, what class of licence?

☐ **Class A Water Licence** ☐ **Class B Water Licence**

SECTION 6: WASTE DISPOSAL AND TREATMENT METHODS

1. List the types of waste associated with the proposed project activities:

Type of waste	Projected amount generated	Method of Disposal	Additional treatment procedures
Sewage (human waste)			
Greywater			
Combustible wastes			
Non-Combustible wastes			
Overburden (organic soil, waste material, tailings)			
Hazardous waste			
Hazardous Materials			

2. Describe the proposed Waste Management Plan.

SECTION 7: COMMUNITY INVOLVEMENT & REGIONAL BENEFITS

1. List the community representatives that have been contacted and provide the minutes of the meetings if available:

Community	Name	Organization	Date Contacted

SECTION 8: GENERAL QUESTIONS

1. **Will you be disturbing any known archaeological sites?**

☐ **YES** **X NO**

SECTION 9: APPLICANT SIGNATURE

Please sign and date your application:

Signature	Title	Date
	Senior Project Advisor	2016-09-09

APPENDIX A
Project Type Definitions

Access Trail: A project proposal with the objective of providing vehicular access to an area of interest involving minimal alteration to the terrain.

Advanced Exploration: A project proposal with the objective of identifying size, grade, and physical characteristics of a mineral occurrence and to assess the economic and technical feasibility of developing the mineral deposit into a producing mine

All-Weather Road: A project proposal with the objective of road construction for use in all seasons.

Bulk Sampling: A project proposal with the objective of extracting of large samples of mineralized material involving hundreds to thousands of tonnes. Samples are selected as representative of the potential mineral deposit being sampled. May involve crushing/milling (on small-scale)

Harvesting activities: A project proposal with the objective of harvesting animals, marine mammals and/or fish from their natural habitats by means of hunting or trapping for traditional and commercial use.

Marine Based Activities: Any activity occurring in the marine environment, such as vessel use associated with land-based activities or disposal at sea.

*Please note that normal community re-supply or individual ship movements not associated with land-based project proposals shall not be screened by NIRB (Section 12.12.2 of NLCA).

Mine Development: A project proposal with the objective of extracting broken rock with mineralization of sufficient grade and tonnage to sustain commercial mining operations (ore). Mining a body of ore can be achieved by either open pit and/or underground development. Mine development may involve milling. Milling involves treatment of the extracted ore through a combination of mechanical and chemical processes to selectively recover the valuable mineral.

Mineral Exploration: A project proposal with the objective of exploring an area to find geological anomalies. It involves site reconnaissance (ground and/or air) to locate broad and fiscal mineral deposits.

Offshore Infrastructure: A project proposal with the objective of building off loading facilities constructed off the shoreline and connected to the mainland of the marine or freshwater environment. Examples include a jetty, dock, or port facility.

Oil and Gas Exploration/Activities: A project proposal that includes 1) exploration, such as seismic or geological mapping, 2) drilling of oil and gas wells, 3) construction and operation of a pipeline, a gas processing plant or any oil and gas facility within Nunavut.

Pits and Quarries: A project proposal with the objective of pitting, which involves the extraction of granular material (i.e. sands and gravels) and quarrying, which involves the removal of consolidated rock (i.e. bedrock, frozen soil).

Scientific Research: A project proposal with the objective of implementing a series of site activities comprised of observation of phenomena, measurement and collection of data necessary for scientific investigation in designated areas within a limited time period.

Seismic Survey: A project proposal with the objective of conducting a survey to map the depths and contours of rock strata by timing the reflections of sound waves released from the surface. Survey site locations may be offshore (not within 12 nautical miles of any coast), near shore, and extended onshore.

Site Cleanups: A project proposal with the objective of site cleanups (includes DEW line site cleanups), which focuses on the remediation of chemically contaminated soils, stabilization of landfills and dumps, demolition/disposal of infrastructure and debris and monitoring after cleanup is completed.

Tourism Activity: A project proposal with the objective of conducting travel predominantly for recreational, sport or leisure purposes within a designated area and limited time period.

Winter Road: A project proposal with the objective of building a road for winter use by leveling and compacting surface snow and ice. Winter road is removed at end of season.

Winter Trail: A project proposal with the objective of building a trail for winter use by a single pass of a tracked vehicle using a blade, if necessary.

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ᑐᓴᕐᕕᑎᓂᖅ ᐱᓕᕆᐊᖃᕐᕕᒋᔭᓂᑦ ᑐᓴᒃᑲᐅᑦᑎᐊᓂᑦ ᐱᓴᕐᕕᒋᔭᓂᑦ

ᑐᓴᒃᑲᓂᕐᑲᒃᓴᑦ ᐱᓴᐅᔨᓐᓇᖅᑐᑦ ᐱᔨᔪᑎᓕᑦ ᓄᓇᕗᑦ ᐊᕐᕌᑎᓕᕆᔨᑦ ᑲᑎᒪᔨᖏᑐᓂᒃ ᑌᒋᐊᑎᑦ ᐅᖄᓇ ᖃᑲᓕᑕᐅᓴᒃᑯᑦ http://ftp.nirb.ca/ ᐅᕐᕌᒐᐊᑦᖃᖅ ᐊᖏᔪᑎᑎᐊᑎᑦ ᓄᓇᕗᑦ ᐊᕐᕌᑎᓕᕆᔨᑦ ᑲᑎᒪᔨᖏᑎᒍ ᐊᑦᓚᖏᓪᓗᑎᑦ, ᐱᓕᕆᐊᒃᓴᓪᓚᕆᔨᒃᑯᓂᖅ ᖃᑎᖃᕐᕌᖓᑦ, ᐊᒻᒪᓗ ᐱᓕᕆᐊᒃᓴᐅᑦ ᑐᑭᔪ ᖃᑎᖃᕐᕕᐅᑎᓯᑦᑎᓂᖅᓱᒍ ᑌᒋᐊᑎᑦ ᓄᓇᕗᑦ ᐊᕐᕌᑎᓕᕆᔨᑦ ᑲᑎᒪᔨᖏᑎᒍ ᖃᑲᓕᑕᐅᓴᒃᑯᑦ ᓴᖅᑭᑐᒪᔨᑦ ᐅᕐᕌᓂ http://ftp.nirb.ca/.

ᐅᓴᐃᖅᑕᐅᑦᓯᐊᖃᓕᑎᒋᓪᓗᒍ

ᖃᐅᔨᒪᓂᐊᕐᓇᑎᑦ ᑐᓴᒃᑲᐃᑎᑎᑦ ᐱᕐᓂᓪᓕᐊᑲᓂᖅᓴᓪᓕᒪᒪᓕ ᐅᑯᑎᒧᐊᓇ ᐊᑐᑎᓪᓕᖃᖅᑐᖓᓂᖅ ᐃᓕᖅᑐᒍᓱᓕᕆᓂᖅ sections 1 - 9 ᐱᓴᓵᖅᑕᐅᖃᖅᑎᓇᐊᖃᖅᓯᒪᓕᒃ ᖃᓄᖅᑖᓂᑦ ᐊᒻᒪᓗ ᐃᓄᒃᑎᑦ (ᐃᓄᐃᑦᓇᖅᑐᑦ ᖃᐅᑎᖅᑎᐅᓂᐸᑕ).

ᐃᓕᖅᑲ 1: ᑐᓴᒃᑲᐅᑦ ᑐᓴᒃᑲᖅᑲᖅ

1. ᐱᓪᓚᐊᒃᓴᐅᑦ ᑕᑎᐃᖅᑎᐊᐅᖅ ᑕᓯᖅᓴᐊᖅ ᐅᓴᖅᓂᓂᐊᖅᓘᒃ ᐃᓂᖅᑲ ᓇᓪᓕᖃᖅᓴᓪᓕᑕᐅᓂᖅᑲ, ᓄᓇᕗᑦ ᓄᓇᓕᒫᑦ

2. ᑐᓴᒃᑲᐅᑦ ᐊᑎᖅᑲ ᐊᒻᒪᓗ ᑐᑭᓯᑦ:

ᐃᓄᓪᓚᓴᑐᖅᑯᑦ ᑲᓇᑕ
10th Floor, 25 Eddy Street
Gatineau, QC
K1A 0H4

ᐅᖃᖅᑕᐅᑎᓪᓗ: _____
ᓯᑲᓴᖅᑯᑦ: _____
ᖃᓄᖅᑕᐅᓴᖅᑯᑦ _____

3. ᖃᐅᔨᓴᕐᓂᐊᕐᕌᖅᑲᓂᕐᓂᐊᓪᓚᖅᑐᖅ ᓯᕗᓕᕐᕆᓪᓗ ᐊᑎᖅᑲ ᑐᑭᓯᑎᑲᓗ:

ᒪᑲ ᔾᕐᒪᓐ, ᐊᖏᓚᖅᑲᒃ ᐱᓕᕆᐊᖏᓚᓄᑦ ᐅᐊᐅᓚᐊᕐᐸ
ᐃᓄᓪᓚᓴᑐᖅᑯᑦ ᑲᓇᑕ
10th Floor, 25 Eddy Street
Gatineau, QC K1A 0H4

ᐅᖃᖅᑕᐅᑎᓪᓗ: 819-934-1188
ᓯᑲᓴᖅᑯᑦ: 819-934-9229
ᖃᓄᖅᑕᐅᓴᖅᑯᑦ mark.yetman@aandc.gc.ca

ᐃᓕᖅᑲ 2: ᑲᓚᓯᑲᐃᔨᓄᑦ ᑲᓚᓯᑲᖅᑕᐅᓴᖃᓕᑎᒋᓪᓗᒍ

1. ᑕᒪᖏᑦ ᓇᓗᓇᐃᖅᑕᐅᓂᖅᓴᓇᓗᑎᑦ ᑲᓚᑎᑦᓯᔨᑦ ᐊᐅᑐᐊᓕᓚᖓᔪᓐᓇᓂᖅᓴᒃ ᐱᓕᕆᐊᒃᓴᓪᓚᕆᔨᒃᑯᓂᖅᓴᒃ ᑐᓴᒃᑲᐅᑦᑎᓪᓗᒍ:

X	ᐊᖏᔪᑐᖅᓯᒪᓕᒃ ᐃᓄᓪᓕᐃᑦ ᑲᑐᔨᓴᖅᑎᑎᑦ (RIA)		ᑲᓇᑕᒥ ᖁᔭᓐᓄᑦᑎᐅᓂᐊᖅᑐᓄᑦ ᐊᑲᓂᖅᑕᐃᓕᓕᒫᑦ (CLS)
X	ᓄᓇᕗᑦ ᐃᓕᓕᒫᑦ ᑲᑎᒪᔨᖏᑦ (NWB)		ᑲᓇᑕᒥ ᐊᕐᕌᑎᓕᕆᔨᑦᑯᑦ (EC)
X	ᓄᓇᕗᑦ ᑮᖏᐃᔨᑦ ᑲᑎᒪᔨᖏᑦ (NPC)		ᓄᓇᕗᒥ ᓴᕐᓚᑦᑯᑦ (GN)
X	ᐃᓄᓪᓚᓴᑐᖅᑯᑦ (AANDC)		ᑲᓇᑕᒥ ᐅᓇᑕᖅᑐᔨᓕᓚᑦᑯᑦ (DND)
	ᐃᖅᑲᓗᓕᓚᑦᑯᑦ ᐊᒻᒪᓗ ᐃᓚᒥᐅᑕᓕᓚᑦᑯᑦ (DFO)		ᕼᐊᒻᒪᓚᓕᑦᑯᑦ
	ᓄᓇᓕᖏᓂ ᓴᕐᓚᓕᓕᓚᑦᑯᑦ ᐱᔨᑭᔪᖅᑎᑦᑐᓗ (CG&S)		ᑲᓇᑕᒥ ᒥᖅᐳᐃᓯᖅᓂᓕᓕᓚᑦᑯᑦ (PC)
	ᓄᓇᕗᒥ ᖃᐅᔨᓴᖅᑐᓕᓕᓚᑦᑯᑦ (NRI)		ᑲᓇᑕᒥ ᓂᖅᐊᑎᓕᓕᓚᑦ(CWS)
	ᐃᓕᖅᑭᓕᓕᓚᑦᑯᑦ ᐱᖅᑭᓕᓕᓚᑦᑯᑦᓗ ᓴᕐᓚᓕᑦᑯᓂ (C&H)		ᐊᓯᖏᑦ (ᓇᓗᓇᐃᖅᑐᑦ ᑭᑭᖅᓴᓐᓄᑦ):

2. ᑎᑎᕐᓗᒋᑦ ᐊᑐᕐᓂᖅ ᐱᓕᕆᓂᐅᑎᑦ, ᓕᐃᓴᑦ, ᐊᓯᖏᑦᓯᓂᖅ ᐊᑐᑕᐅᓕᕆᓂᖅᓯᒪᓕᒃ ᑐᓴᖅᑐᑎᑎᒍᑦ ᐱᓕᕆᔨᒃᑲᐅᓕᒫᑦ, ᐃᓕᓴᕐᕕᒃᓴᖅᑕᐅᓂᖅ ᐱᓕᕆᔨᒃᑲᐅᓕᒫᑦ:

- ᑎᐱᑦ-ᒥᑦ [Tibbit] ᑕᐃᑯᖏᑐ ᑕᓯᖏᐊᕐᖓ [Contwoyto] ᑲᑐᔪᖅᑎᑎᑦ ᐅᑭᐅᖅᑯᑦ ᐊᖏᑎᓄᑦ - ᐱᓕᕆᓂᖅᓴᖅᑐᑦ
ᓄᓇᒃ ᐊᑐᓵᓇᐅᑎ 75 M/11-1 (ᐅᐃᒍᖅ 1.). ᐊᑐᑎᖅᑲᓵᓂᔪᓐ ᐊᖏᕿᒥ 2033.

3. ᐊᖏᒧᑦ ᑎᑎᕋᔪᓂᑦ ᐱᓕᕆᓇᐅᑎᑕᑭᑎᕐᓂᕆᔨᒋᐊᖅᑐᑎᑦ, ᓕᐃᔪᖏᑕᑭᑎᑎᕐᓂᕆᔨᒋᐊᖅᑐᑎᒋᔪ, ᐅᕙᓚᓂᓵᓂ ᐊᓯᖏᑦᓯᓂᖅ ᐊᑐᑕᐅᓕᕆᓂᖅᓯᒪᓕᒃ ᐱᓕᕆᑎᖅᑐᓂᖅ ᑐᓴᖅᑐᑎᑎᒍᑦ ᐱᓕᕆᔨᒃᑲᐅᓕᒫᑦ:

- ᐃᓄᒋᓚᐅᑐᖅᑐᒍᑦ ᑲᓇᑕᒥ ᓄᓇᖏᓂᒃ ᐊᑐᑭᓇᐅᑎᑦ (ᐅᐱᒍᖅ 2)
- ᓄᓇᕗᑦᒥ ᐃᒪᒋᓚᐅᒃᑯᑦ ᑲᓇᑕᒥ ᐃᒪᓕᒍᑦ ᑕᐃᑕᓯ (ᐅᐃᒍᖅ 3)
- ᖃᑎᖅᑎᐅᑦ ᐃᓄᐃᑦ ᑲᑐᔪᖅᑎᑎᕐᓂᑦ ᐊᑐᑭᓇᖅᑐᓂᐊᖏᒪᑕ ᐃᓄᐃᑦ ᓄᓇᕋᑎᖅᑭᓂᒃᓂᒃ ᐱᓕᕆᓇᐅᑎ (ᐅᐃᒍᖅ 4)
- ᓄᓇᕗᑦᑎᒃ ᑮᓇᐅᔭᑦ ᒪᑐᓂᓂᐊᖏᓚᖓᒋᒪ ᖃᑎᖅᑭᑭᐊᖅᑐᑦ

3. 4. ᐅᓇ ᐱᓕᕆᐊᕆᔨᒪᔭᐃᑦ ᐅᕙᓚᓂᓵᓂᓂ ᓇᐅᒃᑯᑐᐃᓇᓐᓂᖅ ᓇᓕᓕᐊᑐᐃᓇᓐᓂᑦ ᐱᓕᕆᐊᕆᔨᒪᔭᒪᓕᒃ ᐃᓗᐊᓂᑐᑐᒍᑦ ᖃᑎᖅᑭᔭᐅᓂᒪᓕᕐᓂᓕᒫᑦ ᐅᕙᓚᓂᓵᓂ ᖃᐅᔨᓴᖅᑎᑎᓂᐊᓕᒫᑦ ᓄᓇᕗᒻᒥ ᐊᖏᕿᒥ ᐊᑐᑕᐅᓂᖅᓯᒪᔪᑦ ᑲᑎᒪᔨᓄᑦ ?

□ ᐃ X ᐊᖏᑲ

ᐃᓕᓴᕐᕕᑦ, ᑎᑎᕋᖅ ᐱᓕᕆᐊᕆᔨᒪᓕᒃ ᑕᐃᔨᓯᒪᓂᖅᑲ ᐊᓯᒪᓗ NIRB-ᒥᑦ ᑎᑎᕋᖅᓯᒪᓂᕐᓂᑎᒍᑦ ᓇᓱᐅᑎᖅᑲ

ᐃᓕᖅ 3: ᐱᓕᕆᐊᖃᐅᔨᓕᔪᑦ ᑐᖅᓯᖏᑦ ᖃᓄᐃᑦᑐᓂᖅᓯᓂᖅ ᐅᓂᒃᑲᖅ

1. **1.** ᓇᓗᓇᐃᖏᓐᓄᐃ ᑐᖅᓯᖏᑐᑎᖅᑯᑦ ᐱᓕᕆᐊᖃᓴᐅᔨᓕᔪᖅ (ᐃᓕᐃᑦᑐᒥᓴ ᓴᓂᕐᔭᑎᑦ ᑎᑎᖏᓐᓄᑦ ᐊᑐᖏᖅᑐᖅᑕᒥᓪᓗᑦ) [1,2]: (ᑕᑯᒋᐊᖏᓐᓄᐃ ᐊᑕᔪᖅ A ᐱᓕᕆᐊᖃᓴᐅᔨᑦ ᖃᓄᐃᑦᑐᒃᔪᑦ ᑐᑭᓯᑐᖅᑐᖏᓐᓄᑦᑕᐅᓯᒪᓂᕐᒥᑦ)

1	ᓯᓚ ᖃᓄᐃᑦᑐᑐᐃᓐᓇᓴᑯᑦ ᐊᖏᑎᑎᕆᓚᐅᔪᓂᖅ ᐅᓴᖃᓴᓯᐅᓴᖏᓚᐅᔪᓂᖅ	☐	**9**	ᐃᓂᑐᖃᖅᑐᓐᓂᓴ ᐊᖃᑭᖅᓯᐱᐃᓂᖅ/ ᓄᓇᒥᒃ ᐊᑦᖃᑭᖅᓯᐱᐃᓂᖅ	■
2	ᐅᑭᐅᓴᑯᑦ ᐊᑐᕆᐊᖃᓴᖅ /ᐅᓴᕐᓂᓴ ᖃᓄᐅᔨᒪᖃᓂᓴ	■	**10**	ᐅᖃᓯᔪᐊᖃᓯᐅᔪᓂᖅ ᓄᓇᒋᑦᑐᑐᖃᓂᓪᓗ ᒪᓕᒥᖃᓯᐅᔪᓂᖅ	☐
3	ᓴᙱᕆᔨᖃᓴᓯᐅᔪᓂᖅ (ᓄᓇᐅᑦ ᖃᐅᖏᓂᓴ ᑎᓐᓕᔪᓴᑯᑦ)	☐	**11**	ᑕᕆᐅᑐᐃᓐᓇᕐᒥ ᐱᓕᕆᐊᖃᓴᐅᔨᑦ	☐
4	ᓯᑲᒪᒍᖃᓴᓂᖅᓯᓪᓚᔪᑦ ᓴᙱᕆᔨᖃᓴᓯᐅᔪᓂᖅᓕᒪᑦ ᓄᓇᐅᑦ ᐃᑭᐊᖏᓚᐃᓂᓕᓂᓴ ᖃᓄᐅᔨᓴᓂᖅ	☐	**12**	ᖃᓄᐅᔨᓴᓂᖅ/ᐅᑭᐅᖃᓄᑕᖃᓐᒍᑦ ᖃᓄᐅᔨᓴᓂᐅᔨᑦ ᐊᑦᕿᔪᖏᓚ ᖃᓄᐅᔨᓴᓯᑕᐅᓂᖏᓚ*	☐
5	ᐅᓴᕐᓯᐅᔪᓂᖅᓯᓂᖅ/ᐅᓴᕐᓄᑕᒪᐅᔨᓂᓴ ᐊᒥᓯᓂᓴ ᖃᓄᐅᔨᓴᓂᖅ	☐	**13**	ᐊᖏᓚᓯᐊᖃᓂᓪᓗᑦ ᐱᓕᕆᐊᖃᓴᓴᓴᑦ *	☐
6	ᐃᑎᖃᓴᐃᑦ/ᑐᐊᐸᓴᑕᙱᓪᓗᓐ	☐	**14**	ᐳᓪᓕᖃᓴᑐᓂᓪᓗᒍᐊᓪᓚᖏᓚᔪᑦ *	☐
7	ᑕᕆᐅᒥ ᓴᓇᓴᐅᓯᒪᔪᑦ (ᐅᒥᐊᖃᓯᐊᙱᓴ, ᒪᑦᓪᓗᐊᖃᑕᐃᓪᓕᔪᑦ, ᐃᓴᓴᖃᙱᓴ)	☐	**15**	ᐊᓯᖏᓚ [2]:	☐
8	ᖃᓄᐃᑎᒥ ᐃᑎᓂᓴᖃᓴᑎᑎᕐᓴᓴᐊᕆᓚᖏᓪᓂᓴ ᐃᓗᓪᓕᓪᓂᓴ ᖃᓄᐅᔨᓴᓂᖅ ᐅᓴᖃᑕᓪᓕᓂ ᖃᓄᐅᔨᓴᑭᑎᓴᑯᑦ ᐅᓴᑐᓴᑎᑎᓴᑯᑦ	☐			☐

ᖃᓄᐅᔨᒪᓕᐅᕕᒪᐊᖃᓴᖃᓄᖅ:

1. ᖃᓄᐃᑦᑐᑐᐃᓐᓇᐃᑦ ᐱᓕᕆᐊᖃᓪᓚᑯᑦᓯᓐ ᑎᑎᕋᖃᓯᒪᔨᐃᓐᓇᓚᐃᑦ, ᑭᓯᐊᓂ (*)-ᒥᓴ ᓴᓂᕐᔭᑎᑦ ᑎᑎᖃᓯᒪᔨᑦ, ᐱᓕᕆᐊᖃᖅᑭᒪᔨᖏᓚ ᖃᓄᐃᑦᓯᓴᕆᐊᖃᓴᖃᓂᐊᖃᒋᔨᖏᓚᑕᐅᓴᖏᓚ **ᐃᓕᓐᓄ 2-ᒦᑦᑐᒥᖃᑕᐅᓴᖏᓚ ᐱᓕᕆᐊᖃᓕᒫᓂᕆᑕᓐᓄᑦᓂᓪᓕ ᑐᓴᓴᒃᑲᐅᑎᓂᒃᑲᓴᓂᓂᓴᓂᓴᓂᓴ Project Specific Information Requirement (PSIR) ᑕᑕᑎᖃᓯᒪᔪᓐᓄᓂᓪᓕ**. Ċᓐᓇ NIRB-ᑯᓐᓂᓪᓕ ᑐᓴᓴᖃᑐᑕᐅᓂᓐᓄ ᐱᓴᓰᖃᓴᓯᒪᔨᖏᑎᑐᑦ ᐃᓴᓕᓴᒃᑲᓴᐅᔨᐅᓇᓐᓄᓴᓕᓐᓄᑐᑦ Ċᓐᓇ ᐃᓕᓐᓄ 2 PSIR ᑕᑕᑎᖃᓯᒪᔪᓰᓐᓂᑐᑐᖃᓴᓴᑦ.
2. ᖃᓄᐅᔨᒪᔪᐅᓴᓯᐊᖃᓕᒫᖃᓄᖅ ᐱᔪᓰᖃᑕᐅᔨᓐᓇᓕᑯᑦᓂᓗᐃ NIRB-ᑯᓐᓂᓪᓕ ᐱᓕᕆᐊᖃᓪᓚᑯᐅᓪᓕᓯᓂᐊᖃᓪᓚᑯᒫᖃᓄᖅᑕᖏᓚ,tĊᒃᑯᐊ NIRB-ᑯᑦ ᖃᓄᖏᑐᐃᓐᓇᓴᓯᓴᐊᖃᓄᖅ ᑐᓴᓴᑎᑎᖃᓄᑐᐃᓐᓇᓚᖏᓴᓯᐊᓂᓐᓄᓴ ᐱᓕᕆᐊᖃᓪᓚᑯᐅᓪᓕᓯᓂᐊᖃᓪᓚᖏᓚᓂᓴ.
3. “ᐊᓯᖏᓐᓄᑦ” ᓂᕈᐊᖃᖅᑕᐅᔪᓂ, ᖃᓄᐅᔨᓕᐊᖃᖅᑲᓐᓇᓪᓚᑯᒫᖃᓄᖅᑕᑎᑦ NIRB-ᑯᑦ ᖃᓄᓂᖅ ᐱᓕᕆᐊᖃᓪᓚᑯᐊᖃᓪᓚᑯᒫᖃᓄᖅᖏᓚᓯᐅᑦ ᐃᓕᓐᓄ 2 PSIR ᑕᑕᑎᖃᓯᒪᔪᓪᓚᑯᒫᖃᓄᖅᑕᐅᓴᖏᓚᓂᓴᓂᓴᓂᓴ.

2. ᐱᓕᕆᐊᑲᓴᓄᑦ 3, 4 ᐅᕐᓂᒧᓐᓄᑦ 5 ᖃᑦᓯᓂᑐᓂᑐᑦ ᓂᕈᐊᖅᑕᐅᓐᓂᕈᑎᒃ, ᖃᓄᐃᕐᑐᑦᓯᓚᕆᐊᖅᑎᑦ ᑎᑎᕋᖅᑕᕈᓚᕐᔪᐊᖅᑐᓄᑦ.

	ᓴᖅᑭᑲᓴᐃᑦ (ᓵᖅ zinc, ᑲᓐᖅ copper, ᔪᓕ gold, ᓱᐅᓐᖅ silver,ᐊᓱᖅᑎᓕᒐ)_____
	ᑕᐃᒪᓐ
	ᓯᕋᐃᓂᐊᒡ
	ᐊᓱᖅᑎᑦ: _____

3a. ᐱᓕᕆᐊᑲᓴᐅᔪᓂ 12, 13 ᐅᕐᓂᒧᓐᓂᑦ 14 ᖃᑦᓯᓂ ᓂᕈᐊᖅᑕᐅᓐᓂᕈᑎᒃ, ᐊᑎᓕᓱᖅᓯᓐᓂᒋᖅ ᐱᔨᔪᓐᓇᖅ ᐊᐱᖅᑯᑕᐅᓱᒪᔨᓐᓇ ᑭᐅᓇᑎᑦ ᐊᑕᓂᒋᑦ.

ᐃᖅᑎᖅᓯᑕᐅᓂᐊᖅᑐᖅᖢᖅ (ᑦ)	ᖃᓄᐃᑦ	ᖃᓄᖅ ᐊᑐᖅᑕᐅᓂᐊᖅᓯᒪᓕᖅ	ᖃᓄᐅᑎᑦ
ᐅᓄᑐᑎᑦᓇᔪ: ᖃᑦᓯᔪᓕᓄ	*1*	*ᐱᓕᕆᐊᓘᖅᓱᐃᐅᔨᓂᑦ (ᔨᓂᓄ) ᐊᓱᔪᖅᑐᑕᐅᖃᓄᖅᑕᖅᑎᑦᓇᓂᓂ*	*6 -ᓂᓄ ᐅᑦᓇᓂᓄ*

3b. ᐅᖃᓄᐅᔪᓚᓇᑎᑦ ᑐᓚᓄᑕᖃᖅᑎᖅᓄᖅᑦᑦ, ᐅᔪᐊᓄᑯᓄᑕᖃᖅᑎᖅᓄᖅᑦᑦ, ᒥᑦᑕᖃᖅᑎᖅᓄᖅᑦᑦ, ᐅᕐᓂᒧᓐᓂᑦ ᑐᓄᔪᑐᑎᑎᔪᑦ ᐱᓕᕆᐊᖅᓯᒪᔪᖅᑎᑦ. ᐱᔨᑎᖅᑎᖅᑐᓇᓂᑦ ᐃᓚᖓᓂᑦ ᐊᒪᓗ ᓴᓇᔨᐅᓂᓂ ᐃᓚᖓᓂᑦ 2-ᑯᓴᖅᑐᑦ ᑕᑎᑎᖅᓴᖅᑐᐃᓐᓇᐊᖅᑎᓂᕐᓂᓄᓂᓂᓂ

_____ _____

_____ _____

_____ _____

6a. ᐊᐃᓴᖅᓯᒪᔨᖅᓂᒥᒥ (ᑎᑎᕐᓗᓂ ᑕᒪᐃᑦ ᐊᑐᖅᑯᓂᐅᕐᖓᑦ):

☐ ᖃᑉᑭᖅᑕᔪᓐᓇ ᐅᐊᖅᓇᖅᓱᓂ	☐ ᑭᓯᓕᖅᒥ	☒ ᖃᑎᖅᒥᐅᓂ	☐ ᓄᓇᕗᖅᓯᐅᔨᓐᓇ ᑭᖅᓕᓕᖅᑐᑦᓯᐊᖅᑐᑦ: _____
☐ ᖃᑉᑭᖅᑕᔪᓐᓇ ᓂᒋᐊᓂ	☐ ᒥᖓᔪᐃᖅᓯᓯᓇᖅᒥ		

6b. ᐅᖅᑲᓯᓚᕐᓯᐊᖅᑐᓗᔪ ᓄᓇᕗᓂ ᓇᓕᐊᖅᓂ ᐊᐃᓴᖅᓯᒪᔨᖅᓂᖅᓱᓂᑲᓐᓂᖅᓂᖅ ᑐᓴᓯᖅᑐᑎᑎᔪᓕ ᐱᓕᓚᐊᓚᐅᒪᔭᐃᑦ, ᓇᓇᕗᖅᓂᖅ ᓄᓇᕗᑦ ᓇᓕᐊᖅᓂᖅ ᓴᓪᓕᐊᓂᖅᓱᓂᑲᓐᓂᖅᓂᖅᓗᓂ.

ᐅᓇ ᐃᓂᖅᓱ ᓇᓕᖅᑲᓕᓕᖅᑐᑎᑕᐅᓂᖅᓱᖅ ᐱᓕᓚᐊᖅᔪᓂᖅᑐᖅ ᐃᑲᓯᓇᖅᑕᐅᓂᓂᒥ ᐃᓄᖅᑎᓯᓂᖅᑐᑦ ᑕᕼᐃᕐᕼᐅᐊᖅ ᑕᓯᔨᐊᖅᑐᖅ [Jericho Mine] ᑕᐅᖅᓂᑎᖅ 260 ᑭᓚᒋᑦ ᓂᒋᐊᓂ ᑲᓇᖅᑐᖅᓱᓂ, ᓇᓇᖅᓂ ᐊᓚᓗ 30 ᑭᓚᒋᑦ ᐅᐊᖅᓇᖅᓱ ᔅᐱᐠ [Lupin Mine] ᐅᖅᑎᖅᓂᐊᖅᓴᖅ ᑕᐅᖅᓂ ᑕᓯᔨᐊᖅᓱᖅ-ᐃᔨᓪ [Contwoyto-Itchen] ᓇᓇᖅᓱᓂᖅᓂ.

6c. ᑎᑎᕋᐅᓯᓚᓗᔪ ᐱᓕᓚᐊᓚᖅᓴᒋᔨᓴᓴᑦ ᐃᓂᖅᓱ ᐱᓕᓚᐊᓚᖅᓴᐃᐅᓕᐅᑦᓯᓚᔨᕋᓚᐊᖅᓱᓂᖅᓂᖅ.

ᐅᓇ ᑕᕼᐃᕐᕼᐅᐊᖅᑐ ᑕᓯᔨᐊᖅᑐ ᐅᖅᑎᖅᓂᐊᖅᓴᖅ ᒪᑐᐃᓕᐅᑦᓯᓚᔨᖅᑐᖅ 2006 ᒐᐅᓇᖅᓱᑦ ᑎᕼᐃᐅᓕ ᑕᐃᒪᖅᓵ ᑯᐊᐳᓵᓵᖅ [Tahera Diamond Corporation] ᐅᑯᐊᓗ ᑭᓇᐅᖅᑎᖃᖅᓂᖅᓯᓚᔨᓂ ᑲᑕᓯᓚᔨᓗᑎᖅ 2008-ᒥ. ᓯᐅ ᑕᐃᒪᖅᓵ ᑯᐊᐳᓵᓵᖅ [Shear Diamonds Corp] ᓇᖅᒥᓂᖅᒎᓕᐅᑦᓯᓚᖅᓱᓂᑦ ᒐᖓᓇ ᑕᕼᐃᕐᕼᐅᐊᖅᑐ ᑕᓯᔨᐊᖅᑐᖅ ᐅᖅᑎᖅᓂᐊᖅᓴᖅ ᑕᐃᑲᓂ 2010 ᐊᓚᓗ ᐃᖅᑎᕋᑎᑦᓗᔪ ᐅᖅᑎᖅᓂᐊᖅᓴᖅᓗᑎᖅ ᐊᓚᔪᑦ <ᕋᓯᐅᐅᓗᑎᖅ ᐊᓚᓗ ᓴᓇᐅᑦᓯᖅᑕᖅᓗᑎᖅ ᑎᑭᖃᓇᓱᖅᓂᖅᓱᓂ 2012 ᑕᐃᑲᓂ ᓯᐅ ᓄᓕᐅᑦᓯᓚᖅᓱᓂᖅᓂᖅ ᑕᕼᐃᕐᕼᐅᐊᖅ ᑕᓯᔨᐊᖅᑐᖅ ᐊᐅᓚᓐᓂᖅᓱᓂᖅᓂᖅ. ᐃᓄᓕᓐᓂᑦᓯᖅᑲᓕᐅᑦ ᑲᓇᖅᓗᔪ ᐊᓕᓚᐊᓚᖅᓴᖅᓂᖅ ᓴᓪᓕᐊᓂᖅᓱᓂᖅᓗᑎᖅ ᑕᕼᐃᕐᕼᐅᐊᖅ ᑕᓯᔨᐊᖅᑐᖅ ᐅᖅᑎᖅᓂᐊᖅᓴᖅ ᑕᐃᒪᓕᖅᓂᑦ >ᓴᓐᓇᖅ 2013, ᐊᓚᓗ ᐊᐅᓕᓐᓗᔪ ᑕᕼᐃᕐᕼᐅᐊᖅ ᑕᓯᔨᐊᖅᑐᖅ ᐅᖅᑎᖅᓂᐊᖅᓴᖅ ᑕᐃᒪᓕᖅᓂᑦ ᐅᓇᓐᓇᖅ 2014.

ᐅᓇ ᐊᑭᑭᓯᒪᓂᑦᓴᖅᓐᓇ ᐅᖅᑎᖅᓂᐊᖅᓴᖅ <ᓴᓇᐅᑎᑦᓴᖅᑦ ᐊᑭᑭᖅᑕᐅᓕᐅᓂᖅᑐᑦ ᐱᓕᓚᐊᖅᔪᓕᑦ 8-ᓄᓕ ᐊᑎᖏᔪᓄᓕ ᐃᖅᑎᕋᑎᑦᓗᔪ ᐊᓚᓗ ᐱᓴᐃᓕᓗᑎᖅ ᐱᓴᐃᓕᓗᑎᖅ ᐊᑭᑭᖅᑕᐅᓕᐅᓂᖅᑐᑦ ᐊᓚᓗ ᓇᓇᕋᖅᓴᓂᖅ ᐊᑐᖅᑕᓂᖅᑐᑦ ᐅᖅᑎᖅᓂᐊᖅᓴᖅᓴᖅᑎᖅᓗᑎᖅ ᐊᓚᓗ ᓄᓇᕗᓂ ᐃᑭᐊᖅᓱᓂ ᐱᓕᓚᔪᓐᓇᖅᓂᖅᓂᖅ ᐊᑐᖅᑕᓂᖅᑐᑦ ᐊᓚᓗ ᐊᑐᖅᑕᓂᖅᑐᑦ ᓴᓇᐅᑦᓯᖅᑕᖅᓗᑎᖅ ᐊᐅᓚᓐᓂᖅᓱᓂᖅᓂᖅ. ᐅᓇ ᐅᖅᑎᖅᓂᐊᖅᓴᖅᓗᒋ ᓴᓇᐅᖅ ᐱᓯᓕᓕᐅᓯᖅᑐᖅᑕᖅᑦ ᐊᓯᐊᓄᓕ ᓴᓇᐅᑦᓯᖅᑕᖅᓗᑎᖅ ᐅᖅᑎᖅᓂᐊᖅᓴᖅᓴᖅᑎᖅᓗᑎᖅ ᓄᓇᕗᓂ ᐃᑭᐊᖅᓱᓂ.

6d. ᓇᖅᒥᓂᖅ ᖃᐅᔨᒪᔭᖃᑎᖅᓚᐊᖅᓴᖅ ᐃᓕᓴᖅᓂᑕᖃᖅᑕᖃᐅᑎᖅᓚᐊᖅᓱᓂᖅᓂᖅ /ᑐᐱᖅᖅᓂᖅᑕᖃᐅᑎᖅᓚᐊᖅᓱᓂᖅᓗᑎᖅ ᐅᖅᑲᐅᓯᒪᔪᖅ.

ᑎᑎᐃᐅᓕ ᓯᐅᓕᓕᒥᐅᑦ ᐱᓇᓱᓇᐅᑎᑕᒥᑦ ᐅᓪᑐᑎᑎᓱᓄᑦ ᐅᖅᑲᖅᓯᒪᓕᐅᖅᑐᑦ ᐱᓴᓱᖅᓂᐊᖅᓴᖅᓗᒋ ᐃᑕᖅᓂᑕᖅᑐᑦᓯᓚᖅᓱᓂᖅᓂᖅ ᐊᐃᑐᖅᑕᐅᓴᖅᓯᒪᓕᖅᓂᑦ ᖃᐅᔨᓴᖅᑎᑦᓯᐊᖅᓂᖅ. ᓇᓂᔪᑎᖅ ᑎᑎᕋᖅᓗᑎᑦ ᑐᐳᓯᓇᖅᓯᒪᓂᕋᓂᕐᔪᐊᑎᑦᓂᑦ ᐃᓕᓴᖅ: “ᐱᑕᒃᓱᖅᓂᑐᖅ 25 ᐃᑕᖅᓂᑕᖅᑎᖅᓴᐅᔨᑦ ᓇᓗᓇᐃᖅᑕᐅᓯᒪᔪᑦ ᐃᓂᖅᓂᓱᓂ ᐊᐅᓚᐅᖅᑐᖅ ᐱᓕᓚᐊᖅᓱᓂᖅᓂᖅ ᐊᑐᐃᑦᓴᖅᑐᑦ ᐊᐅᓚᐅᖅᑐᖅ ᐱᓕᓚᐊᖅᓱᓂᖅᓂᖅ ᐊᐅᓚᐅᖅᑐᖅ ᐊᐅᓚᐅᖅᑐᖅ ᐊᐅᓚᐅᖅᑐ

7. ᓄᓇᐅᔭᒃ ᐱᓱᕈᕆᖅᑐᑐᖅ (ᑕᒪᐃᑦ ᐊᑐᕆᓂᖅᑐᑦᓯᐊᖅᑐᑦ ᑎᑎᒍᑦ):

X	ᑲᓇᑕᐅᑉ ᓴᖅᓚᖓᑦᑕ ᓄᓇᕆᑎᖓ		ᑲᒥᓱᓇᐅᑉ ᓄᓇᕆᑎᖓ		ᕼᐊᒪᓪᓕᐅᑉ ᓄᓇᕆᑎᖓ
X	ᐃᓄᐃᑦ ᓇᖏᒥᓂᕿᖓᓐᓂᒃ ᓄᓇᐅᑉ ᖁᑦᖓᓂᒋᑦ		ᐃᓄᐃᑦ ᓇᖏᒥᓂᕿᖓᓐᓂᒃ ᓄᓇᐅᑉ ᐃᑭᐊᖓᓂᒋᑦ		

8a. ᓄᓇᖕᒪᐊᖅᑎᒍᑦ ᓱᒃᑯᓱᑦᓪᓕᐊᖓᓐᓂᒪᖓᖅ:

Min ᐊᖏᒍᑦ (degree/minute)	65 ° 58 ’ 59.92 ” ᐅᐊᖏᓇᖓ	Min ᓴᓂᒍᑦ (degree/minute)	111 ° 25 ’ 57.53 ” ᐱᓇᖏᓇᖓ
Max ᐊᖏᒍᑦ (degree/minute)	66 ° 02 ’ 00.81 ” ᐅᐊᖏᓇᖓ	Max ᓴᓂᒍᑦ (degree/minute)	111 ° 32 ’ 01.93 ” ᐱᓇᖏᓇᖓ

ᓄᓇᖕᖓᔪᐊᒥ ᐅᒥᖕᖓ 076L04; 076E13, 076L03; 076E14
ᐊᓴᐅᑎᖅᑐᕐᑐᑦ:
(ᐱᓕᕆᐊᓕᓂᐊᖅᑕᐃᓕᑦ ᓄᓇᖕᖓᐊᑦ ᐃᓕᖅᑭᐅᑎᓂᐊᖅᑐᐸᑎᑦ (1:50,000 ᐊᑐᐃᓐᓇᐅᔪᖅᑕᕆᖅᑐᓂᕐᒃ, 1:250, 000 ᐃᓕᖅᑭᐅᑎᑦᓯᓚᑎᐊᓪᓚᑦ) ᑲᓇᑕᐅᑉ ᓄᓇᒥᐅᑕᓕᓚᐅᔨᓴᕐᓂᓐᓂ ᐊᑐᐃᓐᓇᐅᔪᖅᑕᕆᖅᑐᖅᑐᖅ)

8b. ᑐᑭᓯᖅᑐᑎᑎᒍᑦ ᐱᓕᕆᐊᓕᓚᐅᔪᓐᓇᑦ ᐃᓚᓐᑐᖅᑎᓂᐊᕐᓂᓐᓂᑦ ᑐᐱᖅᑕᖅᐅᓂᐊᕐᓂᓐᓂᑦ,
ᓱᒃᑯᓱᐊᓂᑦᓯᓚᖓᓕᕆᓂᕐᓂᓂᒃ ᓄᓇᖕᖓᐊᑦ ᐊᑐᐃᓐᓇᐅᑎᓱᓂᐊᖅᑐᐸᑎᑦ>ᑎᑦ

Min ᐊᖏᒍᑦ (degree/minute)	65 ° 59 ’26.25” ᐅᐊᖏᓇᖓ	Min Long (degree/minute)	111 ° 30 ’08.99 ” ᐱᓇᖏᓇᖓ
Max ᐊᖏᒍᑦ (degree/minute)	65 ° 59 ’26.25” ᐅᐊᖏᓇᖓ	Max Long (degree/minute)	111 ° 30 ’08.99 ” ᐱᓇᖏᓇᖓ

ᖃᐅᔨᓴᓕᑐᐃᓐᓇᐸᒃᓴᐅ :
ᓄᓇᖕᖓᔪᐊᒥ ᐅᒥᖕᖓ 076L03
ᐊᓴᐅᑎᖅᑐᕐᑐᑦ:
(ᐱᓕᕆᐊᓕᓂᐊᖅᑕᐃᓕᑦ ᓄᓇᖕᖓᐊᑦ ᐃᓕᖅᑭᐅᑎᓂᐊᖅᑐᐸᑎᑦ (1:50,000 ᐊᑐᐃᓐᓇᐅᔪᖅᑕᕆᖅᑐᓂᕐᒃ, 1:250, 000 ᐃᓕᖅᑭᐅᑎᑦᓯᓚᑎᐊᓪᓚᑦ) ᑲᓇᑕᐅᑉ ᓄᓇᒥᐅᑕᓕᓚᐅᔨᓴᕐᓂᓐᓂᑦ ᐊᑐᐃᓐᓇᐅᔪᖅᑕᕆᖅᑐᖅᑐᖅ)

ᖃᐅᔨᒪᓕᕆᐅᓂᐊᖅᑯᓂᖅ ᓱᒃᑯᓱᑦᓚᓇᖏᑦᑐᕆᐊᖓᓐᓂᒃ ᐱᓕᕆᐊᓕᓚᐅᔨᓴᒪᓕᔪᑦ ᑐᓴᒪᒃᓴᐅᑎᐅᒪᒃᓴᒃᖯᓂᓂᒃ ᑐᑭᓯᖅᑐᓴᕐᐳᐅᒃᖯᓐᓇᐅᓚᐅᓂᐊᖅᑎᓂᓂᒃ ᐱᓕᕆᐊᓕᓚᐅᔨᓴᒪᓕᔪᑦᓯᓚᐅᑎᓂᓂᒃ ᑐᑭᓯᖅᑐᑕᐅᔨᐊᕐᓂᓗᓂ (PSIR). ᖃᒃᓚᑕᐅᔪᖅᑎᒍᑦ ᓄᓇᖕᖓᔪᐊᓕᕐᐳᓂᓕᖅᑐᓐᓇᑐᐊᓚᐅᖃᖅᑐᖅᑐᖅ (GIS).

ᐃᓕᖕᖓ 4: ᑐᑭᓯᖅᑐᑎᒃᓯᑦ ᐱᓕᕆᐊᓚᐅᔨᔨᓕᔪᑦᑕ ᖃᒃᓄᐃᑦᑐᑐᓯᐊᕐᓂᖓᓐᓄᑦᓄᑦ ᐅᖃᒃᐅᓯᐅᑎᖓᓐᓂᖓ

ᐃᓕᖅᑭᐅᑎᓗᒍ ᑐᑭᓯᖅᑐᑎᒃᓯᑦ ᐱᓕᕆᐊᓕᓚᐅᔨᔨᓕᔪᑦᑕ ᖃᒃᓄᐃᑦᑐᑐᓯᐊᕐᓂᖓᓐᓄᑦᓄᑦ, ᒡᒃᓯᐊ ᑎᑎᕐᖅᑕᑎᑦ 500-ᓂᒃ ᐅᖃᒃᐅᓯᑎᑦ ᑎᑎᕐᖅᑎᓚᐊᖅᑎᖅᑐᑦ ᖃᒃᖏᑎᐅᓯᒪᓚᐊᖅᑎᒃᖳᑎᑦᑐᑦ, ᖃᒃᓕᓗᓀᑎᑦᓗᓐᓂᓄᑦᓄᑦ ᐃᓄᒃᑎᑦᓗᓐᓂᓄᑦᓄᑦ (+ᐃᓄᐃᓐᓇᖅᑎᑦᓗᓐᓂᓄᑦᓄᑦ, ᖁᑎᕐᒥᐅᓄᓄᓕᕐᓂᓂᒃ). ᐱᓕᕆᐊᓚᐅᔨᔨᓕᔪᑦᑕ ᐅᖃᒃᐅᓯᐅᓂᖓᓐᓂ ᐅᑯᓂᖓᓐᓂ ᐃᓗᓕᑦᑎᒃᓴᖅᑎᑐᖅᑐᖅ:

- ᐱᓕᕆᐊᓂᒃᓴᑦ ᐱᓕᕆᐊᓕᓚᐅᔨᓕᖅᑐᑦ, ᐱᓕᖃᒃᓚᐊᖅᑎᓂᓐᓂᒋᓕᓗᑦ ᐊᒪᓗᑦ ᖃᒃᓄᖓᑎᑦ ᐱᓕᕆᐊᓕᓚᐅᔨᓕᖅᑐᑦᓚᐊᓕᖅᑐᓂᒃ;
- ᐊᐅᓕᓗᒃᑕᐅᑎᐅᓕᖅᑐᑦ ᐊᐸᒪᓗᒋᑕᐅᓕᖅᑐᑦ;
- ᓱᓇᐃᐃᓐᓇᑦ ᓇᕐᓂᖃᒃᑎᑕᐅᓕᖅᑐᑦ (ᓇᕐᓯᑯᓐᓕᖅᑐᑦ/ ᐊᑐᖃᑕᐅᒃᐃᓐᓇᓕᖅᑐᑦᓗᓐᓂᓐᓂᒃ);
- ᐊᓱᓂᖓᓂ ᐊᑐᖃᑕᐅᓂᒋᐅᓐᓇᖃᑦᑐᑦ; ᐊᒪᓗᑦ
- ᓱᔭᓕᒃᓴᑯᓗᒍᑦ ᓴᓇᔨᐅᐸᓂᐊᓕᓕᖅᑎᖃᖅᑐᑦ, ᓴᓇᔨᐅᓕᐊᕆᓱᒃᓴᐅᔨᓚᓐᓂᓗ ᓱᓇᒪᑦ ᐊᑐᖃᑕᐅᓕᐊᓚᖓᓂᓐᓂᓄᑦᓄᑦ ᐱᓕᕆᐊᓚᖏᐃᐅᓕᐊᓕᖅᑐᑦᑐᖅ ᐊᑐᖃᑕᐅᓕᐊᓚᖓᓂᑦ.

ᖃᐅᔨᓴᓕᕐᓂᓪᓚᑎᐊᖅᑐᖃᖅᑐᖅ: ᐱᓕᕆᐊᓚᕐᐅᑎᐊᓴᕐᓂ NIRB PART 2 PSIR-ᒧᑦ ᑕᑎᑭᑕᑎᖃᓚᐊᖅᑎᓂᕈᑎᖅ ᐃᓕᓴᐅ 8-ᑭᑦᑐᖅ ᑭᓯᐊᓂ ᑕᑎᑎᖃᑕᐅᔨᓚᐊᖅᑎᖃᖅᑐᖅ ᑕᒪᓐᓇᑐᐊᐊᖓᔪᓄᓂ, ᐊᓯᖏᑦᓂ ᐃᓕᓴᐅ 5-ᒥᒃ ᐱᑎᐊᖅᐸᑎᓄᒍ ᑕᑎᑎᖃᑕᐅᔨᓚᐊᖅᑎᖃᖅᑐᖅ.

ᐃᓕᓴᐅ 5: ᐊᑐᖃᑕᐅᓕᒃᖏᑦ ᐊᑐᖃᑕᐅᓂᐊᖅᓂᖏᑦ

1. ᐱᖅᑯᑎᑦ ᐊᑐᖃᑕᐅᓂᐊᖅᑐᑦ ᑎᑎᕖᖅᓗᑎᑦ (ᐃᓕᖃᕆᓯᐅᑎᓗᑎᑦ ᐃᑯᑕᑭᑎᑦ, ᐅᖃᓕᖅᑐᑐᐃᑎᑦ, ᑎᖏᒥᓱᑦ, ᓄᓇᕗᑯᓱᑦ, ᐊᓯᖏᓚᐅᖏᓪᓗ.):

ᖃᓄᐃᑐᖅ ᐱᖅᑯᑦ ᓇᓴᐅᑎᖏᓐᓄᓗ	ᐊᖏᑕᓂᖏᓐ – ᑕᑭᓂᖏᓐ >ᖃᑐᓂ	ᓯᓚᒥᑦ

2a. ᐅᖃᓕᒃᖏᐃᑦ ᐊᑦᑕᓇᖅᑐᖅᑎᑦᓗ ᐊᑐᖃᑕᐅᓂᐅᓴᐊᓪᓚᑦ ᐅᖃᐅᓕᐅᑦᓕᐊᓚᐊᓯᓪᓕᑦ:

ᐅᖃᓕᒃᖏᐃᑦ	ᐅᖃᓕᓴᐃᐅᑎᑦ ᐊᑐᖃᑕᐅᓂᐊᖅᑐᑦ ᐃᒪᖃᖅᑎᑎᓂᓂᖏᑦᓗ ᖃᐅᑦᑕᐅᔪᐃᑦ	ᐅᖃᓕᒃᖏᐃᑦ ᐊᑐᖃᑕᐅᓂᐊᖅᑐᑦ ᑲᑎᑦᓗᑎᑦ (ᓯᓚᑕᐃᑦ ᐊᑐᖏᓗᑎᑦ)	ᖃᓄᐃᑦ ᑐᖅᑯᖃᑕᐅᓕᒪᓂᐅᔪᓕᐅᑦ
ᐅᖃᓕᓴᕐᔪᐊᖃᖅ			
ᓴᓴᓯᖃᖅ			
ᑎᓐᓚᕐᔪᖃᓕᓴᐅᑎᑦ			
ᐳᑦᑕᓯᑦ			
ᐊᓕᓐᓂᑦ			
ᐊᑦᑕᓇᖅᑐᖃᖅᑕᓯᑦ ᐃᓕᐅᕐᓇᖅᓕᕐᓗᓓ		ᑲᑎᑦᓗᑎᑦ ᐊᑦᑕᓇᖅᑐᖃᖅᑕᓯᑦ ᐃᓕᐅᕐᓇᖅᓕᕐᓗᓓ (ᓯᓚᑕᐃᑦ ᐊᑐᖏᓗᑎᑦ)	

2b. ᑯᐃᕐᓂᖅᑕᖏᓂᐅᓴᐃᖅᑎᑦᓗᒍ ᖃᓄᖅ ᐸᖏᓇᐅᑎᖃᖏᓂᐅᓴᐊᓚᐊᐃᐃᑦ ᑯᐃᕐᓂᖅᑕᖏᓂᖅᐸᑦ ᐅᖃᐅᓕᐅᓚᑦᓕᐊᐅᒃ .

3a. ᖃᓄᐅᑎᑎ ᐃᒪᒥᒃ ᐊᑐᖃᑦᑕᖏᓂᐊᕿᓕᖅᓴᓚᖅᑕᑦ

ᐅᓪᓗ ᑕᒪᖅ ᐱᖓᓕᐊᖅᑎᖏᓪᓗᒍ (m³)	ᓕᓚᒥᑦ ᖃᓄᐅᖏᓪᓗ ᐃᒥᖅᑕᖃᑦᑕᖏᓂᐊᓚᐊᐃᐃᑦ	ᓇᐹᑦ ᐃᒥᖅᑕᖃᑦᑕᖏᓂᐊᓚᐊᐃᐃᑦ

3b. ᐃᒥᖅᑕᖅᑕᕋᓂᐊᕋᓂᒍᑦ ᓄᓇᕗᒥ ᐃᒪᓕᕆᓂᖅᓴᑦ ᑲᑎᒪᔨᓂᖅ ᓕᐃᓴᐅᓚᑕᕐᓯᐊᖅᐱᑦ ?

☐ ᐊ ☐ ᐊᖏᑐ

ᐊ-ᖃᓄᓂᕈᓂ, ᖃᓄᐃᑕᑐᖅᓄᑦ ᓕᐃᓴᖅᓯᑎᒍᑦ ?

☐ Class A ᐃᒥᖅᑕᕋᓂᒍᑦ ᓕᐃᓴᐅᓴ

☐ Class B ᐃᒥᖅᑕᕋᓂᒍᑦ ᓕᐃᓴᐅᓴ

ᐃᓕᖅ 6: ᐊᐅᑕᑯᑦ ᐃᑎᐅᖃᖅᑕᐅᓂᐊᖅᓂᖅᐳᓐᓄᑦ ᓴᓗᓚᖅᓴᐃᓂᖅᒧᑦᓗ

1. ᑎᑎᕕᖅᓗᑎᑦ ᐊᐅᑕᖅᑕᐅᓵᐅᓴᑦ ᑐᐱᓯᖅᑐᑎᐅᑯᑦ ᐱᓕᕆᐊᕆᓴᐅᓂᐅᓴᓚᓪᓚᑦ ᓴᖅᑭᐊᑎᑕᐅᓂᐊᕐᓯᑎᐅᓵᑦ :

ᐊᐅᑕᑯᖅ	ᓴᖅᑭᐊᓂᐊᕐᓯᑎᓴᐅᓵᑦ	ᖃᓄᖅ ᐃᑎᐅᖃᖅᑕᐅᓂᐊᖅᑕᐅᑦ	ᓴᓗᓚᖅᓴᐃᑕᐅᖃᓄᐅᓂᕕᓂᐊᖅᑐᑦ
ᖃᒧᖅᑕᑦ (ᐃᓄᐃᓕᓐᓂᒃᑯᖅᑐᑦ)			
ᐅᐊᓴᑭᑎᕆᔨᓕᒃ			
ᐃᑯᐊᓕᑕᐅᓵᓐᓇᖅᑐᑦ			
ᐃᑯᐊᓕᑕᐅᓵᓐᓇᖅᑎᑦᑐᑦ			
ᓄᓇᒥᑦᑐᑦ (ᓄᓇ, ᐊᑐᖅᑕᐅᓵᓐᓇᖅᓯᐊᖅᑎᑦᑐᑦ, ᓱᖃᓕᖅᑐᖅᑕᐅᓴᒪᓂᑯᐃᐸᑦ)			
ᐊᑦᑕᓇᖅᑐᖅᑕᓪᓕᖅ			
ᐊᓱᓴᑎᑦ:			

2. ᐅᖃᕆᔨᓴᓪᓗᒍ ᖃᓄᖅ ᐊᐅᑕᑯᑦ ᐃᑎᐅᖃᖅᑕᐅᖃᕆᑦᑕᓂᐊᓪᓚᐊᖅᑎᓴᓄᑦ.

ᐃᓕᖅ 7: ᓄᓇᓕᒋᓴᐅᓵᑦ ᐃᓕᐅᑎᑕᐅᓂᐊᕐᓯᑎᐅᓴᓄᑦ & ᐊᐃᕆᑐᖅᓴᒪᐅᖃᖅᑐᒧᓪᓗ ᐃᑲᓪᑕᐅᓂᐊᖅᑐᑦ

1. ᑎᑎᕕᖅᓗᑎᑦ ᓄᓇᓕᒋᓴᐅᓵᒋᑦ ᑭᓚᖅᑐᐃᐃᓕᑦ ᖃᐅᔨᓴᖅᖃᖅᑎᑕᐅᓵᐃᓚᐅᓂᐊᖅᑐᑦ ᐊᓪᓚᓗ ᑲᑎᒪᔨᐅᑎᐃᓚᓂᖅᑕᖅᖃᓂᖅᑕᐅᓗᓂᓗ ᐊᑐᐃᓴᓐᓇᐅᑎᓪᓗᑎᑦ:

ᓄᓇᓕᒋᓴᖅ	ᐊᑎᓚᖅ	ᑲᑐᔨᓴᖅᑎᑎᑦ	ᐅᓪᓗᒥᓚᖅ ᖃᖅᑐᔨᓴᖅᑕᐅᓂᐃᓂᖅᓚᖅ

ᐃᓕᓐᓄᐅ: ᑭᓯᑐᐃᓐᓇᖏᑦ ᐊᐱᖅᓯᒪᔨᑦ

1. ᖃᐅᔨᓪᓚᕆᔨᓯᓂᒃ ᐃᑦᓴᕐᓂᑦᖃᖅᑲᐃᓐᓇᕐᓂᒃ ᐊᒃᑐᐃᓂᐊᖅᐸᑦ ?

☐ ᐋ X ᐊᓱᒃ

ᐃᓕᓐᓄᐅ: ᐊᑎᓕᐅᕈᓯᑦ

ᑐᒃᓯᖅᑎᑦ ᐊᑎᓕᐅᕐᓗᒍ ᐅᑉᓗᓐᓚᓗ ᑎᑎᕐᓗᒍ :

ᐊᑎᓕᐅᕈᓯᑦ	ᑭᓯᓕᓴᐅᓂᑦ	ᐅᑉᓗᒥ

ᐊᑕᓪᓚᖅ A
ᐱᓕᕆᐊᓱᐅᓂᐊᖅᑐᑦᓂᓄᑦ ᑐᑭᖏᑦ

ᐊᑐᕆᐊᒃᓴᓕᐅᕈᒪᓂᖅ: ᑐᓴᕐᕕᑐᑎᒃᓯᑦ ᐱᓕᕆᐊᕆᓱᐅᔪᓚᖅ ᓄᓇᒃᓯᔨᓄᑦ ᐊᑐᕆᐊᖅᑕᕐᕼᑭᓇᖏᑦᓴᑐᔪ ᓄᓇ ᓯᓂᓴᐊᖅᑕᐅᑦᑕᐃᓕᓴᓂ.

ᓯᕗᓪᒎᑎᐊᖅᑕᐅᓯᒪᔪᖅ ᓴᓇᕐᓱᒃᓴᖅᓯᐅᕈᒪᓂᖅ: ᑐᓴᕐᕕᑐᑎᒃᓯᑦ ᐱᓕᕆᐊᕆᓱᐅᔪᓚᖅ ᐊᓴᓇᐃᖅᑕᐅᓇᓯᐊᕐᓴᓂ ᐊᖏᕐᓂᖏᓐ, ᐱᐅᓂᖏᓐ, ᖃᐅᓇᐃᑐᑑᓂᖏᓐᓴᓗ ᓴᓇᕐᓱᒃᓴᖅᑕᕐᕼᖅᑐᑦ ᐊᒻᒪᓗ ᑭᓇᐅᖅᓯᕈᑕᐅᔪᓐᓇᕐᓂᕆᐊᖏᓐᓂᖏᓐᓂᓗ ᐅᖅᕼᓯᐅᖅᓴᕐᑕᖅᑕᐅᔪᓐᓇᕐᓂᕆᐊᖏᓐᓂᖏᓐᓂᓗ ᓴᓇᕐᓱᒃᓴᖅᑕᕐᕼᖅᑐᑦ.

ᖃᐅᓇᐃᑕᑐᐃᓐᓇᐅᒃᑯᑦ ᓯᓚᒃᑯᑦ ᐊᖏᓯᐅᕈᒪᓂᖅ: ᑐᓴᕐᕕᑐᑎᒃᓯᑦ ᐱᓕᕆᐊᕆᓱᐅᔪᓚᖅ ᐊᖏᕎᒍᒥᒻᒧᖅ ᐊᑐᕆᐊᖅᑕᕐᕼᑭᓇᖏᑦᓴᑐᔪ ᐊᖏᕎᒍᒥᒻᒧᖅ ᐊᑐᕆᐊᖅᑕᕐᕼᑭᓇᖏᑦᓴᑐᔪ ᐱᓕᕆᐊᕆᓱᐅᔪᓚᖅ ᐃᓕᓴᕐᓂᖅ. (ᓯᕗᓪᒎᑎᐊᖅᑕᐅᑐᑦᓂᓄᑦ ᐅᖅᕼᓯᐅᕈᒪᓂᖅᓴᖅᑐᑦ ᐅᖅᕼᓯᐅᕈᒪᓂᖅᓴᖅᑐᑦᓂᓄᑦ)

ᐊᖏᓐᓄᓯᐊᕈᒪᓂᖅ: ᑐᓴᕐᕕᑐᑎᒃᓯᑦ ᐱᓕᕆᐊᕆᓱᐅᔪᓚᖅ ᐊᖏᓐᓄᓯᐊᕐᓴᓂᒃᓯᑦ, ᑕᕆᐅᒥᓗ ᓂᕐᐸᑎᓂᓵᓐᓂᑦ ᐊᒻᒪᓗ/ᐅᕙᓐᓂᓐᓂᑦ ᐃᖅᑲᓴᓯᐅᓂᕐᓂᓵᓐᓂᑦ ᑕᒪᐃᓐᓂᓂᖅ ᐊᑐᓂ ᐱᓕᕆᐊᖅᑕᐅᓂᖅ ᐊᖏᓐᓄᓯᐊᕐᓴᓂᒃᓯᑦ ᒥᑭᕐᐊᖅᑕᕐᓂᒃᓯᑦ ᐃᓄᖏᓂ ᓂᕆᔨᐅᓂᕐᐊᖅᑐᓂ ᐊᒻᒪᓗ ᓂᐅᐃᐊᖅᑐᓂ ᐃᓕᓴᕐᓂᖅ ᓂᕆᔨᐅᓂᕐᐊᖅᑐᓂᓗ.

ᑕᕆᐅᒥ ᐱᓕᕆᐊᕆᓱᐅᔪᓚᖅᑕᕐᕼᖅᓂᖅ: ᑕᕆᐅᒥ ᐱᓕᕆᐊᕆᓱᐅᓯᓐᓇᕐᓂᖅ, ᐅᖅᑐᑎᑎᒋᔪ ᐅᒥᐊᒃᓯᑦ ᐃᓄᖏᓂ ᐊᖏᓐᓄᓯᐊᕐᓴᓂᒃᓯᑦ ᑕᕆᐅᒥᓵᓐᓂᑦ ᐱᓕᕆᐊᕆᓱᐅᔪᓚᖅ ᐊᖏᓐᓄᓯᐊᕐᓴᓂᒃᓯᑦ ᒥᑭᕐᐊᖅᑕᕐᓂᒃᓯᑦ ᐃᓄᖏᓂ ᐅᖅᑐᑎᑎᒋᔪ ᐱᓕᕆᐊᕆᓱᐅᔪᓚᖅ ᐊᖏᓐᓄᓯᐊᕐᓴᓂᒃᓯᑦ ᐱᓪᓚᕆᐊᖅᑕᕐᕼᖅᓂᖅ ᐊᑐᓂ ᐱᓕᕆᐊᖅᑕᐅᓂᖅ ᐊᒻᒪᓗ ᓂᐅᐃᐊᖅᑐᓂ ᐊᖏᓐᓄᓯᐊᕐᓴᓂᒃᓯᑦ ᐱᓕᕆᐊᕆᓱᐅᔪᓚᖅ ᐊᖏᓐᓄᓯᐊᕐᓴᓂᒃᓯᑦ ᐃᓄᓐᓂ ᓂᕆᔨᐅᓂᕐᐊᖅᑐᓂ ᐊᒻᒪᓗ ᓂᐅᐃᐊᖅᑐᓂ ᐊᖏᓐᓄᓯᐊᕐᓴᓂᒃᓯᑦ ᐱᓕᕆᐊᕆᓱᐅᔪᓚᖅ ᐊᖏᓐᓄᓯᐊᕐᓴᓂᒃᓯᑦ ᐃᓄᓐᓂᓗ.

ᑕᕆᐅᒥ ᐱᓕᕆᐊᕆᓱᐅᔪᓚᖅᑕᕐᕼᖅᓂᖅ: ᑕᕆᐅᒥ ᐱᓕᕆᐊᕆᓱᐅᓯᓐᓇᕐᓂᖅ, ᐅᒃᑐᑎᑎᒋᔪ ᐅᒥᐊᒃᓯᑦ ᓄᓇᒃᓯᔨᓄᑦ ᑕᕆᐅᒥᓵᓐᓂᑦ ᐱᓕᕆᐊᕆᓱᐅᔪᓚᖅ ᐊᖏᓐᓄᓯᐊᕐᓴᓂᒃᓯᑦ ᑕᕆᐅᒥᓵᓐᓂᑦ ᐱᓕᕆᐊᖅᑕᐅᓂᖅ.

*ᖃᐅᓇᐃᓕᓴᐅᓂᐊᖅᑕᕐᕼᖅᓂᖅ ᓄᓇᒃᓯᑎᓴᐅᔪᓄᑦ ᓂᐅᐃᒃᓴᓂᒃ ᐊᓗᖅᑐᑐᐃᓂᖅ ᐅᕙᓐᓂᓐᓂᑦ ᐃᓕᒃᑯᖅᑐᑦ ᐅᒥᐊᑦᓴᐊᒃᓯᑦ ᐅᒥᐊᑦᓴᐊᒃᓯᑦ ᐊᒥᓱᓂᖅ ᑲᑎᒪᔨᒃᓯᑦ ᓄᓇᒥ ᑐᓴᕐᕕᑐᑎᒃᓯᑦ ᐱᓕᕆᐊᕆᓱᐅᔪᓚᖅᓄᑦ ᐱᓪᓚᕆᐊᖅᑐᑦᓂᓗ ᓄᓇᒥ ᐊᖏᓐᓄᓯᐊᕐᓴᓂᒃᓯᑦ ᐱᓕᕆᐊᕆᓱᐅᔪᓚᖅ ᐊᖏᓐᓄᓯᐊᕐᓴᓂᒃᓯᑦ ᐊᓯᐊᓂᖅᓴᖅᑐᑦᓂᓗ ᐊᑐᓂ ᐱᓕᕆᐊᖅᑕᐅᓂᖅ ᐊᒻᒪᓗ ᐊᑐᓂ ᐅᑭᐅᖅᑕᕐᕼᖅᓂᖅ (ᐃᓕᓴᕐᓕᑦ ᐃᓕᓴᕐᓂᓕᕆᓂᖅ 12.12.2 ᓄᓇᕗᓂᓐᓇᑦ ᐊᓴᕐᑐᑎᓂᕐᒪᖅ).

ᐅᖅᕼᓯᐅᓂᕐᓴᐅᕈᒪᓂᖅ: ᑐᓴᕐᕕᑐᑎᒃᓯᑦ ᐱᓕᕆᐊᕆᓱᐅᔪᓚᖅ ᐅᖅᕼᑭᓂᓂᐊᓐᓇᑦ ᓯᓂᐅᑎᖅᑕᐅᓯᒪᔪᓂᒃ ᐊᖏᓐᓄᓯᐊᕐᓴᓂᒃᓯᑦ ᐱᐅᓂᖅᑲᐅᖅᑕᐅᓂᒃ ᐊᒥᓱᓂᒃ ᐅᑭᐅᖅᑕᐅᑕᐅᔪᓐᓇᖅᓂᐊᓐᓇᑦ ᐅᖅᕼᓯᐅᓂᕐᓴᓂᒃᓯᑦ ᐅᓂᖅᑲᐅᖅᑕᐅᓂᒃᓯᑦ ᐃᓂᖅᑲᐅᖅᑕᐅᓂᒃᓯᑦ (ᐅᕙᓐᓂᑦ). ᐅᐊᑕᕐᓂᓐᓇᖅᓴᓗᑎᒃ ᓄᓇᕗᑦ ᖃᖏᓐᓂᒃ ᐊᒻᒪᓗ /ᐅᕙᓐᓂᓵᓐᓂᑦ ᓄᓇᕗᑦ ᐃᑭᐊᖏᓂᓵᓐᓂᑦ. ᐅᖅᕼᓯᐅᓂᕐᑎᓴᑎᑎᒃ ᓯᓂᖃᓂᕐᓴᖅᑕᐅᑭᓂᓕᕆᐊᓂᓐᓇᕐᓂᕆᐊᖅᑐᓂ. ᓯᓂᖃᓂᕐᓴᐃᓂᓕᖅᓴᖅᑐᑦᓂᓗ ᓴᓇᓪᓚᖅᑲᖅᑕᐅᓂᕐᐊᖅᑐᓂᓕᕆᐊᖅᑐᓂᒃᓯᑦ ᐃᓕᐅᕙᖅᓯᓯᓚᕐᓵᓐᓂᑦ ᐊᑭᓕᕆᓂᖅᓴᖅᑕᐅᓂᒃᓯᑦ ᐊᑭᓴᓪᓕᖅᓴᖅᑕᐅᓴᖅᑐᑦ ᐱᓕᕆᐊᖅᑕᐅᓂᒃᓯᑦ ᐊᑭᓴᓪᓕᖅᓴᖅᑕᐅᓴᖅᑐᑦᓂᓗ ᐊᑭᓴᓪᓕᖅᓴᖅᑕᐅᓴᖅᑐᑦᓂᓗ.

ᓴᓇᕐᓱᒃᓴᖅᓯᐅᕈᒪᓂᖅ: ᑐᓴᕐᕕᑐᑎᒃᓯᑦ ᐱᓕᕆᐊᕆᓱᐅᔪᓚᖅ ᐅᖅᕼᑭᓇᐅᕙᓐᓂᓐᓇᕐᓂᖅ ᐊᓯᓴᖅᓯᕐᓂᑐᓂᒃ ᖃᐅᔨᓴᖅᓂᐊᓐᓇᑦ. ᓴᓇᕐᓱᒃᓴᖅᓂᖅᓴᖅᑐᑦ (ᐊᓂᒃᑯᑦ ᐊᒻᒪᓗ /ᑎᓕᓯᒃᑯᓵᓐᓂᑦ) ᓴᓇᕐᓱᒃᓴᖅᓂᒃ ᑭᓇᐅᖅᑕᐅᑕᐅᔪᓐᓇᕐᓂᕆᐊᖅᑐᓂᒃᓯᑦ ᐅᖅᕼᓯᐅᓂᕐᓴᐅᕈᒪᓂᖅᓴᖅᑐᑦᓂᓗ ᑲ.

ᑕᕆᐅᒥ ᓇᖏᖅᑎᑦᓯᐊᕐᓴᓂᒃᓯᑦ: ᑐᓴᕐᕕᑐᑎᒃᓯᑦ ᐱᓕᕆᐊᕆᓱᐅᔪᓚᖅ ᓂᐅᐃᐊᖅᑐᓂᒃᓯᑦ ᐊᓯᓴᖅᓯᕐᓂᑐᓂᒃ ᖃᐅᔨᓴᖅᓂᐊᓐᓇᑦ ᑕᕆᐅᒥ ᐅᖅᕼᑭᓇᐅᕙᓐᓂᓐᓇᕐᓂᖅ ᐊᓯᓴᖅᓯᕐᓂᑐᓂᒃ ᖃᐅᔨᓴᖅᓂᐊᓐᓇᑦ ᐱᓕᕆᐊᖅᑕᐅᓂᖅ ᐊᖏᓐᓄᓯᐊᕐᓴᓂᒃᓯᑦ ᐱᓕᕆᐊᕆᓱᐅᔪᓚ

ᓄᓇᒥ ᑕᓪᓕᒥᔨᖅᓂ ᓄᓇᖅᐱᐊᓕᓕᒫᓂᖅ: ᑐᓴᕐᕆᑎᑦᓴᖅᑕᒪᓕᕐᓂᖅ ᐱᓕᕆᐊᓪᓚᕐᔪᓕᕐᓂᖅ ᖃᖅᐳᑎᕐᓂᖅᑐᒧᑦ ᑕᕐᑐᑦᓴᕐᓂᖅᑕᕐᕕᒃᓴᓂ ᖃᓄᖅᑎᑦ ᓄᓇᕗᑦ ᐃᑭᐊᑐᐃᓐᓇᖅᓂ ᕗᖅᕿᐃᑦ ᖃᓄᖅᑐᐃᓐᓇᓪᓗ ᐃᓐᓇᕐᓂᖅᑕᕐᕕᒃᓴᓂᑎᒃ ᓄᕐᕿᒻᒪᕗᑦ ᖃᓄᖅᑐᓴᕐᓂᖅᑕᕐᕕᒃᓴᓂᑎᒃ ᓄᕐᕿᒻᒪᕗᑦ ᐃᓐᓇᕐᓂᕆᔨᒪᓂᖅᓴᓂ

Ilaga 1 Titigakhak
HAVAGIYAOYUMAYUMIK HIVUNIKHIYUTIKHANIK PIKAGEAKAKNIGA

Hivonikhivaligomagovin Nonavomi Avatilikiyin Katimayenik (NIGB-kon) takoenagealgin kagitaoyami kongeakhan ovani www.nirb.ca tapkoatlunet piyanginik Avatilikiyit titigakotae, havangoyot naonaeyaotae, tapkoatlo havangoyot naonaeyakne takoinagealgit tapkoat Nonavot Avatiligiyit Katimayit ftp kagitaoyakakvea http://ftp.nirb.ca.

ATOKLOAKTOK!
Kaoyimaneakutin una tukhigaotin havagiyaolimaetok ukoa ilagani 1-min 9-mun inikaktilogin tamaeta Kavlunatun Inuktitulo (Inoenaktulo, Kitikmeonetpan).

ILAGA 1: TUKHIGAKTUP KANOGINIGAGUN HIVONIKHIYUTIN

1. b) Havap Atea Jericho Uyaraqtarvik Nayugaa Ihuaqhiyakhat, Nunavut

2. Tokhigaktum tamaeta aten titigakakvikulo tugaktakvea:

Inuliqiyit Kavamatuqatkunnut Kanatami
10th Floor, 25 Eddy Street
Gatineau, QC
K1A 0H4

Kayumiktokun:
Hivayaota:
Kagitaoyakun:

3. Okakvigiyaoloaktukham tamaeta aten titigakakvikulo tugaktakvea:

Mark Yetman, Angayukhium Havaariyakhanut Kiuliqiyi Inuliqiyit Kavamatuqatkunnut Kanatami
10th Floor, 25 Eddy Street
Gatineau, QC K1A 0H4

Kayumiktokun: 819-934-1188
Hivayaota: 819-934-9229
Kagitaoyakun: mark.yetman@aandc.gc.ca

ILAGA 2: AGIGUTAOYAGEAKAKTOK UKUNANGA

1. Titiklogit tamaeta agigeakaktun tugagayunik havagiyaoyumayumun:

x	Aviktokhimayuni Inoen Katimayen (RIA-guyun)		Kanatami Aolaktitigeagutinun Aneaknaetukun (CLS-kun)
x	Nunavumi Imalikiyin Katimayin (NWB-kun)		Avatilikiyin Kanatami (EC-kun)
x	Nunavumi Paknaeyaeyin Katimayin (NPC-kun)		Kavaman Nunavumi (GN-kun)
x	Kavamatukani Inulikiyin (AANDC-kun)		Kavamatukani Aguyaktulikiyin (DND-kun)
	Kavamatukani Imakmeotalikiyin (DFO-kun)		Hamleoyok
	Nunalikni Kavamalikinikun Ikayutiniklo (CG&S-kun)		Mingeokhikvilikiyin Kanatami (PC-kun)
	Nunavumi Ilitokhaeyin Havakvean (NRI-kun)		Kanatami Umayulikiyin (CWS-kun)
	Ilitkuhilikiyin, Pitqhiliriyitkolo (C&H-kun)		Ahelo (Okateayavatin):

2. Titigaklogit atokhimaktun piyunaotit, laesaoyulo, tapkoatlonet ahenik ihumakhutaoyun togagayun havagiyaoyumayumun ihulilvikhaelo:

- Tibbit-mit Tahiryuamut Ilagiyangit Ukiumi Apqutikhanut - Naammagiyangit Atuqtakhat Nayuqtakhangillu Kuin

Nunaani Piyunnautit
Nuna Piyunnautit 75 M/11-1 (Ilagiyakhaat 1). Iniqtirutaanit 2033.

3. Titigaklogit <u>nahugiyaoyun</u> piyunaotit, laesaoyulo, tapkoatlonet ahenik ihumakhutaoyun togagayun havagiyaoyumayumun:
- Inuliqiyit Kavamatuqangit Kanata (INAC) Nuna Atuqtaunikhainut Piyunnautit (Ilagiyakhaat 2)
- Nunavunmi Imaliriyit Laisia (Ilagiyakhaat 3)
- Kitikmeot Inuit Katudjiqatigiit (KitIA) Inikhaliurutikhamut uvunga Inuit Nanminiriyangit Nunaqutait Piyunnautit (Ilagiyakhaat 4)
- Nunavunmi Parnaiyaiyit Malittiarnikhanut Qimilrurningit

4. Una havak, <u>ilagiyaelunen havam</u> hivoagun ilitokhaktaohimavan ihivgeoktaohimavalunen NIRB-kunin?

☐ **IYA** ■ **IMANAK**

Agiguvin, okayavan atigiyagaloaga havam NIRB-kunilo titigagiyaeni napa.

_____

ILAGA 3: HAVAGIYAOYUMAYUM KANOGITUNIGA

1. Titiklogo kanogituniga havagiyaoyumayum (titigaklogin tamaeta atoktun)([1],[2]):
(Takulogo Oegoa A Havam Kanogituniganik Okaoheoyunik)

1	Ukeogalok Apkutaoyok/Aolakveoyok Nunanun	☐	**9**	Inigiyatik Kiklimaktiklogo / Utiktigeaklogolo Ilitkuhigaloaganun	■
2	Ukeomi Apkutaoyok / Ukeomi Aolakveoyok	■	**10**	Okhokyoakheoknik Kasileniklo	☐
3	Oyagakheokvikhakheoknik	☐	**11**	Takyumi Havaguyun	☐
4	Oyagakheokvikhakheoveokhaktok	☐	**12**	Naonaeyaenik/Hilakyoami Ukeoktaktumi Ilitokhaenik*	☐
5	Oyagakheoktun / Agiyunik Naonaeyaeyun	☐	**13**	Angunahoaknen*	☐
6	Oyagaktaken	☐	**14**	Polakpaktun hulilugagutikhaen *	☐
7	Takyumi pikutin (tulaktakvik, malelgumeovik, tunmigak)	☐	**15**	Ahea [(2)]:	☐
8	Nunanik Ilitokhaenik Havivalukaknikata	☐			☐

<u>Kaoyimaneakutin:</u>

1. Tamaeta havan titigakhimayun havuma kulanetuni, ukoagugitok titigakaktunik (*)-mik, piyageakakneakok Havakagumayok tunihiyagan **Ilaga 2-mik Havakhamun Hivunikhiyutaoyunik Piyageakaktunik (PSIR-mik) Titigakhamik**. NIRB-kun tukhiknikun aolaniga ihumagiyaolimagitok pikagitpan Ilaga 2 PSIR-mik Titigakhamik.
2. Ilihimaneakuhi iniktigeagani taman NIRB-kun aolaniga, NIRB-kun tukhikneagunakhiyun ilageagutikhanik hivunikhiyutikhanik kagugulika aolanigiyamikni.

3. “Ahea” titigakhimakpan, okakatigiyavatin NIRB-kun kanogileoguhikhamik piyavikni Ilaga 2 PSIR-mik Titigakhamik piyageakakmaga.

2. Havam Kanogituniganik 3, 4-lunen 5-lunen titigakhimakpan havuma kulanetuni, okayavan kanogitunik oyagakhakakmaga. Naetugaloamik okateayavan hunaokmaga.

- [ ] Havivaloen (zinc, kanoyak, Kuli, Kivliktulo, taemaetunik)
- [ ] Pinikutikhanik
- [ ] Nuguyoetunik
- [ ] Ahenik:

3a. Havam Kanogituniganik 12, 13-lunen 14-lunen titigakhimakpan havuma lulanetuni, iniktiyavan naonaepkun apkutaoyulo havuma atanetuni.

Aolagutim Kanogituniga	Kavin	Kanok Atoktaoneakmaga	Hivituniga Atoknigagun
Imatun, Hanikaptak	*Ataohik*	*Nunanin nunanun akyaktoelotik*	*Siksini upluni*

3b. Okateaklogin tulaktakven, tunmikalo, milvelo atoktulo pikutin havagiyaoyumayumi. Kaoyimaneakutin: napaktigiyagani nutanik pikutinik atugeakakneagunakhiyutin Ilaga 2-mik Titigakhamik.

Tadja milvingit atuqtauhimmaaqtuq havagvianit parnautigiyakhait haffumani tukhiutauhimayumik nayugaanit ihuaqhaiyakhanut hulidjuhiit. Una milvik nakuuvluni hanayauhimayangit hamna Jericho Uyaraqtarviugaluaq aulattitivluni.

3c. Hiniktakveokavuktukhamik pineaknikata, okayavatin hunaokmaga napayukhan kanogituniginiklo kanoklo alguyaktutikakneakmaga iglukpakakvikhami atugeakaknikan.

Tadja havakhimayauyuq Jericho Uyaraqtarvik nayugaat igluliurahuaqtunut parnautiginiaqtangit nayugaat ihuaqhaiyakhangit hulidjutikhainit. Hamna nayugaat ihuaqtaunikkut hulidjuhiit inirumiuk hamna nayugaat ahivaqtauniaqtuq nunam illiriyauhunnguyuqtauq. Nayuqtangit qullikhait uunaqutikhait januviitanit parnautiginiaqtangit inikhainit hamna Jericho Uyaraqtarviup aulapkaivluni.

4. Havakteoyun

Tamaeta kaveonigin havaktun havakvikmi = (A) 50

Tamaeta uplun havakviknetun = B 180

Tamaeta uplun inukakneaknigagun (A) × (B) = 9000 (angi)

5. Kakongukan Pigeagutikhan

Kanok havakveoneakmaga: Ubluqtuhinia 2017 *talvonga* Qiqailruq 2018

Atugumayanik hivitunikhata piyunaotim: Ubluqtuhinia 2017 *talvonga* Qiqailruq 2018

6a. Nonalet Aviktokhimanea (titiklogit tamaeta atoknilgit):

- [ ] Tununga Kigiktalok
- [ ] Hivuga Kigiktalok
- [ ] Kivalik
- [ ] Mingoekhikvik
- [x] Kitikmeot
- [ ]
- [ ] Nonani ataohenaogitumi:

6b. Okaklogin humenigin havagiyaoyumayun nunan aviktokniga atoklogo, okaklogolo kanitoanenikhak nunagiyaoyok monagiyaoyulo pikaknikan nunanik.

Una nayugaanit ihuaqhaqtauyukhat havaariyakhat havaktauniaqtuq ikhinnaqhimayumi Jericho Uyaraqtarvik nayuqhimayaraluangit huqpaniittumi 260 km hivuraa kivataani Qurluqtuq, NU una 30 km tun'nganiittuni Lupin Uyaraqtarvik iluani Tahiryuaq-Itchen Aviktuqhimayumi.

6c. Discuss the history of the site if it has been used for any project activities in the past.

Hamna Jericho Uyaraqtarvik angmaqhimagaluaqtuq 2006 mi ukunanngat Tahera Diamond Kuapuriisan (Tahera) maniiqtauhimayuq uvani 2008 mi. Shear Diamonds Kuapuriisan (Shear) amiriyangit haffumani Jericho Uyaraqtarvik 2010 mi aulapkaivluniuk uyaraqtarviup amirivlugulu havaktauvlunilu nutqaqhutik uvani Apitilirvik 2012 mi hamna Shear nutqaqtitauvluniuk aulavingat. INAC iniqtiriniaqhimayangit kigliinnangit avatikhanut hapummiyakhait haffumani Jericho Uyaraqtarvik upinngaami 2013 mit, unalu naaguhirivlugulu amiqhaiyakhait haffumani Jericho Uyaraqtarvik uvani Ubluqtuhinia 2014 mi. Hamna nanminikhautaugaluaqhuni havaktaugiaqaraluaqtut uvani iinut ukiukhamut naalugu qiniqhiavlutik Uyarak manilik qiplariktumik angmaumayumik hauvikhainit unalu nunaup iluaniittuni uyaraqtarviuyukhautaugaluaqtuni. Una uyaraqtarvik havaangit havaktauhimaittuni angmaumayumik hauvikhamut uyaraqtarviunikkut.

6d. Indicate if there are any known archaeological/palaeontological historical sites in the area.

Tahera piyunnautilraanga atuqtakhanut uqariiqhimagaluaqtut iniqhimavlutiguuq Initurlinganit Aktuqturningagut Ihivriuqhimaningit. Naunairiiqhimayangit titirariiqhimayangit uuminngat: "Ilittupkaqhimanngittangit 25 nit initurliminiit naunaiqhimayangit nunami Havaariyakhautillugit EIS nit ihumagiyauvluni nalaumattiaqtumik ihumagiyauyunit havaktailiquyauvlutik havaanut."

Aulanngittangit qanurilinganingit atiliuqtauyut uvunga nayugaanit ihuaqhaiyakhaat havaangit kiglikhautaunngittumi naunairiiqhimayangit uyaraqtarviugaluami aulattitivlutik huli aulalaittullu atuqtakhamaat ukiumi apqunmi inikhamut aturvikhait.

7. Kiya Nunagikmaga (titiklogit tamaeta atoknilgit):

- [x] Koen
- [x] Inoenaet Nanminea Nunaplo Kaginaenetun
- [ ] Kamisinaop
- [ ] Inoenaet Nanminea Nunaplo Iloanetun
- [ ] Hamleoyun

8a. Humeniga Nunam:

Mikinikha Nunaoyami Hanimon (nahaotaen)	65 ° 58 ' 59.92 " N	Mikinikha Nunaoyuami Tokimon (nahaotaen)	111 ° 25 57.53 " W
Anginikha Nunaoyami Hanimon (nahaotaen)	66 ° 02 ' 00.81 " N	Anginikha Nunaoyami Tokimon (nahaotaen)	111 ° 32 01.93 " W

NTS Nunaoyami Ilagata Napa: 076L04; 076E13, 076L03; 076E14

Ilaoyavun nunaoyan humeniginik havan pikaktunik (1:50,000 **pikakat**, 1:250, 000 **Piyakakpeaktok**) piyaolat talvaga Nunameotalikiyinin Kanatami.

8b. Havakun **hiniktakvikakneaknikata**, titigatyavot nahaotaen hiniktakveoyun.

Hanimon (nahaotaen)	65 ° 59 '26.25" N	Tokimon (nahaotaen)	111 ° 30 '08.99 " W
Hanimon (nahaotaen)	65 ° 59	Tokimon (nahaotaen)	111 ° 30 '08.99 " W

’26.25” N

Alagakpata huvuma kulanetunin hiniktakveoyok:
NTS Nunaoyami Ilagata Napa: 076L03

Nunavumi Avatilikiyin Katimayin piyumaneagunakhiyun hivunikhivaligutikhanik humeniganik ilagani Havam Kanoginigagun Hivunikhiyutikhani (PSIR-guyok). Imaetuneagunakhiyok Nunan Kanoginigagun Nunaoyani Naonaepkutini (GIS-guyun

ILAGA 4: TUKIHEANAKTUNIK HAVAGIYAOYUMAYUMIK OKAOHEOYUN

Ilaopkayavan tukiheanaktok kanogitunikha havam, avatkutaelilogo 500 taegohet, Kavlunatut Inuktitoto (Inoenaktolo, Kitikmeonetpata). Havam kanoginiga ilakaktukhaogaloak ukuniga:

- Havami havagiyaoyukhan, piyakakne hivitonikhalo;
- Kanoktut aolagutikakneakmaga
- Kitulikak napaktakhat hanayaoneat (ilihimaenaktokhat / atokaphoktakhat);
- Aheagugutikhat ihumagiyaoyun; unalo
- Hivunikhami havakhan, kanoklo kigoagun kanogiliyutikha nunani hunaolikalo pivikhakaknigagun.

ATUGEALIK: HAVAGIYAOYUMAYUMI HULILUGAGUTIN TUNIHIYUTIKAGEAKAKNIKATA NIRB-KUN ILAGA 2 PSIR-MIK TITIGAKHAMIK, INIKTIYAVAN ILAGANI 8-METUN TALVATOAK, TAEMAEGITPAN INIKTIKHIMAYAVAN ILAGANI 5-METUN.

ILAGA 5: IHOAKUTIVALOEN ATOKTAOYUKHAN

1. Titiklogit Pikutin (ikutavaloelo, papaotilo, tikmiyan, akhalutivaloelo taemaetun).:

Pikun hunaokmaga napalo	Agitilaga - uktaotitigulo	Kanok atoktaoneakmaga

2a. Oniktoteaknea okhokhat hivoganaktulo honat atoktaone:

Okhokhat	Kaveone Puguyut, Agitilagilo	Ataotimun Okhokhat (Litres-guyuni)	Kanok Tutkumayaoneakmaga
• Okhokyoak			
• Kasilek			
• Tikmiyutin okhokhae			
• Puplakhat			
• Ahenik			
Hivuganaktot Pikutin Kuviyaktulo		**Ataotimun Hivuganak-tun Kuviyaktulo (litaoyuni)**	

2b. Okaohigiyavatin Kuvegitagani Paknaeyaotin.

3a. Oniktokteaknea uplotoagagan imaknik atoknigin kanogalok:

Uplutoagagan (m^3-guyuni)	Atugumayaen imavaloen utiktitagani kanok	Atuligumayaen imavaloen utiktitagani humi

4. Tukhikhimavin Napagiya A-mik Laeseoyumik Nunavumi Imalikiyinin Katimayinin?

☐ **IYA** ☐ **IMANAK**

Agiguvin, hunaova napagiya laeseoyum?

☐ **Napagiya A Imaknik Atugeagani Laeseoyok**

☐ **Napagiya B Imaknik Atugeagani Laeseoyok**

ILAGA 6: IKAGUKNIKUN IMAVALOELO HALUMAGANIGEAGANI HAVAN

1. Titigaklogin kanogitunigin ikaguvaloen:

Kanogituniga ikaguyum	Nalaonealogin kanogalok ikagukakneakmaga	Kanok ikaguneakmaga	Halumaktiganigutikhan piyutin
Anagun (Inoen anagoen)			
Oakhitin			
Ikulalaktun ikaguvaloen			
Ikulalimagitun ikaguvaloen			
Atakoen (halumaektun nunan, ikaguvaloelo, ataguvaloelo oyakikivikmin)			
Hivuganaktun ikaguvaloen			
Ahelo			

2. Okaohigiyavan Ikaguvaloknik Paknaeyaotin.

ILAGA 7: NUNALEN ILAOYUN, AVIKTOKHIMAYUNETUNULO IKAYUHEAGUYUN

1. Titigaklogit nunaliknin kivgaktokte okakatigiyaohimayun, tunilogilo titigakniginik katimayutinun kahaknikata:

Nunaoyok	Atea	Timeoyok	Uploani okakatigiyaokmata

ILAGA 8: HUNALIKA APIKUTIKHAN

1. Kahaknikneakihi kaoyimayaoyunik igilgan inituklenik?

☐ **IYA** ■ **IMANAK**

ILAGA 9: TUKHIGAKTUP SAENEOTA

Saeniyavan uploaniklo titigaklogo tukhiktutin:

Saeneota: **Havanga:** **Uploa:**

OEGUYOK A
Havami Kanogituniginik Tukitagutin

Tikitagani Ineoyun Nunami: Havagiyaoyumayumi ihumagiyakaknikata akhalutikun tikitagani ihumagiyaoyumun aktoknikakpalalimaginikan manikanik.

Nalvakheokveokhaktok: Havagiyaoyumayumi naonaeyaeneakata agitilaginik, peoteaknigilo, kanogitunigilo oyagaktakhan naonaeyageaganilo manileogutaoteakneakmaga havatigulo namateakneakmaga oyagaktakveoliknikan.

Ukeogalok Apkutaoyok: Havagiyaoyumayumi apkutuleogumakpata atoktaoyukhamik ukeogalok.

Uyagaktakhanik Naonaeyaenik: Havagiyaoyumayumi ahivaeneakgumik agiyunik havivalokaktunik oyakanik ukumaeyoaktunik pineaknikata. Naonaeyaevaktun oyagaktakveoyukhamin naonaeyaktaoyumin. Hikuptigilaktun oyakikivikmi (mikaogaloamik).

Angunahoaknik: Havagiyaoyumayumi agunahoakneakata umayunik, takyumeotaniklo huganik ikalokniklunen nunaginaeyin agunahoaklogin nanigeaktoklogilunen nanminik atoktakhamiknik neovgutigiyakhamikniklunen.

Takyumi Hulilugagutin: Hulilugagutin takyumi avataoyumi, umiyanik atoknikata nunami havamikni ikagumiklunen takyumun.

*Kaoyimaneakutin nunaliknun umiyan tikitpaktun akyaktun pikutinik ilaoginman nunami havagiyaoyumayunun ilitokhaktaolimagitun NIRB-kunin (Ilagani 12.12.2-mi NLCA-mi).

Oyagaktakvikhamik Pivaleanik: Havagiyaoyumayumi ahivaeneakata hikuptikhimayunik oyakanik havivalukaktunik ukumaeyoaktuniklo manileogutaotealakan oyagakheokveoligumi (oyagaktak). Oyagaktageagani oyagaktanik anmukpalealotik nunam kaganin iloanugakpalealotiklunen nunamun. Oyagaktaknik oyakikivikalaktok. Oyakikinik ahivakpaleayagani atoklogin pikutin kuviyaktulo piyutin atoktaolaktun ugavageagani akituyok oyagaktakhak.

Oyagaktakvikhakheoknik: Havagiyaoyumayumi kinikheaneakata oyagaktakveoneaktunik nunanik. Nunanik ihivgeoknik (nunakun tikmeakulunen) nanihiyagani agiyunik takunaktuniklo oyagaktakhanik.

Takyumi Pikutin: Havagiyaoyumayumi hananeakata uheyakvikhanik pikutinik hinanin takyumi atanikata nunaloamun takyumin imavaloknilunen avataoyumin. Ayikutaen ukoa tulaktakvik, tunmigaklo, umiyanilune atoktaoyunik.

Ohokyoanik Kasileniklo Nalvakheoknik/Hulilugagutilo: Havagiyaoyumayumi ilakaktumik 1) nalvakheoknikmik, ima kukulaktunoen atoklogin nunaoyatigulunen, 2) ikutakan okhokyoaktakvikhanik kasileniklo, 3) hanakpan atukalo tukhoakyoanik, kasileniklo hanakivikmik okhokyoakakvelunen kasilekakvelunen Nunavumi.

Heogaktakveoyun: Havagiyaoyumayumi heogaktakneagumik, ahivaeneakata heogavaloknik (imaetun, heokan oyagalealo) oyagaktakatalo, ahivaeneakata ataotimetunik oyakanik (imaetun, kaektunik, kikumayuniklo nunanik).

Naonaktunik Naonaeyaenik: Havagiyaoyumayumi atuligeagani iglukakveoyumi hulilugagutinik taotuklogin akliknaktun, naonaeyaklogilo katitigeaklogilo naonaepkutikhan piyageakaktun naonaktunik ilitokhaenikun tikoaktaohimayuni nunani pivikhakaklaktilogilo.

Kokulaktunoanun Naonaeyaenik: Havagiyaoyumayumi naonaeyaeneakata nunaoyeogeagani hiliktilagin unugagalok oyakan nalgulogin kanok kokuktunoak utikniga naonaegutaoneakman hiliktilaganik nunam kaganin. Naonaeyaeven takyumelaktun (iloanelimagitun 12-nik maelinik ugahiktilaganik hinanin imam), hinatalo kanitoanilo, unanilaloklo takyumi.

Inigiyaoyun Kiklimaktiknigin: Havagiyaoyumayumi inigiyaoyun kiklimaktikneakata (ukoalo Tulaekakven kiklimaktiktaonigin), ihumagiloakhugin utiktitagani ilitkuheanun kuviyaktuvaloknin halumaekhimayun nunavaloen, aolalimaegeaganilo haohimayun kuvelo, agiptikniginiklo / ikaklogilo napayun pikutin ikaguvaloelo amigilogilo kanogilivaleanigagun kigoagun kiklimaktiktaotakan.

Polaktulikiyutin Havan: Havagiyaoyumayumi aolaktitiyagani tugagaloaktunik tunikgoektigiyutinun, ulapkiyutinulo neamgiyaginageaganilunen tikoaktaohimayumi nunami pivikhakaktilogo hivitunigagun

Ukeoginakmi Apkun: Havagiyaoyumayumi apkutileokneakata ukeomi atoktukhamik atagikhaklogin kikhoktiklogilo kaginaen aputin hikulo. Ukeomi apkutoayok ahivaktaoneakok kikumanaekan ukeom ilagani.

Ukeoginakmi Inin: Havagiyaoyumayumi hananeakata inimik ukeomi atoktukhamik ataotimin tulakaktumin akhalunmin atoklotik poalgiyaonmik, piyageakaknikan.

SCREENING PART 2 FORM
PROJECT SPECIFIC INFORMATION REQUIREMENTS (PSIR)

1. SUBMISSIONS

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

IMPORTANT: Please be advised of the following:

1. NIRB does not accept references to an ftp or web sites as a submission.

2. The Proponent must provide NIRB with 1 (one) electronic copy and 1 (one) hardcopy of the required information in English.

3. All maps should be shapefiles, be legible, and should include grids, be of appropriate scale, indicate the scale, include latitude and longitude references, NTS Maps numbers, title, legend and a north arrow. To the extent possible, avoid hand-drawn demarcations and faxed maps; and,

4. Please complete all required information in each section below. If the required information is not applicable to the project proposal, please indicate this in the response with "n/a". If the request has been provided in a different section or report, please note the section or report where the response can be found.

2. GENERAL PROJECT INFORMATION REQUIREMENTS

Project Coordinates and Maps

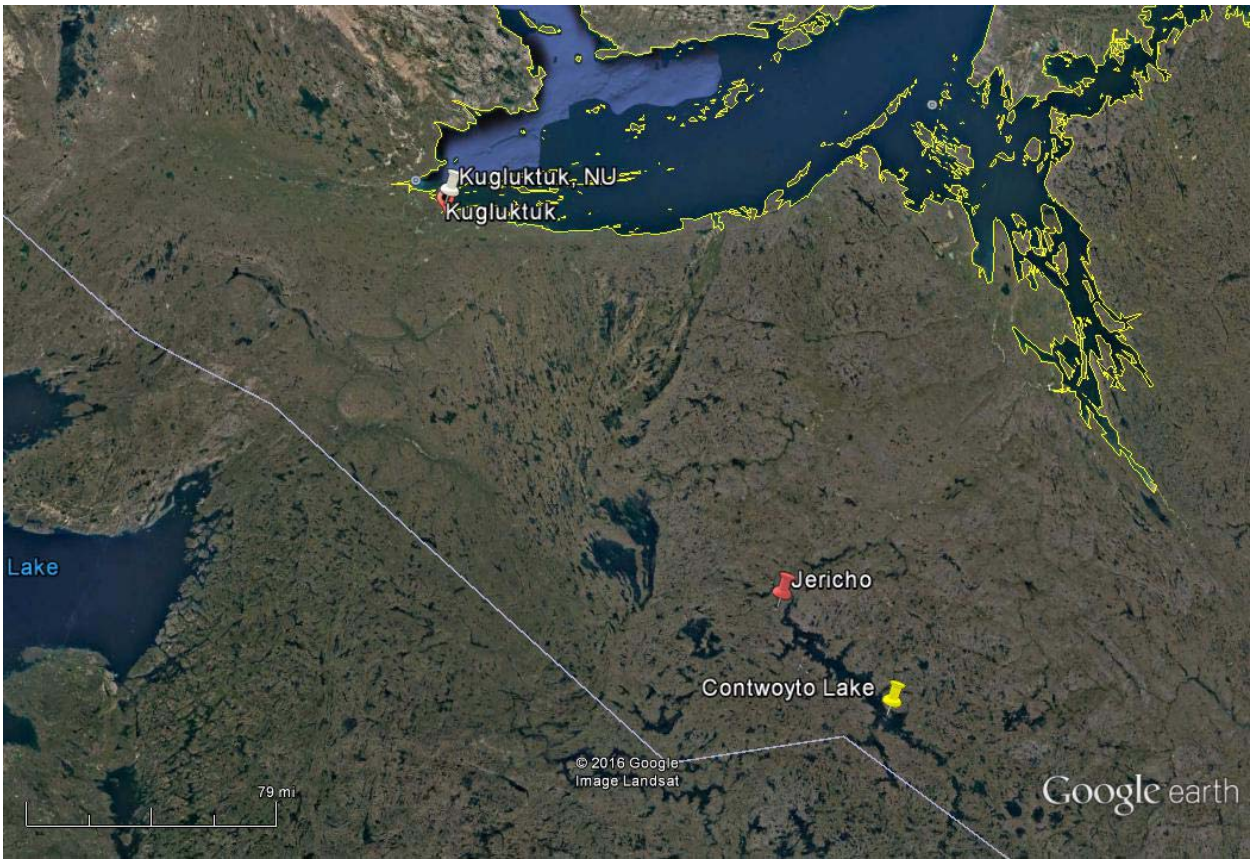
1. The preferred method for submitting project coordinates information is through the use of a Geographic Information System (GIS) compatible digital file. Although an ESRI ArcView 3.x shape file (in decimal degrees) is the preferred interchange format, the NIRB has the capacity to receive over 100 GIS and CAD related formats, including MapInfo and AutoCAD, provided proper format and projection metadata is also submitted. The NIRB requires coordinates for the project proposal which reflect the entire project area as defined by:

   - Area/sites of investigation;
   - Boundaries of the foreseen land use permit/right-of-way area(s) to be applied for;
   - Location of any proposed infrastructure or activity(s); and,

- Boundaries of the mineral claim block(s) where proposed activities will be undertaken.

Min Lat (degree/minute)	65 ° 58 ’ 59.92 ” N	Min Long (degree/minute)	111 ° 25 ’ 57.53 ” W
Max Lat (degree/minute)	66 ° 02 ’ 00.81 ” N	Max Long (degree/minute)	111 ° 32 ’ 01.93 ” W
NTS Map Sheet No:	076L04; 076E13, 076L03; 076E14		

The Jericho Mine site is located approximately 260 km southeast of Kugluktuk, NU and 30 km north of the Lupin Mine in the Contwoyto-Itchen Region. The site is accessible by air and the Tibbitt to Contwoyto Winter Road.



Please see additional diagrams and maps contained in the Phase III Environmental Site Assessment located in Appendix 8. Additional details on the proposed Site Stabilization work can be found in Appendix 9.

2. Map of the project site within a regional context indicating the distance to the closest communities.
   Please see response in question 1 above.

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

This project will utilize the existing camp infrastructure found at:

Latitude: (65 ° 59 ’26.25” N) Longitude: (111 ° 30 ’08.99 ” W)

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

Please see additional diagrams and maps contained in the Phase III Environmental Site Assessment located in Appendix 8.

Project General Information

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

The activities of the Site Stabilization Plan will accomplish the following:

- stabilize the site to prevent water accumulation
- restore the site to an environmentally safe condition and
- prevent environmental migration of contaminants into the surrounding ecosystem

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

The activities of the Site Stabilization Plan will accomplish the following:

- stabilize the site to prevent water accumulation
- restore the site to an environmentally safe condition and
- prevent environmental migration of contaminants into the surrounding ecosystem

The alternative no-go alternative would see the site left in its present abandoned mine state with limited care and maintenance activities being conducted. This alternative would almost certainly result in environmental migration of contaminants into the surrounding ecosystem.

7. Provide a schedule for all project activities.

- February/March 2017: JV winter road extension Ekati to Jericho
- March 2017: Mobilization of materials and equipment to Jericho Site
- May-October 2017: Site Stabilization activities
- February/March 2018: JV winter road extension Ekati to Jericho
- March 2018: Demobilization of materials and equipment

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

- Canada Labour Code (R.S. 1985, c.L.-2)
- Canada Occupational Health and Safety Regulations (SOR/86-304)
- Environmental Protection Act (Nunavut) (R.S.N.W.T. 1988, c.E-7)
- Transportation of Dangerous Goods Act (S.C. 1992, c. 34) a 1999, c. 31
- Nunavut Land Claim Agreement (Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada, 1993)
- Spill Contingency Planning and Reporting Regulations (N.W.T. Reg. 068-93)
- Migratory Birds Convention Act (1994, c. 22)
- National Fire Code of Canada (1995) a. 2002
- Ozone Depleting Substances Regulations (SOR/99-7)
- Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health (CCME, 1999)
- Canadian Water Quality Guidelines for the Protection of Aquatic Life (CCME, 1999)
- CCME - Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (2002).
- Canadian Environmental Protection Act (1999, c. 33)
- Controlled Products Regulations (SOR/88-66) a.SOR/2001-254
- Transportation of Dangerous Goods Regulations (SOR/2001-286) a. SOR/2003-400
- Intra-provincial Movement of Hazardous Waste Regulations (SOR/2002-301)
- Nunavut Waters and Surface Rights Tribunal Act (2002, c. 10)
- Nunavut Environmental Guideline for Waste Asbestos (GN, 2002)
- Contaminated Sites Management Policy (INAC, 2002)
- Northern Affairs Contaminated Sites Management Policy (INAC, 2002)
- A Federal Approach to Contaminated Sites (CSMWG, 2002)
- Used Oil and Waste Fuel Management Regulations (N.W.T. Reg. 064-2003)
- INAC NCSP Project Level Risk Management Guidance Document (AANDC, 2008);
- Contaminated Sites Cost Estimating Guide (AANDC, 2012)
- Treasury Board Policy on Management of Real Property (TB, 2006)

- Risk Management Tool & Reporting Tool User Guide (INAC, 2007)
- Canada-Wide Standard for Petroleum Hydrocarbons (PHC) in Soil (CCME, 2008)
- Environment, Health & Safety Management System Manual (AANDC, 2012)
- Environment, Health & Safety Standard Operating Procedures Manual (INAC, 2008)
- Environment, Health & Safety Control Framework, Northern Contaminated Sites Program (INAC, 2008)
- Environment, Health & Safety Audit Program Guide (INAC, 2008)
- Construction Project Safety Management Guide, 5th Edition (PWGSC, 2008)
- Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations (SOR/2008-197)

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

The approvals, permits, licenses required include:
- Water Licence (Appendix 3)
- Crown Land-Use Permit (Appendix 2)
- Inuit Owned Land Access Permit (Appendix 4)

DFO Operational Statement (OS) Conformity

10. Indicate whether any of the following Department of Fisheries and Oceans (DFO) Operational Statement (OS) activities apply to the project proposal:
    - Bridge Maintenance
      N/A
    - Clear Span Bridge
      N/A
    - Culvert Maintenance
      Potential
    - Ice Bridge
      Potential
    - Routine Maintenance Dredging
      N/A
    - Installation of Moorings
      N/A

    Please see DFO's OS for specific definitions of these activities available from DFO's web-site at http://www.dfo-mpo.gc.ca/regions/central/habitat/os-eo/index-eng.htm
11. If any of the DFO's OS apply to the project proposal, does the Proponent agree to meet the conditions and incorporate the measures to protect fish and fish habitat as outlined in the applicable OS? If yes, provide a signed statement of confirmation.

    Aboriginal and Northern Development Canada agrees to meet the conditions and incorporate the measures to protect fish and fish habitat as outlined in the applicable Operational Statements.

Mark Yetman
Senior Project Advisor – Contaminated Sites Program

2016-09-09
Date

Transportation

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

The Jericho Mine site is located approximately 260 km southeast of Kugluktuk, NU and 30 km north of the Lupin Mine in the Contwoyto-Itchen Region. The site is accessible by air and the Tibbitt to Contwoyto Winter Road.

Material and equipment to conduct this site stabilization work will be mobilized and demobilized to and from Jericho via the JV Winter Road. Presently the Road is only constructed as far as the Ekati Diamond Mine, therefore the extension to Jericho will be constructed as part of this project. See Appendix 10 and 11 for maps related to the winter road.

Site crews and other specialized contractors will be flown in using the airstrip that was constructed and used for mining operations at Jericho when the mine was in operation. The diagram below shows a map of the airstrip in relation to the site.

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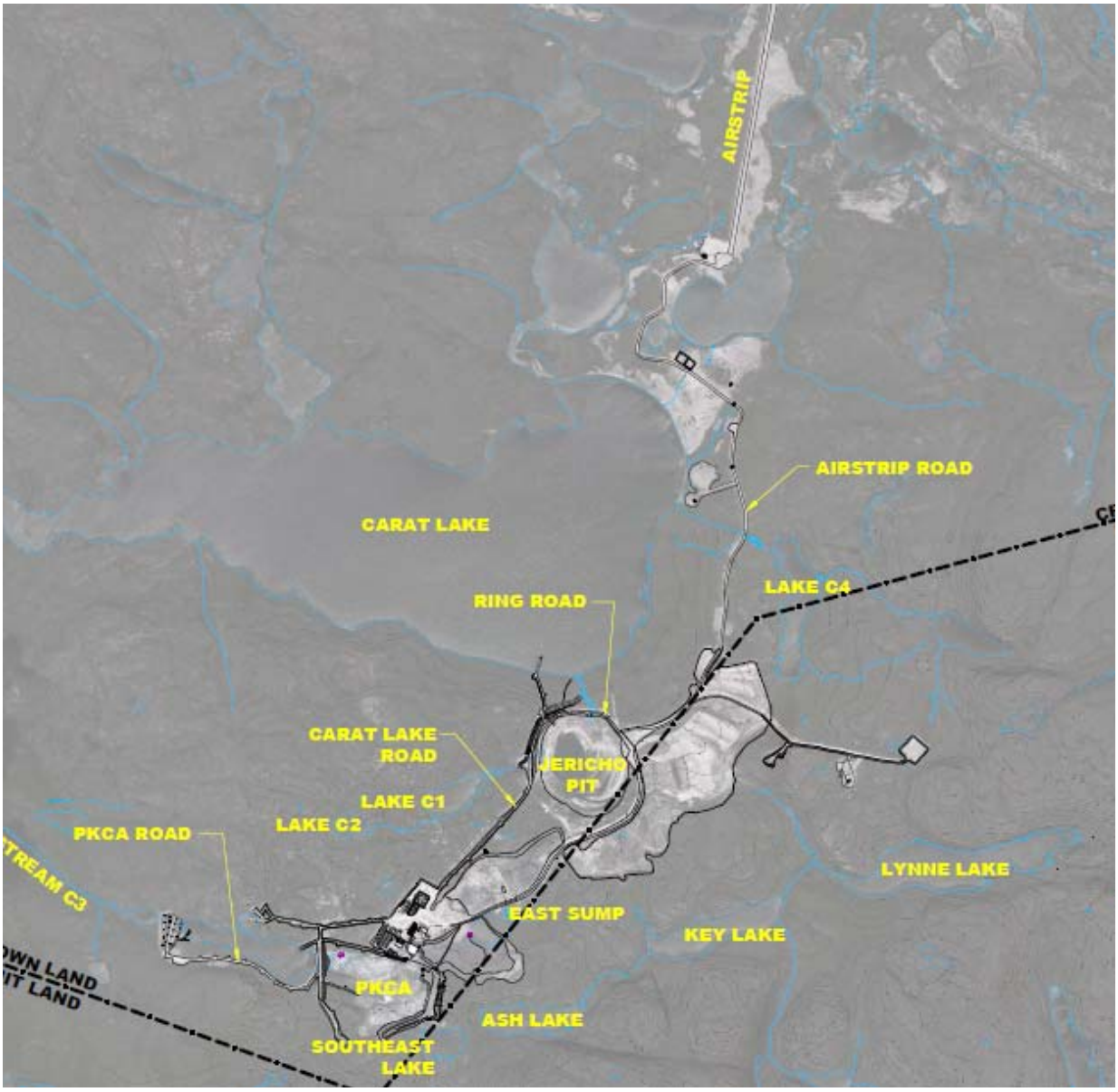

13. If a previous airstrip is being used, provide a description of the type of airstrip (ice-strip/all-weather), including its location. Describe dust management procedures (if applicable) and provide a map showing location of airstrip.

Please see response in question 12 above. The airstrip is located at:

Latitude: (66 ° 01 ’35.75” N) Longitude: (111 ° 27 ’48.59 ” W)

14. If an airstrip is being constructed, provide the following information:
    a. Discuss design considerations for permafrost
       N/A; existing airstrip
    b. Discuss construction techniques
       N/A; existing airstrip

c. Describe the construction materials, type and sources, and the acid rock drainage (ARD) and metal leaching (ML) characteristics (if rock material is required for airstrip bed).
   N/A; existing airstrip
d. Describe dust management procedures.
   N/A; existing airstrip
e. Provide a map showing location of proposed airstrip.
   N/A; existing airstrip

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

It is anticipated that crews will be shifted in and out every two weeks via aircraft. Chartered aircraft will for the most part be flown out of Yellowknife and Kugluktuk to Jericho. Flight altitudes to and from Jericho will be heavily dependent on weather and the ceiling available to the pilots for flying.

Camp Site

16. Describe all existing and proposed camp structures and infrastructure

Presently there exist three large sleeping quarters, recreation facilities, offices, as well as a kitchen and eating area. There structures were built for use during peak mine operations. For the proposed site stabilization work we foresee the contractor using only one of the sleeping quarters as well as the kitchen, recreation area and potentially some of the office space. Please see diagram below for locations of all of these pieces of infrastructure.

17. Describe the type of camp:
    a. Mobile
    b. Temporary
    c. Seasonal
    d. Permanent
    e. Other
18. Describe the maximum number of personnel expected on site, including the timing for those personnel involved with the project.

The maximum number of individuals expected onsite is 50.

Timing:

May/June: 10-20 people on site
July/Aug: 30-50 people on site
Sept/Oct: 10-20 people on site

Equipment

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

Site Stabilization Activities:

The following equipment will be used for the site stabilization activities listed in Appendix 9:

- Drum crusher
- 3 x excavators
- 6 x Rock trucks
- 2 x bulldozer
- Compactor
- Water pump (s)
- Incinerator
- Generator
- Loader
- aqueous liquid waste treatment system to treat aqueous liquids for onsite disposal
- water truck to haul water to camp, if required, or for dust suppression
- trucks for transportation on site
- ATVs
- Other equipment as deemed appropriate by the contractor

Winter Road construction:

Nuna Logistics is constructing the Tibbitt to Ekati portion of the winter road and it is likely that similar equipment will be used. The following is an excerpt from Nuna's website which discusses the types of equipment that they use in the construction of the JV Winter road.

"Nuna commences construction of the TCWR January of each year which entails the use of Nuna's specialized early road opening equipment such as Hagglund amphibious track vehicles equipped with ground penetrating radar to determine ice thickness and light plow equipment;

both supported by helicopter surveillance to report major ice cracks or pressure ridges ahead. Throughout the road season, Nuna uses plows, graders, water trucks, dozers, snow blowers and other specialized low ground pressure equipment to keep the road clear of snow in order to continually build up ice thickness and keep portages smooth. At various locations along the entire length of the road Nuna measures the lake ice thickness and determines allowable vehicle load weights.

20. If possible, provide digital photos of equipment.

Not possible at this time.

Water

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

Carat Lake was the water source which was approved for usage (quality and quantity) when the Jericho Mine was in operation. The volumes of water being proposed for usage in this application are for a small camp, which is a fraction of what was used during mine operations. Before the water from Carat Lake would be used for camp operations, extensive water testing would be conducted to ensure its safety and suitability for this camp of no more than 50 workers.

Water will be extracted using an intake hose with a screen to ensure that no fish become trapped. Water will either be pumped directly from the lake to the camp using existing infrastructure put in place when the mine was in operation, or will be transported via truck to the camp.

22. Describe the estimated rate of water consumption (m^3/day).

    10 m^3/day to support camp and remedial activities.

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

    Waste water will be managed as per previously approved Tahera Waste Water Treatment Plant Operations Plan (see Appendix 12)

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

    N/A

Waste Water (Grey water, Sewage, Other)

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

    30 litres/day x 50 people (max) = 1500 litres/day

    Waste water will be managed as per previously approved Tahera Waste Water Treatment Plant Operations Plan (see Appendix 12)

    - Camp grey water

    80 litres/day x 50 people (max) = 4000 L/day

    Waste water will be managed as per previously approved Tahera Waste Water Treatment Plant Operations Plan (see Appendix 12)
    - Combustible solid waste]

    2 m3

    Combustible solid waste generated from camp operations will be incinerated in an on-site incinerator.

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

    42,919 m3 +2,614 items

    On-site non-hazardous landfill

- Hazardous waste or oil

Hazardous waste	1,286 m3 (Organic content and materials in drums, ASTs, tanks, pails, etc.)	Incinerate using on-site incinerator that meets applicable emission controls.
Hazardous Materials	2,467 items (Batteries, light bulbs, drums, compressed gas cylinders, fire extinguishers, batteries, etc.)	Depressurize gas cylinders and fire extinguishers. Sort and ship offsite to a designated licensed disposal facility if contents are unknown or cannot be discharged to environment. If known, dispose of in landfill if appropriate.

- Contaminated soils/snow

Soils contaminated with PHC 3,315 m3
Metal impacted soil: 64 m3

Excavate, load-haul and consolidated the PHC soils to on-site landfarm.

- Empty barrels/ fuel drums

- Empty barrels/fuel drums will be handled as per the Barrel Protocol described in the Abandoned Military Site Remediation Protocol (INAC 2009).
- Barrels will be inspected, sampled, tested, have any contents removed and treated, cleaned, crushed, Landfilled.

- Any other waste produced

Not at this time.

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

The generalized landfarm design consists of a bermed enclosure graded to direct runoff to a sump area at one corner. The area is lined to prevent contaminant migration and the berms are sized to accommodate runoff from a 1:10 24-hour storm event. The liner system comprises a high density polyethylene liner, sandwiched between layers of non-woven geotextile for protection. Contaminated soil is spread in a thin layer over the landfill base and tilled to encourage biodegradation of the hydrocarbon-impacted soils. It is expected that the PHC soils can be remediated however, amendments to the PHC contaminated soil, such as oxidizers, may be required to effectively treat the soil within the Project schedule.

The Phase I and II tankfarns shown in the diagram below will be the location of the Landfarm. During the planned Site Stabilization activities the tanks in the tank farm will be removed from their present location and treated. Please see appendix 9 for further details on this.

Fuel

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

Fuel	Number of Containers and Capacity of Containers	Total Amount of Fuel (in Litres)	Proposed Storage Methods
Diesel		300,000 L	Large fuel tanks, as per appropriate storage regulations
Gasoline	25	5125L	205 L drums, as per appropriate storage regulations
Aviation fuel			
Propane	16	45kg tanks	as per appropriate storage regulations

All fuel will be mobilized to site via winter road and will be stored as per appropriate storage regulations. Please see details in attached Interm Fuel Contingency Plan for Jericho (Appendix 13)

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

Interm Fuel Contingency Plan for Jericho (Appendix 13)

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

Interm Fuel Contingency Plan for Jericho (Appendix 13)

30. Describe spill control measures in place.

Interm Fuel Contingency Plan for Jericho (Appendix 13)

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

Chemicals and Hazardous Materials*

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

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

A small amount of oil and grease will be brought to site to complete the maintenance requirements for the equipment on site. These will be transported as per the requirements of the Transportation of Dangerous Goods (TDG) Act & Regulations. The oil and grease will be stored in the fuel storage area until used. Used oil and grease will be collected and shipped off site for disposal at a licenced disposal facility. The exact quantities of these will be determined once a contractor is hired.

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

Interm Fuel Contingency Plan for Jericho (Appendix 13)

33. Describe the method of chemical transfer.

Interm Fuel Contingency Plan for Jericho (Appendix 13)

34. Describe spill control measures in place.

Interm Fuel Contingency Plan for Jericho (Appendix 13)

Workforce and Human Resources/Socio-Economic Impacts

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

The contract for remedial activities will contain an Inuit Opportunities Considerations (IOC) clause that requires the contractor to maintain a target level of Inuit employment on the project (and applies a penalty if the contractor fails to meet the target level). On past similar projects the Inuit employment level in the IOC has been in the range of 60-70%. The IOC also sets a target level of Inuit subcontracting. Past similar projects have had minimum Inuit subcontracting levels of 60-80%.

The contract will also contain a training fund that will allow the contractor access to up to 2% of the contract value.

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

It's assumed that workers will be mobilized to site from both Kugluktuk and Yellowknife. Site stabilization work will take place from May- October 2017. Workers will work on a rotational schedule to be determined by the contractor.

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

N/A

Public Involvement/ Traditional Knowledge

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

Residents and community organization from Kugluktuk would be positively impacted from this project and the employment/training opportunities it provides.

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

In August 2016 a community meeting occurred in Kugluktuk to present the details of the proposed site stabilization work and to seek community feedback and direction. Appendix 14 contains the meeting summary notes while Appendix 15 the attendance sheet.

Furthermore a separate meeting with the Kitikmeot Inuit Association took place the day before the community meeting to discuss the site stabilization activities and get their feedback. Please see Appendix 16 for a letter from the KIA in support of the site stabilization activities.

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

Please see appendix 14 which summarizes questions raised at the community meeting in Kugluktuk. There were no direct concerns raised at this community meeting.

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

At the present time traditional knowledge has not been directly integrated into the site stabilization project, however, community elders from Kugluktuk did attend the community consultation.

42. Discuss future consultation plans.

Additional community meetings will be held in Kugluktuk once a contractor is hired. The first will be in early 2017 to tell people about the plan for the summer and potential employment/training and sub-contracting opportunities. There will also be a meeting held prior to the conclusion of the work in either late 2017 or early 2018. The purpose of the final meeting will be to let the community know the results of the work.

3. PROJECT SPECIFIC INFORMATION

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

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

Table 1: Project Type and Information Required

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

SECTION A: Roads/Trails

A-1. Project Information

1. Describe any field investigations and the results of field investigations used in selecting the proposed route (e.g. geotechnical, snow pack)

The Tibbitt to Contwoyto Winter Road Joint Venture (JV Winter Road) will be used for the mobilization and demobilization of equipment and materials from the Jericho site. When the Jericho Mine was in operation the JV Winter Road extended all the way to Jericho. During the planning for this, many field investigations would have been conducted to validate the selected route. It's anticipated that a very similar route will be used for the construction of this winter road, and that detailed field investigations by the contractor will once again be conducted.

2. Provide a conceptual plan of the road, including example road cross-sections and water crossings.

Please see Appendix 10 for detailed driving maps for the JV winter road as well as appendix 11 for the route of the proposed extension of the road from Lupin to Jericho.

3. Discuss the type and volume of traffic using the road/trail (i.e. type of vehicles and cargo and number of trips annually).

From Ekati to the Jericho site we anticipate 20-25 truckloads going up and back on the winter road per season. The project will have two winter road seasons from 2017-2018.

4. Discuss public access to the road.

The Ekati to Jericho section of the winter road is being built for the sole purpose of mobilizing and demobilizing equipment and materials to the Jericho site. For these reasons we don't anticipate any public access to the road at this point.

5. Describe maintenance procedures.

Maintenance of the road will be the responsibility of the company hired to build the road.

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

All sections of the road that fall within the Jericho Site Stabilization Project are within the Nunavut Settlement Area.

A-2. All-Weather Road/Access Trail

7. Discuss road design considerations for permafrost.

There will be no construction of new all-weather roads.

8. Describe the construction materials (type and sources for materials), and the acid rock drainage (ARD) and metal leaching characteristics of the construction materials.

There will be no construction of new all-weather roads.

9. Discuss construction techniques, including timing for construction activities.

There will be no construction of new all-weather roads.

10. Indicate on a map the locations of designated refuelling areas, water crossings, culverts, and quarries/borrow sources.

There will be no construction of new all-weather roads.

11. Identify the proposed traffic speed and measures employed to ensure public safety.

Vehicle operators are expected to operate all vehicles and machinery in a manner that ensures a high level of public safety on site. We do not envision having to implement any additional measures around this.

12. Describe dust management procedures.

All weather roads onsite will be wetted down when needed to control dust.

A-3. Winter Road/Trail

13. Describe the surface preparation, including the use of snow berms or compaction, and any flooding. If flooding is to be used, provide the location of the water source on a map.

The surface preparation and flooding necessary for winter road construction will be determined by the contractor hired to construction the winter road. Please see appendix 17 for details on the winter road, water withdrawal locations and amounts.

14. Describe the operating time period.

The winter road will be used by 20-25 trucks traveling to and from the Jericho Mine site one time per winter in 2017 and 2018. We anticipate that they will travel in February or March of that year.

15. Identify the proposed traffic speed and measures employed to ensure public safety.

Traffic speed and other measures employed to ensure public safety on these winter roads will be set by the JV Winter Road group.

Typical speeds on ice are as follows:

Loaded trucks – 25 km/hr (15 mph) with some areas 10 km/hr; empty trucks – 60 - 70 km/hr (35 mph) on “Express Lanes” – which are return (southbound lanes) built on larger lakes

16. Discuss whether the selected route traverses any fish-bearing water bodies.

The proposed route traverses fish bearing water bodies such as Contwoyto Lake.

SECTION B: Mineral Exploration /Advanced Exploration /Development

B-1. Project Information

1. Describe the type of mineral resource under exploration.

B-2. Exploration Activity

2. Indicate the type of exploration activity:
   - Bulk Sampling (underground or other)
   - Stripping (mining shallow bedded mineral deposits in which the overlying material is stripped off, the mineral removed and the overburden replaced)
   - Trenching
   - Pitting
   - Delineation drilling

- Preliminary Delineation drilling
- Exploration drilling
- Geophysical work (indicate ground and/or air)
- Other

3. Describe the exploration activities associated with this project:
   - Satellite remote sensing
   - Aircraft remote sensing
   - Soil sampling
   - Sediment sampling
   - On land drilling (indicate drill type)
   - On ice drilling (indicate drill type)
   - Water based drilling (indicate drill type)
   - Overburden removal
   - Explosives transportation and storage
   - Work within navigable waters
   - On site sample processing
   - Off site sample processing
   - Waste rock storage
   - Ore storage
   - Tailings disposal
   - Portal and underground ramp construction
   - Landfilling
   - Landfarming
   - Other

B-3. Geosciences

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

B-4. Drilling

8. Provide the number of drill holes and depths (provide estimates and maximums where possible).
9. Discuss any drill additives to be used.
10. Describe method for dealing with drill cuttings.
11. Describe method for dealing with drill water.
12. Describe how drill equipment will be mobilized.
13. Describe how drill holes will be abandoned.

14. If project proposal involves uranium exploration drilling, discuss the potential for radiation exposure and radiation protection measures. Please refer to the *Canadian Guidelines for Naturally Occurring Radioactive Materials* for more information.

B-5. Stripping/ Trenching/ Pit Excavation

15. Discuss methods employed. (i.e. mechanical, manual, hydraulic, blasting, other)

Mechanical: - excavations will occur with an excavator.

16. Describe expected dimensions of excavation(s) including depth(s).

The project will use less than 50,000 m3 of borrow material predominantly for the construction of a non-hazardous landfill. We anticipate that much of this borrow material will come from the removal of existing infrastructure such as gravel pads, and dams that are nearby. Any other necessary borrow will be taken from the existing borrow Area “A” shown in the diagram below.

17. Indicate the locations on a map.

18. Discuss the expected volume material to be removed.

The project will use less than 50,000 m3 of borrow material predominantly for the construction of a non-hazardous landfill.

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

This is an existing borrow source that was used during Jericho Mine development and operations. If the borrow material is suspected of having acid rock drainage and metal leaching potential then it will be sampled. This is unlikely as the material used will be from the surface/near surface and no blasting will occur.

B-6. Underground Activities

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

B-7. Waste Rock Storage and Tailings Disposal

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

B-8. Stockpiles

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

B-9. Mine Development Activities

34. Indicate the type(s) of mine development activity(s):
    - Underground
    - Open Pit
    - Strip Mining
    - Other
35. Describe mine activities.
    - Mining development plan and methods
    - Site access
    - Site infrastructure (e.g. airstrip, accommodations, offshore infrastructures, mill facilities, fuel storage facilities, site service roads)
    - Milling process

- Water source(s) for domestic and industrial uses, required volumes, distribution and management.
- Solid waste, wastewater and sewage management
- Water treatment systems
- Hazardous waste management
- Ore stockpile management
- Tailings containment and management
- Waste rock management
- Site surface water management
- Mine water management
- Pitting and quarrying activities (please complete Section C)
- Explosive use, supply and storage (including on site manufacturing if required)
- Power generation, fuel requirements and storage
- Continuing exploration
- Other

36. Describe the explosive type(s), hazard class, volumes, uses, location of storage (show on map), and method of storage.

B-10. Geology and Mineralogy

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

B-11. Mine

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

B-12. Mill

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

SECTION C: Pits and Quarries

1. Describe all activities included in this project.
   - Pitting
   - Quarrying
   - Overburden removal
   - Road use and/or construction (please complete Section A)
   - Explosives transportation and storage
   - Work within navigable waters
   - Blasting
   - Stockpiling
   - Crushing
   - Washing
   - Other
2. Describe any field investigations and the results of field investigations used in determining new extraction sites.
3. Identify any carving stone deposits.
4. Provide a conceptual design including footprint.
5. Describe the type and volume of material to be extracted.
6. Describe the depth of overburden.
7. Describe any existing and potential for thermokarst development and any thermokarst prevention measures.
8. Describe any existing or potential for flooding and any flood control measures.
9. Describe any existing or potential for erosion and any erosion control measures.
10. Describe any existing or potential for sedimentation and any sedimentation control measures.
11. Describe any existing or potential for slumping and any slump control measures.
12. Describe the moisture content of the ground.
13. Describe any evidence of ice lenses.
14. If blasting, describe methods employed.
15. Describe the explosive type(s), hazard class, volumes, uses, location of storage (show on map), and method of storage.
16. Discuss methods used to determine acid rock drainage (ARD) and metal leaching (ML) potential and results.
17. Discuss safety measures for the workforce and the public.

SECTION D: Offshore Infrastructure

D-1. Facility

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

6. Describe whether part of the facility or project will be located outside of the Nunavut Settlement Area and whether any other regulatory requirements must be met (e.g. CEAA).

D-2. Facility Construction

7. Describe the types of material used for construction (i.e. granular or rock, steel piling or sheet piling, concrete). If material is granular, consider acid rock drainage potential, metal leaching potential, percentage of fines, size.
8. Describe dredging activities.
9. Indicate source of granular or rock material used in construction.
10. List quantities of the various types of material used in construction.
11. Describe construction method(s).
12. Indicate whether a site engineer will be on-site to inspect construction.
13. If proposed construction method involves dumping of fill into water, discuss measures for mitigating the release of suspended solids.

D-3. Facility Operation

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

D-4. Vessel Use in Offshore Infrastructure

19. Please complete Section H

SECTION E: Seismic Survey

E-1. Offshore Seismic Survey

1. Indicate whether the survey is 2D or 3D at each site.
2. Describe the type of equipment used, including:
   - Type and number of vessels including length, beam, draft, motors, accommodation capacity, operational speeds when towing and when not towing
   - Sound source (type and number of airguns)
   - Type and number of hydrophones
   - Number, length, and spacing of cables/ streamers
3. On a map, indicate the grid, number of lines and total distance covered by each line, the distance to nearby community/communities and sensitive areas (e.g., National Parks, National Wildlife Areas, Migratory Bird Sanctuaries, recognized breeding grounds or migratory routes).
4. Indicate the discharge volume of the airguns, the depth of airgun discharge, the noise levels of acoustic signal at various distances from the source (e.g.,500 metres,1000 metres), and the frequency and duration of airgun operation at each site.

5. Discuss the potential for dielectric oil to be released from the streamer array, and describe proposed mitigation measures.
6. Indicate whether additional seismic operations are required for start-up of operations, equipment testing, repeat coverage of areas.
7. Indicate whether air gun procedures will include a “ramping up” period and, if so, the proposed rate of ramping up.
8. Indicate whether the measures described in the *Statement of Canadian Practice for Mitigation of Noise in the Marine Environment* will be adhered to for this project.
9. Describe whether any part of the project will be located outside of the Nunavut Settlement Area and whether any other regulatory requirements must be met (e.g. CEAA).

E-2. Nearshore/Onshore Seismic Survey

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

E-3. Vessel Use in Seismic Survey

16. Please complete Section H.

SECTION F: Site Cleanup/Remediation

1. Describe the location, content, and condition of any existing landfills and dumps (indicate locations on a map).

There was one landfill constructed during Jericho Mine operations which is located on Inuit Owned Land. This landfill is not part of the proposed Site Stabilization activities. Located below is what is known about this landfill:

Non-hazardous wastes were landfilled by Tahera in Waste Dump 2 on IOL. It was a combination of a dry waste disposal and burn area. Waste from their incinerator was also disposed of in the area. Solids from the waste water clarifier were apparently placed in a segregated sludge pit located away from the waste cells. The landfill was closed by Shear in 2011.

2. Identify salvageable equipment, infrastructure and/or supplies.

As part of the proposed Site Stabilization activities, we are allowing the contractor the option of salvaging any equipment that is on the Jericho site. Please see Appendix E of the Phase III Environmental Site Assessment (ESA) (appendix 8) for a detailed list of all equipment available.

3. Provide a list of all contaminants to be cleaned up, anticipated volumes and a map delineating contaminated areas. This includes buildings, equipment, scrap metal and debris, and barrels as well as soil, water (surface and groundwater) and sediment.

The table below lists all of the contaminants to be cleaned up as part of this project. The location of these can be seen in the Phase III ESA found in appendix8.

Type of Waste	Composition	Quantity Generated	Treatment Method	Disposal Method
Contaminated soil	Soils contaminated with PHC.	3,315 m3	Excavate, load-haul and consolidated the PHC soils to on-site landfarm	Excavate, load-haul and consolidated the PHC soils to on-site landfarm
Contaminated Soils	Metal Impacted Soil	64 m3	Metal-impacted soils will be handled as per the *Abandoned Military Site Remediation Protocol* (AMSRP); Tier 1 soils to be land treated and Tier 2 soils to be removed offsite to a designated licensed disposal facility	Metal-impacted soils will be handled as per the *Abandoned Military Site Remediation Protocol* (AMSRP); Tier 1 soils to be land treated and Tier 2 soils to be removed offsite to a designated licensed disposal facility
Hazardous Materials	Organic content and materials in drums, ASTs, tanks, pails, etc.	1,286 m3	Incinerate using on-site incinerator that meets applicable emission controls.	Incinerate using on-site incinerator that meets applicable emission controls.
Hazardous materials	Batteries, light bulbs, drums, compressed gas cylinders, fire extinguishers, batteries, etc.	2,467 items	Depressurize gas cylinders and fire extinguishers. Sort and ship offsite to a designated licensed disposal facility if contents are unknown or cannot be discharged to environment. If known, dispose of in landfill if	Depressurize gas cylinders and fire extinguishers. Sort and ship offsite to a designated licensed disposal facility if contents are unknown or cannot be discharged to environment. If known, dispose of in landfill if appropriate.

			appropriate.	
Non-hazardous Materials	waste material such as wood debris, metal debris, aboveground storage tanks (AST), drums, rubber, concrete, plastic and other inert items.	42,919 m3	Onsite Non-hazardous landfill	Onsite Non-hazardous landfill
Non-hazardous materials	waste material such as wood debris, metal debris, aboveground storage tanks (AST), drums, rubber, concrete, plastic and other inert items.	2,614 items	Onsite Non-hazardous landfill	Onsite Non-hazardous landfill

4. Describe the degree of pollution/contamination, and list the contaminants and toxicity.

The degree of contamination is low to moderate.

5. Describe technologies used for clean-up and/or disposal of contaminated materials. Include a list of all the physical, chemical and biological cleanup/ remediation methods, operational procedures, and the dosage/frequency of reagents and bacterial medium.

Only proven methods and technologies will be used. See Site Stabilization Plan TOR for further information (Appendix 9)

6. Identify and describe all materials to be disposed of off site, including the proposed off site facilities, method of transport and containment measures.

See chart in question 3 above for list of materials that are being disposed of off-site. The JV Winter Road will be used to transport materials off-site that need to be disposed of. The exact disposal location has yet to be determined but will be once a contract is in place.

7. Discuss the viability of landfarming, given site specific climate and geographic conditions.

Landfarming has proven to be a viable option for the treatment of hydrocarbons (F1-F3) on many other contaminated sites projects that INAC has overseen including both mine and Distant Early Warning (DEW) Line sites in Nunavut.

8. Describe the explosive types, hazard classes, volumes, uses, location of storage (indicate on a map), and method of storage (if applicable).

None

9. If blasting, describe the methods employed.

N/A

10. Describe all methods of erosion control, dust suppression, and contouring and re-vegetation of lands.

None specifically required.

11. Describe **all** activities included in this project.
    - Excavation (please complete Section B-5)
      See section B-5
    - Road use and/or construction (please complete Section A)
      See Section A
    - Airstrip use and/or construction
      See Part 2 – Transportation Questions 12-15.
    - Camp use and/or construction
      See Part 2 – Camp Site Transportation Questions 16-18.
    - Stockpiling of contaminated material
      Contaminated materials will be consolidated and packaged for transportation. They will be stored at a staging area until they are loaded onto trucks to be removed from site. Confirmatory samples will be taken from the staging area once the materials are removed to confirm that the area is not contaminated.
    - Pit and/or quarry (please complete Section C)
      N/A
    - Work within navigable waters (please complete Section H)
      N/A
    - Barrel crushing
      Empty barrels will be handled as pre the Barrel Protocol described in the Abandoned Military Site Remediation Protocol (INAC 2009).
    - Building Demolition
      All structures that are to be demolished are described in the Site Stabilization TOR found in Appendix 9.
    - Other
      N/A

SECTION G: Oil and Natural Gas Exploration/Activities

G-1. Well Authorization

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

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

    j. Proposed Total Depth in mTDV and mMD.
    k. Formation of Total Depth
    l. Sour well? (yes or no)
        i. If Yes: Maximum H_2S concentration in mol/kmol
            Emergency planning zone radius in km
    m. Blowout Prevention (Well Class I – VI)
    n. Deviation Surveys
        i. Will be run at intervals less than 150m? (yes or no)
    o. Wireline logs
        i. Will run logs in hole for surface casing? (yes or no)
        ii. Will run a minimum of 2 porosity measuring logs? (yes or no)

G-2. On-Land Exploration

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

G-3. Off-Shore Exploration

14. Will drilling wastes contain detrimental substances (including, but not limited to, oil-based or invert mud and high salinity fluids)? If yes, indicate the substances and estimated volumes.

15. Attach the proposed or existing contingency plan which describes the course of action, mitigative measures and equipment available for use in the event of system failures and spills of hazardous materials.
16. Attach an outline of planned abandonment and restoration procedures.
17. Please complete Section H.

G-4. Rig

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

SECTION H: Marine Based Activities

H-1. Vessel Use

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

15. Describe all proposed measures for reducing impacts to marine habitat and marine wildlife (including mammals, birds, reptiles, fish, and invertebrates).
16. Describe whether any part of the project will be located outside of the Nunavut Settlement Area and whether any other regulatory requirements must be met (e.g. CEAA).

H-2. Disposal at Sea

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

SECTION I: Municipal and Industrial Development

1. Describe the business type, including public, private, limited, unlimited or other.
2. Describe the activity (e.g. development of quarry, development of hydroelectric facility, bulk fuel storage, power generation with nuclear fuels or hydro, tannery operations, meat processing and packing, etc.).
3. Describe the production process or service provision procedures.
4. Describe the raw materials used in this activity, the storage and transportation methods. If hazardous materials are included in raw materials, products or by-products; include safety regulations methodology.
5. Provide detailed information about the structure and/or building in which the activity will be conducted.
6. List the PPE (personal protective equipment) and tools to be used to protect personal health and safety.
7. Describe the firefighting equipment that are or will be installed.
8. Describe the noise sources, noise level in work area, technical measurements that will be adopted to abate the noise levels and regulatory requirements for noise abatement and noise levels.
9. Describe the type of gaseous emission that will be produced during this activity. Include the allowable thresholds and mitigation measures.
10. Describe odours that the activity might release and include corresponding allowable threshold. Describe mitigation measures if thresholds are exceeded.
11. Describe radiation sources that might be emitted during the activity. Include type and source and include mitigation measures. Also describe preventative measures for human exposure (i.e. PPE).
12. Discuss the employee safety and environment protection training program.
13. If the activity involves a bulk fuel storage facility, include drawings showing the bulk fuel storage facility location in proximity to natural water courses, high water marks, etc.

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

4. DESCRIPTION OF THE EXISTING ENVIRONMENT

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

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

The following is intended as a guide only.

Physical Environment

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

A description of the physical environment can be found in the Final Environmental Screening Report which is located in Appendix 18.

- Proximity to protected areas, including:
  i. designated environmental areas, including parks;
  ii. heritage sites;
  iii. sensitive areas, including all sensitive marine habitat areas;
  iv. recreational areas;
  v. sport and commercial fishing areas;
  vi. breeding, spawning and nursery areas;
  vii. known migration routes of terrestrial and marine species;
  viii. marine resources;
  ix. areas of natural beauty, cultural or historical history;
  x. protected wildlife areas; and
  xi. other protected areas.
- Eskers and other unique landscapes (e.g. sand hills, marshes, wetlands, floodplains).
- Evidence of ground, slope or rock instability, seismicity.
- Evidence of thermokarsts.
- Evidence of ice lenses.
- Surface and bedrock geology.
- Topography.
- Permafrost (e.g. stability, depth, thickness, continuity, taliks).
- Sediment and soil quality.
- Hydrology/ limnology (e.g. watershed boundaries, lakes, streams, sediment geochemistry, surface water flow, groundwater flow, flood zones).
- Tidal processes and bathymetry in the project area (if applicable).
- Water quality and quantity.
- Air quality.
- Climate conditions and predicted future climate trends.

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

Biological Environment

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

Socioeconomic Environment

- Proximity to communities.
- Archaeological and culturally significant sites (e.g. pingos, soap stone quarries) in the project (Local Study Area) and adjacent area (Regional Study Area).
- Palaeontological component of surface and bedrock geology.
- Land and resource use in the area, including subsistence harvesting, tourism, trapping and guiding operations.
- Local and regional traffic patterns.
- Human Health, broadly defined as a complete state of wellbeing (including physical, social, psychological, and spiritual aspects).
- Other Valued Socioeconomic Components (VSEC) as determined through community consultation and/or literature review.

5. IDENTIFICATION OF IMPACTS AND PROPOSED MITIGATION MEASURES

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

Please see attached table.

2. Discuss the impacts identified in the above table.

Please see Final Environmental Screening Report which is located in Appendix 18.

3. Discuss potential socioeconomic impacts, including human health.

Please see Final Environmental Screening Report which is located in Appendix 18.

4. Discuss potential for transboundary effects related to the project.
   Please see Final Environmental Screening Report which is located in Appendix 18.

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

Please see Final Environmental Screening Report which is located in Appendix 18.

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

Please see Final Environmental Screening Report which is located in Appendix 18.

6. CUMULATIVE EFFECTS

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

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

Please see Final Environmental Screening Report which is located in Appendix 18.

7. SUPPORTING DOCUMENTS

Where relevant, provide the following supporting documents:

- Abandonment and Decommissioning Plan

Please see Site Stabilization Plan TOR in Appendix 9

- Existing site photos with descriptions

Please see Phase III Environmental Site Assessment in Appendix 8

- Emergency Response Plan

Not available, will be completed prior to mobilizing to site.

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

Please see Appendix 13 for draft Spill Contingency Plan.

- Waste Management Plan/Program

Not available, will be completed prior to mobilizing to site.

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

Not available, will be completed prior to mobilizing to site.

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

Not Applicable

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

- Remediation Plan including cleanup criteria and how the criteria were derived.

Please see the Site Stabilization TOR located in appendix 9. The cleanup criteria used in this plan were either the Abandoned Military Site Remediation Protocol (AMSRP) or Canadian Council of Ministers of the Environment (CCME).

- Human Health Risk Assessment of the contaminants at the site.

Not available as established criteria are being used.

THE NUNAVUT IMPACT REVIEW BOARD
PROJECT SPECIFIC INFORMATION REQUIREMENT - PART 2 FORM

TABLE 1 - IDENTIFICATION OF ENVIRONMENTAL IMPACTS

		ENVIRONMENTAL COMPONENTS	PHYSICAL	designated environmental areas (ie. Parks, Wildlife Protected areas)	ground stability	permafrost	hydrology/ limnology	water quality	climate conditions	eskers and other unique or fragile landscapes	surface and bedrock geology	sediment and soil quality	tidal processes and bathymetry	air quality	noise levels	other VEC:	other VEC:	other VEC:	BIOLOGICAL	vegetation	wildlife, including habitat and migration patterns	birds, including habitat and migration patterns	aquatic species, incl. habitat and migration/spawnin	wildlife protected areas	other VEC:	other VEC:	other VEC:	SOCIO-ECONOMIC	archaeological and cultural historic sites	employment	community wellness	community infrastructure	human health	other VSEC: aesthetics
PROJECT COMPONENTS/ACTIVITIES																																	
CONSTRUCTION	Winter road construction, mobilization, transportation of equipment						M				M	M		M							M	M	M						P	P	P		
OPERATION	Camp Operation Including Water Use, Waste Water Treatment, Waste Incineration						M				M		M							M	M	M	M						P	P			
DECOMMISSIONING	Open Pit Infilling and Stabilization				M		M	M				M										M	M	P						P				P
	Processed Kimberlite Containment Area Management				P		P	P				P										M	M	M						P				P
	Structure Demolition and Debris Handling				M		M					M		M							M	M	M						P				P
	Onsite Construction of Non-hazardous Landfill				M		M					M		M							M	M	M						P				M
	Onsite Incineration of Liquid Organic Waste						P	P				M		M							P	P	P						P				P
	Onsite Handling and Consolidation of Hazardous Waste						M	P				M									M	M	M	M					P				P
	Excavation of Impacted soils						M	P				M										M	M	M						P				
	Landfarm Area Operation				M		M					M		M							M	M	M						P				
	Offsite Removal of Hazardous Waste and Tier 2 Metal Impacted Soil						P	P				M		M								P	P	P						P				P
	Site Contouring				M		P					M		M							M	M	M	M						P				P
	Demobilization, Transportation of Equipment on Winter Road						M					M		M								M	M	M								P		
	Long-term Monitoring						M	M														M	M	M						P				

Notes: Please indicate in the matrix cells whether the interaction causes an impact and whether the impact is:

P *Positive*
N *Negative and non-mitigatable*
M *Negative and mitigatable*
U *Unknown*

If no impact is expected then please leave the cell blank

APPENDIX 1

TIBBITT TO CONTWOYTO JOINT VENTURE WINTER ROAD GROUP- RIGHT TO USE AND OCCUPY CROWN LAND PERMIT #75M11-1-1

File No.: **75 M/11-1**

THIS INDENTURE, made in duplicate, this 26 day of August, 2009.

BETWEEN: **BHP BILLITON DIAMONDS INC.,** a body corporate, incorporated under the Canada Business Corporations Act and registered in the Northwest Territories under the Business Corporations Act, with a registered office in the City of Yellowknife in the Northwest Territories, and

DIAVIK DIAMOND MINES INC., a body corporate, incorporated under the Canada Business Corporations Act and registered n the Northwest Territories under the Business Corporations Act, with a registered office in the City of Yellowknife in the Northwest Territories as Joint Tenants and not as Tenants-In-Common;

hereinafter called "the Assignor"

OF THE FIRST PART

AND: **BHP BILLITON DIAMONDS INC.,** a body corporate, incorporated under the Canada Business Corporations Act and registered in the Northwest Territories under the Business Corporations Act, with a registered office in the City of Yellowknife in the Northwest Territories, and

DIAVIK DIAMOND MINES INC., a body corporate, incorporated under the Canada Business Corporations Act and registered n the Northwest Territories under the Business Corporations Act, with a registered office in the City of Yellowknife in the Northwest Territories, and

DEBEERS CANADA INC., a body corporate, incorporated under the Canada Business Corporations Act and registered n the Northwest Territories under the Business Corporations Act, with a registered office in the City of Yellowknife in the Northwest Territories, as Joint Tenants and not as Tenants-In-Common;

hereinafter called "the Assignee"

OF THE SECOND PART

WHEREAS by a licence dated the **7th day of January 2003,** and numbered **75 M/11-1-5** , made between Her Majesty the Queen in Right of Canada as licensor and **ECHO BAY MINES LTD., BHP BILLITON DIAMONDS INC.,** and **DIAVIK DIAMOND MINES INC**.subsequently assigned to the assignor as licencee, the said licensor did demise unto the said licencee the lands hereinafter mentioned to hold from the **1st day of May 2003,** for a term of **thirty (30) years**, at the yearly rent of **two thousand and twenty-five ($2025.00)** dollars and subject to the licencee's covenants and agreements therein.

I hereby certify that the within instrument was duly registered in the office of the Manager, Land Administration, Department of Indian Affairs and Northern Development, Yellowknife, Northwest Territories

on the 5 day of MARCH 20 10 A.D.

under number 75 M/11-18

Manager, Land Administration

This transfer or assignment is hereby consented to subject to the rights, interest of any third party.

Director of Operations
N.W.T. Region

NOW THIS INDENTURE WITNESSETH that in consideration of the sum of one ($1.00) dollar now paid by the assignee (the receipt which is hereby acknowledged) the assignor doth hereby grant and assign unto the assignee:

> all that certain parcel or tract of land situate, lying and being composed of the Tibbitt to Contwoyto Winter Road, comprising of all those parcels of land from Tibbitt Lake in the Northwest Territories to Contwoyto Lake in Nunavut constituting said right of way, containing an area of approximately 81 hectares more or less, and as more specifically shown in red in the Tibbitt to Contwoyto Winter Road Map Book, maps 1 thru 37, annexed to and forming part of N.W.T. Licence No. 75 M/11-1-5

together with the residue unexpired of the said term of years, and the said licence and all benefit and advantage to be derived therefrom.

TO have and to hold unto the assignee, subject to the payment of the said rent and the observance and performance of the licencee's covenants and conditions in the said licence.

THE assignor covenants with the assignee that, notwithstanding any act of the assignor, the said licence is a good, valid and subsisting licence, and that the rent thereby reserved has been duly paid up to the **30th day of April 2010** and the covenants and conditions therein have been duly observed and performed by the assignor up to the day of the date hereof.

AND that, notwithstanding as aforesaid, the assignor now has in him good right, full power and absolute authority to assign the said lands and licence in manner aforesaid according to the true intent and meaning of this indenture.

AND that subject to the said rent, and to the licencee's covenants and the conditions in the said licence, the assignee may enter into and upon and hold and enjoy the said lands for the residue of the term granted by the said licence and every renewal thereof (if any) for his own use and benefit, without any interruption of the assignor or any other person whomsoever claiming or to claim by, through or under him.

AND that the assignor shall and will from time to time, and at all times hereafter, at the request and costs of the assignee, execute such further assurances of the said lands as the assignee shall reasonably require.

AND the assignee covenants with the assignor that the assignee shall and will, from time to time during all the residue of the said term granted by the said licence and every renewal thereof, pay the rent and perform the licencee's covenants, conditions and agreements therein respectively reserved and contained, and indemnify and save harmless the assignor therefrom and from all actions, suits, costs, losses, charges, damages and expenses for or in respect thereof.

AND it is hereby declared and agreed that this indenture shall enure to the benefit of and be binding upon the parties hereto, their heirs, executors, administrators, successors and assigns, respectively.

AND it is further agreed that the "Address for Notices" referred to in the licence or subsequent assignments be changed to that of the current assignee as follows:

BHP BILLITON DIAMONDS INC.
1102, 4920 52 Street
Yellowknife, NT X1A 3T1

DIAVIK DIAMOND MINES INC.
P.O. Box 2498
5007 50 Avenue
Yellowknife, NT X1A 2P8

DEBEERS CANADA INC.
Suite 300, 5102 50 Avenue
Yellowknife, NT X1A 3S8

IN WITNESS WHEREOF the assignor and assignee have hereunto set their hands and seals.

SIGNED SEALED AND DELIVERED)
on behalf of)
BHP BILLITON DIAMONDS INC.,)
- Assignor)
)
)
)
)
)
)

Chris Wilshire (C/S)
Signature

Chris Wilshire, Director
Name and title of Director or Officer

SIGNED SEALED AND DELIVERED)
on behalf of)
DIAVIK DIAMOND MINES INC.,)
- Assignor)
)
)
)
)
)
)

(C/S)
Signature

President +
KIM TRUTER, Chief Operating Officer
Name and title of Director or Officer

SIGNED SEALED AND DELIVERED)
on behalf of)
BHP BILLITON DIAMONDS INC.,)
- Assignee)
)
)
)
)
)
)

Chris Wilshire (C/S)
Signature

Chris Wilshire, Director
Name and title of Director or Officer

SIGNED SEALED AND DELIVERED)
on behalf of)
DIAVIK DIAMOND MINES INC.,)
- Assignee)
)
)
)
)
)
)

(C/S)
Signature

KIM TRUTER, President + Chief Operating Officer
Name and title of Director or Officer

SIGNED SEALED AND DELIVERED)
on behalf of)
DEBEERS CANADA INC. - Assignee)
)
)
)
)
)
)
)

(C/S)

Signature

Chantal Lavoie, Chief Operating Officer

Name and title of Director or Office:

APPROVED

AS TO CONTENT

Manager
Land Administration

AS TO FORM

File No.: 75 M/11-1

THIS INDENTURE, made in triplicate, this 29TH day of NOVEMBER, 2006.

BETWEEN: **KINROSS GOLD CORPORATION (pursuant to Articles of Amalgamation effective January 1, 2006, the successor to Echo Bay Mines Ltd.), a body corporate, incorporated under the laws of Canada and having its head office in the City of Toronto, in the province of Ontario**

and

BHP BILLITON DIAMONDS INC., a body corporate, incorporated under the laws of Canada and having a registered office in the City of Yellowknife, in the Northwest Territories

and

DIAVIK DIAMOND MINES INC., a body corporate, incorporated under the laws of Canada and having a registered office in the City of Yellowknife, in the Northwest Territories

(hereinafter collectively called the "assignor")

OF THE FIRST PART

AND: **BHP BILLITON DIAMONDS INC., a body corporate, incorporated under the laws of Canada and having a registered office in the City of Yellowknife, in the Northwest Territories**

and

DIAVIK DIAMOND MINES INC., a body corporate, incorporated under the laws of Canada and having a registered office in the City of Yellowknife, in the Northwest Territories

(hereinafter collectively called the "assignee")

OF THE SECOND PART

WHEREAS by a license dated the 7th day of January, 2003, and numbered 75 M/11-1-5 (the "**License**"), made between Her Majesty the Queen in Right of Canada as licensor and said assignor as licensee, the said licensor did grant the said licensee the right to use and occupy the lands hereinafter mentioned, from the 1st day of May, 2003, for a term of thirty (30) years, at the yearly rent of two thousand twenty-five ($2,025.00) dollars, and subject to the licensee's covenants and agreements therein.

NOW THIS INDENTURE WITNESSETH that in consideration of the sum of one ($1.00) dollar now paid by the assignee (the receipt which is hereby acknowledged) the assignor doth hereby grant and assign unto the assignee:

The right to use and occupy, for the purposes described in the License, that

certain parcel or tract of land situate, lying and being composed of a right-of-way, approximately Twelve (12) metres in average width, more or less, described as The Tibbett to Contwoyto Winter Road, comprising all those parcels of land from Tibbett Lake in the Northwest Territories to Contwoyto Lake in Nunavat constituting said right-of-way, containing an area of approximately 81 hectares more or less, and as more specifically shown in red in the Tibbett to Contwoyto Winter Road Map Book, maps 1 through 37, annexed to the License,

together with the residue unexpired of the said term of years, and the License and all benefit and advantage to be derived therefrom.

TO have and to hold unto the assignee, subject to the payment of the said rent and the observance and performance of the licensee's covenants and conditions in the License.

~~PROVIDED HOWEVER said grant and assignment shall not be effective~~ until, and shall be conditional upon, ~~obtaining Her Majesty~~ the Queen in Right of Canada's ~~consent thereto and no later than January 31, 2007.~~

AND that, except as aforesaid, the assignor now has in him good right, full power and absolute authority to assign the said lands and the License in manner aforesaid according to the true intent and meaning of this indenture.

AND that subject to the said rent, and to the licensee's covenants and the conditions in the License, the assignee may enter into and upon and hold and enjoy the said lands for the residue of the term granted by the License and every renewal thereof (if any) for his own use and benefit, without any interruption of the assignor or any other person whomsoever claiming or to claim by, through or under him.

AND that the assignor shall and will from time to time, and at all times hereafter, at the request and costs of the assignee, execute such further assurances of the said lands as the assignee shall reasonably require.

AND it is hereby declared and agreed that this indenture shall enure to the benefit of and be binding upon the parties hereto, their heirs, executors, administrators, successors and assigns, respectively.

AND it is further agreed that the "Address for Notices" for the lessee referred to in the License be changed as follows:

BHP Billiton Diamonds Inc.
(Ref: Winter Road Joint Venture)
#1102, 4920 52nd Street
Yellowknife, NT X1A 3T1
Ph: (867) 669-6100
Fax: (867) 669-9293

AND TO:

Diavik Diamond Mines Inc.
(Ref: Winter Road Joint Venture)
5007-50th Avenue
Yellowknife, NT X1A 2P8
Ph: (867) 669-6500
Fax: (867) 669-9058

IN WITNESS WHEREOF the assignor and assignee have hereunto set their hands and seals.

SIGNED SEALED AND DELIVERED)
on behalf of)
Kinross Gold Corporation)

(C/S)
Signature

Rick Baker SVP EHS
Name and title of Director or Officer

(C/S)
Signature

Shelley Ruby
VP Admin. + Corp. Sec.
Name and title of Director or Officer

SIGNED SEALED AND DELIVERED)
on behalf of)
BHP Billiton Diamonds Inc.)

(C/S)
Signature

Sean Brennan President & COO
Name and title of Director or Officer

(C/S)
Signature

Timothy Holt, Vice President Finance
Name and title of Director or Officer

SIGNED SEALED AND DELIVERED)
on behalf of)
Diavik Diamond Mines Inc.)

(C/S)
Signature

Mark V. Anderson President & C.E.O.
Name and title of Director or Officer

(C/S)
Signature

Richard Klein, Vice President, Finance
Name and title of Director or Officer

DM_VAN/258842-00008/6585574.3

APPROVED
AS TO CONTENT
MANAGER
LAND ADMINISTRATION
AS TO FORM

Indian and Northern Affairs Canada / Affaires indiennes et du Nord Canada

Licence No.: 75 M/11-1-5

File No.: 75 M/11-1

THIS LICENCE made this 7th day of JANUARY, 2003 am

BETWEEN

Her Majesty the Queen in right of Canada,

hereinafter called "Her Majesty"

OF THE FIRST PART

AND **ECHO BAY MINES LTD.** a body corporate, incorporated under the laws of Canada and having its head office in the City of Edmonton, in the Province of Alberta, and **BHP BILLITON DIAMONDS INC.** a body corporate, incorporated under the laws of Canada and having a registered office in the City of Yellowknife, in the Northwest Territories, and **DIAVIK DIAMOND MINES INC.** a body corporate, incorporated under the laws of Canada and having a registered office in the City of Yellowknife, in the Northwest Territories, as Joint Tenants and not as Tenants-in-Common;

hereinafter called "the Licencee"

OF THE SECOND PART

WITNESSETH that in consideration of the premises, covenants and agreements herein reserved and contained, on the part of the Licencee to be paid, observed and performed, and pursuant to the Federal Real Property Act and its Regulations, Her Majesty grants the Licencee, insofar as Her Majesty has the right to do so, the right to use and occupy, for the purposes hereinafter described, that certain parcel or tract of land situate, lying and being composed of a right-of-way, approximately Twelve (12) metres in average width, more or less, described as:

The Tibbitt to Contwoyto Winter Road, comprising all those parcels of land from Tibbitt Lake in the Northwest Territories to Contwoyto Lake in Nunavut constituting said right of way, containing an area of approximately 81 hectares more or less, and as more specifically shown in red in the Tibbitt to Contwoyto Winter Road Map Book, maps 1 thru 37, annexed hereto and forming part of this description;

I hereby certify that an assignment of the within lease was registered in the office of the Manager, Land Administration, Department of Indian Affairs and Northern Development, Yellowknife, Northwest Territories.
on the 31ST day of JANUARY A.D. 2007
under number 75M/11-1-7
Manager, Land Administration

I hereby certify that an assignment of the within lease was registered in the office of the Manager, Land Administration, Department of Indian Affairs and Northern Development, Yellowknife, Northwest Territories.
on the 5 day of MARCH A.D. 2010
under number 75 M/11-1-8.
Manager, Land Administration

hereinafter called "the land", SUBJECT to the following:

Initial _____

Canada

THE PARTIES COVENANT AND AGREE AS FOLLOWS:

DEFINITIONS:

1. (a) "Minister" means the Minister of Indian Affairs and Northern Development and any person authorized by him in writing to act on his behalf;

(b) "Director" means the Director of Operations, of the Department of Indian Affairs and Northern Development at Yellowknife, Northwest Territories, or any person authorized by him in writing to act on his behalf;

(c) "facilities" means all physical structures or appurtenances placed in or upon the land;

(d) "construction" means all manner of disturbance of the natural state of the surface of the land, including the sub-surface and sub-strata;

(e) "body of water" means any lake, river, stream, swamp, marsh, channel, gully, coulee or draw that continuously or intermittently contains water;

(f) "commercial user" means any person using the road or causing the road to be used for purposes of transporting more than three (3) tonnes of goods, supplies or materials in any one year;

(g) "Candidate Commercial User" means any person proposing to use the road or cause the road to be used for purposes of transporting more than three (3) tonnes of goods, supplies or materials in any one year;

(h) "public lands" has the same meaning as in the *Northwest Territories Act*, R.S.C. 1985, c. N-27;

TERM:

2. The term of this licence shall be for a period of **thirty (30)** years commencing on the **1st day of May, 2003**, AD and terminating on the **30th day of April 2033**, AD.

RENT AND TAXES:

3. Subject to Clause #4, the Licencee shall pay to the Minister yearly and every year in advance a licence fee of two thousand and twenty-five **($2,025.00)** dollars.

4. The Minister may, not less than three (3) months before the expiration of the first five (5) year period of the said term, or of any succeeding five (5) year period during the term, notifiy the Licencee in writing of an amended Licence fee payable for the following five (5) year period and, failing further notification, for the remainder of the term; the said Licence fee to be based upon the fair appraised value of the land at the time of such notification but without taking into account the value of any improvements placed thereon by and at the expense of the Licencee.

5. The Licencee shall during the term of this Licence, pay all taxes, rates and assessments charged upon the land or upon the Licencee in respect thereof.

USE:

6. The Licencee shall use the land for the **construction, operation, maintenance, inspection, alteration, replacing and repair of a winter access road only**.

SUBLETTING OR ASSIGNMENTS:

7. The Licencee shall not sublet, assign or transfer this licence or any portion thereof without the consent of the Minister in writing, which consent will consider land management practices in place at that time.

8. No sublet, assignment or transfer of this Licence to any party will receive the consent of the Minister unless Leases numbered 76 D/8-1-3 and 85 P/9-2-5 are sublet, assigned or transferred to the same party.

9. Any sub-let, assignment or transfer of this Licence must be concurrent with the subletting, assignment or transfer of Leases numbered 76 D/8-1-3 and 85 P/9-2-5 and the sub-Licencee(s), assignee(s) or transferee(s) of Leases numbered 76 D/8-1-3 and 85 P/9-2-5 must be the same person(s) as the sub-Licencee(s), assignee(s) or transferee(s) of this licence, unless otherwise authorized by the Minister in writing.

BREACH:

10. Where any portion of the annual licence fee herein reserved is unpaid for more than thirty (30) days after it becomes due, whether formally demanded or not, the Minister may by notice in writing terminate this licence and on the day following the mailing of such notice, this licence is cancelled.

11. Where the Licencee breaches or fails to perform or observe any of the covenants, terms, conditions or agreements herein contained, other than the covenant to pay an annual licence fee, the Minister may so advise the Licencee by written notice and if the Licencee fails to remedy the breach or non-performance within a reasonable time thereafter or within the time granted in the said notice, the Minister may, by notice in writing, terminate this licence and on the day following the mailing of such notice, this licence is cancelled.

12. Unless a waiver is given in writing by the Minister, Her Majesty will not be deemed to have waived any breach or non-performance by the Licencee of any of the covenants, terms, conditions or agreements herein contained and a waiver affects only the specific breach to which it refers.

TERMINATION:

13. Upon the termination or expiration of this licence, the Licencee shall sever and remove from the land all structures, facilities, and improvements, saving and excepting the following, unless required pursuant to restoration requirements: all and any land fill, and without restricting the generality of the foregoing, in the form of soil, topsoil, sod, clay, sand, gravel, rock, crushed rock, glacial till, concrete, grout, asphalt, or any combination thereof, which during the said term were affixed or placed at the Licencee's expense on the land and shall leave the land in a condition satisfactory to the Minister.

14. Termination or expiration of this licence will not prejudice Her Majesty's right to unpaid licence fees or any other right with respect to a breach or non-performance of any covenant, term, condition or agreement herein contained nor will the Licencee be relieved of any obligation contained herein.

15. Should the said lands or any portion thereof under this Licence no longer be under the control, management and administration of the Minister of Indian Affairs and Northern Development, this Licence will be terminated on the effective date of the change without further notice. Termination of the Licence will not relieve the Licencee from payment of any Licence fees owning to the date of such termination.

SECURITY DEPOSITS:

16. The Minister may, at any time during the duration of this Licence require the Licencee to deposit and maintain with the Minister a security deposit in an amount not exceeding the sum total required to abandon and restore the land to an environmentally and aesthetically sound condition, pursuant to the plan of restoration required in Clause 19, said security deposit to be in a form satisfactory to the Minister.

17. The security deposit shall be held by the Minister as security for the performance by the Licencee of its obligations under this licence.

18. At final abandonment, either at termination or expiration of the licence, the Minister may draw down and use all or part of the said security deposit to remedy any damage or default, or to carry out any restoration necessary resulting from the Licencee's non-compliance, and shall refund any excess to the Licencee.

RESTORATION:

19. The Licencee shall, within one (1) year of the execution of this Licence, deliver to the Minister for his review and approval a plan of restoration which, where applicable, shall include but is not limited to the following

a) roads;
b) site drainage systems and granular material deposits
c) other facilities or sites utilized during the operation;
d) the land generally;

and such plan shall be prepared with the objective of restoring the land as near as possible to its original state, including the removal of all improvements, or such alternate objectives as may be approved by the Minister

20. The Minister may at any time during the term of the Licence request the Licencee to review and update the approved plan of restoration and upon receipt in writing of such a request, the Licencee shall submit to the Minister, for his approval and within the time specified, an updated plan of restoration.

21. Within six (6) months of the receipt of any plan from the Licencee including an updated plan of restoration, the Minister shall notify the Licencee whether or not the plan has been approved.

22. Upon the receipt of any plan, including an updated or revised plan of restoration, the Minister may;

(i) approve the plan submitted;
(ii) reject the plan or any portion thereof and return the plan to the Licencee for revision, stating the reasons for the rejection; or
(iii) require the Licencee to include in the plan provisions that, in his opinion, are necessary to meet the objectives in Clause 19;

and the Licencee will be advised accordingly in writing.

23. Where the Minister notifies the Licencee of the rejection of any plan or any portion thereof, the Licencee shall, within six (6) months of receipt of such notification, deliver to the Minister a revised plan for approval.

24. The Licencee shall undertake ongoing restoration during the term of the Licence for any land or improvements which are no longer required for the Licencee's operations on the land.

25. Where the Licencee fails to restore the land as required and within the time allowed by the Regulations or by the Minister, the Minister may order the restoration of all or any part of such land and any expenses thus incurred by the Minister shall be recoverable from the Licencee as a debt due to Her Majesty.

WASTE DISPOSAL:

26. The Licencee shall dispose of all garbage and debris in a manner and at a time acceptable to the Minister.

27. The Licencee shall not discharge or deposit any refuse substances or other waste materials in any body of water, or the banks thereof, which will, in the opinion of the Minister, impair the quality of the waters or the natural environment.

ENVIRONMENTAL:

28. The Licencee shall at all times keep the land in a condition satisfactory to the Minister.

29. The Licencee shall not do anything which will cause erosion of the banks of any body of water on or adjacent to the land, and shall provide necessary controls to prevent such erosion.

30. The Licencee shall not disturb the insulating capability of natural vegetation and organic soil in such a manner as to cause permanent subsidence or erosion of the land surface and shall, if subsidence occurs as a result of construction or maintenance of the facilities, restore the land to design grade at the expense of the Licencee, to the satisfaction of the Minister.

31. The Licencee shall not unduly interfere with the natural drainage pattern of the land, except with the permission of the Minister.

32. In the event that the Licencee is conducting operations which are, in the opinion of the Minister, whose opinion will be reasonably exercised, causing irreparable damage to the environment, the Minister may require that the operations of the Licencee hereunder be suspended and the operations shall be suspended until such time as the situation has been satisfactorily remedied.

33. The Licencee shall be required to undertake such corrective measures as may be specified by the Minister in the event of waste spill on the land, or water or wind erosion of the land, resulting from the Licencee's operations.

34. If the Licencee, by its operations on the land, has contributed to any detrimental environmental change, the Licencee shall pay its proportionate share of any costs of remedial action which may be considered necessary, as determined by the Minister.

35. The Licencee shall not permit the movement of any equipment or vehicles unless the ground surface is in a state capable of fully supporting the equipment or vehicles without rutting or gouging.

36. The Licencee shall suspend overland travel if rutting or gouging occurs.

FUEL AND HAZARDOUS CHEMICALS:

37. The Licencee shall immediately report all spills of petroleum and hazardous chemicals in accordance with the Government of the Northwest Territories/Nunavut Spill Report and any amendments thereto, or in a manner satisfactory to the Minister.

38. The Licencee shall, within six (6) months of the execution of this Licence deliver to the Minister for his approval, a comprehensive Prevention and Spill Contingency Plan of transported goods and shall before December 1st of each year of the Licence term update said plan and shall maintain the provisions of the said Plan, and any modifications approved by the Minister, throughout the term of this Licence.

39. The Licencee shall handle, store, dispose and keep records of all hazardous and toxic chemicals in a manner satisfactory to the Minister.

40. The Licencee shall prevent the possibility of migration of spilled fuel over the ground surface or through seepage in the ground.

41. The Licencee shall take all reasonable precautions to prevent the migration of petroleum products into bodies of water.

42. The Licencee shall not store petroleum products on the land.

BOUNDARIES AND SURVEYS:

43. Her Majesty is not responsible for the establishment on the ground of the boundaries of the land.

44. The boundaries of the land are subject to such adjustment and alteration as may be shown to be necessary by survey.

45. The Minister may, during the term herein granted, by notice in writing, order the Licencee to survey the boundaries of the land and the Licencee shall, at its own expense, within one (1) year from the date of said notice, make or cause to be made a survey of the land, such survey to be made in accordance with the instructions of the Surveyor General, and upon completion of the survey and the production of survey plans suitable for recording in the Canada Lands Surveys Records and filing in the Land Titles Office for the Northwest Territories Land Registration District, Her Majesty will execute an Indenture in amendment of this licence for the purpose of incorporating herein descriptions of the land based on the said plans.

IMPROVEMENTS:

46. The Licencee is responsible for ensuring that all improvements to the land are made within the boundaries of the Licenced area.

ACCESS:

47. Her Majesty assumes no responsibility, express or implied, to provide access to the land.

48. The Minister may grant to such persons as he may consider fit, at the sole risk and expense of persons so authorized, rights-of-way or access across, through, under or over all or any portion of the land for any purpose whatsoever, but such rights-of-way or access will not unreasonably interfere with the rights granted to the Licencee hereunder, or with any improvements made by the Licencee on the land.

49. In the event that the Minister grants access to the land and use of the road for a business or commercial undertaking, such access to the land and use of the road shall be granted subject to the commercial user having entered into a user agreement with the Licencee, ensuring the fair and equitable distribution of the costs of the road, as contemplated under clauses 53 & 54 hereunder.

50. Notwithstanding any other provision of this licence, the Licencee at all times shall permit any vehicle owned by or under contract to any department of the Government of Canada or of the Government of the Northwest Territories or the Government of Nunavut to use the road free of any fees or charges whatsoever.

51. The Licencee shall in no way interfere with the use by the public of any existing roads or trails crossing the land.

52. The Licencee shall, subject to clauses 53 to 62, permit any person or persons to travel along or across the road and road right-of-way on foot or by all-terrain or other automotive vehicle, without charge.

53. The Minister authorizes the Licencee to enter into user agreements with commercial users regarding access to the land and the use of the road for business or commercial undertakings. Such agreements shall require the commercial user to pay a user-charge to the Licencee for the use of the road, in accordance with clause 54 hereunder.

54. The user-charge shall be limited to the Licencee recovering the user's pro-rated portion of the Licencee's expenses for operating the winter road in that season. The pro-rating of such costs shall be based on the commercial user bearing a share of the Licencee's cost of constructing, maintaining, replacing and operating the road, which is proportionate to the commercial user's actual use of the road compared to the actual total usage by all commercial users (including the Licencee) of the road.

55. The Licencee shall before the first (1st) day of September in each and every year during the term of the Licence, provide to the Minister, a report of that years winter road activities. The report will include, but not be limited to:

a) total number of loads hauled in that season;
b) total road operating costs for that winter road season;
c) total number of loads hauled under each and every user agreement;
d) Road use fees collected pursuant to road user agreements for that season.

56. The Licencee shall disclose to all candidate commercial users, the option of seeking access to the lands and the use of the road from the Minister and the option of making a request to the Director to resolve disputes arising during the negotiations of a user agreement, as set out in clauses 57 to 62 hereunder.

57. Where a dispute arises between the Licencee and a candidate commercial user during the negotiation of a user agreement, the candidate commercial user may make a request in writing to the Director to settle the dispute in accordance with the process set out hereunder and the Licencee agrees to adhere to a decision made by the Director in accordance with that process.

58. Where a request is made to settle a dispute pursuant to clause 57 hereof, the Director shall, within seven (7) days of the written request:

a) serve a copy of the written request upon the Licencee; and
b) set a date for a review of the request and notify the candidate commercial user and the Licencee of the date and place of the review.

59. The date for the review referred to in clause 58 (b) shall not be later than fourteen (14) days after the Director receives the written request and not less than five (5) days after the candidate commercial user and the Licencee receives the notice referred to in clause 58 (b), hereof.

60. The Director shall, at a review held pursuant to clause 58(b) hereof:

a) consider written presentations of the candidate commercial user and the Licencee;
b) hear oral presentations by the parties; and
c) request further information in writing from either party, if necessary.

61. The Director shall, within five (5) days following the review held pursuant to clause 58 (b), hereof, make a decision allowing or refusing the commercial user to access the land and use the road for a business or commercial undertaking.

62. Where the decision of the Director is to allow the commercial user to access and use the road for a business or commercial undertaking, the Director shall prescribe:

a) the compensation to be paid by the commercial user to the Licencee for the use of the road and the manner of payments; and
b) any other terms and conditions upon which the commercial user may use the road.

63. The Licencee agrees to post signs along the road in order to give users thereof notice of the requirements for the use of the road and to advise such users that the use of the road is at their own risk.

64. The Licencee will close the said road by or on the first (1st) day of May in each and every year during the term of the Licence, unless otherwise directed by the Director, and notice of the said closure and dates will be posted along the said road pursuant to clause 63.

65. Where it appears that traffic may damage the road, the Director may close the road to all vehicles.

INDEMNIFICATION

66. The Licencee shall at all times hereafter indemnify and keep Her Majesty indemnified against all claims, demands, actions or other legal proceedings by whomsoever made or brought against Her Majesty by reason of anything done or omitted to be done by the Licencee, his officers, servants, agents or employees arising out of or connected with the granting of this licence or arising from the use of the lands or the road by the public or a commercial user who has entered into an agreement with the Licencee pursuant to clause 53 hereof.

67. Except in the case of a grant referred to in clause 48, where Her Majesty grants to any person rights-of-way or access under clause 48 hereof, the Licencee shall not be liable to Her Majesty or any other person for any damages, costs, demands, claims or actions brought by reason of anything done or omitted to be done by the person(s) so authorized pursuant to clause 48.

68. The Licencee hereby releases and indemnifies Her Majesty against all claims, demands, actions, or other legal proceedings made or brought by the Licencee or any other person arising from or in connection with the authority, or lack of authority, of Her Majesty to grant a licence in respect of the use and occupation of a road on public lands.

69. The Licencee will not be entitled to compensation from Her Majesty by reason of the land or any portion thereof being submerged, damaged by erosion, or otherwise affected by flooding.

70. Her Majesty will not be liable for damages caused by vandalism or interference by others with the Licencee's improvements and equipment.

PUBLIC UTILITIES

71. Her Majesty may re-enter and occupy any portion of the land for construction of any public works.

REVIEW:

72. At the request of the Licencee, any decision of the Minister will be reviewable by the Trial Division of the Federal Court of Canada; costs of such review are the responsibility of the Licencee unless otherwise ordered by the Court.

NOTICES:

73. All written notices respecting the land or the covenants, terms, conditions or agreements contained in this licence shall, unless otherwise stipulated herein, be deemed to have been received by the Licencee ten (10) days after the mailing thereof or, if hand delivered, on the day of delivery.

74. Any notice affecting this licence which Her Majesty may desire to serve upon the Licencee, or any notice which the Licencee may desire to serve upon Her Majesty shall, unless otherwise stipulated herein, be sufficiently served if posted by registered mail to the last known address of the opposite party as follows:

To Her Majesty:

Director of Operations
Northwest Territories Region
Department of Indian Affairs and Northern Development
P. O. Box 1500
Yellowknife, N.W.T.
X1A 2R3

To the Licencee:

Echo Bay Mines Ltd, BHP Billiton Diamonds Inc. & Diavik Diamond Mines Inc.
(Ref: Winter Road Joint Venture)
#1102, 4920 52nd, Street
Yellowknife, NT X1A 3T1

Either party may change its address for service during the term of this licence by notifying the other party in writing.

75. No notice of breach or default given herein by Her Majesty shall be valid or of any effect unless it is also given to any mortgagee of the Licencee, in respect of the licenced lands, of which Her Majesty shall have received written notice.

GENERAL:

76. The Licencee shall at all times, conform to and abide by, all applicable federal, territorial and local laws, by-laws and regulations.

77. This licence enures to the benefit of and is binding upon Her Majesty, Her Heirs and Successors and the Licencee, its successors and assigns.

78. The Licencee shall not fence the land, or any part thereof, except as may be reasonably required for safety purposes. This clause does not apply to the installation of protective guard rails at hazardous sections of the road.

79. If an archaeological site is discovered within the land, the Licencee shall immediately advise the Minister in writing of such a discovery and shall take all reasonable precautions necessary to prevent any further disturbance or destruction of such site.

80. Subject to the reservations, conditions, covenants and agreements herein contained, the Licencee, its successors and permitted assigns, having performed and observed and performed all of the stipulations, provisos and conditions on its part to be observed and performed, will be entitled to the quiet enjoyment of the lands herein licenced without hindrance, molestation or interruption on the part of Her Majesty or any person claiming by, through or under Her.

81. This agreement shall not entitle the Licencee to exclusive possession of the land, and Her Majesty reserves the right to grant other dispositions of the land, or any part of it, for the purposes permitted herein, or any other purpose, so long as the grant does not materially affect the exercise of the Licencee's rights hereunder.

82. Nothing herein contained shall be deemed to vest in the Licencee any title to timber or any minerals, whether solid, liquid or gaseous, or limestone, marble, clay, sand, gravel, earth, building or construction stone or coal, in, on or over the lands except only the parts thereof that are necessary to be dug, carried away or used in the construction of the installations of the Licencee, and this licence is granted subject to the rights of the holders of recorded mineral claims under the Canada Mining Regulations.

Licence No.: 75 M/11-1-5

IN WITNESS WHEREOF the Director of Operations, Northwest Territories Region, Department of Indian Affairs and Northern Development, has hereunto set his hand and seal on behalf of Her Majesty the Queen in right of Canada and **Echo Bay Mines Ltd., BHP Billiton Diamonds Inc. and Diavik Diamond Mines Inc.**, have hereunto affixed their corporate seals attested to by its proper officers duly authorized in that behalf.

SIGNED, SEALED AND DELIVERED on behalf of Her Majesty by the Director of Operations, Northwest Territories Region, Department of Indian Affairs and Northern Development in the presence of

Director's Witness

(Seal)
Director's Signature

SEALED, ATTESTED TO AND DELIVERED

by the Vice President - Operations

(Seal)
Signature of Licencee

and the Vice President + Secretary

(Seal)
Signature of Licencee

of **ECHO BAY MINES LTD.**.

SEALED, ATTESTED TO AND DELIVERED

by the President, Vice

(Seal)
Signature of Licencee

and the Financial Vice President

(Seal)
Signature of Licencee

of **BHP BILLITON DIAMONDS INC.**

SEALED, ATTESTED TO AND DELIVERED

by the V.P. Operations.

(Seal)
Signature of Licencee

and the Controller

(Seal)
Signature of Licencee

of **DIAVIK DIAMOND MINES INC.**

APPROVED
AS TO CONTENT
MANAGER LAND ADMINISTRATION
AS TO FORM

Initial

APPENDIX 2

INAC LAND USE PERMIT APPLICATION

APPLICATION FOR LAND USE PERMIT

***Privacy Act* Statement**
The information you provide in this document is collected under the authority of the *Territorial Land Use Regulations* for the purpose of responding to your application for land use permit. Information on individuals is used by Aboriginal Affairs and Northern Development Canada Land Administration employees who need to know the information in order to respond to your request and/or the program requirements. We share the information you give us with First Nations, Aboriginal groups and Inuit, Territorial and Federal Government Expert Agencies and Public Government Institutions. The personal information will be retained 6 years after the last administrative use and then destroyed. Individuals have the right to the protection of and access to their personal information under the *Privacy Act* http://lois.justice.gc.ca/en/P-21/index.html.

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Application Fee	Land Use Fee	General Receipt No.	Date (YYYYMMDD)	Class	Permit Number

To be completed by all applicants ▶ ● New Application ○ Amendment

1. Applicant's Name and Mailing Address (Full name, no initials)	Facsimile Number
Mark Yetman, Senior Project Officer Indigenous and Northern Affairs Canada	819 934-9229
	Telephone Number 819 934-1188
2. Head Office Address 10th Floor, 25 Eddy Street Gatineau, QC	Facsimile Number
	Telephone Number

Field Supervisor	Radio Telephone	E-Mail Address	Telephone Number

3. Other Personnel (Subcontractor, Contractors, Company Staff, etc.)

Not know until project is tendered and successful bidder is hired.

Total ▶

4. Qualifications
Refer to Section 21 of the *Territorial Land Use Regulations*
a(i) ☐ a(ii) ☐ a(iii) ☐ b ☐ c ☑

Number(s) exploration permit mineral claims (If applicable)
N/A

5. a) Summary of Operation (Describe purpose, nature and location of all activities.)
Refer to Section 22(2)(b) of the *Territorial Land Use Regulations* (Use last page of form if necessary.)

A general overview of the project can be found in the NIRB plain language summary in Appendix 1 while further details on the proposed site stabilization activities for the this project can be found the the Terms of Reference in Appendix 4. In addition to the site stabilization work, an extension of the JV Winter Road will have to be built. (continued on last page).

b) Please indicate if a camp is to be set up (Use last page to provide details.)

It's assumed that existing Jericho Mine camp infrastructure will be used for the site stabilization activities. (continued on last page)

6. Summary of potential environmental and resource impacts
(Describe the effects of the proposed program on land, water, flora and fauna and related socio-economic areas.)
(Use separate pages if necessary.)

The project is not expected to have any negative impacts on land, water, flora and fauna. Please see attached Environmental Screening Report for the proposed Jericho Mine Site Stabilization activities in Appendix 10.

7. Proposed Restoration Plans (Please use last page if required.)

The proposed Site Stabilization Plan will:

- stabilize the site to prevent water accumulation
- restore the site to an environmentally safe condition and
- prevent environmental migration of contaminants into the surrounding ecosystem

(Please see Appendix 4 for details on the proposed site stabilization activities.)

8. Other rights, licences or permits related to this permit application (Mineral claims, Yukon timber permits, water licences, etc.) (Please use last page if required.)

Active:

- Tibbit to Contwoyto Joint Venture Winter Road Group - Right to Use and Occupy Crown Land Permit
Land Permit 75 M/11-1 (Appendix 5). Expiry 2033.

(continued on last page)

Roads ▶ ○ Is this to be a pioneered road? ● Has the route been laid out or ground truthed?

9. Proposed Disposal Methods (Please use last page if required.)

a) Garbage	b) Sewage (Sanitary and Grey Water)
non-hazardous incinerated onsite	Waste Water Treatment Plant (see appendix 14)
c) Brush and Trees	**d) Overburden (Organic soils, waste material, etc.)**
N/A	N/A

10. Equipment (Includes drills, pumps, etc.) (Please use last page if required.)

Type and Number	Size	Proposed Use
• Drum crusher		site stabilization activities
• 3 x excavators		site stabilization activities
• 6 x Rock trucks		site stabilization activities
• 2 x bulldozer		site stabilization activities
• Compactor		site stabilization activities
• Water pump (s)		site stabilization activities
11. Fuels	Number of Containers	Capacity of Containers
☑ Diesel	300,000 L	stored in large tanks
☑ Gasoline	25	205L drums
☐ Aviation Fuel	N/A	N/A
☑ Propane	16	45kg tanks
☐ Other: _____		

12. Containment Fuel Spill Contingency Plans (Please attach separate contingency plan if necessary.)
Please see attached fuel contingency plan in appendix 13

13. Methods of Fuel Transfer (To other tanks, vehicles, etc.)
Please see attached fuel contingency plan in appendix 13

14. Period of Operation (Includes time to cover all phases of project work applied for, including restoration.)

- February/March 2017: JV winter road extension Ekati to Jericho
- March 2017: Mobilization of materials and equipment to Jericho Site
- May-October 2017: Site Stabilization activities
- February/March 2018: JV winter road extension Ekati to Jericho
- March 2018: Demobilization of materials and equipment

15. Period of Permit (Up to two years, with maximum of one year extension.)	Start Date (YYYYMMDD)	Completion Date (YYYYMMDD)
	2017-01-01	2019-01-01

16. Location of activities by map co-ordinates (Attach maps and sketches.)

	Degrees	Minutes	Seconds		Degrees	Minutes	Seconds
Minimum Latitude ▶	65	58	59.92 N	Minimum Longitude ▶	111	25	57.53 W
Maximum Latitude ▶	66	02	00.81 N	Maximum Longitude ▶	111	32	01.93 W

Map Sheet Number
076L04; 076E13, 076L03; 076E14

17. Applicant (Print Full Name)	Signature	Date (YYYYMMDD)
Mark Yetman	Mark Yetman	2016-09-09

18. Fees

○ Class **A** - $150.00 ○ Class **B** - $150.00 ▶		$150.00
Land Use Fees: Less than or equal to 2 hectares ▶	$50.00	$ 50.00
For each additional hectare over 2 hectares or portion of a hectare ▶	X $50.00 =	
Total application and land use fees ▶		

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19. Calculation of area involved (Includes access, staging areas, airstrips, campsites, etc.)

Total Area (Ha)	Less than or equal to 2 hectares	Total (For Fee Calculation)

20. Application Checklist

- ☐ a) Application Signed and Dated
- ☐ b) Fees Attached
- ☐ c) Map Included
- ☐ d) Address and Telephone Number
- ☐ e) Screening Report
- ☐ f) Timber Permit Applied for - Yukon
- ☐ g) Fees Attached
- ☐ h) Lease Applied for

Remarks (Please use last page if additional space is required.)

Accepted by	Date (YYYYMMDD)

21. Additional Information (Attach additional pages if necessary.)

5 a) The supply of equipment to the Jericho Mine to support the site stabilization activities, as well as the transport of equipment and materials out of the site, will take place through the use of the JV Winter road. Currently a "Right to Use and Occupy Crown Land Permit" (appendix 5) exists for the portion of the JV Winter that extends to the Lupin Mine, which is approximately 40 km by winter road from Jericho. Although a permit exists for this road to Lupin Mine, the current plan for JV Winter Road construction has it only being built to the Ekati Mine. As such, the Jericho Site Stabilization Project would be responsible for the construction of the road from Ekati to Jericho and as such seeks approval through a Crown Land Use Permit as well as its Access to Inuit Owned Lands Permit (Appendix 6) for the Lupin to Jericho section of this road.

For your reference and consideration, Appendix 7 contains driving maps for the JV Winter Road to Lupin, Appendix 8 a map showing the proposed route from Lupin to Jericho, and Appendix 9 a past AMEC report detailing proposed water withdrawal for the construction of the road.

5 b) The camp would house a maximum of 50 workers and would be operational predominately during the 2017 field season (may to October). As per our application to the Nunavut Water Board, water withdrawal from Carat Lake would not exceed 10m3 per day during operations.

8) Applications Submitted:
- Nunavut Water Board Water Licence (Appendix 11)
- Kitikmeot Inuit Association (KitIA) Access to Inuit Owned Lands Permit (Appendix 6)
- Nunavut Planning Commission Conformity Review
- Nunavut Impact Review Board- Part 1 and 2 (Appendix 12)

10)
- Incinerator (site stabilization activities)
- Generator(s) (site stabilization activities)
- Loader (site stabilization activities)
- trucks for transportation on site (site stabilization activities)
- ATVs (site stabilization activities)
- aqueous liquid waste treatment system to treat aqueous liquids for onsite disposal
- water truck to haul water to camp, if required, or for dust suppression
- Other equipment as deemed appropriate by the contractor

APPENDIX 3

NUNAVUT WATER BOARD
WATER LICENCE APPLICATION

General Water Licence Application
(Application for a new Water Licence)

Document Date: April 2013

Application Submission Date: _____
Month/Day/Year

P.O. BOX 119
GJOA HAVEN, NUNAVUT
XOB 1J0
TEL: (867) 360-6338
FAX: (867) 360-6369

kNK5 wmoEp5 vtmpq
NUNAVUT IMALIRIYIN KATIMAYIT
NUNAVUT WATER BOARD
OFFICE DES EAUX DU NUNAVUT

DOCUMENT MANAGEMENT

Original Document Date: April 2010

DOCUMENT AMENDMENTS

	Description	Date
(1)	Updated for public distribution as separate document from NWB Guide 4	June 2010
(2)	Updated NWB logos and reformatted table to allow rows to break across page	May 2011
(3)	Update NWB logo	April 2013
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

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kNK5 wmoEp5 vtmp5
NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYIT
OFFICE DES EAUX DU NUNAVUT

GENERAL WATER LICENCE APPLICATION
(APPLICATION FOR NEW WATER LICENCE)

The applicant is referred to the NWB's Guide 4: *Guide to Completing and Submitting a Water Licence Application for a New Licence* for more information about this application form.

LICENCE NO:
(for NWB use only)

1. APPLICANT (PROPOSED LICENSEE) CONTACT INFORMATION (name, address)

Mark Yetman
Senior Project Advisor
Indigenous and Northern Affairs Canada
10th Floor, 25 Eddy Street
Gatineau, QC
K1A 0H4

Phone: 819-934-1188
Fax: 819-934-9229
e-mail: mark.yetman@aandc.gc.ca

2. APPLICANT REPRESENTATIVE CONTACT INFORMATION if different from Block 1 (name, address)

Phone: _____
Fax: _____
e-mail: _____
(Attach authorization letter.)

3. NAME OF PROJECT (including the name of the project location)

Jericho Mine Site Stabilization, Nunavut

4. LOCATION OF UNDERTAKING

Project Extents

NW:	Latitude: (66 ° 02 ' 00.81 " N)	Longitude: (111 ° 32 ' 01.93 " W)
NE:	Latitude: (66 ° 02 ' 00.40 " N)	Longitude: (111 ° 25 ' 57.53 " W)
SE:	Latitude: (65 ° 58 ' 59.92 " N)	Longitude: (111 ° 26 ' 00.04 " W)
SW:	Latitude: (65 ° 59 ' 00.11 " N)	Longitude: (111 ° 31 ' 59.86 " W)

Camp Location(s)

Latitude: (65 ° 59 '26.25" N) Longitude: (111 ° 30 '08.99 " W)

5. **MAP** - Attach a topographical map, indicating the main components of the undertaking.

NTS Map Sheet No.: 076L04; 076E13, 076L03; 076E14 Map Name: ____ Map Scale: _____

6. **NATURE OF INTEREST IN THE LAND** - Check any of the following that are applicable to the proposed undertaking (at least one box under the 'Surface' header must be checked).

Sub-surface

☐ Mineral Lease from Nunavut Tunngavik Incorporated (NTI)
Date (expected date) of issuance: _____ Date of expiry: _____

☐ Mineral Lease from Indian and Northern Affairs Canada (INAC)
Date (expected date) of issuance: _____ Date of expiry: _____

Surface

✔ Crown Land Use Authorization from Indian and Northern Affairs Canada (INAC)
Date (expected date) of issuance: December 2016 Date of expiry: _____

✔ Inuit Owned Land (IOL) Authorization from Kitikmeot Inuit Association (KIA)
Date (expected date) of issuance: December 2016 Date of expiry: _____

☐ IOL Authorization from Kivalliq Inuit Association (KivIA)
Date (expected date) of issuance: _____ Date of expiry: _____

☐ IOL Authorization from Qikiqtani Inuit Association (QIA)
Date (expected date) of issuance: _____ Date of expiry: _____

☐ Commissioner's Land Use Authorization
Date (expected date) of issuance: _____ Date of expiry: _____

☐ Other: _____
Date (expected date) of issuance: _____ Date of expiry: _____

Name of entity(s) holding authorizations:
_____

7. **NUNAVUT PLANNING COMMISSION (NPC) DETERMINATION**

Indicate the land use planning area in which the project is located.

☐ North Baffin
☐ South Baffin
☐ Akunniq
☐ Keewatin
☐ Sanikiluaq
✔ West Kitikmeot

Is a land use plan conformity determination required?

✔ Yes ☐ No

If Yes, indicate date issued and attach copy (expected September 2016)
If No, provide written confirmation from NPC confirming that a land use plan conformity review

is not required.

8. NUNAVUT IMPACT REVIEW BOARD (NIRB) DETERMINATION

Is an Article 12 Part 4 screening determination required?

✔ Yes ☐ No

If Yes, indicate date issued and attach copy _____
If No, provide written confirmation from NIRB confirming that a screening determination is not required.

The Nunavut Impact Review Board (NIRB) Part 1 and 2 Forms are being submitted concurrently with this application. Copies of the forms can be found in Appendix 1.

9. DESCRIPTION OF UNDERTAKING – List and attach plans and drawings or project proposal.

Please see the "Jericho Mine Site Stabilization, Nunavut Terms of Reference" in Appendix 2 for a description of site stabilization activities that are proposed to occur at the site. Site diagrams, maps as well as details on assessment related work can be found in the 2014 Phase III Environmental Site Assessment completed by Tetra Tech EBA in Appendix 3.

10. OPTIONS – Provide a brief explanation of the alternative methods or locations that were considered to carry out the project.

Alternative methods and locations for this work were not considered.

11. CLASSIFICATION OF PRIMARY UNDERTAKING - Indicate the primary classification of undertaking by checking one of the following boxes.

☐ Industrial ☐ Agricultural
☐ Mining and Milling (includes exploration/drilling/exploration camps)
☐ Conservation
☐ Municipal (includes camps/lodges) ☐ Recreational
☐ Power ✔ Miscellaneous (describe below):
_____Site Stabilization of an abandoned mine site in Nunavut._____

See Schedule II of *Northwest Territories Waters Regulations* for Description of Undertakings.

Information in accordance with applicable Supplemental Information Guidelines (SIG) must be submitted with a New Water Licence Application. Indicate which SIG(s) are applicable to your application.

☐ Hydrostatic Testing
☐ Tannery
✔ Tourist / Remote Camp
✔ Landfarm & On-Site Storage of Hydrocarbon Contaminated Soil
☐ Onshore Oil and Gas Exploration Drilling
☐ Mineral Exploration / Remote Camp
☐ Advanced Exploration

☐ Mine Development
☐ Municipal
☐ General Water Works
☐ Power

12. **WATER USE -** Check the appropriate box(s) to indicate the type(s) of water use(s) being applied for.

✔ To obtain water for camp/ municipal purposes
☐ To obtain water for industrial purposes
✔ To cross a watercourse
☐ To alter the flow of, or store water
☐ To divert a watercourse
☐ To modify the bed or bank of a watercourse
☐ Flood control
✔ Other: To return a watercourse back to its natural flow

13. **QUANTITY AND QUALITY OF WATER INVOLVED -** For each type of water use indicated in Block 12, provide the source of water, the quality of the water source and available capacity, the estimated quantity to be used in cubic meters per day, method of extraction, as well as the quantities and qualities of water to be returned to source.

Name of water source(s) (show location(s) on map):

A) To Obtain Water for Camp/municipal Purposes
- Please see diagram below for location.

Describe the quality of the water source(s) and the available capacity:

Carat Lake was the water source which was approved for usage (quality and quantity) when the mine was operating at full capacity. The volumes of water being proposed for usage in this application are for a small camp and remedial activities, which is a significantly smaller amount than was approved for when the mine was in operations. Before the water from Carat Lake would be used for camp operations, extensive water testing would be conducted to ensure its safety and suitability for this camp of no more than 50 workers.

Provide the overall estimated quantity of water to be used:
10 m^3/day to support camp and remedial activities.

Provide the estimated quantity(s) of water to be used from each source:
10 m^3/day from Carat Lake

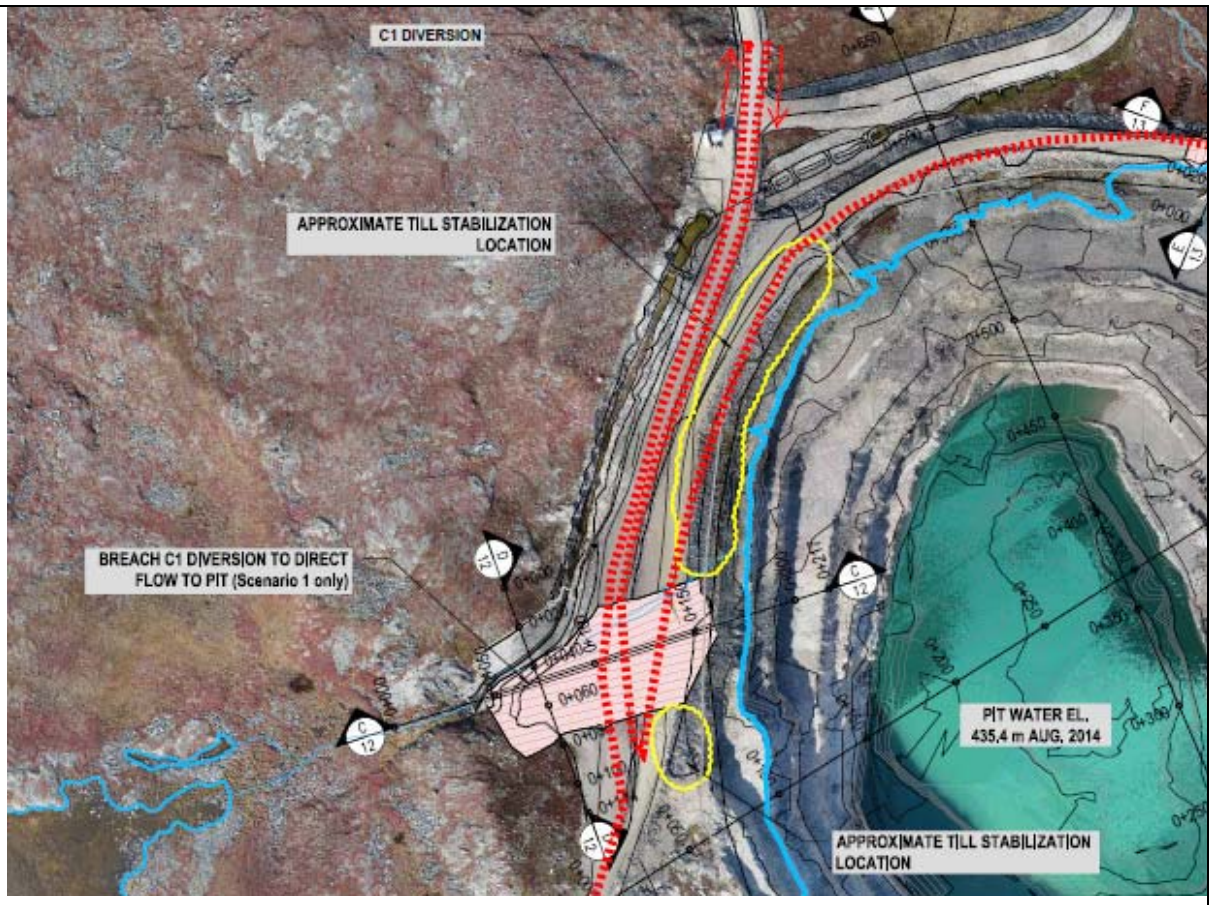
Indicate the estimated quantities to be used for each purpose (camp, drilling, etc.)
6 m^3/day for camp; 4 m^3/day for remedial activities

Describe the method of extraction(s):
Water will be extracted using an intake hose with a screen to ensure that no fish become trapped. Water will either be pumped directly from the lake to the camp using existing infrastructure put in place when the mine was in operation, or will be transported via truck to the camp.

Estimated quantity(s) of water returned to source(s)
- 0 m^3/day
- Water will not be returned to the source, Carat Lake

Describe the quality of water(s) returned to source(s):
Water will be treated using the existing water treatment facility (please see Appendix 4), and tested that it meets applicable discharge criteria before being released to environment.

B) Other: To Return a Watercourse Back to its Natural Flow
- C1 Diversion (breach and construct pit overflow returning back to natural flow)
- Please see diagrams below for location
- There is no water being used in this site stabilization activity. The watercourse is simply being diverted back to its natural flow.
- Please see Environmental Screening Report in Appendix 5 for details on environmental impacts of this activity.

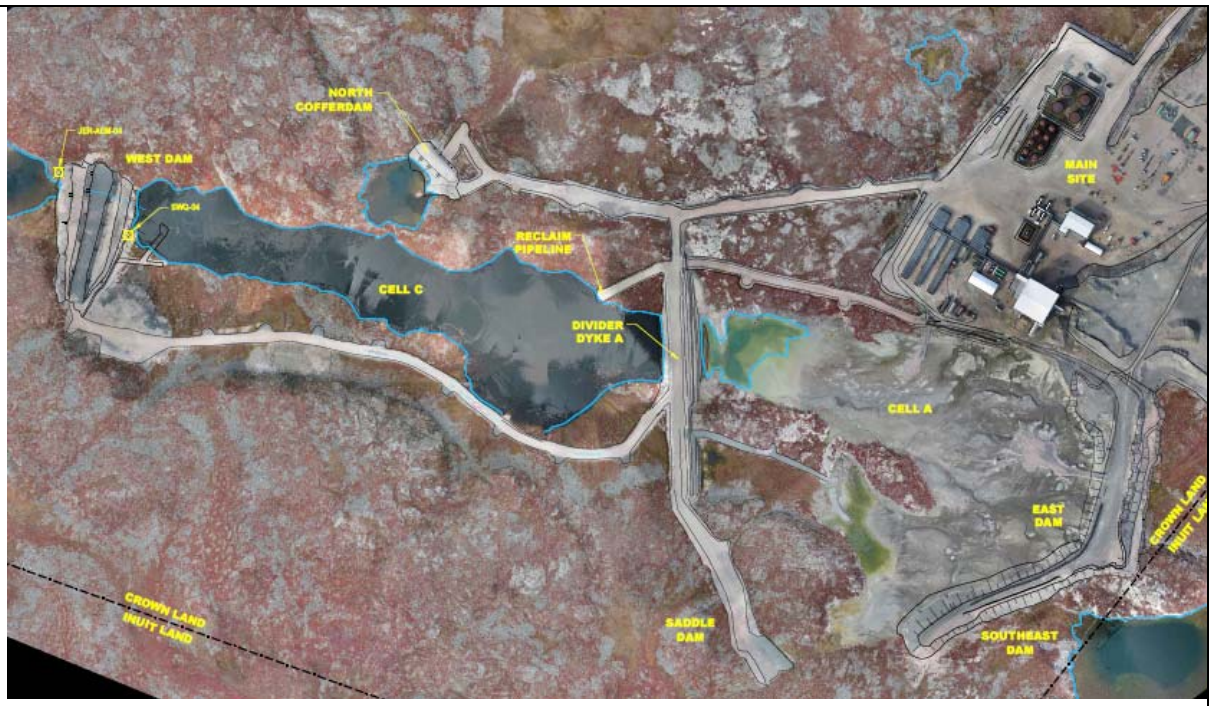


C) Other: To Return a Watercourse Back to its Natural Flow

- Breach West Dam and Notch Divider Dyke A
- Please see diagram below for locations.
- There's no water being used or additional water being deposited back to the environment in this site stabilization activity. We are simply breaching dams that were constructed for mining operations.
- All water will be adequately tested to ensure it meets applicable guidelines before dams are breached. Regular water testing of these areas has occurred as part of past care and maintenance activities, and during mine operations.
- Before dam breach, water in the containment area will be effectively drawndown, and sediment controls will be put in place.
-- Please see Environmental Screening Report in Appendix 5 for details on environmental impacts of this activity.

D) To Cross a Watercourse

- Water will be used to construct the winter road necessary for the mobilization and demobilization of equipment to and from the Jericho Site.
- It's estimated that 5700 m3 of water will be required to construct the land portions of the road, all of which will be returned to the natural environment. Please see Appendix 6 for details on this.



_____
_____

14. **WASTE** – Check the appropriate box(s) to indicate the types of waste(s) generated and deposited.

- ✔ Sewage
- ✔ Solid Waste
- ✔ Hazardous
- ✔ Bulky Items/Scrap Metal
- ☐ Animal Waste
- ☐ Other (describe): _____
- ✔ Waste oil
- ✔ Greywater
- ☐ Sludges
- ✔ Contaminated soil and/or water

15. **QUANTITY AND QUALITY OF WASTE INVOLVED** – For each type of waste indicated in Block 14, describe its composition, quantity in cubic meters/day, method of treatment and method of disposal.

Type of Waste	Composition	Quantity Generated	Treatment Method	Disposal Method
sewage	Black water	30 litres/day x 50 people (max) = 1500 litres/day	Waste Water Treatment Plant	As per previously approved Tahera Waste Water Treatment Plant Operations Plan (see appendix ____)
greywater	greywater	80 litres/day x 50 people (max) = 4000 L/day	Waste Water Treatment Plant	As per previously approved Tahera Waste Water Treatment Plant Operations Plan

				(see appendix ____)
Waste Oil	Oil	0.002 Litres/day	Collected in drums	Shipped south for recycling and/or disposal
Solid waste	Camp waste (paper, packaging, food, etc.)	2 m3	Incineration	Incineration in onsite incinerator
Contaminated soil	Soils contaminated with PHC.	3,315 m3	Excavate, load-haul and consolidated the PHC soils to on-site landfarm	Excavate, load-haul and consolidated the PHC soils to on-site landfarm
Contaminated Soils	Metal Impacted Soil	64 m3	Metal-impacted soils will be handled as per the *Abandoned Military Site Remediation Protocol* (AMSRP); Tier 1 soils to be land treated and Tier 2 soils to be removed offsite to a designated licensed disposal facility	Metal-impacted soils will be handled as per the *Abandoned Military Site Remediation Protocol* (AMSRP); Tier 1 soils to be land treated and Tier 2 soils to be removed offsite to a designated licensed disposal facility
Hazardous Materials	Organic content and materials in drums, ASTs, tanks, pails, etc.	1,286 m3	Incinerate using on-site incinerator that meets applicable emission controls.	Incinerate using on-site incinerator that meets applicable emission controls.
Hazardous materials	Batteries, light bulbs, drums, compressed gas cylinders, fire extinguishers, batteries, etc.	2,467 items	Depressurize gas cylinders and fire extinguishers. Sort and ship offsite to a designated licensed disposal facility if contents are unknown or cannot be discharged to environment. If known, dispose of in landfill if	Depressurize gas cylinders and fire extinguishers. Sort and ship offsite to a designated licensed disposal facility if contents are unknown or cannot be discharged to environment. If known, dispose of in landfill if appropriate.

			appropriate.	
Non-hazardous Materials	waste material such as wood debris, metal debris, aboveground storage tanks (AST), drums, rubber, concrete, plastic and other inert items.	42,919 m3	Onsite Non-hazardous landfill	Onsite Non-hazardous landfill
Non-hazardous materials	waste material such as wood debris, metal debris, aboveground storage tanks (AST), drums, rubber, concrete, plastic and other inert items.	2,614 items	Onsite Non-hazardous landfill	Onsite Non-hazardous landfill

16. OTHER AUTHORIZATIONS – In addition to the sub-surface and surface land use authorizations provided in Block 6, indicate any other authorizations required in relation to the proposed undertaking. For each provide the following:

Authorization: _____None_____

Administering Agency: _____N/A_____

Project Activity: _____N/A_____

Date (expected date) of issuance: _____ Date of expiry: _____

17. PREDICTED ENVIRONMENTAL IMPACTS OF UNDERTAKING AND PROPOSED MITIGATION MEASURES - Describe direct, indirect, and cumulative impacts related to water and waste.

A final Environmental Screening Report was completed for the project in August 2016 and is provide in Appendix 5.

18. WATER RIGHTS OF EXISTING AND OTHER USERS OF WATER

Provide the names, addresses and nature of use for any known persons or properties that may be adversely affected by the proposed undertaking, including those that hold licences for water use in precedent to the application, domestic users, in-stream users, authorized waste depositors, owners of property, occupiers of property, and/or holders of outfitting concessions, registered trapline holders, and holders of other rights of a similar nature.

Advise the Board if compensation has been paid and/or agreement(s) for compensation have been

reached with any existing or other users.

None

19. INUIT WATER RIGHTS

Advise the Board of any substantial affect of the quality, quantity or flow of waters flowing through Inuit Owned Land (IOL), and advise the Board if negotiations have commenced or an agreement to pay compensation for any loss or damage has been reached with one or more Designated Inuit Organization (DIO).

None

20. CONSULTATION – Provide a summary of any consultation meetings including when the meetings were held, where and with whom. Include a list of concerns expressed and measures to address concerns.

- Monthly conference calls with Kitikmeot Inuit Association
- Biweekly conference calls with Jericho Site Stabilization Working Group
- August 2016 community consultation in Kugluktuk on the Jericho Site Stabilization Plan
- August 2016 meeting with the Kitikmeot Inuit Association on the proposed site stabilization plan.

21. SECURITY INFORMATION

Provide an estimate of the total financial security for final reclamation equal to the total outstanding reclamation liability for land and water combined sufficient to cover the highest liability over the life of the undertaking. Estimates of reclamation costs must be based on the cost of having the necessary reclamation work done by a third party contractor if the operator defaults. The estimate must also include contingency factors appropriate to the particular work to be undertaken.

Where applicable, the financial security assessment should be prepared in a manner consistent with the principals respecting mine site reclamation and implementation found in the *Mine Site Reclamation Policy for Nunavut,* Indian and Northern Affairs Canada, 2002.

22. FINANCIAL INFORMATION

Provide a statement of financial responsibility. N/A

If the applicant is a business entity, provide a list of the officers of the company. N/A

If the applicant is a business entity attach a copy of the Certificate of Incorporation or evidence of registration of the company name. N/A

23. STUDIES UNDERTAKEN TO DATE - List and attach copies of studies, reports, research, etc.

1) Jericho Mine Site Stabilization Terms of Reference, 2016. (Appendix 2)
2) Environmental Site Assessment, Materials Survey and Geotechnical Assessment Jericho Diamond Mine. 2014 (Appendix 3)
3) Jericho Mine Wastewater Treatment Plant Design Plan- Addendum Tahera Diamond Corporation. 2006. (Appendix 4)
4) Environmental Screening Report, 2016. (Appendix 5)

24. PROPOSED TIME SCHEDULE – Indicate the proposed start and completion dates for each applicable phase of development (construction, operation, closure, and post closure).

Construction
Proposed Start Date: _____ (month/year) Proposed Completion Date: _____ (month/year)

Operation
Proposed Start Date: _____ (month/year) Proposed Completion Date: _____ (month/year)

Closure (Site Stabilization)
Proposed Start Date: _____01/01/17_____ (month/year) Proposed Completion Date: ____03/31/18___ (month/year)

Post – Closure (Long- Term Monitoring)
Proposed Start Date: _____07/19___ (month/year) Proposed Completion Date: _____07/44_____ (month/year)

For each applicable phase of development indicate which season(s) activities occur.

Construction
☐ Winter ☐ Spring ☐ Summer ☐ Fall ☐ All season

Operation
☐ Winter ☐ Spring ☐ Summer ☐ Fall ☐ All season

Closure (Site Stabilization)
☐ Winter ☐ Spring ☐ Summer ☐ Fall ✔ All season

Post – Closure (Long- Term Monitoring)
☐ Winter ☐ Spring ✔ Summer ☐ Fall ☐ All season

25. PROPOSED TERM OF LICENCE

Number of years (maximum of 25 years): 3 years

Requested Date of Issuance: _____01/17_____ (month/year) Requested Expiry Date: ____01/20____ (month/year)

(The requested date of issuance must be at least three (3) months from the date of application for a type B water licence and at least one (1) year from the date of application for a type A water licence, to allow for processing of the water licence application. These timeframes are approximate and do not account for the time to complete any pre-licensing land use planning or development impact requirements, time for the applicant to prepare and submit a water licence application in accordance with any project specific guidelines issued by the NWB, or the time for the applicant to respond to requests for additional information. See the NWB's *Guide 5: Processing Water Licence Applications* for

more information)

26. **ANNUAL REPORTING –** If not using the NWB's *Standardized Form for Annual Reporting*, provide details regarding the content of annual reports and a proposed outline or template of the annual report.

Will use NWB's Standard form.

27. **CHECKLIST –** The following must be included with the application for the water licensing process to begin.

Written confirmation from the NPC confirming that NPC's requirements regarding land use plan conformity have been addressed.

☐ Yes ✔ No If no, date expected _____Submitted_____

Written confirmation from the NIRB confirming that NIRB's requirements regarding development impact assessment have been addressed.

☐ Yes ✔ No If no, date expected _____Submitted_____

Completed General Water Licence Application form.

☐ Yes ✔ No If no, date expected Submitted

Information addressing Supplemental Information Guideline (SIG) , where applicable (see Block 11)

☐ Yes ☐ No If no, date expected N/A

English Summary of Application.

✔ Yes ☐ No If no, date expected

Inuktitut and/or Inuinnaqtun Summary of Application.

✔ Yes ☐ No If no, date expected

Application Fee of $30.00 CDN (Payee Receiver General for Canada).

☐ Yes ✔ No If no, date expected N/A

Water Use Fee Deposit of $30.00 CDN (Payee Receiver General for Canada). The actual water use fee will be calculated by the NWB based upon the amount of water authorized for use in accordance with the Regulations at the time of issuance of the licence.

☐ Yes ✔ No If no, date expected N/A

28. SIGNATURE

Mark Yetman	Senior Project Advisor		2016-09-09
Name (Print)	**Title (Print)**	**Signature**	**Date**

APPENDIX 4

KITIKMEOT INUIT ASSOCIATION ACCESS TO INUIT OWNED LAND PERMIT APPLICATION

Kitikmeot Inuit Association
Kitikmeot Inuit Katuyikatigit
ᑭᐱᑎᒃᒪᑦ ᐃᓄᐃᑦ ᑲᑐᔾᔨᖏᑦ

KITIKMEOT INUIT ASSOCIATION
LANDS DIVISION
APPLICATION FOR ACCESS TO INUIT OWNED LAND

Office use only

Category	Application No:	Accepted By:	Date Accepted:

To be completed by all applicants

1. Applicant's name and mailing address (Full name, no initials or abbreviations)

Mark Yetman
Indigenous and Northern Affairs Canada
10th Floor, 15 Eddy Street
Gatineau, QC
K1A 0H4

Fax no. 819-934-9229

Telephone no. 819-934-1188

2. Head Office address

Same as above

Fax no.

Telephone no.

3. Field supervisor and address if different from above

Telephone no.

4. Other personnel list (Subcontractors or contractors to be used)

Project will be going to tender in August. Details of who the winning bidder is will not be available until after the process is completed. Details around sub-contractors will follow after.

Total no. of personnel: 50 (max) No. of person days: 9000 days (max)

5. Location of activities by map coordinates. Attach **ORIGINAL** maps and sketches.

MAX Lat Min 02 '	MIN Lat Deg 65 °	MIN Lat Min 58 '	MAX Lat Deg 66 °
MAX Long Min 32 '	MIN Long Deg 111 °	MIN Long Min 25 '	MAX Long Deg 111 °

Map Sheet No: Please see appendix 1 Inuit Land Parcel No:

Coordinate of camp (if applicable) Lat. 65 ° 59 ' 26.25 " N Long. 111 ° 30 ' 08.99 " W

6. Periods of operation including periods of seasonal shut down and periods for restoration.

This application is for permission to build a winter access road across IOL as well as for permission to use existing roads on the Jericho Mine Site which cross IOL. The winter road would be used in February/March 2017 and 2018, and the existing Jericho Mine roads from May-October 2017.

7. Period of access required (up to one or two years for licenses, depending on license level, up to five years for residential/recreational leases and level I and II commercial leases, and up to forty years for level III commercial leases)	Start date	Completion Date
	01 01 2017	01 01 2019

8. Other rights, licenses, permits or leases related to this application. Provide proof of rights or indicate if in the process of applying for rights.

- ☐ NTI Subsurface Right
- ☐ DIAND Subsurface Right
- ☒ NWB Water License
- ☐ NRI Research License
- ☐ RWED Tourism License
- ☐ Explosives Permit
- ☐ CWS Permit
- ☒ Other – Please Specify

INAC Land Use Permit

9. TYPE OF LAND USE ACTIVITY

Check off the appropriate land use activities.

Mining/Oil & Gas
- ☐ staking and prospecting
- ☐ exploration (geophys-grd/air)
- ☐ drilling (diamond/ice, etc.)
- ☐ bulk sampling
- ☐ mine (open pit, undergrd, etc.)
- ☐ bulk fuel storage
- ☐ other: _____

Construction:
- ☐ camp
- ☐ building
- ☒ winter road
- ☐ all-season road
- ☐ quarrying
- ☒ other: use of existing all-season road

Tourism:
- ☐ tourism facility
- ☐ outfitting
- ☐ other: _____

Municipality:
- ☐ bulk storage of fuel
- ☐ residential building
- ☐ commercial building
- ☐ other: _____

Research:
- ☐ wildlife/fish/birds/marine
- ☐ survey (grd/aerial/collars)
- ☐ collection of species
- ☐ research station
- ☐ other: _____

Other:
- ☐ commercial harvest
- ☐ recreational camp
- ☐ _____
- ☐ _____

10. TYPE OF WATER USE

Check off the kind of project for which water will be used and the type of water use.

Undertaking
- ☐ Advanced Exploration
- ☐ Exploration Drilling
- ☐ Industrial
- ☐ Mine Development
- ☐ Power
- ☐ Remote/Tourism
- ☐ Other: _____

Water Use:
- ☐ To obtain water
- ☐ To modify the bed or bank of water course
- ☐ To Alter the flow of, or store water
- ☐ To cross the watercourse
- ☐ To Divert the watercourse
- ☐ Flood control
- ☐ Other: _____

11. QUANTITY OF WATER INVOLVED

Please include the quantity of water to be used during the land use activity.

Quantity of water to be used: 0 m^3/year
Quantity of water to be returned: 0 m^3/year

---

12. On a separate page, provide a NON-TECHNICAL project summary. This should include a non-technical description of the project proposal, no more than 300 words, in English and Inuktituk (Inuinaktun, in the West Kitikmeot). The project description should outline the project activities and their necessity, method of transportation, any structures that will be erected, expected duration of activity and alternatives considered. If the proposed activity fits into any long-term developments, please describe the projected outcome of the development for the area and its timeline.

Please see Appendix 2 and 3.

---

13. Attach a detailed project description as outlined in APPENDIX A. Please see Appendix 1.

---

14. LAND USE APPLICATION FEES:

- ☐ Land use license I -
  Inuit - $ 0
  Non-Inuit - $100 per 1:250,000 NTS Map Sheet
- ☐ Land use license II - $250
- ☐ Land use license III- $500
- ☐ Residential/Recreational Lease — Inuit - $ 0; Non-Inuit - $250
- ☒ Exemption Certificate
- ☐ Commercial Lease I - $500
- ☐ Commercial Lease II - $2000 plus Legal Fees
- ☐ Commercial Lease III - $5000 plus Legal Fees

Land use fees: # of hectares used @ $50.00/hectare = $_____

Note: The land use fee is for the amount of land used on an annual basis.

---

15. WATER USE APPLICATION FEES:

- ☐ Land use license I
  Application fee - $100 per 1:250,000 NTS Map Sheet/year
  Water use fee - $1/1000$m^3$
- ☐ Land use license II
  Application fee - $250/2 years
  Water use fee - $1/1000$m^3$
- ☐ Land use license III
  Application fee - $500/2 years
  Water use fee - $26.35/1000$m^3$
- ☐ Commercial Lease I
  Application fee - $50/year
  Water use fee - $26.35/1000$m^3$
- ☐ Commercial Lease II
  Application fee - $500/year
  Water use fee - $26.35/1000$m^3$
- ☐ Commercial Lease III
  Application fee - $5000/year
  Water use fee - $26.35/1000$m^3$

Water use fees: volume of water used (m^3) * Water use fee = $_____

Note: The water application type is related to the land use application type. A water protection fee will be charged according to the type and stage of the development project.

16. a) The Applicant requests a Certificate of Exemption ☒

OR

b) The Applicant agrees to be bound by terms and conditions to be attached to the Inuit Land Use License or Lease. ☐

Sign name in full: _____ 2016-09-09

Signature Date

APPENDIX A

1. **Outline project activities, their necessity, their expected duration and alternatives considered. If the proposed activity fits into any long-term developments, describe the projected outcome of the development for the area and its timeline.**

The Jericho Mine was opened in 2006 by Tahera Diamond Corporation (Tahera) who went through bankruptcy proceedings in 2008. Shear Diamonds Corp. (Shear) took over the Jericho Mine in 2010 and operated the mine under care and maintenance until September 2012 when Shear suspended operations. Indigenous and Northern Affairs Canada (INAC) has been undertaking basic environmental protection of the Jericho Mine since spring 2013, and assumed control of the Jericho Mine in January 2014.

Through the Government of Canada's 2016 Federal Infrastructure Initiative funding was identified to perform site stabilization activities on the abandoned Jericho site. Such activities are necessary to:

- restore the site to an environmentally safe condition;
- prevent environmental migration of contaminants into the surrounding ecosystem
- stabilize the site to prevent water accumulation

This application is for permission to build a winter access road across IOL (see map in appendix 4) as well as for permission to use existing roads on the Jericho Mine Site (see figure in appendix 5) which cross IOL. Both these project related activities are critical for the supply of equipment to and from the Jericho site as well as for the planned site stabilization activities (see appendix 3 for details surrounding planned site stabilization work).

The supply of equipment to the Jericho Mine to support the site stabilization activities, as well as the transport of equipment and materials out of the site, will take place through the use of the JV Winter road. Currently a "Right to Use and Occupy Crown Land Permit" (appendix 6) exists for the portion of the JV Winter that extends to the Lupin Mine, which is approximately 40 km by winter road from Jericho. Although a permit exists for this road to Lupin Mine, the current plan for JV Winter Road construction has it only being built to the Ekati Mine. As such, the Jericho Site Stabilization Project would be responsible for the construction of the road from Ekati to Jericho and will be applying for as part of this project a Crown Land Use Permit for the Lupin to Jericho section of this road.

For your reference, Appendix 7 contains driving maps for the JV Winter Road to the Lupin Mine. Once a contract is awarded for the Jericho Site Stabilization Plan, detailed road maps for the Lupin to Jericho section will be developed.

Appendix 8 contains a report done by AMEC detailing estimates surrounding water withdrawal necessary for the construction of the winter road when the Jericho Mine was in development and operation. Since we are proposing the construction on the identical road, the same water withdrawal would occur.

The only alternative that was considered was the use of planes, however this alternative was cost prohibitive. The winter road is essential for the mobilization and demobilization of equipment and materials necessary for successful site stabilization activities at Jericho.

2. Schedule of activities including both operations and shutdowns

- February/March 2017: JV winter road extension Ekati to Jericho
- March 2017: Mobilization of materials and equipment to Jericho Site
- May-October 2017: Site Stabilization activities
- February/March 2018: JV winter road extension Ekati to Jericho
- March 2018: Demobilization of materials and equipment

3. Provide a preliminary plan showing the location of the lands proposed to be used and an estimate of their area in hectares. The preliminary plan should show the approximate location of all:

I. existing or new lines, trails, rights-of-way and cleared areas proposed to be used in the exercise of the Right;

- Please see appendix 4 for the proposed route for the construction of the winter road from Lupin to Jericho (estimated at 2 hectares);
- Please see map below showing existing roads on IOL (yellow shading) that will be used during site stabilization activities (roads estimated at 2 hectares).

II. buildings, campsites, air landing strips, air navigation aids, fuel and supply storage sites, waste disposal sites, excavations, ponds, reservoirs and other works and places proposed to be constructed or used during the exercise of the Right;

- There is no other infrastructure on IOL other than the roads which are to be used during site stabilization activities at Jericho.

III. manmade structures and works, including bridges, dams, ditches, highways, roads, transmission lines, pipelines, survey lines and monuments, air landing strips; all topographical and natural features, including eskers, rivers, streams, lakes, inland seas and ponds; and all areas of biological interest, including wildlife and fish habitat, specifically, calving, denning, spawning or nesting areas, identified in consultation with the NWMB, RWO, or HTO, as appropriate, that may be affected by the exercise of the Right; and

- **None**

IV. the accurate location of all carving stone, archaeological sites, and archaeological specimens

- Tahera in their initial permitting application indicated that they did an Archaeological Impact Assessment. Their findings are summarized as such: “None of the 25 heritage sites identified sites during the Project EIS were

determined to be of sufficient potential of significance to require avoidance by development."

- The same circumstances apply to the site stabilization work as it will not go beyond the boundaries set out by the previous mining operations and will be using the same winter road route.

4. **Provide a list of structures that will be erected.**

   - No new structures are being erected as part of this application.

5. **Equipment to be used, indicating type and number, size and ground pressure and proposed use. Include all drills, pumps, vehicles etc.**

   - Nuna Logistics is constructing the Tibbitt to Ekati portion of the winter road and it is likely that similar equipment will be used. The following is an excerpt from Nuna's website which discusses the types of equipment that they use in the construction of the JV Winter road.

   Nuna commences construction of the TCWR January of each year which entails the use of Nuna's specialized early road opening equipment such as Hagglund amphibious track vehicles equipped with ground penetrating radar to determine ice thickness and light plow equipment; both supported by helicopter surveillance to report major ice cracks or pressure ridges ahead. Throughout the road season, Nuna uses plows, graders, water trucks, dozers, snow blowers and other specialized low ground pressure equipment to keep the road clear of snow in order to continually build up ice thickness and keep portages smooth. At various locations along the entire length of the road Nuna measures the lake ice thickness and determines allowable vehicle load weights.

6. **Fuels to be used, capacity of containers and number of litres. Include diesel, gasoline, aviation fuel, propane and other fuel types. Describe method of fuel transfer.**

   - Details surrounding fuels to be used for the construction of the winter road will be provided by the winter road construction contractor once a contracted is awarded.
   - Fuels for the construction of the winter road will not be stored on IOL.

7. **Provide a copy of fuel spill contingency plan**

   - Please see Appendix 8 for the draft site specific fuel contingency plan for the Jericho Site Stabilization work. A spill contingency plan specific for the winter road will be provided once a contract is awarded.

8. **Proposed disposal methods for garbage, sewage, grey water, overburden (organic soil, waste material, tailings etc.), hazardous waste and other waste products. Describe the acid rock drainage potential of waste rock materiel and testing methods, if applicable. List the type, estimated quantities and storage methods of any hazardous materials that are going to be stored on the property.**

- N/A

9. **Describe the methods of transportation.**

- Large trucks hauling heavy equipment and materials on the JV Winter Road will be the predominant method of transport for this element of the project. While on the Jericho site, service vehicles, and equipment necessary for the site stabilization activities will be the primary method of transport.

10. **Indicate the components of the environment that are near the project area, as applicable. Include the type of species, the important habitat area (calving, staging, denning, migratory pathways, spawning, nesting etc.) and the critical time periods (calving, post-calving, spawning, nesting, breeding etc.). Also include information on eskers, communities and historical/archaeological sites.**

- This project is a site stabilization project which will:
    I. restore the site to an environmentally safe condition;
    II. prevent environmental migration of contaminants into the surrounding ecosystem
    III. stabilize the site to prevent water accumulation

- For further details please consult the Environmental Screening Report in appendix 9
- For details in relation to the environment pre-Jericho Mine operations please consult Tahera Corporations “Environmental Baseline Report” which can be found on the Nunavut Water Board’s public registry at: http://www.nwb-oen.ca/public/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AMJER1119%20Shear/1%20APPLICATION/2004%20New%20Application/040826NWB1JER--%20Appendix%20AA%20Final%20EIS%20January%202003/B.1.1.%20Baseline%20Summary%20Report.pdf

11. Summary of potential environmental, wildlife and resource impacts and mitigation measures to be used. Describe the effects of the proposed program on lands, water, flora and fauna.

- This project is a site stabilization project which will:
  - restore the site to an environmentally safe condition;
  - prevent environmental migration of contaminants into the surrounding ecosystem
  - stabilize the site to prevent water accumulation
- For further details please consult the Environmental Screening Report in appendix 9

12. Reclamation cost analysis for advanced exploration activities.

- N/A

13. Proposed reclamation plan, that includes, but is not limited to the proposed methods and procedures for the progressive:

- This application is for the construction of a winter road. The construction of the winter road will use the earth natural elements (snow, water, ice, etc.) and will not have a negative impact on the natural environment therefore does not require a reclamation plan.
- For details on the Jericho Mine Site Stabilization activities please see appendix 10.

14. Provide information on the socio-economic aspects of these activities. In particular, please provide details on:

- This RFP is a design/build project.
- A significant element of the proposal evaluation process for selecting a contractor for this project revolves around aboriginal opportunities for participation in this work.

APPENDIX 5

NIRB PART 4 NON-TECHNICAL DESCRIPTION (ENGLISH)

SECTION 4: NON-TECHNICAL PROJECT PROPOSAL DESCRIPTION

Indigenous and Northern Affairs Canada (INAC) has secured funds under the Government of Canada's 2016 Federal Infrastructure Initiative to conduct site stabilization activities at the abandoned Jericho Mine. The Site is located approximately 260 km southeast of Kugluktuk, NU and 30 km north of the Lupin Mine in the Contwoyto-Itchen Region. The site is accessible by air and the Tibbitt to Contwoyto Winter Road. The winter road was opened to the Jericho Mine during the Tahera operation and construction years and will have to be built again to facilitate the proposed site stabilization work. The Jericho Mine is located partially on Crown land and partially on Inuit Owned Land (IOL).

The Jericho Mine was opened in 2006 by Tahera Diamond Corporation (Tahera) who went through bankruptcy proceedings in 2008. Shear Diamonds Corp. (Shear) took over the Jericho Mine in 2010 and operated it under care and maintenance until September 2012 when Shear suspended operations. INAC has been undertaking basic environmental protection of the Jericho Mine since spring 2013, and assumed control of the Jericho Mine in January 2014.

The original mine plan was to construct a project with an eight-year life and extract the Kimberlite ore by using an open pit and underground mining methods. The mine work did not advance beyond the open pit extraction.

A detailed Environment Site Assessment (ESA) report was prepared by Tetra Tech/EBA (EBA) in December 2014 (see Appendix 8). The report presented the results and finding of their August 2014 on-site investigation work, planned following a gap analysis in support of developing of a remedial action plan for the project site. Contaminated soil, water, hazardous and non-hazardous material and infrastructure, and geotechnical information all form part of the ESA document.

In consideration to the overall remediation objectives for the Jericho Mine site, the timelines to complete the proposed work and the amount of funding available to the project through the Government of Canada's 2016 Federal Infrastructure Initiative, a Site Stabilization Plan has been developed. Such activities are necessary to:

- restore the site to an environmentally safe condition;
- prevent environmental migration of contaminants into the surrounding ecosystem
- stabilize the site to prevent water accumulation

The main tasks of the Site Stabilization Plan are:

- Re-establish the natural drainage flow by re-aligning the current diversion (called the C1 diversion) that flows into Carat Lake into the pit
- breaching the West Dam and Divider Dyke A to allow surface water flow out of the Processed Kimberlite Containment Area (PKCA)

- covering the PKCA
- grading pads and borrow areas
- excavation and treatment or disposal of contaminated soil
- building demolition
- landfill construction
- disposal of non-hazardous material
- offsite disposal of hazardous waste

The mobilization and demobilization of equipment and materials to the Jericho Mine to support the site stabilization activities will take place through the use of the JV Winter road. Currently a “Right to Use and Occupy Crown Land Permit” (appendix 1) exists for the portion of the JV Winter that extends to the Lupin Mine, which is approximately 40 km by winter road from Jericho. Although a permit exists for this road to Lupin Mine, the current plan for JV Winter Road construction has it only being built to the Ekati Mine. As such, the Jericho Site Stabilization Project would be responsible for the construction of the road from Ekati to Jericho and will be applying for, as part of this project, a Land Use Permit for the Lupin to Jericho section of the road.

For your reference, Appendix 10 contains driving maps for the JV Winter Road to the Lupin Mine. Once a contract is awarded for the Jericho Site Stabilization Plan, detailed maps for the Lupin to Jericho section will be developed.

APPENDIX 6

NIRB PART 4 NON-TECHNICAL DESCRIPTION (INUKTITUT)

ᐃᓕᓐᓄ 4: ᑲᓇᐃᓕᐅᓚᐊᖏᑲᓂᕐᑎᓇᓯᑦ ᐱᓕᓚᐽᑲᓇᑦ ᑐᓴᕋᐅᑎᓂ ᓇᓗᓀᐃᔪᖏᓴᕐᕋᖅ

ᐃᓇᓕᓚᔨᑐᖅᑯᑦ ᑲᓀᑕᒥ ᑭᓀᐅᔪᖅᑲᓂᒃ ᐱᓴᒪᓕᖅᑐᑦ ᐊᑕᒍᑦ ᓇᓀᐅᕐᑦ ᑲᖏᒪᖅᑯᑦ 2016 ᑲᖏᒪᑐᖅᑯᑦ ᐃᒡᓗᑯᑎᖓᑦ ᓀᐸᓚᐊᕈᑦ ᐱᓕᓚᖓᓗᓗᑎᒃ ᐃᓂᖓᑦ ᓀᓕᖅᑲᓵᓕᖅᑎᑕᐅᓗᓂᓂ ᐃᒡᓴᓀᖅᑕᐅᓴᒪᔪᒥ ᑕᕼᐃᕿᕼᐅᐊᖅ ᑕᓴᖅᔪᐊᖅ ᐅᔪᕿᖓᓂᐊᕿᒪᒃ [Jericho Mine]. ᐅᓀ ᐃᓂᖓᑦ ᑕᐅᖏᓂᑐᖅ ᖃᑲᓂᖏᓂ 260 ᑭᓚᒋᑦ ᓂᒋᐊᓂᑦ ᑲᓀᓀᖓᓂ ᖃᑎᖅᑐᖅ, ᓇᓀᖏᑦ ᐊᒻᒪᓗ 30 ᑭᓚᒋᑦ ᐅᐊᖏᓀᖓᓂᑦ ᓗᐱᐟ ᐅᔪᕿᖓᓂᐊᕿᒪᒃ [Lupin Mine] ᑕᐃᑲᓂ ᑕᓴᖅᔪᐊᖅ [Contwoyto-ltchen] ᓇᓀᖓᓂ. ᐅᓀ ᐃᓂᖓᑦ ᐅᐸᑲᑕᔪᐟᓀᖅᑐᖅ ᖃᖏᖓᑕᓵᑲᑎᑦ ᐊᒻᒪᓗ ᑎᐱᑦᒥᑦ [Tibbitt] ᑕᐃᑎᖓᑦ ᑕᓴᖅᔪᐊᖅ ᐅᑭᐅᑲᑎᑦ ᐊᑎᑎᖏᑦ. ᑕᑲᑎᐊ ᐅᑭᐅᑲᑎᑦ ᐊᖃᑎᖏᑦ ᒪᑐᐃᕐᑕᐅᓕᐅᖅᑐᑦ ᑕᕼᐃᕿᕼᐅᐊᖅ ᑕᓴᖅᔪᐊᖅ ᐅᔪᕿᖓᓂᐊᕿᒪᖓᒥᑦ ᑕᐃᑲᓂ [Tehera] ᐊᐅᓪᓚᐅᑎᑦᓗᓂᑦ ᐊᒻᒪᓗ ᐃᒡᓗᑐᐅᖅᓴᑎᒃ ᐊᒥᓂᓄᑦ ᐊᖃᖏᑦ ᐊᒻᒪᓗ ᓴᓇᑲᓂᐅᓂᖅᑎᓂᐊᓪᓚᑦᓗᑎᒃ ᑐᓴᕋᖅᑕᐅᔨᒥᒃ ᓀᐸᖅᑕᐅᔨᒪᔨᒥᒃ ᐃᓂᖓᑦ ᓀᓕᖅᑲᓵᓕᖅᑎᑕᐅᓗᓂᓂ ᓴᓇᓂᐊᖅᑐᖅᑯᓂ. ᐅᓀ ᕕᕼᐃᕿᕼᐅᐊᖅ ᑕᓴᖅᔪᐊᖅ ᐅᔪᕿᖓᓂᐊᕿᒪᒃ ᐃᓂᕋᑲᖅᑯᖅ ᖃᑎᖅᑐᖅ ᐅᑎᐊᓂ ᐃᓕᓐᓄᑦ ᓇᓀᖏᑦ ᑲᖏᒪᖅᑯᑦ ᓇᓀᕐᑎᖓᓂᑦᓴᓗᓂ ᐊᒻᒪᓗ ᐃᓕᓐᓄᑦ ᐃᓇᐃᑦ ᓇᓀᕐᑎᖓᓂᑦᓴᓗᓂ.

ᐅᓀ ᕕᕼᐃᕿᕼᐅᐊᖅ ᑕᓴᖅᔪᐊᖅ ᐅᔪᕿᖓᓂᐊᕿᒪᒃ ᒪᑐᐃᑕᐅᖅᓴᒪᔪᖅ 2006-ᒥ ᑕᑲᑯᓇᖓᑦ ᒪᑐᐃᖅᑕᐅᑦᓗᓂ ᑎᕼᐃᕿᕼᐅᐊᖅ ᑕᐃᒪᓐᓇ ᑯᐊᐳᓴᓇᓐᓄ [Tahera Diamond Corporation] (ᑎᕼᐅᐃᐅᑕᒪ) ᐅᑯᐊ ᓄᖓᔪᑎᓪᑕᐅᖅᓴᒪᔪᓂ ᑭᓀᐅᔪᓂᑐᒃ ᑲᑕᖏᓂᒃ ᑕᐃᑐᓂ 2008. ᓴᐅ ᑕᐃᒪᓐᓇ ᑯᐊᐳᓴᓇᓐᓄ [Shear Diamonds Corp] ᐱᖓᓪᓕᐅᖅᑐᓴᖓᓗ ᐊᐅᓕᓕᖅᓴᑐᒍ ᑕᕼᐃᕿᕼᐅᐊᖅ ᑕᓴᖅᔪᐊᖅ ᐅᔪᕿᖓᓂᐊᕿᒪᒃ ᑕᐃᑐᓂ 2010 ᐊᒻᒪᓗ ᐊᐅᓕᑎᐊᖅᓴᑐᒍ ᐊᒻᒪᓗ ᓴᓇᖅᑲᑕᖅᓴᑐᒍ ᑎᑭᐅᑎᓇᓴᖓᓂᖅᓗᓂ ᓴᑎᐱᓚ 2012 ᑕᐃᑐᓂ ᓴᐅ ᓄᖅᖅᓴᑎᒃ ᐱᓕᓚᔪᑎᒃ. ᐃᓇᓕᓚᔨᑐᖅᑯᑦ ᑲᓀᑕᒥ ᐱᓕᓚᒋᐊᖓᓗᑎᓂ ᐊᐅᑎᖓᓗ ᓴᓗᒥᓪᓗᑐᒍ ᑕᕼᐃᕿᕼᐅᐊᖅ ᑕᓴᖅᔪᐊᖅ ᐅᔪᕿᖓᓂᐊᕿᒪᒃ ᑕᐃᒪᓗᓂᑦ ᐅᐱᕿᖓᓗ 2013, ᐊᒻᒪᓗ ᐊᐅᓕᓄᓴᓕᖅᓴᑐᒍ ᑕᕼᐃᕿᕼᐅᐊᖅ ᑕᓴᖅᔪᐊᖅ ᐅᔪᕿᖓᓂᐊᕿᒪᒃ ᑕᐃᑲᖓᓂᑦ ᔪᓄᐊᑌ 2014.

ᐊᖏᕿᑕᐅᑎᖓᓇᖅᑕᐅᖅᓴᒪᔪᖅ ᐅᔪᕿᖓᓂᐊᕿᒪᖓᒍᑦ ᓴᖅᓄᐅᑕᐅᓕᐅᖅᑐᖅ ᓴᓇᖅᑯᓕᓂᑦ 8 ᐊᖅᑭᒍᓄᑦ ᐃᓄᖅᑲᖅᓂᐊᕿᒪᑦ ᐊᒻᒪᓗ ᐅᓴᐃᓗᑎᒃ [Kimberlite ore] ᖃᑯᓕᑲᖅᓴᑐᑦᑐᒥ ᓄᓇᐅᐸ ᐃᑭᐊᖓᓂᑦ ᐊᒻᒪᓗ ᓄᓇᐅᐸ ᐃᑭᐊᖓᓂᑦ ᐅᔪᕿᖓᓂᐊᑭᓱᑦ ᐊᑐᖅᓗᑦ. ᐅᓀ ᐅᔪᕿᖓᓂᐊᕿᒪᒃ ᓴᓇᓴᐅᓂᖓ ᐱᖓᓱᓕᓕᖅᓴᑐᖅᑯᓂᕐᑎᓇᖅ ᑕᐃᒪᖓᓂ ᖃᑯᑎᖅᓂᖓ ᐅᓴᐃᓗᑎᒃ.

ᐅᓀ ᓇᓀᓇᐃᖅᑲᓕᑎᐊᖅᑐᖅ ᐊᖏᑎᑎᓂᓂᒃ ᐃᓂᖓᓄᓂ ᖃᑲᐅᓴᓇᓱᑎᐊᑭᑕᐅᔪᖅ ᐅᓂᒃᑲᓂᐅᖅᓴᒪᔪᖅ ᑎᑎᕿᖅᑕᖓᓕᓂ ᑎᑐᓪ ᑎᒃ/ᐃᐸ [Tetra Tech/EBA] ᑎᓱᐱᓚ 2014 (ᑕᑯᔪᒃ ᐅᐃᔪᖅ 8). ᐅᓂᒃᑲᖅᓴᒪᔪᖅ ᖃᑲᐅᔨᖅᑕᐅᓴᒪᔪᓂᓂ ᐊᖅᑭᐅᑎᓴᒪᔪᓂᒃ ᑐᑭᓱᐅᓴᒪᔪᓂᒃ ᐊᒻᒪᓗ ᓇᓂᔨᐅᓴᒪᔪᓂᒃ ᑕᐃᒪᓂ ᐊᑲᓱ 2014 ᐃᓂᖓᓄᓂᒃ ᖃᑲᐅᔨᓇᓴᑎᑎᑕᒥᒃ, ᐸᖅᓇᐃᓪᓗᑎᒃ ᐱᔨᓴᖅᑎᓪᓗᔪ ᐃᖅᐸᖅᓴᒪᔪ ᐱᓪᓗᑐᓂ ᖃᑲᐅᔨᔨᐅᓴᓇᑎᖅᑐᓂ ᐃᑲᔪᑎᑦᓪᓗᑐᓂ ᐱᓕᓪᓕᐊᑎᕿᑎᖅᑎᑦᓪᓗᑐᓂ ᐃᓂᑐᖅᑲᖓᓂᑦ ᓇᓀᖓᓂᒃ ᐱᓕᓚᐽᑲᓇᑦ ᐸᖅᓇᐃᓗᑎᒃ ᐱᓕᓚᐊᓴᖓᓕᑦ ᐃᓂᖓᑦ. ᓴᐳᖅᓴᒪᔪᖅ ᐃᔪᖅ, ᐃᒪᖓᑕ, ᐊᑦᑕᕿᖅᑐᑦ ᑐᓴᓄᖅᑐᓪᓚᑦ ᐊᒻᒪᓗ ᑐᓴᓄᖅᑐᖅᑯᓂᑦ ᐊᒻᒪᓗ ᓀᐸᔪᑦ ᐃᒡᓗᑦ, ᐊᒻᒪᓗ ᓇᓀᖏᑦ ᖃᑎᖅᑐᖅᑯᓂᑦ ᐊᒻᒪᓗ ᓀᓕᖅᑲᓵᓕᖅᑎᑕᐅᓗᓂᓂ ᐃᓂᖓᑦ ᓇᓀᕐᑎᖓᓂᑦᓴᓗᓂ ᐃᓂᖓᑦ ᓇᓀᕐᑎᖓᓂᑦᓴᓗᓂ.

ᐃᓱᒪᒋᑎᐊᖅᓯᒋᑦ ᑕᒪᖅᑲᒃ ᐃᓕᑐᖃᖅᓯᓚᓄᑦ ᓄᓇᖅᓯ ᐅᑎᖅᑎᑕᐅᓕᖅᓯᓚᓄᑦ ᑐᑭᓕᐅᕈᑕᐅᖅᑯᓕᓕᐊᓕᐊᖅᑐᑦ ᑕᐃᓴᓱᒪᖅ ᑕᐱᓱᓕᐊᖅ ᑕᐱᐅᖅᓯᐊᖅ ᐅᓴᖃᖅᓯᐊᕐᓂᖅᓴᖅ ᐃᓕᓐᓂᑦ, ᖃᓄᖅ ᐊᑯᓕᐅᑎᑕᓇᓂᖅᓯᖅ ᐱᓴᓂᖃᑦᑕᓂᖅᓯᓚᓄᑦ ᑐᓴᕐᓂᖅᑕᐅᕐᓇᖅ ᓴᓇᓴᐅᓪᓚᕐᓂᓕ ᐊᒪᓚᓂ ᖃᓄᕐᓗᑕᒃ ᑭᓇᐅᓴᖅᓴᓂᖅ ᐊᑐᐃᓇᐅᕐᓂᖅ ᐱᓕᕆᓇᖅᓴᓂᑦ ᑕᒪᐅᓇᖅᓴᓂᑦ ᓇᐸᓕᐅᕐᓂᖅ ᑲᓇᓴᐅᓂᖅ <ᖁᓇᐅᑦᑕ. ᑕᒪᖅᑯᐊ ᐱᓕᕆᐅᓴᕆᓇᐊᓕᑦ ᐃᒪᐃᓇᐅᓂᖅᓯᓚᓄᑦ:

- ᐃᓂᑐᖃᖅᓯᓚᓄᑦ ᐅᑎᕐᓗᓂ ᐃᓂᖅᓯ ᐊᐅᑎᖅᓯ ᐊᑦᑕᕐᓇᖅᑐᑐᖃᓄᑦᓂᓂᐊᕐᒪᑦ;
- ᐊᐅᑎᖅᓯ ᐊᐅᑐᓗᐊᖅᑕᐃᓕᓚᑎᑦᓗᑐᐊᔪ ᓱᑭᖅᓱᒪᓴᓂᒃ ᑕᒪᑐᒪᖅᓯ ᐊᐅᑕᓚᓄᑦ ᐅᒪᓴᓚᓄᑦ ᐊᐅᑎᓕᒫᖅᓯᒪᓕᕐᓂᐊᓗ;
- ᐋᕿᑭᑎᐊᕐᓗᐊᔪ ᐃᓂᖅᓯ ᐃᓕᒋᖅᑕᑦᑕᕐᓂᐊᐅᖅᑎᑦ.
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ᐱᓴᓂᖅᑎᑦ ᐃᓂᖅᓱᓂᒃ ᓇᓕᖅᑲᓕᑕᓗᑐᐊᒃ <ᖁᓇᐅᑕᓂᑦ ᐅᑯᐊ:

- ᓂᖅᑭᑎᑲᓐᓂᕐᓗᑐᐊᒃ ᓄᓇᒥᑦ ᑯᐅᕕᓂᓂᓗᐊᔪ ᐃᓐᓇᐅᑦᓗᐊᔪ ᐃᓕᖅᓯᖅ (ᐊᑎᖅᑲᖅᑐᖅ C1 ᐃᓕᖅᓯ) ᐅᓇᓗ ᑯᐅᑐᖅ ᑲᓀᑦ ᑕᓯᔪᒥ ᑕᑲᓄᖅ ᐃᓗᐊᖅᑐᖅᓯᓚᓄᑦ
- ᐱᓕᕆᐊᖓᔪᒥᑦ ᓴᕕᑎᕐᑲᓂᒥᑦ ᐃᓂᓂᖅᑎᕕᐅᔪᖅ ᖃᑯᔪᖅᓯᓕᖅᓴᐊ ᐱᓇᖅᓇᖅᓯᓂ ᑯᖅᓴᓂᑦ ᐊᐅᑕᓚᓄᑦ ᐊᕕᖅᓯᓚᕐᔨᒃ A ᐊᔪᖅᓱᓂᒃᓂᐊᕐᓂᑦ ᖃᐅᖅᓯᐊᔪ ᐃᒥᖅ ᑯᕕᔪᖅᓇᓂᓂᒃ ᑕᒪᐃᓚᖅᓯᒪᓕᕐᓂᐊᕐᓗᐊᔪ ᐱᓇᓱᐊᕐᒥᑦ ᓴᕕᑎᕐᑲᓂᒥᑦ ᐃᓂᓂᖅᑎᕕᐅᔪᖅ
- ᖃᐅᓕᓐᓂᐊ ᐱᓕᕆᐊᖓᔪᒥᑦ ᓴᕕᑎᕐᑲᓂᒥᑦ ᐃᓂᓂᖅᑎᕕᐅᔪᖅ
- ᓯᖃᕆᓕᕐᑦ ᖃᐅᖅᓱᖅᓯ ᐊᒪᓚᓂ >ᐊᓐᓴᖅᓕᖅᑲ ᐃᓂᖅᑦ
- ᓴᐅᖅᑦᓴᖅᓂᑦ ᐊᒪᓚᓂ ᓴᓂᒪᖅᓴᖅᖅᓂᑦ ᐅᓚᓀᓇᓄᖅᑦ ᐃᑦᓂᓂᑦ ᓯᑭᖅᓯᒪᓕᕐᑦ ᐃᓴᖅᓱᖅᑦ
- ᐃᓗᓂ ᓯᕿᖅᑎᓂᑦ
- ᓄᓇᖅᓄᓂ ᓴᐅᓯᓂᐅᒃ
- ᐊᐅᑕᖅᓂᑦ ᑐᖅᑯᓇᖅᑐᖅᑎᓇᖅᑦᑐᑦ ᓯᑭᑦ
- ᐃᓂᑦᑎᓂᖅᑐᖅᑐᓂᑦ ᑐᖅᑯᓇᖅᑐᖅᑐᖅᑦ ᐃᑦᐅᖅᑎᖅᑦ ᐃᓴᖅᓱᖅᑦ

ᓄᐅᑕᖅᓂᑦ ᐊᒪᓚᓂ ᓄᖅᖅᓱᓚᖅᑎᒋᓂᑦ ᐃᓂᐅᓴᖅᑦ ᓴᓇᕿᑎᑦ ᐊᒪᓚᓂ ᐱᖅᑯᑎᑦ ᑕᐃᑯᖅᓱ ᑕᑎᐃᖅᑎᐅᐊᖅ ᑕᓯᔪᖅᑲᐊᖅ ᐅᔾᖅᓴᓂᐊᖅᓇᖅ ᑕᐃᑯᖅᓱ ᐃᑲᔪᖅᑐᐃ ᐃᓕᓐᓂᑦ ᓇᓕᖅᑲᓕᑕᓗᑐᐊᖅᑎᓂᑦᓗᐃ ᐱᓕᕆᐊᓂᐅᓂᖅᑐᖅ ᐊᑐᖅᑐᖅ [JV Winter] ᐊᑯᑕᐅᖅᑲᑕᖅᑐᑦ. ᐃᓐᓇ “ᐊᑐᕐᓇᖅᑐᑦ ᐊᒪᓚᓂ ᓄᓇᑕᐃᐃ ᓱᖅᓚᒃᑯᑦ ᓄᓇᖅᑯᒋ ᐱᔪᓇᐅᑎᓕ” (ᐅᐱᒍᖅ 1) ᐱᑕᖅᑲᖅᑐᖅ ᐃᓕᓐᓄᓂᓂ ᐅᑭᐅᒃᑯᑦ ᐊᖅᑯᒋᑦ ᑎᑭᓕᔪᖅ ᔪᐱᓐ ᐅᓴᖅᓱᖅᓯᐊᖅᓯᓂ, ᐅᓇᓗ ᖃᓄᓕᒃᓂ 40 ᑭᓚᒋᑕᑋ ᐅᑭᐅᒃᑯᑦ

ᑕᐃᑲᖏᑦ ᑕᕿᐃᖅᑎᐊᖅ ᑕᓯᖅᓯᐊᖅ ᐅᓴᖅᓂᓕᕆᖅᓵᑦ. ᑕᐃᒪᐢᓇᐅᓗᓕᕆᑎᑦᓗᔪ ᐱᓯᐢᓇᐅᑎᑕᖅᑲᖅᑐᖅ ᑕᒪᑐᒍᖏᑦ ᐊᔪᓂᑎᒍᑦ ᑕᐃᔪᖏᓚᐅᖏᓚᓯᒍᑦ ᓗᑦᐢ ᐅᓴᖅᓂᓕᕆᖅᓵᖏᓐ, ᐃᐢᓇ ᑦᓇᐅᑎᑦ ᑕᑲᖏᖏᓐ ᐅᑭᐅᖅᔪᑦ ᐊᔪᒋᓇᑦ ᑭᑦᓯᒍᖏᑐᖅᑐᑦ ᐊᓇᓴᐅᑦᓗᓕᕆᖅᓵᑦ. ᑕᐃᒪᓗ, ᐅᓇ ᑕᕿᐃᖅᑎᐊᖅ ᑕᓯᖅᓯᐊᖅ ᐅᓴᖅᓂᓕᕆᖅᓵᑦ ᐃᓂᖏᓐᓂᑦ ᓇᑕᖅᓱᑕᖅᑎᑎᓂᖅ ᐱᓴᖅᓴᖅᓂᓕᕆᖅᑐᖅ ᓴᓇᓴᐅᓗᑎᑦ ᐊᔪᑎᑦ ᑕᐃᑲᖏᓐ ᐃᑲᑎ ᑕᖏᑐᖅ ᑕᕿᐃᖅᑎᐊᖅ ᑕᓯᖅᓯᐊᖅ ᐅᓴᖅᓂᓕᕆᖅᓵᑦ ᐊᒻᒪᓗ ᐅᑦᑐᖅᓂᓕᕆᖅᑐᑐᑦ ᑐᑭᓯᖅᓗᑕ, ᐃᓕᑎᒋᓗᔪ ᑕᒪᑐᒍᖏᓐ ᐱᑕᓱᐊᖅᓯᒪᑦ, ᓄᓇᒥᑦ ᐊᑐᕈᑎᓂᑦ ᐱᓯᐢᓇᐅᑎᓂᑦ ᑕᐃᕀᓯᒍᖏᓐ ᓇᐱᓴ-ᒥᑦ ᑕᕿᐃᖅᑎᐊᖅ ᑕᓯᖅᓯᐊᖅ ᐅᓴᖅᓂᓕᕆᖅᓵᑦ-ᒧᑦ ᐃᓕᓴᖏᓄ ᐊᖅᑎᑎᒥᑦ.

ᐃᖏᖅᑦ ᖃᐅᔨᒪᔪᑎᑎᓂᓕᕆᖅᑕᖅᓄᑦ, ᐅᐃᒍᖅ 10 ᐃᓗᓕᐊᖅᖃᖅᑐᖅ ᐊᖅᑎᑦᑐᓄᑦ ᓄᓇᵒᖓᐊᓂᑦ ᑕᐃᑎᖏᓐ ᐅᑭᐅᖅᑎᑦ ᐊᖅᑎᒋᓂᑦ ᑕᐃᑎᖏᓐ ᓇᐱᵒ ᐅᓴᖅᓂᓕᕆᖅᓵᖏᓐᓄᑦ. ᑕᐃᒪᓗ ᑲᵒᑐᖅᑲᖅ ᑐᑭᐅᓗᑕᕆᖅᑕᖅᑐᑦ ᑕᕿᐃᖅᑎᐊᖅ ᑕᓯᖅᓯᐊᖅ ᐅᓴᖅᓂᓕᕆᖅᓵᖅ ᐃᓂᖏᓐ ᓇᑕᖅᓱᑕᖅᑎᑎᓂᖅ ᐸᖅᓇᐅᒋᓂᑦ, ᓇᓗᓇᐃᓴᖅᑎᐊᖅᓯᒪᓕᑦ ᓄᓇᵒᖓᐊᓂᑦ ᑕᐃᑎᖏᓐᓂᑦᓯᒪᓕᑦ ᓇᓂᵒᖓᐊᑦ ᑕᐃᑎᖏᓐ ᓇᐱᵒ ᐅᓴᖅᓂᓕᕆᖅᓵᖅ-ᒧᑦ ᐃᓕᓴᖏᓄ ᐊᖅᑎᑎᒥᑦ.

APPENDIX 7

NIRB PART 4 NON-TECHNICAL DESCRIPTION (INUINNAQTUN)

ILAINNAA 4: AYURNAITTUKKUT HAVAARIYAUYUKHAT TUKHIUTINGIT TUKILIUTAA

Inuliqiyit Kavamatuqangit Kanatami (INAC) tutquqhimayangit manngit malikhamayangit Kavamatuqat Kanatam 2016 Kavamatuqait Maniliurahuarnikkut Ikayuutikhait aullaqtiriangani nayugaanut ihuaqhaivikhamut hulidjuhiit uvani ikhinnaqtauhimayumi Jericho Uyaraqtarvingmi. Una Uyaraqtarvik Havagvia nayugaa 260 km ungahingnia hivuraani kivataaniittuq Qurluqtuq, Nunavunmi unalu The Site is located approximately 260 km southeast of Kugluktuk, NU unalu 30 km ungahingnia tun'nganiittuni Lupin Uyaraqtarvik iluani Tahiryuaq-Itchen Aviktquhimayumi iluani. Tingmiakkut nayugaanunngaulaaqtut unalu Tibbitt mit Tahiryuam Ukiumi Apqutikkuurnaqhunilu. Una ukiumi apqutaa angmaumayuq ukunanngat Jericho Uyaraqtarvik hamna Tahera aulapkaigaangat havaktaugaangallu ukiunganit hanaffaariaqaqhunilu ihuaqhaiyaami tukhiutauhimayumi nayugaanit havaangit. Una Jericho Uyaraqtarvik nayugaa ilanganiittuni Kuin nunangani uvanilu Inuit Nanminiriyaanit Nunangani (IOL).

Una Jericho Uyaraqtarvik angmaqhimayuugaluaqtuq 2006 mi ukunanngat Tahera Diamond Kuapuriisan (Tahera) maniiqtauhimavlutik uvani 2008 mi. Shear Diamond Kuapuriisan (Shear) amiriliqhugu Jericho Uyaraqtarvik uvani 2010 mi aulapkaivlugulu amiqhaivlugulu ihuaqhaivlugulu uvani Apitilirvik 2012 mi hamna Shear nutqaquivlugulu havaangit. INAC iniqtiriniaqhimayait kigliinnaa nunaup avatinut hapumminahuarniq haffumani Jericho Uyaraqtarvik upinngaami 2013 mi, naaguhivlutiktauq amirivlutik haffumani Jericho Uyaraqtarvik uvani Ubluqtuhinia 2014 mit.

Hamna hivunngani uyaraqtarviup upalungaiyautaa havaariyukhauvluni havaangit uumani iinik ukiungani naahimalugu unguvaiyarnahuarlutik manilik uyarak qiplariktumik aturlugulu angmaumayumik hauvikhait unalu nunaup iluani uyaraqtarviuyumi. Una uyaraqtarvik havaangit angmaumayumik hauhimanngittuni.

Hamna tamatkiumayumi Nunaup Avatinut Nayugaanit Ihivriuqhimaniq (ESA) titiraq upalungaiyariiqhimayuq ukunanngat Tetra Tech/EBA (EBA) uvani Ubluirvia 2014 mi (takulugu Ilainnaa 8). Una unipkaaliuqhimayangit titiraqhimayait kiuviniit nanihimayangillu haffumani Niqiliqivik 2014 mi iluani nayugaanit qanilrukkut ihivriuttiaqhimayangit havaangit, upalunaiyariiqhugillu malikhugu iniqarluaqtumik naunaiyaiviniit ikayuqhugulu pivallianirnit ingattaqhittailinahuarlugulu huligumik upalungaiyaut haffumani havaariyakhaat nayugaani. Halumaittut marluit, imaq, hivuuranaqtumik hivuuranaittumiglu ilaliutauhimayut igluqpaqarvikhaliurutikhait, unalu nunamiqauyihaqhimaningit naunaitkutait tamainnit aallatqiit ilainnaatigut haffuminngat ESA m titiqqangit.

Hamna ihumaliuqhugu tamainnut ingattaqhittailinahuarnikkut hivunikhautait ukunanngat Jericho Uyaraqtarvik nayugaanit, hamna havaanut ikaarnikhait iniqtiqhimayakhait hamna tukhiutauhimayumi havaangi unalu qaffiuningit manngiit piqarniqqat uvani havaariyauyukhanut ukunanngat Kavamatuqangit Kanata'p 2016 mi Kavamatuqangit Igluqpaqarvikhaliurutikhanut Ikayuutikhait, una Nayugaanit Havagviat Ihuaqhainikhanut Upalungaiyautikhaq pivalliayukhaq. Hapkuat hulidjuhiit piyukhaq:

- Utiffaarmilik nayugaanit havagviat nunaup avatinut hivuuranaittumik ihuaqpiaqtumik iniqaqtukhaq;
- Pittailinahuarlugu nunaup avatinut ingilrattailinahuarlugit huruqhimaningit ilua haniraanit nunaup avatingillu
- Ihuaqhittiaqhimalugillu havagviat nayugaanit kititiqhimaittumik imarmit

Hamna havaarilluaqtakhait haffumani Havagviat Nayugaanit Ihuaqhainiq Upalungaiyautikhat:

- Aullaqtirmilugu nanminia qurluarningit imaatut qurluarngit ihuaqharmilugu (taidjutilik C1 ihuaqhaqtauhimayuq) qurluaqhimayumi iluani Carat Tahiani iluanut hauhimayumi
- Angmaqtirlugu hamna Uataa Hapuhimayumik unalu Aviktuqhimaningit Imaiyarvik A qurluariami qaanganut uvanngat Hitiyumi Unguvaqtiqhimayumi Uyararnik Manilik Qiplariktumik Ilaliutingit (PKCA)
- Pulahimayangit hamna PKCA
- Ihuaqhaiyumik puukhait unalu halummaivikhangit iningit
- Unguvaiyaiyut unalu amiqhaiyangit uuminngalluuniit iqqaqhimayangit halumaittut marlut
- Iglunut ahiruqtirniq
- Nunaup illiriyangit havaangit
- Iqqaqhimayangit haffuminngat hivuuranaittumik ilulingit
- Nayugaaniunngittumik iqqaqhimayangit haffuminngat hivuuranaqtumik iqqakuut

Una ingilralaaqtumik unguvaiyalaaqtumik haffuminngat ingniqutainit ihuaqutikhangillu uvunga Jericho Uyaraqtarvingnut ikayukhamaat nayugaanit havagviani ihuaqhainahuarniq hulidjuhiit havaariyauniaqtangit ukunanngat atuqhimalugulu hamna JV Ukiumi apqutaat. Tadja “Piyunnautiqaqtumik Aturiangani Havaarilugulu iluani Kuin Nunangani Piyunnautingit” (ilainnaa 1) atuqhimayangit ilangani haffumani JV Ukiumi tahiyaaqhimayumi uvunga Lupin Uyaraqtarvik, ungahingnia 40 km uvanngat ukiumi apqutikkut Jericho-mit. Kihiani una piyunnautingit itquuvluni havaktauhimagamik apqutaanit Lupin Uyaraqtarvingnut, una tadja parnautingit haffumani JV Ukiumi Apqutaat havaangit hanayaulihaaqhimayangit uvanngat Ekati Uyaraqtarvingnut. Uuminngattauq, una Jericho Nayugaan Havagviat Ihuaqhainiq Havaariyakhaat amiriyauyukhaq havaatigut apqutaanit hamanngat Ekati-mit Jericho-mut atiliurahuaqtangillu, ilagiyangillu havaariyauyukhanut, una Nunat Atuqtakhainingit Piyunnautikhamik Lupin-mit Jericho-mut ilanganit apqutikhaanit.

Turaarvigiangani, Ilainnaatigut 10 ilaliutauhimayuq nunauyanit haffumani JV Ukiumi Apqutikhaanit Lupin Uyaraqtarvingmut. Havaariyaunahuarumik ilitarihimayaugumik haffumani Jericho Nayugaanit Havagvia Ihuaqhainiq Parnautikha, tiliuqhimayuq nunauyanit haffumani Lupin-mit Jericho-mut ilainnaa havaktaugiaqaqtuq.

APPENDIX 8

JERICHO ENVIRONMENTAL SITE ASSESSMENT PHASE III

TETRA TECH EBA

ENVIRONMENTAL SITE ASSESSMENT MATERIALS SURVEY AND GEOTECHNICAL EVALUATION JERICHO DIAMOND MINE, NUNAVUT

PRESENTED TO

Aboriginal Affairs and Northern Development Canada

DECEMBER 2014
ISSUED FOR USE
FILE: E14103202-01

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EXECUTIVE SUMMARY

Tetra Tech EBA has prepared this Environmental Site Assessment (ESA) based on the investigation, results, and findings from the August 19 to September 1, 2014 visit to the Jericho Diamond Mine (Jericho Mine), Nunavut. The Jericho Mine is partially on Crown land and partially on Inuit Owned Lands (IOL). Only the portion on Crown land is covered by the ESA or was investigated. The ESA covers four main areas: contaminated soil, water, hazardous and non-hazardous materials and infrastructure, and geotechnical.

Surface Waters

Evidence of historically and/or currently impacted surface waters were reported as a result of seepage from the waste rock piles, the processed kimberlite containment area (PKCA) and its discharge, inside the pit, and surface runoff and windblown materials from the mine and PKCA. However, based on the August 2014 analytical data, the water quality in and around the Jericho Mine currently meets the Canadian Council of Ministers of the Environment (CCME) Protection of Freshwater Aquatic Life (PFAL), Canadian Drinking Water Quality (CDWQ) standards, and the water licence guidelines with the exception of copper and uranium. Total copper levels exceeded guideline levels in Key Lake, and uranium levels exceeded guidelines inside the pit and East Sump.

Hazardous and Non-Hazardous Materials and Infrastructure

The existing infrastructure is extensive for a remote site. Hazardous materials included a volume of 1,816 m^3 (uncrushed) and 2,855 items. Non-hazardous materials included a volume of 225,055 m^3 (uncrushed) and 2,015 items. Hazardous materials were characterized by hazard type and non-hazardous materials were characterized by wood, metal, and other non-hazardous materials.

The truck shop, camp facility, and process plant are the major structures on site. The truck shop and process plant appear to be in good structural condition; however, there is some degradation of the camp facility, largely due to water damage and fox habitation. There is mould observable in all major structures. The care and maintenance team reported that they cleaned the fox-related damage subsequent to Tetra Tech EBA's August 2014 site visit.

There are some equipment and vehicles on site that will be useful for decommissioning. This includes functioning loaders, an excavator, pumps, generators, a water remediation unit, and light trucks.

Contaminated Soil

Fifteen areas of potential environmental concern (APECs) were identified from the gap analysis or while conducting the field investigation. The main contaminants of concern across the Jericho Mine included petroleum hydrocarbons (PHC) fractions F1 to F4, polycyclic aromatic hydrocarbons (PAHs), benzene, toluene, ethylbenzene, xylene (BTEX), glycols, and metals. Samples were selected based on visual, olfactory, or photo-ionization detector evidence of hydrocarbon impacts observed in the field. Laboratory analysis was compared to the 2009 Environmental Protection Division, Department of Environment, Government of Nunavut (GNU), Environmental Guideline for Contaminated Site Remediation (CSR) and the CCME, Soil Quality Guideline for the Protection of Environmental and Human Health. From the sampling program metal impacted material was located at APEC 2, APEC 10 and APEC 13 for an estimated total of 64 m^3. The estimated PHC impacted material observed on site is approximately 7,854 m^3. Vertical and horizontal delineation was assumed for most APECs based on soil analytical results and field observations. A conservative approach to estimating volumes was employed. Actual volumes will vary.

Berm Water Testing

Standing water was observed at the six berm locations during the site assessment. Samples were analyzed for BTEX, PHC fractions F1 to F2, routine water chemistry, glycol, and/or dissolved and total metals. Water analytical data was compared to CCME PFAL guidelines, control background wells and the water licence No. 2AM-JER119. One water sample located in the berm at APEC 2 (Hazmat Storage Area) exceeded CCME PFAL guidelines for Anthracene, Benz(a)anthracene, Benzo(a)pyrene, Fluoranthene, Fluorene, Phenanthrene, Pyrene. The water collected from SW 1-1, SW 3-1, and SW 9-1 were below the CCME PFAL guidelines at the time of sampling. The water located in SW 7-1 and SW 8-1 exceeds the CCME PFAL guidelines but meet the water licence, except for iron. The exceedances observed for iron are less than the control wells for both total and dissolved metals. Thus the water in SW7-1 and SW 8-1 do not appear to be impacted.

The care and maintenance team lowered all berm water levels in the fall of 2014.

Groundwater Sampling

Two control wells were installed in areas where mining activities were unlikely to impact the wells. The values observed in these two monitoring wells for Aluminum, Arsenic, Cadmium, Copper, Iron, Lead, Nickel, Phosphorus, Selenium, Silver, Thallium, Uranium and Zinc are greater than the CCME-FPAL guidelines. Therefore, these values appear to be naturally occurring.

The wells located adjacent to APEC 2 were analyzed for BTEX and PHC fractions F1 to F2. All analytical results were below laboratory detection limits except for toluene. Toluene was below the CCME PFAL guidelines; however, toluene is not typically observed in natural conditions, thus this may be an indicator that contamination is moving from outside of the berm area of APEC 2.

The monitoring wells located down-gradient of the waste rock pile (APEC 4) had metal exceedances when compared to the CCME PFAL guidelines. Since the control wells had values greater than the CCME PFAL guidelines, the values were used as a baseline in conjunction with the water licence for the mine site. The following metals still exceeded this criteria: Aluminum (total), Arsenic (total), Copper (total and dissolved), Iron (total and dissolved), Lead (total), Nickel (total), Phosphorus (total), Selenium (total), Silver (Total), Thallium (total), and Zinc (total and dissolved).

Seep Water Sampling

Three seeps were identified during the site assessment. Samples were collected and analyzed for routine water chemistry, dissolved and total metals. The seep samples were compared to the CCME PFAL guidelines, and the control monitoring wells. There were exceedances for Aluminum (total), Copper (total and dissolved), Iron (total) and Uranium (total and dissolved) when compared to the CCME PFAL guideline. These exceedances observed in the seeps are below the control well values, except Uranium (dissolved), which was found in the control wells. Thus, these exceedances may be naturally occurring. The dissolved Uranium values were compared to the water licence and found to be less.

Geotechnical Assessment

A geotechnical assessment was carried out on the PKCA dams and dykes, fuel containment berms, water diversion earthwork structures, waste rock piles, coarse processed kimberlite (PK) piles, fine PK (FPK) disposal areas, borrow areas and potential areas for new landfills and landfarms required for the mine closure. Overall, the earthwork features were generally found to be in good condition, similar to observed conditions in 2011 and 2012, with no significant issues noted. The C1 Diversion culvert inlet may be restricting flows somewhat, but does not pose an immediate threat to the diversion performance. Overall, no immediate remedial action is

required for the earthworks components, although consideration of long-term stability for some components will be required as part of closure design.

The PKCA water level needs to be periodically lowered to prevent it from overflowing the North Dam. This was reportedly done by the care and maintenance team in the fall of 2014.

Suitable areas exist for the construction of a new landfill and landfarm. The borrow materials are limited to materials in waste rock piles, coarse PK piles, and the till stockpile.

TABLE OF CONTENTS

EXECUTIVE SUMMARY i

1.0 INTRODUCTION 1
1.1 General 1
1.2 Document Scope 1
1.3 Document Organization 1
1.4 Project Team 1

2.0 BACKGROUND INFORMATION 2
2.1 Location and Project Details 2
2.2 Regional Geology and Topography 2
2.3 Hydrology and Hydrogeology 3
2.4 Regional Climate 3
2.5 Permafrost 4
2.6 Vegetation and Ecology 4
2.7 Wildlife 4
2.8 Human Activities 4

3.0 ANTHROPOGENIC SITE CONDITIONS 5
3.1 Site Infrastructure 5
3.1.1 Buildings 5
3.1.2 Airstrip 5
3.1.3 Utilities 6
3.1.4 Tanks and Bermed Enclosures 6
3.1.5 Jetty (Water Intake Causeway) 6
3.1.6 Roads 6
3.1.7 Pads and Laydown Areas 7
3.2 Processed Kimberlite Containment Area 7
3.3 C1 Diversion 8
3.4 Waste Rock Piles 8
3.5 Coarse PK pile 8
3.6 Landfill 8
3.7 Open Pit 8
3.8 Equipment 8

4.0 REGULATORY 10
4.1 Mine Site 10
4.2 Contaminated Soil Regulatory Guidelines 10
4.3 Land Use Assessment 10
4.4 Applicable Exposure Pathways 11
4.4.1 Human Pathways 11
4.4.2 Ecological Pathways 11
4.5 Applicable Guidelines 11
4.6 Particle Size Designation 13

4.7 Water Criteria 13
4.8 Hazardous Materials Criteria 13
4.8.1 Drum/Tank Content 14
4.8.2 Lead Amended Paint 14

5.0 METHODOLOGY 14
5.1 Soil Assessment 14
5.1.1 Test Pitting 14
5.1.2 Soil Sampling 15
5.2 Berm Surface Water Testing 15
5.3 Groundwater Assessment 16
5.3.1 Monitoring Well Installation 16
5.3.2 Groundwater Level Monitoring 16
5.3.3 Monitoring Well Development and Purging 16
5.3.4 Groundwater Sampling and Analysis 16
5.4 Seepage Testing 16
5.5 Surface Water 17
5.5.1 Surface Water Quality Monitoring 17
5.6 Material Survey 20
5.6.1 Drum Contents Sampling 20
5.6.2 Lead Containing Paint 21
5.6.3 Materials Inventory 21
5.7 Geotechnical Assessment 22

6.0 ENVIRONMENTAL RESULTS 22
6.1 Soil Results 22
6.1.1 Overview of APECs 22
6.1.2 APEC 1: Airstrip 23
6.1.2.1 APEC 1A: North End of the Runway 23
6.1.2.2 APEC 1B: Airstrip Fuel Storage Berm 23
6.1.2.3 APEC 1C: Maintenance Shop 24
6.1.2.4 APEC 1D: Generator 25
6.1.2.5 APEC 1E: Fuel drums 25
6.1.3 APEC 2 (Contaminated Soils Storage Area) and APEC 3 (Hazardous Waste Transfer Area) 26
6.1.4 APEC 4: Waste Rock Pile 27
6.1.5 APEC 5: Coarse Processed Kimberlite Stockpile 28
6.1.6 APEC 6: Low Grade Ore Stockpile 28
6.1.7 APEC 7 and 8: Phase 1 and Phase 2 Tank Farm 28
6.1.8 APEC 9: Genset and Fuel Berm 30
6.1.9 APEC 10: Truck Shop and Laydown Area 31
6.1.10 APEC 11: Wind Blown Processed Kimberlite Tailings 33
6.1.11 APEC 12: Fine Processed Kimberlite Containment Area 33
6.1.12 APEC 13: Carat Lake Laydown Area 33
6.1.13 APEC 14: Process Plant 34
6.1.14 APEC 15: Reclaimed Carat Camp 35

6.1.15 Soil Quality Assurance and Quality Control....35
6.1.16 Soil Summary....36
6.2 Berm Water Testing....37
6.3 Groundwater Monitoring....38
6.3.1 Control Groundwater Wells....38
6.3.2 APEC 2 Contaminated Soils Storage Area....39
6.3.3 APEC 4 Waste Rock Pile....39
6.3.3.1 Seepage Testing....41
6.3.4 Groundwater, Seep and Berm Surface Water Quality Assurance and Quality Control (QA/QC)....42
6.4 Surface Waters....44
6.4.1 Surface Water Quality Monitoring....44
6.4.1.1 Quality Controls....45
6.4.1.2 Seepage from the Waste Rock Pile to Carat Lake....46
6.4.1.3 PKCA Discharge....48
6.4.1.4 Runoff to the C1 Catchment....49
6.4.1.5 Surface Runoff to Lake C4....50
6.4.1.6 Surface Runoff and Windblown Materials to the Lynne Lake Group....51
6.4.1.7 Runoff from Storage Pads and Inside the Pit....53
6.5 Hazardous Materials inventory....54
6.5.1 Lead Containing Paint....54
6.5.2 Drum and AST Contents....55
6.5.3 Mercury....55
6.5.4 Batteries....56
6.5.5 Ozone Depleting Substances....56
6.5.6 Compressed Gas Cylinders....56
6.5.7 PCBs in Light Ballasts....56
6.5.8 Miscellaneous Hazardous Liquids and Solids....56
6.5.9 Mould and Bio-hazardous Materials....57
6.6 Non-hazardous Materials Inventory....57
6.6.1 Wood....57
6.6.2 Metals....57
6.6.3 Other Non-Hazardous Materials....57
6.6.4 Major Structures....58
6.6.4.1 Truck Shop....58
6.6.4.2 Camp Facility....58
6.6.4.3 Process Plant....59
6.7 Summary of Hazardous and Non-Hazardous Materials Totals....59

7.0 GEOTECHNICAL INSPECTION....61

7.1 Processed Kimberlite Containment Area....61
7.1.1 West Dam....62
7.1.2 East and Southeast Dams....64
7.1.3 Saddle Dam....65
7.1.4 Divider Dyke A....65

7.1.5 North Cofferdam 66
7.2 C1 Diversion 66
7.3 Coarse Processed Kimberlite and Waste Rock Piles 68
7.3.1 Coarse Processed Kimberlite 68
7.3.2 Waste Rock Pile 69
7.4 Roads and Pads 69
7.4.1 Roads 69
7.4.2 Pads 70
7.5 Berms and Containment 70
7.5.1 Tank Farm 70
7.5.1.1 Phase 1 Area 70
7.5.1.2 Phase 2 Area 71
7.5.2 Generator Tank Containment Area 71
7.5.3 Airstrip Tank Containment Area 72
7.5.4 Hazardous Waste Transfer Area 72
7.6 Open Pit 73

8.0 BORROW SOURCES 73
8.1 Existing Borrows 73
8.2 Till Stockpile 74
8.3 Waste Rock 74
8.4 Coarse Processed Kimberlite 74
8.5 Quarry 74

9.0 POTENTIAL LANDFILL AND LANDFARM LOCATIONS 75
9.1 Site 1 75
9.2 Site 2 75
9.3 Site 3 75
9.4 Site 4 76

10.0 CLOSURE 77

REFERENCES 78

LIST OF TABLES IN TEXT

Table 1.4: Tetra Tech EBA Project Team 2
Table 3.8: On-site Equipment 9
Table 4.8: Summary of Applicable Hazardous Assessment Guidelines 13
Table 5.5.1: Surface Water Quality Sampling Locations 17
Table 6.1.2.1: Summary of APEC 1A Soil Results 23
Table 6.1.2.2: Summary of APEC 1B Soil Results 24
Table 6.1.2.3: Summary of APEC 1C Soil Results 24
Table 6.1.2.4: Summary of APEC 1D Soil Results 25
Table 6.1.2.5: Summary of APEC 1E Soil Results 25

Table 6.1.3: Summary of APEC 2 and 3 Soil Results 26
Table 6.1.4: Summary of APEC 4 Soil Results 28
Table 6.1.6: Summary of APEC 6 Soil Results 28
Table 6.1.7: Summary of APEC 7 and 8 Soil Results 29
Table 6.1.8: Summary of APEC 9 Soil Results 30
Table 6.1.9: Summary of APEC 10 Soil Results 31
Table 6.1.12: Summary of APEC 13 Soil Results 33
Table 6.1.13: Summary of APEC 14 Soil Results 34
Table 6.1.14: Summary of APEC 15 Soil Results 35
Table 6.1.16-1: Soil Volume Calculations for Metal Contaminated Soils 36
Table 6.1.16-2: Soil Volume Calculations for PHC Contaminated Soils 37
Table 6.2: Summary of Berm Water Exceedances 37
Table 6.3.1: Summary of Groundwater Water Exceedances 38
Table 6.3.3-1: Summary of Groundwater Water Exceedances 39
Table 6.3.3-2: Comparison of Monitoring well 14MW05 Exceedances to the Water Licence 40
Table 6.3.3-3: Comparison of Monitoring well 14MW06 Exceedances to the Water Licence 41
Table 6.3.3-4: In Situ Water Chemistry: Seepage Testing 41
Table 6.3.3-5: Summary of Surface Water Exceedances: Seepage Testing 42
Table 6.4.1-1: In Situ Water Chemistry: Seepage from the Waste Rock Pile to Carat Lake 46
Table 6.4.1-2: Summary of Surface Water Exceedances: Seepage from the Waste Rock Pile to Carat Lake 47
Table 6.4.1-3: In Situ Water Chemistry: PKCA Discharge 48
Table 6.4.1-4: In Situ Water Chemistry: Runoff to the C1 Catchment 49
Table 6.4.1-5: Summary of Surface Water Exceedances: Runoff to the C1 Catchment 49
Table 6.4.1-6: In Situ Water Chemistry: Surface Runoff to Lake C4 50
Table 6.4.1-8: In Situ Water Chemistry: Surface Runoff and Windblown Materials to the Lynne Lake Group 51
Table 6.4.1-9: Summary of Surface Water Exceedances: Surface Runoff and Windblown Materials to the Lynne Lake Group 52
Table 6.4.1-10: In Situ Water Chemistry: Runoff from Storage Pads and Inside the Pit 53
Table 6.4.1-11: Summary of Surface Water Exceedances: Pit and Runoff from Storage Pads 53
Table 6.5.1-1: Paint Analysis Lab Results 54
Table 6.5.1-2: Total lead in paint AST quantities 54
Table 6.5.2: Drum/AST Content Analysis and Exceedance 55
Table 6.6.3: Other Non-Hazardous Materials Volumes 57
Table 6.6.4: Main Camp Facility Volumes 59
Table 6.7-1: Jericho Mine Hazardous Materials Inventory 60
Table 6.7-2: Jericho Mine Non-Hazardous Materials Inventory 60
Table 7.1: Summary of Jericho PKCA Structures 61
Table 7.2: West Dam GTC Locations 63
Table 7.3: East and Southeast Dam GTC Locations 64
Table 7.4-1: Roads 69
Table 7.4-2: Airport Road Culvert Crossings 69

APPENDIX SECTIONS

FIGURES

Figure 1 Site Overview
Figure 2 Processed Kimberlite Containment Area
Figure 3 Main Site and Coarse PK Pile
Figure 3.1 Main Site Tank Farm and Laydown Area
Figure 3.2 Main Site Infrastructure
Figure 4 Low Grade Stockpile
Figure 5 Pit and Waste Rock Piles
Figure 6 Carat Lake Infrastructure
Figure 7 Airstrip Area
Figure 7.1 Terminal Building Area
Figure 8 Water Sampling and Drainage Pathways

PHOTOGRAPHS

Photo 1 Aerial view of main camp and the processed kimberlite containment area.
Photo 2 Aerial view of the low grade stockpile and pit.
Photo 3 Aerial view of the pit.
Photo 4 Aerial view of the borrow area and Carat Lake laydown areas. Airstrip infrastructure is visible in the upper right.
Photo 5 Jericho site from the North Cofferdam.
Photo 6 Jericho pit looking southeast.
Photo 7 Main Camp laydown area.
Photo 8 Truck shop and process plant.
Photo 9 The processed kimberlite containment area (PKCA) with the process plant in the background.
Photo 10 Tires beside the PKCA to minimize dusting.
Photo 11 The terminal building, which also functions as a small camp along with the small accompanying shacks.
Photo 12 The jetty building on the water intake causeway.
Photo 13 Phase 2 tank farm.
Photo 14 Soil sampling beside the Phase 1 tank farm.
Photo 15 Soil sampling on the tundra.
Photo 16 Water sampling beside the east sump with the coarse processed kimberlite, process plant, and truck shop in the background (facing southeast).
Photo 17 The pit walls and suspected Peregrine nesting site (facing southeast).
Photo 18 2012 photo of the main facility (facing southeast).
Photo 19 2012 photo of the west dam (facing east).
Photo 20 CAT 936E loader in the truck shop.
Photo 21 CAT 322C excavator (left) and CAT 950 loader (right) in the main site laydown area beside the truck shop.
Photo 22 CAT 980G loader in the truck shop.

Photo 23 CAT D6 bulldozer in the main site laydown area.
Photo 24 SuperPac packer in the main site laydown area.
Photo 25 Sterling dump truck in the process plant.
Photo 26 Large Godwin pump in the truck shop.
Photo 27 Small Godwin pump in the main site laydown area.
Photo 28 Light plan in the main site laydown area.
Photo 29 Scissor lift in the process plant.
Photo 30 The Ford van that was used as one of the main site vehicles.

APPENDICES

Appendix A Tetra Tech EBA's General Conditions
Appendix B Soils
Appendix C Groundwater, Berms, and Seeps
Appendix D Surface Water
Appendix E Hazardous and Non-Hazardous Materials Inventory
Appendix F Selected Infrastructure Drawings
Appendix G PKCA Inspection
Appendix H C1 Diversion
Appendix I Waste Material Storage
Appendix J Roads and Pads
Appendix K Berms and Containment
Appendix L Open Pit
Appendix M Borrow Areas
Appendix N Landfill and Landfarm
Appendix O Laboratory Results

ACRONYMS & ABBREVIATIONS

AANDC	Aboriginal Affairs and Northern Development Canada
AMSL	Above Mean Sea Level
AMSRP	Abandoned Military Site Remediation Protocol
APEC	Area of Potential Environmental Concern
AST	Above-ground Storage Tank
BTEX	Benzene, Toluene, Ethylbenzene and Xylene
CCME	Canadian Council of Ministers of the Environment
CDWQ	Canadian Drinking Water Quality Standards
CEPA	Canadian Environmental Protection Act
COC	Chain-of-Custody
CSR	Contaminated Site Remediation
CWQG	Canadian Water Quality Guidelines
CWS	Canada-Wide Standard
DO	Dissolved Oxygen
EC	Electrical Conductivity
ENR	Environment and Natural Resources
ESA	Environmental Site Assessment
FPK	Fine Processed Kimberlite
GNU	Government of Nunavut
GTC	Ground Temperature Cable
HDPE	High Density Polyethylene
HPGR	High Pressure Grind Circuit
HWTA	Hazardous Waste Transfer Area
ICP	Inductively Coupled Plasma – Mass Spectrometry
INAC	Indian and Northern Affairs Canada
IOL	Inuit Owned Lands
ODS	Ozone Depleting Substances
PAH	Polycyclic Aromatic Hydrocarbon
PCBs	Polychlorinated Biphenyls
PFAL	Protection of Freshwater Aquatic Life
PHC	Petroleum Hydrocarbons
PID	Photo-ionization Detector
PK	Processed Kimberlite
PKCA	Processed Kimberlite Containment Area
PPE	Personal Protective Equipment
RAP	Remedial Action Plan
RPD	Relative Percent Difference
SS	Soil Sample
SW	Surface Water
TSS	Total Suspended Solids

LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Aboriginal Affairs and Northern Development Canada and their agents. Tetra Tech EBA Inc. (Tetra Tech EBA) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Aboriginal Affairs and Northern Development Canada, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this report is subject to the terms and conditions stated in Tetra Tech EBA's Services Agreement. Tetra Tech EBA's General Conditions are provided in Appendix A of this report.

1.0 INTRODUCTION

1.1 General

Tetra Tech EBA Inc. (Tetra Tech EBA) was retained by Aboriginal Affairs and Northern Development Canada (AANDC) to provide a Remedial Action Plan (RAP) for the Jericho Diamond Mine (Jericho Mine), Nunavut. The current document is the Environmental Site Assessment (ESA) that summarizes the on-site investigation, results, and findings. The ESA will be used in the preparation of the RAP.

The site investigation was conducted by Tetra Tech EBA from August 19 to September 1, 2014. The goals of the investigation were documented in Tetra Tech EBA's Jericho Mine Gap Analysis (Tetra Tech EBA, 2014).

The Jericho Mine is partially located on Crown land and partially on Inuit Owned Lands (IOL). Only the portion on Crown land is covered by the ESA or was investigated.

This project has been undertaken under AANDC's Standing Offer number 4600000763.

1.2 Document Scope

The ESAs goal is to present enough site information to support the RAP, including the full site remediation option and limited site remediation options. The August 2014 site investigation provided the observations and results necessary to prepare this ESA.

The ESA covers four categories:

1. Contaminated Soil
2. Water
3. Hazardous and Non-Hazardous Materials and Infrastructure
4. Geotechnical

Each section has summarized public information, on-site methodology, on-site observations, sampling results, and discussion to prepare the assessment. This is prefaced with a background to the site and regulatory framework for the project.

1.3 Document Organization

A background to the Jericho Mine and the regulatory environment is presented in the initial sections. This is followed by the methodology employed during the site inspection, environmental results, and the geotechnical inspection. General photographs and figures are presented as attachments in the photographs and figures sections of the report. Detailed photographs, figures, and tables have been organized into the appendices. For example, Appendix D: Surface Water contains Appendix D.1: Photos, Appendix D.2: Surface Water Tables and Appendix D.3: Surface Water Trend Graphs. Material referenced in the appendices uses the relevant appendix letter in the label (e.g., Photo D.1).

1.4 Project Team

The project team is provided in Table 1.4. The team is supported by ancillary staff including draftsman, administrative assistants, and environmental data management specialists.

Table 1.4: Tetra Tech EBA Project Team

Personnel	Role
Bill Horne, M.Sc., P.Eng.	Senior Technical Advisor
Robert Zschuppe, M.Sc., P.Eng.	Project Manager
Gary Koop, M.Eng, P.Eng.	Technical Lead and Geotechnical Specialist
Karla Langlois, B.Sc., P.Biol.	Environmental Scientist, Water
Michele Crawford, B.Sc., CIE	Environmental Scientist, Hazardous Materials
Tyrel Hemsley, M.Sc., A.I.T.	Environmental Scientist, Soils

2.0 BACKGROUND INFORMATION

2.1 Location and Project Details

The Jericho Mine is located approximately 260 km southeast of Kugluktuk, NU, and 30 km north of the Lupin Mine in the Contwoyto-Itchen Region. At 65°47' north latitude, the Jericho Mine is approximately 60 km south of the Arctic Circle. Daylight is, therefore, almost continuous at the beginning of the summer and virtually absent at the beginning of the winter (SRK 2003). Figure 1 shows an overview of the site.

The Jericho Mine was opened in 2006 by Tahera Diamond Corporation (Tahera) who went through bankruptcy proceedings in 2008. Shear Diamonds (Nunavut) Corp. (Shear) took over the Jericho Mine in 2010 and operated the mine under care and maintenance until September 2012 when Shear suspended operations. AANDC has been undertaking basic environmental protection of the Jericho Mine since spring 2013. It is understood that AANDC assumed control of the Jericho Mine in January 2014. Under the Act, "the Minister may take any reasonable measures to prevent, mitigate or remedy any resulting adverse effect on persons, property or the environment". AANDC's overall objective is to protect the environment and undertake activities to make the most efficient use of the securities held by the department for the abandoned site reclamation.

The original mine plan was to construct a project with an eight-year life and extract the kimberlite ore by using an open pit and underground mining methods. The project was to have a footprint of approximately 220 hectares. The Jericho Mine is accessible by air and by utilizing the winter road that runs north from Yellowknife, NT. The road was opened during the Tahera mine operation and construction years. The Jericho Mine used the winter road access by continuation of the winter road from the Lupin Mine site on Contwoyto Lake (approximately 30km). The Jericho Mine currently has a 1 km long airstrip.

The Jericho Mine is located partially on Crown land and partially on IOL. The proposed work scope is for the mine portion on Crown land.

2.2 Regional Geology and Topography

The Jericho Mine is situated within the Canadian Shield. The oldest rocks in the area comprise Archean tonalites or granodiorites that outcrop in the immediate vicinity of the Jericho Mine kimberlite pipe. The region is considered to be very geologically stable and not subject to active tectonic movement. The last tectonic event is believed to have been the emplacement of Proterozoic diabase dykes approximately 1.3 billion years ago. The Jericho Mine kimberlite pipe, on the south shore of Carat Lake, was formed from multiple emplacement events, comprising a precursor dyke and three diatreme intrusive stages (SRK 2003).

The Jericho Mine was glaciated several times during the Pleistocene era. The last deglaciation was accompanied by deposition of a discontinuous, but locally thick, blanket of gravel and silty sand till with many cobbles and

boulders. Glaciofluvial and glaciolacustrine deposition was also part of this deglaciation. Glaciofluvial deposits include eskers, outwash deltas, kame deltas, and supra-glacial deltas; these sediments range from clean sand and gravel to very coarse thick boulder and block accumulations. Glaciolacustrine sediments consist mainly of silt and sand. Periglacial processes have caused mechanical breakdown and mass wasting of near surface rock. Organic soils have developed in some poorly drained areas (SRK 2003).

Local topographic relief is primarily the result of previous glaciations. The water surface elevation in Carat Lake is approximately 470 m above mean sea level (AMSL), and the topographic highs in the vicinity of the site facilities typically range from approximately 500 m to 550 m AMSL (SRK 2003). At the central mine area, the topography is relatively flat and gently slopes to the north into Carat Lake. Beyond the Jericho Mine, the topography is characterized as gently rolling to hilly. In particular, south and east of the central mine area includes an elevation gain of approximately 100 m over distances of approximately 500 m (AMEC 2007).

2.3 Hydrology and Hydrogeology

The Jericho Mine is located in an area of continuous (90-100%) permafrost (NRCAN 1999) with medium ice content. The active layer of permafrost is vegetation dependent, but ranges from 0.15 m to 1.2 m, with the active layer inversely related to the depth of vegetative cover (Dredge et al. 1999).

Precipitation as rainfall typically occurs between April and November. Precipitation as snowfall can occur at any time throughout the year, but is not typical in July and August. The mean annual precipitation ranges from 200 mm to 300 mm.

2.4 Regional Climate

The climate of the region is marked by short, cool summers and cold winters. Air temperatures range from about +20°C during the summer to -30°C in the winter. The mean annual temperature is -11.8°C. Wind direction and speeds are variable, but tend to favour a northeast-southwest orientation.

Climate data collection at the Jericho Mine has been discontinuous, with the installation of an automated weather station on the eastern shores of Carat Lake only since the summer of 1995. The available data collected are sufficient to confirm a relatively good correlation with the climate data collected at the Lupin Mine weather station, 30 km south of Jericho Mine. The Lupin Mine weather station has been in operation since 1959, with climate data available through the Environment Canada website (http://climate.weatheroffice.ec.gc.ca), which has been compiled as “Canadian Climate Normals 1971-2000” (SRK 2003).

According to data published by Environment Canada, the key climate values for the nearby Lupin Mine are:

- Mean annual ambient temperature: -11.1°C.
- Maximum temperature ever recorded: 31°C.
- Minimum temperature ever recorded: -49°C.
- Average annual precipitation: 299.2 mm (161.1 mm as rain and 138.1 mm as snow).
- Average Days with maximum temperature greater than 0°C: 130.2.
- Average Days with maximum temperature less or equal to 0°C: 235.
- Average Days with minimum temperature greater than 0°C: 89.2.

- Average Days with minimum temperature less or equal to 0°C: 276.1.
- Average Air thawing index: 929.3°C-days.
- Average Air freezing index: -4931.2°C-days.

Various estimates of evaporation have been made at approximately 250 mm per year. Evaporation takes place almost entirely during the four snow-free months of the year.

Wind speed data collected at the Jericho Mine are somewhat consistent with those collected at the Lupin Mine. The Lupin Mine wind data indicate mean monthly wind speeds ranging from 11 to 20 km per hour in December and October, respectively. Wind directions measured at Carat Lake for 1995 and 1996 were predominantly from the west-southwest, and wind directions collected at the Jericho Mine's airstrip were predominantly north-northwest in both 1997 and 1998. Predominant wind direction in 1999 was due west.

2.5 Permafrost

The Jericho Mine lies in a region of continuous permafrost, with permafrost present everywhere except beneath large lakes, rivers, and some streams that do not freeze to the bottom. Thermistor data extrapolation suggests permafrost depth is approximately 540 m below ground level near the Jericho MIne kimberlite pipe. Temperature profiles show that the zero-annual amplitude depth is approximately 15 m to 18 m below ground level (SRK 2003).

In surficial soils on site, the active layer typically ranges in thickness from less than 1 m in organic soil to slightly more than 3 m where well drained granular soils are present. Active layer thickness in exposed rock exceeds 3 m. On-site ground penetrating radar and drilling have revealed stratified ground ice in surficial materials, including massive ice deposits at the base of the Carat Lake outwash delta and within the esker complex to the north (SRK 2003).

2.6 Vegetation and Ecology

The Jericho Mine is located within the Takijuq Lake Upland ecoregion within the southern arctic ecozone. The short growing season and long cold winters restrict plant growth. Despite these difficult growing conditions, shrub tundra communities dominate the area and consist of relatively consistent cover of dwarf birch, willow, Labrador tea, other ericaceous shrubs, and sedge. In particular, drier areas can be dominated by Vaccinium and Dryas species, whereas willow, sphagnum moss, and sedge can dominate the lower areas (ESWG 1996).

2.7 Wildlife

The southern arctic ecozone is described as having low biological productivity due to the short growing season and cold climates (Environment Canada ND). Barren-ground caribou, muskox, grizzly bear, wolverine, Arctic hare, red fox, and grey wolf are common in the area. Birds, such as peregrine falcons, gyrfalcons, waterfowl, shorebirds, and upland nesting birds (e.g., ptarmigan) are present on a seasonal basis, with only the gyrfalcon and common raven possibly over-wintering.

2.8 Human Activities

The land use activities of the area are limited to subsistence fishing, trapping, and hunting (ESWG 1996).

3.0 ANTHROPOGENIC SITE CONDITIONS

Construction and development of the Jericho Mine occurred primarily during Tahera's operation of the mine prior to 2008. The primary development areas include the airstrip, which is located on the north portion of the mine and the camp and processing area, which is located in the south. Figure 1 provides an overview of site development and infrastructure. Detailed site drawings of the various areas are shown in Figures 2 through 7.

The following sections provide an overview of the site infrastructure and development at the Jericho Mine. Specific details relating to development are discussed in subsequent sections.

3.1 Site Infrastructure

3.1.1 Buildings

Most site buildings are localized in the main camp area, shown in Figure 3 and in more detail in Figure 3.2. The area consists of a waste rock pad constructed to a nominal elevation of 521 m. Structures have either been constructed directly on the pad, or founded on bedrock and graded to pad elevation. The major structures, which include the process plant, camp facility, and truck shop, are discussed further in Section 6.7.4.

The primary structures located in the camp area include:

- process plant;
- camp facility;
- gensets;
- truck shop;
- utilidor; and
- ancillary structures:
  - waste water treatment
  - parts wing
  - contractor offices
  - incinerators
  - storage sheds and shacks

The remainder of the Jericho Mine has smaller temporary or portable structures including the airstrip shelter and wastewater treatment plant.

The emulsion plant is the only other permanent building on site; however, it is on IOL and was not assessed.

3.1.2 Airstrip

The airstrip was initially constructed in 1997 on an esker north of the exploration camp. It was 1,000 m long by approximately 30 m wide. The strip was extended in 2006 to 1,374 m in length. The strip extension was accomplished by levelling the existing esker surface and adding crushed mine rockfill where required. The airstrip

is equipped with runway lights powered by a small generator at the airstrip. Two 62,000 L bermed tanks were located at the south apron for aircraft refueling. Figure 7 shows the airstrip area.

3.1.3 Utilities

The main utility lines include:

- Water intake line from Carat Lake to the main camp area (Figure 3 and Figure 5). This is primarily above ground, except where it enters the main camp facility.
- Pipelines, including the processed kimberlite containment area (PKCA) discharge line, pit dewatering line, water reclamation line, tank farm lines, and pumping lines near the West Dam. All of these are above ground, with the exception of some tank farm lines going from the tank farm to the gensets.
- Buried electrical around the camp area, including some at the airstrip.

3.1.4 Tanks and Bermed Enclosures

The main Jericho Mine fuel tank farm consists of two bermed enclosures lined with a high density polyethylene (HDPE) liner which acts as a secondary containment in the event of a fuel spill. The tank farm is located on the northwest side of the camp pad, as shown in Figure 3 and in more detail in Figure 3.1. The first enclosure (Phase 1) contains eight 500,000 L single-wall steel tanks (above-ground storage tanks (ASTs) #1-8) and a smaller tank (AST #15). The Phase 2 enclosure contains four 1,500,000 L single-wall steel tanks (ASTs #9-12).

Other tanks and bermed enclosures include:

- Genset day tank (AST #18) and berm;
- Airstrip tanks and berm (ASTs #20, 21);
- Truck shop tank and berm (AST #14); and
- Five bermed tanks in the hazardous waste transfer area (HWTA) (ASTs #16, 17, 19, 22, 23).

3.1.5 Jetty (Water Intake Causeway)

The jetty was constructed to provide water for the processing plant and as a potable water source for the camp. It was constructed of clean coarse rockfill and extends approximately 90 m into Carat Lake. A vertical steel intake well was installed within the rockfill, the base of which is located in 4.5 m depth of water. This was connected to a horizontal intake section that goes beyond the rockfill and ends with a stainless steel fish screen. Figure 5 includes the jetty and a design drawing has been included in Appendix F: Selected Infrastructure Drawings.

3.1.6 Roads

Several roads have been constructed to facilitate site access, and include haul roads, light vehicle roads, and ramps. The general road network is shown in Figure 1.

The haul roads and ramps were designed for two-lane, 777 haul truck traffic and are a minimum of 24 m wide. Pit ramps are wider to accommodate crest blast over-break. All other site roads were constructed similarly to the main haul road, but with a running surface width varying from 10 m to 18 m.

Roads were constructed of either esker material or run-of-mine granite, capped with a mixture of esker and 2 inch or 3/4-inch crush. Road heights vary depending on local terrain and road grade.

Further details on the road network are available in Section 7.4.

3.1.7 Pads and Laydown Areas

Facilities' pads are composed of crushed rock of variable thickness to provide a level surface for placement or construction of buildings. The average pad thickness is approximately 2 m, principally to insulate the tundra and prevent permafrost melt. The processing plant and heavy plant equipment are exceptions, as they are founded directly on bedrock.

The following pads were constructed:

- Accommodations complex, truck shop, crusher, coarse processed kimberlite (PK). (Figure 3)
- Low grade stockpile area (Figure 4).
- Carat Lake laydown area (Figure 6).
- Reclaimed Carat camp (Figure 6).
- Airstrip apron (Figure 7).
- Emulsion plant (IOL).
- Ammonium nitrate storage (IOL).
- Explosives magazines (IOL).

3.2 Processed Kimberlite Containment Area

The PKCA is located within the existing Long Lake Basin at the south end of the Jericho Mine (Figure 2). The PKCA was to be divided into three cells: Cell A, Cell B, and Cell C. Fine processed kimberlite (FPK) would first be deposited into Cell A, which is between the East Dam and Southeast Dam and Divider Dyke A. After filling Cell A, FPK deposition was to begin in Cell B. Water would then filter through the divider dykes into the western portion (Cell C) of the PKCA. The divider dyke for Cell B was never constructed and Cell B and Cell C are still the same body of water.

Water inflow to the PKCA came from precipitation, runoff from the surrounding catchment area, site water pumped to the facility from the pit and other containment facilities, wastewater from the camp, and supernatant water from FPK deposition.

No FPK was to be deposited in Cell C. It was to remain as a "polishing pond" to facilitate the settlement of any remaining suspended solids such that excess water could be discharged to Stream C3 during the summer and fall.

The PKCA facility required the construction of numerous dams and dykes to contain the FPK and control the water level and discharge. Not all of the planned structures were built and some were only partially completed. The PKCA is discussed further in Section 7.1.

3.3 C1 Diversion

The C1 Diversion diverts natural flow around open-pit mining activities, from C1 Lake to Carat Lake. The diversion consists of three reaches, referred to as Reaches A, B, and C. Reach A collects flow from C1 Lake routing it through a low-lying inlet area and into a rock chasm. The inlet portion of Reach A is lined with a HDPE liner to promote flow into the rock chasm. Reach B is a steep rip-rapped channel intended to transfer flows from Reach A to Reach C. Immediately upstream of Reach B is a 900 mm diameter culvert which passes flow under Carat Lake Road. Reach C is a wide channel flanked by two granular berms with frozen sand and gravel cores to contain high flow events. Low flows meander between the granular berms before reconnecting the natural stream and discharging to Carat Lake.

3.4 Waste Rock Piles

Waste rock generated from open-pit and underground mining is hauled to a stockpile in one of two waste rock dumps. The waste dumps were originally designed as two distinct piles; however, during mining operations, the pile limits encroached on one another.

The waste rock piles are primarily waste rock, although there is some overburden mixed in, primarily on the northeast half, which was formerly called Waste Dump 2. The construction of the dumps were such that runoff would be directed to the open pit.

The thickness of each dump lift was predicted to be approximately 10 m, but the lift thickness was modified in order to develop relatively uniform bench heights. Overall, slopes were designed to be between 2.6:1 to 1.4:1 depending on location and material.

3.5 Coarse PK pile

The waste stream from the process plant was separated into FPK and coarse PK. The coarse PK was trucked to a stockpile area east of the process plant, as shown in Figure 3. The coarse PK pile has been constructed in two lifts, with sideslopes at the angle of repose (estimated to be 1H:1V).

3.6 Landfill

Non-hazardous wastes were landfilled by Tahera in Waste Dump 2 on IOL. It is was a combination of a dry waste disposal and burn area. Waste from their incinerator was also disposed of in the area. Solids from the waste water clarifier were apparently placed in a segregated sludge pit located away from the waste cells. The landfill was closed by Shear in 2011.

3.7 Open Pit

The Jericho pit is located south of Carat Lake, as shown in Figure 1. The pit was developed under Tahera ownership, and developed ceased sometime in 2008. The current pit is approximately 450 m wide and 80 m deep. The pit water is at elevation 435.4 m, corresponding to a depth of approximately 25 m. Further details relating to the pit are available in Section 7.6

3.8 Equipment

Table 3.8 lists equipment Shear considered operational and that is potentially useful for mine closure.

Table 3.8: On-site Equipment

Item	Qty.	Location	Reference	Comments
Fire Truck	1	Truck Shop	Photo E.51	The care and maintenance team reports that both the truck and the integrated water pump are operational.
CAT 950 Loader	1	Main Site Laydown Area	Photo 21	Was in operating condition while on site.
CAT 936E Loader	1	Truck Shop	Photo E.48	Appears in reasonable condition, but was not tested.
CAT 980G Loader	1	Truck Shop	Photo 22	Appears in reasonable condition, but was not tested.
CAT D6 Bulldozer	1	Main Site Laydown Area	Photo 23	Significant wear and tear and an older model. It appears to be in very poor condition.
CAT 322C Excavator	1	Main Site Laydown Area	Photo 21	Was in operating condition while on site.
SuperPac Packer	1	Main Site Laydown Area	Photo 24	Flat tires and does not have an enclosed cab. It appears to be in poor condition.
Sterling Dump Truck	1	Process Plant	Photo 25	Attempted to start it, but were unsuccessful.
Komatsu Grader	1	Main Site Laydown Area	Photo 7, Photo E.46	Tires are flat and it looks heavily used. It appears to be in poor condition.
Large Godwin Pump	1	Truck Shop	Photo 26	Appears to be in very good condition.
Small Godwin Pumps	2	Main Site Laydown Area, Truck Shop Shed	Photo 27, Photo E.52	Appears in reasonable condition, but was not tested.
Light Plants	3	Main Site Laydown Area, Truck Shop Shed	Photo 28, Photo E.52	Two are uncovered, one is covered. They appear to be in reasonable condition. One was tested and started. The other two were not tested.
Oztek Water Remediation Unit	1	Phase 2 Tank Farm	Figure B.1	This is a relatively new unit purchased by Shear and is expected to be in relatively good condition. It is located beside the Temporary Water Treatment in Figure B.1.
Man Lift	2	Process Plant	Photo 29, Photo E.84	Scissor-lift and boom lift types. The boom lift was tagged as non-operational. The scissor lift appeared to be in good condition, but was not tested.
Mobile Jaw Crusher	1	Stockpile Area	Photo E.43	Appears to be in reasonable condition.
Ford F350 with First Aid Cap and Ford F350 Van	2	Terminal Building	Photo 11, Photo 30	Trucks were in reasonable condition, although operation suffered due to a lack of maintenance. A third truck developed problems while on site and was not longer operational.

4.0 REGULATORY

4.1 Mine Site

The original authorization to operate Jericho Mine was given in 2004 to Benachee Resources Inc. (a subsidiary of Tahera) by the Nunavut Water Board under licence No. NWB1JER0410. The licence was reassigned to Shear in 2010. The commercial land lease is split between Crown land and IOL.

The water licence was renewed in 2011 by the Nunavut Water Board under licence No. 2AM-JER119.

Interim reclamation, abandonment and closure plans were prepared for Jericho Mine by both Tahera (Tahera 2003, 2007) and Shear (EBA 2011c).

4.2 Contaminated Soil Regulatory Guidelines

According to the definition adopted by the Government of Canada, a contaminated site is one at which substances occur at concentrations: 1) above background (normally occurring) levels and pose, or are likely to pose, an immediate or long-term hazard to human health or the environment; or, 2) exceeding levels specified in policies and regulations. Based on the terms of reference for this work, the 2009 Environmental Protection Division, Department of Environment, Government of Nunavut (GNU), Environmental Guideline for Contaminated Site Remediation (CSR) and the Canadian Council of Ministers of the Environment (CCME), Soil Quality Guideline for the Protection of Environmental and Human Health were used to compare and interpret the laboratory analytical results of the soil.

The following subsections outline the rationale for the selection of applicable generic risk management guidelines for soil.

4.3 Land Use Assessment

The GNU and CCME land use criteria currently recognizes four different types of land use:

Agricultural/Wildland land use: lands used for growing crops or producing livestock, and that are agricultural in nature. These also include lands that provide habitat for resident and transitory wildlife and native flora.

Residential/Parkland land use: lands where the primary activity is occupation for residency and recreational purposes. These include lands used as buffer zones between areas of residence, but do not include wildlands, such as national and provincial parks, other than campground areas.

Commercial land use: lands where the primary activity is related to commercial operations, such as the provision of goods and services (e.g., shopping mall) and occupancy is not for residential or manufacturing purposes. These do not include operations where the growing of food is the primary activity (i.e. agricultural).

Industrial land use: lands where the primary activity involved the production, manufacture, construction, and/or assembly of goods.

The Nunavut CSR soil quality guidelines are derived for the protection of receptors under these four different land uses.

4.4 Applicable Exposure Pathways

4.4.1 Human Pathways

The Jericho Mine is covered with sand, gravel, boulders, and subarctic tundra vegetation. The majority of the site consists of gravel and boulder fill on the pad and sand and subarctic tundra vegetation off the pad. Soil and water direct contact (dermal contact and ingestion) pathways are considered applicable at the Jericho Mine during remedial activities. There are buildings on site, but they are not in use. Given that the future anticipated use of the site is as natural land with no occupied buildings, the vapour inhalation pathway can be excluded.

4.4.2 Ecological Pathways

The eco-soil contact pathway is applicable under the existing land use. Given the proximity of Carat Lake and other smaller lakes and creeks, the protection of groundwater for aquatic life (freshwater) is applicable.

4.5 Applicable Guidelines

The regulatory guideline documents that were consulted are summarized below. These documents provide a generic set of guidelines against which the analytical results are compared to provide a general site condition.

Canadian Soil Quality Guidelines and Nunavut CSR consider both human health and ecological receptors, and are intended as general guidance for the protection, maintenance, and improvement of specific uses of land and water. Based on the existing site usage and surrounding land use, the CCME/Nunavut Agriculture/Wildland guidelines for soil are applicable.

General Soil Criteria and Metals

- CCME Soil Quality Guideline for the Protection of Environmental and Human Health – Agriculture/Wildland Land Use;
- CCME Canada-Wide Standard for Petroleum Hydrocarbons (CWS PHCs) in Soil; and
- Environmental Protection Division, Department of Environment, GNU, Environmental Guideline for Contaminated Site Remediation [1] (March 2009 Revised) – Agriculture/Wildland Land Use.

Metal concentrations in surficial soils are dependent upon variations of metal content in naturally occurring media (i.e., bedrock, soil). Soils developed from metal-rich parent materials and bedrock may also be naturally enriched in regulated metals and contribute to the cycling of metals in the environment including in water and vegetation. The biogeochemistry of metals in natural systems is complex; however, an understanding of local and regional geochemical processes is necessary to evaluate the effects of metals on the surrounding environment. Natural background soil and sediment metals concentrations impose technical constraints on generic environmental soil criteria for regulated metals, such as the CCME criteria. However, for the current assessment, CCME-regulated metals were compared to Nunavut/CCME Soil Quality Guidelines for the Protection of Environmental and Human Health – Agriculture/Wildland Land Use Criteria.

[1] Government of Nunavut. 2009. Environmental Guideline for Contaminated Site Remediation. Department of Sustainable Development Environmental Protection Service.

Background Metal Concentrations in Soil

Three background soil samples were collected during the field program and analyzed for CCME/Nunavut CSR metals. Tetra Tech EBA compiled and analyzed the laboratory data to determine metal concentrations that may naturally occur in soil in the area.

There were no metal concentrations identified in these samples in excess of the applicable CCME guidelines. The control soil samples for tin were undetectable; however, the detection limit was <1.0 mg/kg, which is greater than the applicable CCME guidelines (0.1 mg/kg), but not the Nunavut guidelines (5 mg/kg). All elevated analytical results are therefore considered to have been anthropogenically impacted from on- or off-site sources if in exceedance of the applicable guidelines. The background metal concentrations are presented in Table B.1 and locations shown on Figure B.14.

Petroleum Hydrocarbons

The CWS PHC is a specialized case of CCME Soil Quality Guidelines[2]. PHCs are subdivided into four broad physico-chemical fractions as defined by the US Total PHCs Criteria Working Group. The fractions are defined in equivalent carbon numbers, as follows:

- F1: C6 to C10;
- F2: >C10 to C16;
- F3: >C16 to C34; and
- F4: C34+.

Aliphatic and aromatic sub-fractions are considered separately in a human health assessment.

Whereas the primary focus in PHC CWS standard development is prevention of toxic effects from F1 to F4 on the receptors in certain situations, these pathways may be of little immediate concern and PHC management is governed by other factors including:

- Ignition hazard;
- Odour and appearance;
- Effects on buried infrastructure;
- Formation of non-aqueous phase liquids; and
- Socio-economics and technological capabilities.

Soil Quality Guidelines can be used as benchmarks to evaluate the need for further investigation or remediation with respect to a specified land use. Guidelines are applied to identify and classify sites, to assess the general degree of contamination at a site, and to determine the need for further action, and as a basis for remediation objectives.

[2] CCME (2008) Canada-Wide Standard for Petroleum Hydrocarbons (PHC) in Soil, Endorsed by CCME Council of Ministers in 2001, Table 1 Revised January 2008. http://www.ccme.ca/assets/pdf/phc_standard_1.0_e.pdf

4.6 Particle Size Designation

A coarse-grained soil is defined as having a median grain size (D50) of 75 µm or greater, whereas a fine-grained soil has a D50 of less than 75 µm. A review of the particles size analyses results and the borehole logs for the Jericho Mine indicates that the soils are predominantly coarse-grained.

4.7 Water Criteria

The lakes support aquatic life and may be used as a potable water source for hunters and trappers in the area. Therefore, the analysis and interpretation of surface water analytical results were compared with the CCME Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL) (CCME, 2007). The guidelines are obtained from the summary table of the CCME PFAL (CCME, 2007); however, various inorganic compounds are pH, temperature or water hardness dependent. These compounds include aluminum, ammonia, cadmium, copper, lead, and nickel. Based on the equations provided in the summary table, specific guideline values were calculated using the average laboratory pH and hardness. Although there is no CCME PFAL guideline level for phosphorus, the CCME indicates phosphorus levels should not exceed 50% of the baseline conditions and suggests trigger ranges for ultra-oligotrophic systems as a potential indicator of environmental impacts. For the purposes of this report, baseline phosphorus conditions represent the maximum total phosphorus level collected from the Reference Lake and Control Lake in the historical data (0.06 mg/L).

As in the case of soils, the geochemical cycling of CCME-regulated metals naturally present in the environment, especially in mining areas enriched in metals, may cause ambient water quality parameters to exceed the CCME PFAL guidelines. Water quality results obtained from the two control wells, 14MWC1 and 14MWC2, were compared to CCME PFAL criteria for the purpose of the present assessment. Mining activities that cause site disturbance and changes in pH and soil salinity are factors that may contribute to resulting above background metals concentrations in water, even if natural waters contain CCME-regulated metals in concentrations higher than the Tier 1 criteria.

4.8 Hazardous Materials Criteria

Analytical results for the site investigation were compared with applicable Abandoned Military Site Remediation Protocol (AMSRP), federal, and / or territorial guidelines. Table 4.8 summarizes the criteria:

Table 4.8: Summary of Applicable Hazardous Assessment Guidelines

Publisher	Title	Description	Year
INAC	Abandoned Military Site Remediation Protocol	Drum content guideline	2009
GNU	Environmental Guideline for Waste Lead and Lead Paint	Lead paint waste guideline	2014
GNU	Environmental Guideline for Waste Paint	Paint waste guideline	2010
GNU	Environmental Guideline for Mercury-Containing Products and Waste Mercury	Mercury disposal guideline	2010
GNU	Environmental Guideline for the General Management of Hazardous Waste	Reference and waste guidelines	2010
GNU	Environmental Guideline for Industrial Activities on Commissioner's Land	Waste and aqueous content discharges guideline	2011
GNU	Environmental Guideline for the Burning and Incineration of Solid Waste	Guidelines for incineration considerations	2012
GNU	Environmental Guideline for Waste Batteries	Guideline and disposal options	2011

Table 4.8: Summary of Applicable Hazardous Assessment Guidelines

Publisher	Title	Description	Year
GNU	Environmental Guideline for Waste Solvent	Waste solvent disposal options	2011
GNU	Environmental Guideline for Waste Antifreeze	Waste antifreeze disposal options	2011
CEPA	Polychlorinated Biphenyls (PCBs) Regulations	Waste remediation and landfill guideline	2011
GNU	Environmental Guideline for Ozone Depleting Substances (ODS)	Disposal criteria and waste management guideline	2011

Notes:
INAC- Indian and Northern Affairs Canada
GNU – Government of Nunavut
CEPA- Canadian Environmental Protection Act
EC- Environment Canada

4.8.1 Drum/Tank Content

The AMSRP is used to classify drum and tank content for potential on-site disposal or incineration, or off-site disposal of drum products. Drum contents were first visually evaluated as being either aqueous or organic-based. The aqueous samples were then analyzed for potential on-site or off-site disposal, whereas, the organic samples were analyzed for potential on-site incineration or off-site disposal. Samples that are classified as aqueous and are less than 2% glycol or alcohol are eligible for on-site disposal, depending on further analysis as per Nunavut's Environmental Guideline for Industrial Activities on Commissioner's Land (GN, 2011a).

4.8.2 Lead Amended Paint

The AMSRP provides guidelines for acceptable total lead and leachable lead in paint. Lead-based painted components are determined by the Environmental Protection Agency analytical method 200.8 – Elements by Inductively Coupled Plasma – Mass Spectrometry (ICP). The Nunavut Environmental Guidelines for Waste Lead and Lead Paint (GN, 2014b) states that paint containing less than 100 mg/kg total lead in paint is not considered hazardous. It also states that products containing leachable lead in excess of 5 mg/L are to be considered hazardous waste.

Leachable lead in paint as determined by toxicity characteristic leachate properties analysis is considered hazardous when levels are greater than 5 mg/L. This material shall be collected and transported off site in accordance with the Nunavut Environmental Guideline for the General Management of Hazardous Waste (GN, 2010b) to a licensed hazardous waste disposal facility.

5.0 METHODOLOGY

5.1 Soil Assessment

5.1.1 Test Pitting

Soil test pits were hand dug on site using a shovel and/or pick axe. A hand auger was used in areas where the soil was not compacted. The depth of the test pits varied across the site from 0.10 metres below ground surface (mbgs) to 1.18 mbgs. Test pits where water accumulated were the shallowest due to the test pits filling up with water, while test pits in sand-textured soil were the deepest. Test pits on the mine pad were shallow as well due to refusal. All test pits were advanced to assess the potential impacts of hydrocarbons and/or metals on the site.

The test pit locations are shown in Figures B.1 to B.14 and borehole logs are shown in Appendix B: Borehole Logs and Table B.3.

5.1.2 Soil Sampling

Soil samples were collected during the test pitting from the sides of the test pits or from hand augers. Soil samples were collected in at regular intervals. The samples were retained for field screening, laboratory analysis, and to evaluate the general soil lithology and stratigraphy, as shown on the borehole logs in Appendix B: Borehole Logs.

Soil samples were field screened using the ambient temperature headspace method hydrocarbon analysis system. Soil samples were placed in plastic bags and allowed to adjust to the outdoor air temperature before the airspace within the bag was analyzed for combustible gases using a PID Drager Multi-PID 2+ instrument. PID screening results and depths of screened samples are shown in Table B.3.

Soil samples were placed into laboratory supplied plastic bags and 120 ml glass jars with Teflon-lined lids. To minimize the potential for cross-contamination during sample collection, Tetra Tech EBA's field representatives wore fresh sampling gloves for each new soil sample collected. Soil samples were selected for analysis based on field observations and PID readings. The soil samples selected for analysis were submitted under chain-of-custody (COC), in coolers, and on ice to Maxxam Analytics (Maxxam) in Edmonton, Alberta for analysis of benzene, toluene, ethylbenzene and xylene (BTEX), PHC fractions F1-F4, Polycyclic Aromatic Hydrocarbons (PAHs), Glycol, and Metals. Maxxam is accredited by the Canadian Association for Laboratory Accreditation.

Tetra Tech EBA followed quality assurance and quality control (QA/QC) procedures during sampling to obtain representative soil samples and to minimize the potential for cross-contamination between sampling. This included collecting and submitting duplicate samples, one from the test pitting and one from the drilling program for laboratory analysis to assess the reproducibility of the sample data (part of the QA/QC process)(Appendix B, Table B.2).

5.2 Berm Surface Water Testing

Surface water samples were collected on August 25, 2014 from five locations across site where water had accumulated within berm areas. These include areas of potential environmental concerns (APECs) 1, 2, 3, 7, 8, and 9.

Water chemistry (pH, electrical conductivity (EC)) was measured using a PCTestr 35 Multi-Parameter prior to sampling. Samples were collected directly into laboratory supplied clean labelled bottles supplied by Maxxam. The samples were immediately placed in a cooler with ice. Samples were transported under COC procedures to Maxxam for chemical analysis of BTEX, PHC fractions F1 to F2, PAHs, glycols, routine analysis, and total and/or dissolved metals. All samples that required preservatives were preserved in the field. The berm surface locations are provided in Figure C.1, C.2, and C.4.

5.3 Groundwater Assessment

5.3.1 Monitoring Well Installation

A total of eight groundwater monitoring wells (14MW01, 14MW03, 14MW04, 14MW05, 14MW06, 14MWC1, and 14MWC2) were installed at the Jericho Mine. Monitoring wells were installed within the active layer in the soil. Monitoring wells were installed to depths ranging from 0.67 mbgs to 1.0 mbgs. The wells were constructed using a 25 mm diameter, screw-jointed Schedule 40 polyvinyl chloride, which was factory washed and bagged to prevent contamination. Each well was constructed using a machine-slotted screen (0.010 inch openings) below an unslotted riser pipe, with a sand point for the bottom cap. The annular space around the well screen was surrounded by a natural course textured soil. All of the wells were completed as stick up wells. The well completion details are shown on the borehole logs in Appendix B.

5.3.2 Groundwater Level Monitoring

The depth to groundwater in each well was measured to the nearest 0.001 m using an interface probe (Heron Instruments H.01L) meter on August 30, 2014. Measurements were made relative to the highest point at the top of the well casing.

5.3.3 Monitoring Well Development and Purging

Monitoring wells were developed and purged on August 30, 2014. The purpose of well development is to remove water and sediment that may have been introduced during well installation and to improve the hydraulic connection with the surrounding aquifer materials. All monitoring wells were developed using Waterra tubing with foot valves and surging the well to remove at least six well volumes, and/or until dry.

5.3.4 Groundwater Sampling and Analysis

On August 31, 2014, after allowing the wells to recharge, groundwater samples were collected from seven of the eight wells. Monitoring well 14MW02 was dry at the time of sampling. Water chemistry (pH, EC) was measured using a PCTestr 35 Multi-Parameter prior to sampling wells (Table B.1). The water that flowed into the wells after purging the wells is considered to be representative of local groundwater conditions and suitable for sampling and analysis.

Samples were collected using Waterra tubing and transferred directly into laboratory supplied clean labelled bottles supplied by Maxxam. The samples were immediately placed in a cooler with ice. Samples were transported under COC procedures to Maxxam for chemical analysis of BTEX, PHC fractions F1 to F2, routine analysis, and total and dissolved metals. All samples that required preservative were preserved in the field. The samples collected were noted to be relatively turbid, with some sediment entrained in the samples.

Tetra Tech EBA followed QA/QC procedures during each sampling event to obtain representative groundwater samples and to minimize the potential for cross-contamination between wells. This included collecting and submitting a duplicate sample from one well for laboratory analysis to assess the reproducibility of the sample data (part of the QA/QC process) (Table B.3).

5.4 Seepage Testing

The entire perimeter of the waste rock pile was traversed during the August 2014 field event to locate seeps (as evidence of flow draining from the toe of the waste rock pile). On August 20 and August 24, 2014, grab samples were collected from three identified seeps. The seep locations are provided in in Figure C.3.

At each of the three seeps, water chemistry (pH, EC) was measured using a calibrated PCTestr 35 Multi-Parameter prior to sampling. Samples were collected with the sample bottles held into the flow and caution was taken to minimize disturbance to the bottom sediment. All samples were filtered and preserved in the field, as appropriate. Sample water was collected directly into pre-labelled bottles supplied by Maxxam, and were immediately placed in a cooler with ice packs. Samples were transported under COC procedures to Maxxam for chemical analysis of routine parameters and total and dissolved metals.

5.5 Surface Water

There are six main pathways that can affect the water quality in and around the Jericho Mine, including:

1. Seepage from the Waste Rock Pile to Carat Lake;
2. PKCA discharge;
3. Runoff to the C1 catchment;
4. Surface runoff to Lake C4;
5. Surface runoff and windblown materials into the Lynne Lake group (Ash, Key, and Lynne lakes and possibly Southeast and Shine lakes); and
6. Runoff from storage pads and inside the mine pit.

The surface water program is designed to analyze water quality within these affected pathways.

5.5.1 Surface Water Quality Monitoring

From August 25 to 29, 2014, surface water quality was collected from 20 stations; the majority of which were consistent with the sampling locations monitored for the aquatic effects and surveillance network programs (as much as possible), and represent water quality locales down-gradient from the project affect pathways (Figure D1; Table 5.5.1).

Table 5.5.1: Surface Water Quality Sampling Locations

Sampling Station	GPS Location (Zone, Easting, Northing) (NAD 27)	Description
Seepage from the Waste Rock Pile to Carat Lake		
JER-AEM-12	12 W, 478021, 7320071	Carat Lake freshwater intake
JER-AEM-15-S	12 W, 477527, 7320674	Carat Lake Basin, surface sample
JER-AEM-15-NB	12 W, 477527, 7320674	Carat Lake Basin, near bottom sample (at 28.0 m depth)
JER-AEM-16	12 W, 478247, 7321321	Carat Lake Outlet
2014-CL-S1	12 W, 478405, 7320101	Carat Lake shoreline down-gradient of Waste Rock Pile
2014-CL-S2	12 W, 478503, 7320263	Carat Lake shoreline down-gradient of Waste Rock Pile
PKCA Discharge		
JER-AEM-04	12 W, 476165, 7318808	Discharge point of the West Dam
SWQ-04	12 W, 476263, 7318739	Inside the PKCA

Table 5.5.1: Surface Water Quality Sampling Locations

Sampling Station	GPS Location (Zone, Easting, Northing) (NAD 27)	Description
Runoff to C1 Catchment		
JER-AEM-09	12 W, 477667, 7319369	Lake C1
JER-AEM-10	12 W, 478209, 7319949	Stream C1
JER-AEM-11	12 W, 478231, 7320112	Outlet of Stream C1 into Carat Lake
Surface Runoff to Lake C4		
JER-AEM-13	12 W, 479202, 7320212	Lake C4
JER-AEM-14	12 W, 478802, 7320750	Lake C4 Stream
Surface Runoff and Windblown Materials into the Lynne Lake Group		
JER-AEM-22	12 W, 477948, 7318375	Ash Lake
JER-AEM-23	12 W, 478695, 7318748	Key Lake
JER-AEM-24	12 W, 479674, 7319091	Lynne Lake
JER-AEM-26	12 W, 477536, 7318141	Southeast Lake
JER-AEM-27	12 W, 477538, 7317959	Shine Lake
Runoff from Storage Pads and Inside the Pit		
SWQ-02	12 W, 478194, 7319683	Pit
SWQ-07	12 W, 477794, 7318820	East Sump

Parameters targeted for this program were those identified with increasing concentrations or trends identified from past aquatic monitoring programs specific to each monitoring station (monitoring data from 2005 to 2012), and included routine and nutrient parameters, total metals, and PHCs. The surface water data was evaluated against the CCME PFAL, CDWQ, and the Nunavut Water Board water licence (Licence No. 2AM-JER1119, expiring December 31, 2019). Under the water licence, effluent discharged from the PKCA to Stream C3 at monitoring station JER-AEM-04 must meet specific effluent quality criteria including the Maximum Concentration of Any Grab Sample. The remaining surface water quality stations monitored in 2014 do not have licensed criteria; however, their water chemistry data was compared against the Canadian Water Quality Guidelines PFAL and CDWQ standards.

ALS Laboratory Group (ALS) (an accredited laboratory) supplied the sample bottles, preservatives, coolers, and ice packs used in the collection and shipment of the field and QA/QC samples. All sample bottles and preservatives were supplied in clean coolers and were secured throughout transport.

The surface water quality sampling methods followed standard grab-sampling methods along the shorelines and from an aluminum boat using a pole extension. A single water quality sample, JER-AEM-15 (near bottom), was collected at depth using a 1.2 L capacity Kemmerer sampler constructed of transparent acrylic with silicone seals, designed for trace metal analysis. The Kemmerer sampler was nitric acid washed (suitable for metal analysis) and thoroughly rinsed with laboratory issued deionized water prior to the field sampling event. Sampling (including the field and quality controls) was consistent with the following field sampling methods:

- Collect in situ field measured pH, water temperature, EC, and dissolved oxygen (DO) using calibrated multi-parameter meters[3]. A second calibrated DO and water temperature meter[4] with a 40 m cable was used at

[3] Oakton® Multi-Parameter 35 Series and Oakton DO 300 meters measured pH, EC, DO, and water temperatures near the water surface.
[4] WTW ProfiLine Oxi 197 model with a TA 197 electrode measured DO and water temperatures at depth.

surface water stations with sufficient water depths (e.g., JER-AEM-15) to measure the DO and water temperatures at 1 m intervals up the water column.

- Use disposable, powder-less, nitrile gloves during handling of all the bottles and equipment.
- Avoid touching the inner portions of the sample and preservative bottles and caps even with gloved hands.
- Collect grab samples by submersing bottles 0.25 m below the surface in lakes and just below the surface in streams to minimize the collection of bottom sediment and any surface material. While submerged, the bottles will be uncapped, allowed to fill, and recapped prior to resurfacing.
- Collect grab samples with an extendable pole at stations with shallow shorelines and/or from the aluminum boat. Each sample bottle is taped onto the end of the pole, extended a minimum of 4 m, and plunged 0.25 m below the surface.
- Care to avoid disturbing the bottom sediment at the sampling station and collecting grab samples into the current or wind, where possible.
- Preserve samples using appropriate acid concentrations provided by ALS.
- Seal together the water quality samples in a Ziploc bag to prevent any possible cross-contamination to other water quality station samples while in transportation.
- Store and transport the water quality samples in laboratory-issued portable coolers with ice packs, to ensure that the water quality samples remain below 4 degrees Celsius (°C), as much as possible.
- Ensure water quality samples remain upright and secured in the cooler, and the cooler sealed with tape prior to shipping.
- Prepare and ship a COC with the water quality samples to ALS for laboratory analysis.

Analytical results from this August 2014 field event were compared to various water quality criteria and the historical data using the Mann Kendall Trend Test; a nonparametric test for whether parameter levels tend to increase or decrease with time. The null hypothesis (no change in parameter levels; i.e., the data is independent and randomly ordered) is rejected when Kendall's S statistic is different from zero. The Mann Kendall Trend Test is commonly used since it does not require the data to be normally distributed and is suitable for data with time series breaks.

Four types of quality control samples were collected with the surface water quality field sampling program:

1. Trip blank: prepared by ALS with deionized water, accompanied the sample bottles to the site, and was left intact (e.g., unopened), and returned to the laboratory with the water quality samples. One trip blank was submitted, and was used to test for possible contamination or parameter loss that might arise during the handling, transport, and storage of samples resulting from the sample bottle, cap, or preservative.

2. Field blank: prepared in the field using deionized water supplied by ALS. One field blank sample was collected on site and returned to the laboratory with the water quality samples. This field blank was used to test for contamination arising from sampling, handling, or from ambient conditions during sampling.

3. Duplicate samples: collected on-site in direct association with the field samples using source water. Duplicate samples, representing 10 percent (%) (or greater) of the source water samples, were collected to test the validity and precision of sampling procedures and laboratory methodology. Duplicate samples were

compared to their respective field samples using a Relative Percent Difference (RPD) Assessment, which provides an index for the sampling and analytical precision. Field duplicates should have a difference of no more than 20% from their field sample parameters. Since analytical error increases near the detection limit, only the results five times greater than the detection limit were considered applicable to the RPD Assessment.

4. Equipment blank: prepared in the office post-field event by repeating the pre-field washing procedure (using a nitric acid wash and deionized water rinses) and filling the Kemmerer water sampler with deionized water supplied by the laboratory. The equipment blank samples were collected to test for contamination arising from the Kemmerer sampler, handling, or from the nitric acid cleaning wash.

5.6 Material Survey

5.6.1 Drum Contents Sampling

Tetra Tech EBA sampled drum contents for classification of materials based on identification for proposed disposal. Prior to sampling, the drum was inspected for, but not limited to:

- Drum pressurization (bulging/ visual dimples);
- Crystals forming on the exterior around any openings;
- Visual identification of leaks, holes, or stains;
- Identifiers that provide information on potential contents;
- Composition and type of drum (steel/poly and open/bung);
- Condition, estimated age if labelled, exterior rust; and,
- Sampling accessibility (is the drum vertical, horizontal, buried, etc.)

Drums that exhibited evidence of pressurization and crystal formation were not sampled by Tetra Tech EBA. Tetra Tech EBA field technicians determined any drums on site exhibiting the above features and decided if they were safe for sampling. Compromised drums that were not sampled were recorded for drum location and estimation of contents if labelled.

Drums were identified by Tetra Tech EBA with sample identifiers recorded on the drum. This will allow for identification in case lids are moved at a later date.

For metal drums not sitting directly on earth, the drum was grounded using grounding wires, alligator clips, and a grounding rod or metal structure if practical. Prior to the opening of the lid, the opening equipment was applied to the bung or drum ring and an electrical conductive current path was allowed time to form. Tetra Tech EBA used spark resistant tools for the opening of equipment.

When the drum was opened, the contents original state was recorded in the field notes. This allowed the field technician to record state, quantity, phases (if possible), and colour of the contents.

A liquid waste sampler was used to retrieve contents from the drum or tanks and fill six laboratory sample vials, two laboratory amber vials, and three laboratory plastic bottles. The vials and bottles were then put in plastic bags with cushioning for transport in plastic coolers. The drums and tanks were all resealed and the equipment was decontaminated or disposed of after each use.

The Tetra Tech EBA drum sampling protocol is provided in the Health and Safety Plan, August Site Investigation, Consulting Services for Jericho Mine, NU (Tetra Tech EBA 2012b). The level of personal protective equipment (PPE) utilized was C Level Protection. This included a full face mask with defender filter cartridges. Thick rubber gloves and disposable Tyvek suits and booties were also worn. Other precautions, such as wash buckets, absorbent pads and eye wash kits were located adjacent to the drum being sampled.

5.6.2 Lead Containing Paint

All materials sampling was conducted with a half-face mask respirator equipped with P100 filters. The following outlines sampling procedures for the collected surface material samples of suspect lead-based paints.

- Donned protective equipment (half-face respirator and nitrile gloves and Tyvek suits with a hood are to be worn if the sampling is conducted within an enclosed area, e.g. confined space).
- Labelled each sample container with a specific ID number, sample location, date and type of material sampled. Recorded the information on a sampling data form. The sample was placed in a labelled laboratory supplied bag.
- Marked the location of the sample on the sampling diagram/ building floor plan and recorded the sample ID number on the plan diagram as well. Photographed the sample collection site for project records and inclusion into the assessment report.
- Moistened area where sample was to be extracted (sprayed the immediate area with water and reapplied water during sampling to minimize particulate release).
- Extracted the paint sample using a paint scraper, which scraped off the material directly into a laboratory supplied bag. Sample size was less than the minimum of 100 grams, due to the paint strength.
- Wiped the exterior of the bag with a wet wipe, which removed any material that may have adhered to it during sampling.
- Cleaned tools with wet wipes to remove all debris.
- Discarded protective clothing, wet wipes and rags, cartridge filters, and drop cloth in a labelled disposal bag. Removed half mask respirator and applied duct tape to the P100 filters to ensure minimum potential for particulate release. Sealed and retained the bag until lab results are received, at which time dispose of the bag as lead-contaminated waste if tests were positive for lead. (Disposal bags must be properly labelled.) Unless every sample tests negative for lead, discard waste as lead–contaminated.
- Back in the field office, the laboratory COC was completed. Under analysis required, wrote “Total Lead” for the method that was conducted. Surfacing materials containing greater than 600 ppm of lead are considered to be hazardous under the Government of NU guidelines. AMSRP lists surfacing materials containing greater than 600 ppm of total lead to be lead-based and 5 mg/L of leachable lead are considered to be hazardous, which is consistent with the Federal Hazardous Products Act.

5.6.3 Materials Inventory

An inventory of hazardous and non-hazardous items at the site was recorded and photographed. Summary tables of the total hazardous and non-hazardous materials and the total volumes of uncrushed hazardous and non-hazardous materials at the site are provided in Appendix E, Tables E.1, and E.2. Photographs of materials are provided in Photos E.1 to E.86. Each item or groups of items were classified by material type, either non-

hazardous or hazardous, then the material description (wood, metal, etc.) and the material item (shelf, generator, etc.) as required. The total volume of each material description was calculated. All material quantities in this report are uncrushed values.

Drum volume was calculated based on a field assessment of residual, 5%, 25%, 50%, 75%, or full for each drum.

5.7 Geotechnical Assessment

A Geotechnical assessment was carried out on all existing earthwork structures and potential landfill and landfarm sites. All existing earthworks structures and their immediate surroundings were visually examined for signs of settlement, seepage, cracking, erosion, or other signs of distress. Observations made during the inspection were photographed and recorded.

A geotechnical site inspection was previously completed by Tetra Tech EBA in 2011 (2011a). Field work subsequent site inspection was also completed in 2012; however, the report was not prepared prior to Shear's departure from the site. The previous inspection work was referenced to evaluate any changes in the structures and evaluate performance trends.

Ground temperature data for PKCA dam structures was collected during the August 2014 inspection. The data plots were reviewed in conjunction with the observations from each site to develop any recommendations presented for each structure.

Potential landfill and landfarm sites were visually assessed and photographed. Test pits were dug at select locations to assess the geotechnical conditions. Laboratory testing, including particle size analysis and moisture contents were complete to characterize the soils.

A similar assessment was undertaken for borrow areas. Potential borrow locations were visually assessed and samples taken for laboratory analysis.

6.0 ENVIRONMENTAL RESULTS

This section contains information on the soil, water, and materials inventory that was completed during the August 2014 field investigation.

6.1 Soil Results

6.1.1 Overview of APECs

Tetra Tech EBA conducted a Phase II ESA in August 2014 to assess 15 APECs that were identified in the gap analysis or in the field. The APEC overview is in Figure B.1 and B.2. A total of 187 test pits were advanced during the project. From the 187 test pits, a total of 128 soil samples (including duplicates) were submitted for laboratory analysis based upon visual, olfactory or PID evidence of hydrocarbon impacts. Sample analyses included the following: 125 samples were analyzed for PHCs, 14 samples for CCME metals, five for PAHs, and one for Glycol analysis.

Figures B.1 to B.14 show the locations of the APECs, locations of the samples collected, and site features including drums, fuel tanks, heavy machinery, building infrastructure, and debris. Soil impacts with delineated boundaries are highlighted in the figures (Appendix B). Samples submitted for laboratory analysis can be found in Table B.1 and Table B.2 (Appendix B). Test pit logs (Appendix B), a data sheet outlining field screening values for PID, and observations for each sample can be found in Borehole Logs and Table B.3.

The main contaminants of concern at the site identified in the gap analysis included PHC fractions F1 to F4, PAHs, BTEX, Glycols, and metals.

Full delineation was not achieved at most of the contaminated soil locations. This was either due to rocky ground preventing vertical delineation, infrastructure blocking horizontal delineation, or lab results identifying contamination extents not predicted in the field. As a result, a conservative approach to estimating volumes was employed. Actual volumes will vary.

6.1.2 APEC 1: Airstrip

APEC 1 consists of five APECs:

- APEC 1A: North End of the Runway
- APEC 1B: Airstrip Fuel Storage Berm
- APEC 1C: Maintenance Shop
- APEC 1D: Generator
- APEC 1E: Fuel Drums

Samples were collected and field screened with a PID. The analytical results for the soil samples are summarized in Table B.1, Figure B.3, and Figure B.4. Copies of the laboratory certificates for the soil samples are provided in Appendix O.

6.1.2.1 APEC 1A: North End of the Runway

Five samples were collected from APEC 1A (Table B.1; Table B.3; Photo B.1; Figure B.3) in which field screening indicated low vapour readings and no visual evidence of staining or impacts were observed. Samples SS1A-2 (10-30 cm) and SS1A-4 (10-30 cm) were analyzed for BTEX and PHC fractions F1-F4. Table 6.1.2.1 summarizes the analytical results.

Table 6.1.2.1: Summary of APEC 1A Soil Results

Sample #	Analysis	Exceedance of Nunavut CSR Guideline
SS1A-2 (10-30 cm)	**BTEX, F1-F4**	Did not exceed guideline
SS1A-4 (10-30 cm)		

6.1.2.2 APEC 1B: Airstrip Fuel Storage Berm

Fourteen samples were collected from APEC 1B (Table B.1; Table B.3; Photo B.2; Figure B.4), of which nine samples were collected outside of the fuel berm and five samples from within the fuel berm. Samples collected outside the fuel berm had low vapour readings and there was no visual evidence of staining or impacts to soil or vegetation, while inside the fuel berm visual, olfactory or PID evidence of hydrocarbon impacts in the soil were identified. A total of five samples were analyzed for BTEX and PHC fractions F1-F4. Table 6.1.2.2 summarizes the analytical results.

Table 6.1.2.2: Summary of APEC 1B Soil Results

Sample #	Analysis	Exceedance of Nunavut CSR Guideline
SS1B-1 (0-10 cm)	**BTEX, F1-F4**	Ethylbenzene, PHC fractions F2 and F3
SS1B-4 (0-10 cm)		
SS1B-8 (0-10 cm)		PHC fractions F2 and F3
SS1B-6 (90-110 cm)		Did not exceed guideline
SS1B-7 (90-110 cm)		

Based on the analytical results and the locations of the samples, the PHC impacts appear to be localized to within the fuel berm. Vertical delineation was not obtained within the berm due to water and the potential to impact the liner. The surface area is estimated to be 260 m^2. Assuming the 0.5 m thick layer of material used to construct the fuel berm is contaminated, the volume of hydrocarbon impacted material is approximately 130 m^3. Confirmatory samples should be collected below the fuel berm once it is dismantled.

6.1.2.3 APEC 1C: Maintenance Shop

Fuel drums were located on the west and north side of the maintenance shop. There was no obvious visual evidence of stained soil near the fuel drums on the west side of the building; however, there was obvious stained material by the fuel drums on the north side of the maintenance shop. Inside the maintenance shop there were vehicles, equipment, generators, and secondary containment berms with fuel and storage cabinets. The floor of the maintenance shop contained stained soil areas, which potentially may be impacted with PHCs.

Three samples were collected from APEC 1C (Table B.1; Table B.3; Photo B.3 and Photo B.4, Figure B.4) in which visual, olfactory or PID evidence of hydrocarbon impacts in the soil were identified. Sample SS1C-1 (0-10 cm) was collected adjacent to the fuel drums on the north side of the maintenance shop, while the remainder were sampled within the maintenance shop. SS1C-2 (0-20 cm) was sampled from a large stain located in the north half of the maintenance shop and sample SS1C-3 (0-20 cm) was collected near the generator and two skid steers. Samples were analyzed for BTEX and PHC fractions F1-F4 and/or metals. Samples SS1C-1 (0-10 cm) and SS1C-2 (0-20 cm) were above Nunavut CSR guidelines for PHC fractions F2 and F3 and nickel. Tin was noted to be above the CCME guideline for sample SS1C-2 (0-20 cm). However, the value for this sample was <1.0 mg/kg, which is the laboratory detection limit. This detection limit is greater than the CCME guideline of 0.1 mg/kg, but less than the Nunavut CSR guideline of 5 mg/kg. Table 6.1.2.3 summarizes the analytical results.

Table 6.1.2.3: Summary of APEC 1C Soil Results

Sample #	Analysis	Exceedance of Nunavut CSR Guideline
SS1C -1 (0-10 cm)	**BTEX, F1-F4**	PHC fractions F2 and F3
SS1C-2 (0-20 cm)	**BTEX, F1-F4, Metals**	PHC fractions F2 and F3, nickel
SS 1C-3 (0-20 cm)	**BTEX, F1-F4**	Did not exceed guideline

The pad was constructed out of blast rock, thus the soils were difficult to hand sample, even with a pickaxe. Vertical delineation of soil impacts was not achieved. The surface area is estimated to be 100 m^2 and the PHC impacts are estimated to extend to 1 m below grade. The approximate volume of impacted materials is therefore estimated to be 100 m^3.

6.1.2.4 APEC 1D: Generator

The generator was located inside of a shipping container with a stained black floor. Adjacent to the generator was a fueling tank and two wooden sheds. A total of seven samples were collected from APEC 1D (Table B.1; Table B.3; Photo B.5, and Photo B.6; Figure B.4) in which visual, olfactory or PID evidence of hydrocarbon impacts in the soil were identified. A total of four samples were analyzed for BTEX and PHC fractions F1-F4. Table 6.1.2-1D summarizes the analytical results.

Table 6.1.2.4: Summary of APEC 1D Soil Results

Sample #	Analysis	Exceedance of Nunavut CSR Guideline
SS1D -1 (0-20 cm)	**BTEX, F1-F4**	Did not exceed guideline
SS1D-3 (0-20 cm)		Benzene and PHC fraction F3
SS1D-4 (20-40 cm)		PHC fraction F2
SS1D-5 (0-20 cm)		Did not exceed guideline

The soils were difficult to sample by hand in this area, even with a pickaxe. Vertical delineation of soil impacts was not achieved. Soil samples were not collected on the east side of the generator due to a wooden shed located adjacent to the generator. Therefore, the surface area, based upon adjacent delineation sample (SS1D-5 (0-20 cm)) and field observations, is estimated to be 33 m^2. The PHC impacts are estimated to extend to 1.5 m below grade. The approximate volume of impacted materials is therefore 50 m^3. Samples should be collected below the generator once it and the adjacent infrastructure is removed.

6.1.2.5 APEC 1E: Fuel drums

There was a black stained area along with fuel drums north of the maintenance shop (Table B.1; Table B.3; Photo B.7 and Photo B.8; Figure B.4). Four samples (SS1E-1 to SS1E-4) were collected from the stained area and six samples (SS1E-5 to SS1E-10) from the fuel drums. Visual, olfactory or PID evidence of hydrocarbon impacts in the soil were identified near both areas. Four samples were selected for BTEX and PHC fractions F1-F4 analyses. Table 6.1.2.5 summarizes the analytical results.

Table 6.1.2.5: Summary of APEC 1E Soil Results

Sample #	Analysis	Exceedance of Nunavut CSR Guideline
SS1E -1 (0-20 cm)	**BTEX, F1-F4**	PHC fractions F3 and F4
SS1E-2 (0-20 cm)		Did not exceed guideline
SS1E-5 (20-40 cm)		PHC fractions F2 and F3
SS1E-9 (0-20 cm)	**BTEX, F1-F4**	PHC fractions F2 and F3

The soils were difficult to sample by hand, therefore, vertical delineation of soil impacts was not achieved. The black stain area was horizontally delineated based on field observations and the confirmatory sample SS1E-2 (0-20 cm). The surface area is estimated to be 4 m^2 and the PHC impacts are estimated to extend 0.5 m below grade. Based on this assumption, the approximate volume of impacted materials was 2 m^3.

The sample SS1E-5 (20-40 cm) was located where stained soil was located while no visible, olfactory or PID evidence was observed near sample SS1E-9. Both samples though exceeded Nunavut CSR guidelines; therefore the horizontal delineation was not obtained. For the purposes of determining the volume of potentially impacted

soil for remediation purposes, the surface area is anticipated to be 18 m^2. It was assumed that the PHC impacts extend to 1 m below grade. The approximate volume of impacted materials is therefore 18 m^3.

6.1.3 APEC 2 (Contaminated Soils Storage Area) and APEC 3 (Hazardous Waste Transfer Area)

APEC 2 and 3 are the Contaminated Soils Storage Area and the HWTA, respectively. These APECs were separated in the gap analysis, but have been combined here due to their proximity and because previous photos indicate the soil material in APEC 2 was moved from APEC 3.

APEC 2 (Table B.1; Table B.3; Photo B.9; Figure B.5) contained fuel drums with soil, containers holding antifreeze, motor oil, transmission and hydraulic oil containers, a large AST, a small AST, a large stockpile of soil, and a soil bag with black stained soil overflowing the edges (Photo B.10). A total of 35 samples were collected from APEC 2, of which 13 samples were selected from APEC 2, five samples outside the berm area, one sample from the small black stained soil pile, three samples around the various containers, and four samples from the large stockpile of soil. Samples were submitted to the laboratory for analysis of BTEX, PHC fractions F1 to F4, PAHs, Glycols and/or metals.

Samples collected outside the berm area had low vapour reading and no visual evidence of staining or impacts to soil or vegetation were noted. Visual, olfactory or PID evidence of hydrocarbon impacts in the soil were identified inside the berm area. All samples submitted outside of the APEC 2 berm were below the Nunavut CSR guidelines. All samples inside the berm were above Nunavut CSR guidelines for PHC fractions F2 to F4, Chromium, Nickel, Zinc, Index of Additive Cancer Risk (IACR), Benzo(b+j)fluoranthene, Benzo(k)fluoranthene, Fluorene, Phenanthreene, and/or Pyrene. Tin exceeded CCME guidelines for sample SS2-8 (0-10 cm) but did not exceed the Nunavut CSR guidelines of 5 mg/kg. Table 6.1.3 summarizes the analytical results.

APEC 3 (Table B.1; Table B.3; Figure B.5) contained four large ASTs and a tanker located within a secondary berm (Photo B.11). There is a berm around the secondary berm that appears to be newly developed (Photo B.13). A total of 22 samples were collected from APEC 3. Nine samples, three from outside the berm and six from inside the berm, were sent to the laboratory for analysis of BTEX, and PHC fractions F1 to F4. Samples collected outside the bermed area had low vapour reading and there was no visual evidence of staining or impacts to soil or vegetation, except for SS3-1 (0-20 cm). However, visual, olfactory or PID evidence of hydrocarbon impacts in the soil inside the berm were identified. Table 6.1.3 summarizes the analytical results.

Table 6.1.3: Summary of APEC 2 and 3 Soil Results

Sample #	Analysis	Exceedance of Nunavut CSR Guideline
SS2-1 (90-102 cm)	**BTEX, F1-F4**	Did not exceed guideline
SS2-2 (50-70 cm)		
SS 2-4 (90-110 cm)		
SS2-6 (90-100 cm)		
14MW01		
SS2-8 (0-10 cm)	**BTEX, F1-F4, Metals**	PHC fractions F2-F4, Chromium, Nickel, Zinc
SS2-9 (0-10 cm)	**BTEX, F1-F4, Glycol**	PHC fraction F3
SS2-10 (0-10 cm)	**BTEX, F1-F4, PAHs**	PHC fractions F2 to F4, Index of Additive Cancer Risk (IACR), Benzo(b+j)fluoranthene, Benzo(k)fluoranthene, Fluorene,

Table 6.1.3: Summary of APEC 2 and 3 Soil Results

Sample #	Analysis	Exceedance of Nunavut CSR Guideline
		Phenanthreene and Pyrene
SS2-14 (0-10 cm)		PHC fractions F2 to F3, Phenanthreene and Pyrene
SS2-16 (90-100 cm)	**BTEX, F1-F4**	PHC fractions F2 to F3
SS2-17 (90-100 cm)		PHC fraction F2
SS2-19 (90-100 cm)		PHC fractions F2 to F3
SS2-20 (0-20 cm)		
SS3-1 (0-20 cm)		
SS3-1 (90-110 cm)		Did not exceed guideline
SS3-4 (80-98 cm)		
SS3-6 20-40 cm)		PHC fraction F2
SS3-7 (20-40 cm)		Did not exceed guideline
SS3-8 (20-40 cm)		
SS3-9 (0-10 cm)		PHC fractions F2 to F3
SS3-11 (0-20 cm)		
SS3-12 (20-40 cm)		Did not exceed guideline

Sample SS2-10 (0-20 cm) and SS2-14 (0-10 cm) Naphthalene values were <0.050 mg/kg, which is the laboratory detection limits. These values are above the CCME guidelines of 0.013 mg/kg, but not the Nunavut CSR guideline of 0.1 mg/kg.

The PHC impacts in APEC 2 appear to be localized within the berm. The stockpile inside the berm is approximately 36 m by 24 m with a surface area of 864 m^2 of PHC impacted material. The stockpile of material is approximately 2 m high, thus the volume of impacted material is 1,728m^3 (volume to be updated when survey information is available). The soil overflowing from the soil bag is impacted with PHC and metals. The approximate volume of this soil is 2 m^3. There are fuel drums located inside the berm filled with soil potentially impacted with PHC. No samples were collected but the volume of impacted soil is anticipated to be 100 m^3. Vertical delineation was not obtained inside the berm area due to water in the berm and the potential to impact the liner. The surface area is estimated to be 2,495 m^2. Assuming the contaminated soil thickness is about 0.5 m the approximate volume of impacted materials is estimated to be 1,248 m^3.

Based on the soil analytical results and the locations of the samples within and around berm, the PHC impacts in APEC 3 appear to be localized to within the berm except for a stain by SS3-1 (0-20 cm)(Photo B.12). Vertical delineation was not obtained within the berm area due to water and the potential to impact the liner. The surface area is estimated to be 550 m^2. Assuming the contaminated soil thickness is 0.5 m thick, the volume of hydrocarbon impacted material is approximately 275 m^3.

6.1.4 APEC 4: Waste Rock Pile

Surficial stains (Table B.1; Table B.3; Figure B.9) were observed near the Waste Rock Pile (Photo B.14). There were approximately 14 areas that were about 0.5 m^2 in size each. Visual, olfactory or PID evidence of hydrocarbon impacts in the soil were identified. One sample SS4-1 (0-20 cm) was collected and analyzed for BTEX and PHC fractions F1 to F4, to represent the stains located in the area. This sample exceeded Nunavut CSR guidelines for both PHC fractions F2 and F3. Table 6.1.4 summarizes the analytical results.

Table 6.1.4: Summary of APEC 4 Soil Results

Sample #	Analysis	Exceedance of Nunavut CSR Guideline
SS4-1 (0-20 cm)	**BTEX, F1-F4**	PHC fractions F2 and F3

The soils were difficult to sample, therefore vertical delineation of soil impacts was not achieved. Horizontal delineation is based on field observations of the surficial stains. The accumulated surface area of all the stains is anticipated to be 7 m^2. It was assumed that the PHC impacts extend 0.5 m below grade, in which case the approximate volume of impacted materials is 3.5 m^3.

6.1.5 APEC 5: Coarse Processed Kimberlite Stockpile

APEC 5 was identified in the gap analysis as an area that does not appear to contain any soil contamination. A walk through of this area was conducted and no obvious area of potentially impacted material was observed. No samples were taken.

6.1.6 APEC 6: Low Grade Ore Stockpile

APEC 6 (Table B.1; Table B.3; Photo B.15; Figure B.10) was identified in the gap analysis as not appearing to contain any soil contamination. A walk through the area was conducted and a large metal shed was observed. The shed contained a boat and trailer and appeared to have stained soil. A total of three samples were collected from APEC 6 in which visual, olfactory or PID evidence of hydrocarbon impacts in the soil were identified. All samples were analyzed for BTEX and PHC fractions F1-F4. Table 6.1.6 summarizes the analytical results.

Table 6.1.6: Summary of APEC 6 Soil Results

Sample #	Analysis	Exceedance of Nunavut CSR Guideline
SS6 -1 (0-20 cm)	**BTEX, F1-F4**	Did not exceed guideline
SS6-2 (0-20 cm)		
SS6-3 (0-20 cm)		

6.1.7 APEC 7 and 8: Phase 1 and Phase 2 Tank Farm

APEC 7 (Photo B.16 and Photo B.17) and APEC 8 (Photo B.18) are the Phase 2 and Phase 1 tank farms, respectively (Table B.1; Table B.3; Figure B.11).

APEC 7 is located north of APEC 8 and contains four large ASTs and fuel drums with potentially impacted soil and water all contained in a lined berm. A total of eight samples were collected from APEC 7, of which three samples were selected from within the berm and two samples outside the berm area. Samples were submitted to the laboratory for analysis of BTEX and PHC fractions F1 to F4. Samples collected outside the berm area had low vapour reading and there was no visual evidence of staining or impacts to soil except SS7-4 (0-20 cm). However, visual, olfactory or PID evidence of hydrocarbon impacts in the soil were identified inside the field berm. All samples submitted outside of the APEC 7 berm were below the Nunavut CSR guidelines. Inside of the berm areas all the samples were above Nunavut CSR guidelines for PHC fractions F2 to F4. Table 6.1.7 summarizes the analytical results.

APEC 8 contains eight large ASTs and one smaller AST in a lined berm. There are two refueling stations for pickup trucks to the east side of APEC 8. A total of 42 samples were collected from APEC 8, of which visual, olfactory or PID evidence of hydrocarbon impacts in the soil were identified both inside and outside of the bermed

area. A total of 25 selected samples were submitted to the laboratory for analysis of BTEX, PHC fractions F1 to F4, PAHs, and Metals. Table 6.1.7 summarizes the analytical results.

Table 6.1.7: Summary of APEC 7 and 8 Soil Results

Sample #	Analysis	Exceedance of Nunavut CSR Guideline
SS7-2 (20-40 cm)	**BTEX, F1-F4**	Did not exceed guideline
SS7-4 (0-20 cm)		
SS7-5 (0-20 cm)		PHC fractions F2 and F3
SS7-7 (0-20 cm)		PHC fractions F2, F3 and F4
SS7-8 (0-20 cm)		PHC fraction F2
SS8-2 (0-20 cm)		
SS8-4 (0-20 cm)	**BTEX, F1-F4, Metals, PAHs**	PHC fractions F2 and F3, Acenaphthene, Fluorene ,Phenanthrene and Pyrene,
SS8-6 (20-40 cm)	**BTEX, F1-F4**	PHC fractions F2, F3 and F4
SS8-8 (60-80 cm)		Did not exceed guideline
SS8-9 (20-40 cm)		PHC fractions F2 and F3
SS8-10 (20-40 cm)		PHC fractions F1, F2 and F3
SS8-11 (20-40 cm)		Did not exceed guideline
SS8-12 (40-60 cm)		
SS8-14 (20-40 cm)		
SS8-15 (0-20 cm)	**BTEX, F1-F4, Metals, PAHs**	PHC fractions F2 and F3, Fluorene, Phenanthrene and Pyrene
SS8-17 (0-20 cm)	**BTEX, F1-F4**	Did not exceed guideline
SS8-19 (0-20 cm)		PHC fractions F2 and F3
SS8-20 (0-20 cm)		Did not exceed guideline
SS8-30 (0-40 cm)		
SS8-31 (20-40 cm)		
SS8-31 (40-70 cm)		
SS8-32 (0-30 cm)		
SS8-32 (50-70 cm)		PHC fractions F2 and F3
SS8-33 (20-40 cm)		Did not exceed guideline
SS8-34 (0-30 cm)		
SS8-34 (50-70 cm)		
SS8-35 (20-40 cm)		
SS8-36 (20-40 cm)		
SS8-37 (50-60 cm)		
SS8-38 (50-60 cm)		

The value for tin in samples SS8-4 (0-20 cm) and SS8-15 (0-20 cm) was <1.0 mg/kg, which is the tin detection limit for the laboratory. The detection limit is greater than the CCME guideline of 0.1 mg/kg, but less than the Nunavut CSR guideline of 5 mg/kg. This was observed in all three control samples, therefore tin does not appear to be a potential impact.

In sample SS8-4 (0-20 cm) and SS8-15 (0-20 cm), Naphthalene values were <0.058 mg/kg and <0.057 mg/kg which was the laboratory detection limits. These values are above the CCME guidelines of 0.013 mg/kg, but not the Nunavut CSR guideline of 0.1 mg/kg. These values do not appear to be a potential impact as they are below the Nunavut CSR guideline.

In sample SS8-4 (0-20 cm) and SS8-15 (0-20 cm), Fluorene values were <0.36 mg/kg and 0.81 mg/kg. The value for SS8-4 (0-20 cm) at <0.36 mg/kg is the laboratory detection limit. There are no guidelines for Fluorene under the Nunavut CSR guidelines; therefore, the CCME guidelines were applied. Both of these values are above the CCME guidelines of 0.013 mg/kg thus these values are a potential impact.

In sample SS8-4 (0-20 cm) Acenaphthene value was 1.3 mg/kg. There are no guidelines for Acenaphthene under the Nunavut CSR guidelines; therefore, the CCME guidelines were applied. This value was above the CCME guidelines of 0.28 mg/kg; therefore, Acenaphthene is a potential impact.

The PHC impacts in APEC 7 appear to be localized to within the berm. Vertical delineation was not obtained inside the berm area due to water ponding and the potential to impact the liner. The surface area is estimated to be 3,376 m^2. Assuming the 0.5 m thick material used to construct the fuel berm is contaminated, the estimated volume of hydrocarbon impacted material is approximately 1,688 m^3.

The PHC and PAH impacts in APEC 8 do not appear to be localized to within the berm. Vertical delineation was not obtained within the berm area due to water ponding and the potential to impact the liner. Impacted material was observed on the west side of berm surrounding APEC 8, extending to about 30 m from the berm. Horizontal delineation was estimated to be approximately 2,533 m^2 based on analytical results. Vertical delineation was not achieved outside of the berm, as the soils were very difficult to sample by hand. The expected depth of impacted material is 0.5 m based on the results from sample SS8-32 (50-70 cm). The volume of hydrocarbon impacted material is estimated to be approximately 1,267 m^3. `

6.1.8 APEC 9: Genset and Fuel Berm

APEC 9 (Table B.1; Table B.3; Figure B.12) contains two APECs: the fuel berm (Photo B.19) and the genset (Photos B.20 and B.21). A total of six samples were collected from the fuel berm area of which three samples were selected from within the berm. Samples were submitted to the laboratory for analysis of BTEX and PHC fractions F1 to F4. Visual, olfactory, or PID evidence of hydrocarbon impacts in the soil were identified inside the berm. Two of the three samples, SS9-3 (0-20 cm) and SS9-5 (20-30 cm), submitted inside the berm were below the Nunavut CSR guidelines. One sample, SS9-1 (0-20 cm), was above the Nunavut CSR guidelines for PHC fractions F1 to F3. Table 6.1.8 summarizes the analytical results.

A total of fifteen samples were collected from the genset area, of which eight samples were selected based on visual, olfactory, or PID evidence of hydrocarbon impacts observed in the field. Samples were submitted to the laboratory for analysis of BTEX, and PHC fractions F1 to F4. Three samples were below the Nunavut CSR guidelines, while five samples were above the Nunavut CSR guidelines for PHC fractions F1 to F3. Table 6.1.8 summarizes the analytical results.

Table 6.1.8: Summary of APEC 9 Soil Results

Sample #	Analysis	Exceedance of Nunavut CSR Guideline
SS9-1 (0-20 cm)	**BTEX, F1-F4**	PHC fractions F1, F2 and F3
SS9-3 (0-20 cm)		Did not exceed guideline
SS9-5 (20-30 cm)		
SS9-7 (0-20 cm)		

Table 6.1.8: Summary of APEC 9 Soil Results

Sample #	Analysis	Exceedance of Nunavut CSR Guideline
SS9-8 (0-10 cm)		PHC fractions F2 and F3
SS9-10 (0-20 cm)		Did not exceed guideline
SS9-13 (0-20 cm)		PHC fractions F2 and F3
SS9-14 (0-20 cm)		
SS9-16 (0-20 cm)		PHC fractions F2
SS9-18 (0-20 cm)		Did not exceed guideline
SS9-20 (0-10 cm)		PHC fractions F2 and F3

There are PHC impacts within the APEC 9 fuel berm. Vertical delineation was not obtained inside the berm area due to ponded water and the potential to impact the liner. Samples were not collected outside the berm as soils are difficult to obtain on the pad. There were two small stains outside of the berm which were about 0.03 m^2. No sample was collected for these stains, as they can be removed when the fuel berm is dismantled. The surface area is estimated to be 111 m^2. Assuming the 0.5 m thick 20 mm minus material used to construct the fuel berm is contaminated; the volume of hydrocarbon impacted material is approximately 56 m^3.

The pad around the generator was constructed out of blast rock, making the soils difficult to sample by hand. Vertical delineation of soil impacts was not achieved. Horizontal delineation was also not achieved, as the impacted materials appear to extend underneath the genset. An estimate of the area of impact is 166 m^2. Assuming that the PHC impacts extend to 2 m below grade, the approximate volume of impacted materials is 332 m^3.

6.1.9 APEC 10: Truck Shop and Laydown Area

APEC 10 (Table B.1; Table B.3; Figure B.8 and Figure B.12) was identified in the gap analysis as having some staining located adjacent to the incinerator. Additional APECs were identified during the site visit. These areas consisted of the laydown area, three slip tanks, two fuel tanks stored on site, in front of a shop, a large AST behind the truck shop and two secondary containment berms. A total of 22 samples were collected from APEC 10 of which visual, olfactory, or PID evidence of hydrocarbon impacts in the soil were identified. Thirteen samples were submitted to the laboratory for analysis of BTEX, PHC fractions F1 to F4, PAHs, and metals. Eight samples were above the Nunavut CSR guidelines for PHC fractions F2, F3, and/or F4. Two samples were above the Nunavut CSR guidelines for Chromium, Molybdenum, and/or Nickel. Four samples were below the Nunavut CSR guidelines for PHC fractions F1 to F4 and metals. Table 6.1.9 summarizes the analytical results.

Table 6.1.9: Summary of APEC 10 Soil Results

Sample #	Analysis	Exceedance of Nunavut CSR Guideline
SS10-1 (0-20 cm)	**BTEX, F1-F4**	Did not exceed guideline
SS10-2 (0-20 cm)	**BTEX, F1-F4, Metals**	Chromium, Molybdenum, Nickel
SS10-4 (0-20 cm)	**BTEX, F1-F4**	PHC fractions F2 and F3
SS10-7 (0-20 cm)		PHC fractions F3
SS10-8 (0-20 cm)		PHC fraction F2 and F3
SS10-9 (0-20 cm		PHC fraction F2
SS10-10 (0-20 cm)		PHC fractions F2 and F3
SS10-11 (30-50 cm)		Did not exceed guideline

Table 6.1.9: Summary of APEC 10 Soil Results

Sample #	Analysis	Exceedance of Nunavut CSR Guideline
SS10-13 (0-20 cm)		
SS10-19 (0-20 cm)		PHC fractions F2 and F3
SS10-21 (0-20 cm)		Did not exceed guideline
SS10-23 (0-20 cm)	**BTEX, F1-F4, Metals PAHs**	PHC fractions F3, Nickel
SS10-24 (0-20 cm)	**BTEX, F1-F4**	PHC fractions F2, F3 and F4

The gap analysis identified staining located adjacent to the incinerator (Photo B.22). During the ESA, no obvious staining was identified near the incinerator. Samples SS10-1 (0-20 cm), SS10-2 (0-20 cm), and SS10-3 (0-20 cm) were collected around the incinerator. Hydrocarbons were identified at SS10-1 (0-20 cm) and SS10-2 (0-20 cm) but were below Nunavut CSR guidelines. Tin was identified in SS-10-1 (0-20 cm) at 1.4 mg/kg which is greater than the CCME guideline of 0.1 mg/kg but are less than the Nunavut guideline of 5 mg/kg. Therefore, tin does not appear to be a potential impact. However in sample SS10-1 (0-20 cm), there were three metals, Chromium, Molybdenum and Nickel that do exceed the Nunavut CSR guidelines. This sample was located near the entrance of the incinerator where contaminants could have been deposited. These metal impacts are anticipated to be associated with the incinerator. Vertical delineation was not achieved as the soils were difficult to sample by hand. Horizontal delineation was also not achieved for this area. Assuming the metal impacted soil is around the incinerator, the estimated surface area is 50 m^2. Assuming that the impacts are only to 0.5 m below surface, the volume of metal impacted material is approximately 25 m^3.

There are PHC impacts around the two fuel tanks (Photo B.23). Vertical delineation was not achieved, as the soils were very difficult to sample by hand. The surface area is estimated to be 18 m^2. It was assumed that the PHC impacts extend to 1 m below grade. Based on this assumption, the approximate volume of impacted materials was 18 m^3.

There are PHC impacts at the front and beside the truck shop (Photos B.24 and B.25). Vertical delineation was not achieved because the soils were difficult to sample by hand. Horizontal delineation was not achieved. Based upon field observations, the surface area is anticipated to be 369 m^2. It was assumed that the PHC impacts extend to 1 m below grade. Based on this assumption, the approximate volume of impacted materials was 369 m^3.

There are PHC impacts near the three slip tanks on the east side of the truck shop (Photo B.26) (Sample SS10-10 (0-20 cm)). Vertical delineation was not achieved as the soils were difficult to sample by hand. Horizontal delineation is assumed based on field observations. Based upon field observations the surface area is estimated to be 18 m^2. It was assumed that the PHC impacts extend to 1.5 m below grade. The approximate volume of impacted materials was 27 m^3.

The laydown area consists of five areas with multiple stains; three stains underneath heavy equipment, stains around the helipad and stains underneath debris. Of the five areas with multiple stains, two stains underneath heavy equipment and debris and the helipad (Photo B.27) are assumed to have similar impacts based on field observations. Results from SS10-19 (0-20 cm) and SS10-23 (0-20 cm) indicate there are PHC impacts. In sample S10-23 (0-20 cm), there was a metal exceedance for nickel of 63 mg/kg. This metal exceedance does not appear to be related to the hydrocarbon impacts and may be related to the pad being developed from blast rock. Horizontal delineation was based on visual, olfactory or PID evidence of hydrocarbon impacts in the soil. Vertical delineation was not achieved as the soils were difficult to sample by hand. The surface area of the accumulated

stains is estimated to be 221 m^2. It was assumed that the PHC impacts extend to 0.5 m below grade. The approximate volume of impacted materials was 111 m^3.

There is a stain underneath a piece of heavy equipment that is assumed to be different than the other surficial stains, as the impacted soil is black and appears to be composed of oil. Soil analytical results from SS10-24 (0-20 cm) indicate PHC F2 to F4 fractions, which is anticipated in oils. Horizontal delineation was based on visual, olfactory or PID evidence of hydrocarbon impacts in the soil. Vertical delineation was not achieved as the soils were difficult to sample by hand. The surface area is estimated to be 41 m^2. It was assumed that the PHC impacts extend to 0.5 m below grade. The approximate volume of impacted materials was 21 m^3.

6.1.10 APEC 11: Wind Blown Processed Kimberlite Tailings

APEC 11 was identified in the gap analysis as an area that that may contain soil contamination. A walk through of this area was conducted during this investigation and no obvious areas of potentially impacted material were observed. This area was not sampled.

6.1.11 APEC 12: Fine Processed Kimberlite Containment Area

APEC 12 was identified in the gap analysis as an area that does not appear to contain any soil contamination. A walk through of this area was conducted during this investigation and no obvious areas of potentially impacted material were observed. This area was not sampled.

6.1.12 APEC 13: Carat Lake Laydown Area

Stained soil, fuel drums and ASTs were observed on APEC 13 (Table B.1; Table B.3; Figure B.6). A total of 23 samples were collected of which visual, olfactory or PID evidence of hydrocarbon impacts in the soil was identified. Ten samples were submitted to the laboratory for analysis of BTEX, PHC fractions F1 to F4, and/or Metals. Six samples were above the Nunavut CSR guidelines for PHC fractions F2, F3 and/or F4. One sample was above the Nunavut CSR guidelines for Zinc. Table 6.1.12 summarizes the analytical results.

Table 6.1.12: Summary of APEC 13 Soil Results

Sample #	Analysis	Exceedance of Nunavut CSR Guideline
SS13-1 (0-10 cm)	**BTEX, F1-F4**	PHC fraction F3
SS13-2 (0-10 cm)	**BTEX, F1-F4**	PHC fractions F2 and F3
SS13-6 (0-20 cm)		
SS13-10 (0-20 cm)		Did not exceed guideline
SS13-11 (0-15 cm)	**BTEX, F1-F4, Metals**	PHC fraction F3 and F4, Zinc
SS13-11 (30-50 cm)		PHC fraction F2 and F3
SS13-15 (0-20 cm)		Did not exceed guideline
SS13-16 (0-20 cm)	**BTEX, F1-F4**	
SS13-19 (0-20 cm)	**BTEX, F1-F4**	Did not exceed guideline
SS13-21 (0-10 cm)		PHC fractions F2, F3 and F4

The laydown area consists of areas with stained soils (Photos B.28 and Photo B.30), ASTs, a slip tank, a cement truck (Photo B.29), and fuel drums. On the northwest side of the laydown there are numerous areas of stained soil (Photo B.28). There was also a large stain on the southeast side of the laydown (Photo B.30). There are PHC impacts at SS13-1 (0-10 cm), SS13-2 (0-10 cm), and SS13-21 (0-10 cm). Horizontal delineation was based on visual, olfactory or PID evidence of hydrocarbon impacts in the soil. Vertical delineation was not achieved. The

surface area of the accumulated stains is estimated to be 22 m^2. It was assumed that the PHC impacts extend to 1 m below grade. The approximate volume of impacted materials was 22 m^3.

There was a slip tank and an AST located in the northwest corner of the laydown area. Field screening of sample SS13-6 (0-20 cm) did not indicate PHC in the area, however the sample did exceed Nunavut CSR guidelines for PHC fractions F2 and F3. Vertical delegation and horizontal delineation was not achieved. It is assumed that this may be localized to the slip tank and AST from storage. The estimated surface area is 46 m^2. It was assumed that the PHC impacts extend to 1 m below grade. Based on this assumption, the approximate volume of impacted materials was 46 m^3.

A cement truck (Photo B.29) appears to have leaked onto the surrounding soil. There are PHC fraction F2 to F4 in this area, based on S13-11 (0-15 cm) and SS13-11 (30-50 cm). Horizontal delineation was achieved based on field observations and analytical results from SS13-15 (0-20 cm). Vertical delineation was achieved for Zinc to 0.3 m below grade, but not for PHC fractions F2 and F3. The surface area is estimated to be 124 m^2. It was assumed that the PHC impacts extend to 1 m below grade. The approximate volume of impacted materials was 124 m^3.

6.1.13 APEC 14: Process Plant

A secondary containment berm with stained soil and a shop was observed near APEC 14 (Table B.1; Table B.3; Figure B.13). A total of 13 samples were collected of which visual, olfactory or PID evidence of hydrocarbon impacts in the soil were identified. Eight samples were submitted to the laboratory for analysis of BTEX, and PHC fractions F1 to F4. Four samples were above the Nunavut CSR guidelines for PHC fractions F2, F3 and/or F4. Five samples were below the Nunavut CSR guidelines for BTEX and PHC fractions F1 to F4. Table 6.1.13 summarizes the analytical results.

Table 6.1.13: Summary of APEC 14 Soil Results

Sample #	Analysis	Exceedance of Nunavut CSR Guideline
SS10-14 (0-20 cm)	**BTEX, F1-F4**	PHC fraction F2 and F3
SS10-15 (0-20 cm)		
SS10-25 (0-20 cm)		Did not exceed guideline
SS14-1 (0-20 cm)		
SS14-2 (0-20 cm)		PHC fraction F2, F3 and F4
SS14-4 (0-20 cm)		Did not exceed guideline
SS14-5 (0-20 cm)		
SS14-7 (0-20 cm)		
SS14-8 (0-20 cm)		PHC fraction F2, F3 and F4
SS14-9 (0-20 cm)		Did not exceed guideline
SS14-10 (0-20 cm)		

There are PHC impacts adjacent to the process plant at the secondary containment berm (Photo B.31) (Samples SS10-14 (0-20 cm) and SS10-15 (0-20 cm)). Horizontal delineation was based on visual, olfactory or PID evidence of hydrocarbon impacts in the soil and the delineation sample SS10-25 (0-20 cm). Vertical delineation was not achieved as the soils were difficult to sample. The surface area of the accumulated stains is estimated to be 54 m^2. It was assumed that the PHC impacts extend to 1 m below grade. Based on this assumption, the approximate volume of impacted materials was 54 m^3.

There are PHC impacts at the main camp storage shed (Samples SS14-2 (0-20 cm) and SS14-8 (0-20 cm)). There were five stained areas in the shop where visual, olfactory or PID evidence of hydrocarbon impacts were observed in the soil (Photos B.32 to B.34). Two of those areas had confirmed exceedances for PHC impacts (SS14-2 and SS14-8), while two other areas with stained soil, SS14-4 and SS14-7, had PHC values below Nunavut CSR guidelines. These areas may have been stained due to moisture. Horizontal delineation was based on visual, olfactory or PID evidence of hydrocarbon impacts in the soil and the delineation samples. Vertical delineation was not achieved as the soils were difficult to sample. The estimated surface area is 76 m^2. It was assumed that the PHC impacts extend to 1 m below grade. Based on this assumption, the approximate volume of impacted materials was 76 m^3.

6.1.14 APEC 15: Reclaimed Carat Camp

A stain was observed at APEC 15 (Table B.1; Table B.3; Photo B.35; Figure B.7). Visual, olfactory or PID evidence of hydrocarbon impacts in the soil were identified at this location. A total of five samples were collected. Four samples were selected for analysis of BTEX, PHC fractions F1 to F4, and metals. Two samples were below Nunavut CSR guidelines, while two samples were above Nunavut CSR guidelines for PHC fractions F2, F3 and F4, and tin. Table 6.1.14 summarizes the analytical results.

Table 6.1.14: Summary of APEC 15 Soil Results

Sample #	Analysis	Exceedance of Nunavut CSR Guideline
RCC- 1 (0-10 cm)	**BTEX, F1-F4, Metals**	PHC fractions F1, F2 and F3
RRC-1 (90-100 cm)	**BTEX, F1-F4**	PHC fractions F2 and F3
RCC-2 (0-20 cm)	**BTEX, F1-F4, Metals**	Did not exceed guidelines
RCC-2 (90-100 cm)	**BTEX, F1-F4**	

The value for tin in sample RCC-1 (0-10 cm) and RCC-2 (0-20 cm) was 3.1 mg/kg and <1.0 mg/kg. The detection limit for tin is <1.0 mg/kg. This detection limit is greater than the CCME guideline of 0.1 mg/kg, but less than the Nunavut CSR guideline of 5 mg/kg. The value from RCC-1 (0-10 cm) of 3.1 mg/kg is greater than CCME guidelines, but less than the Nunavut CSR guidelines. Tin does not appear to be a potential impact as both samples are below the Nunavut CSR guidelines.

The soils in this area consisted of sand, thus it was difficult to obtain samples at depths greater than 110 cm due to the test pit caving in. Vertical delineation was not obtained as the sample at 90-100 cm below ground surface (RCC-1 90-100 cm) was still impacted with PHC fractions F2 and F3. Sample location RCC-2 is located down-gradient of RCC-1 in the direction of the lake. At sample location RCC-2, PHC impacts were not observed. Therefore, based on this and field observations, the estimated surface area of the impacted material is 10 m^2. It was assumed that the PHC impact extends to 2.5 m below grade. Based on this assumption, the approximate volume of impacted materials was 25 m^3.

6.1.15 Soil Quality Assurance and Quality Control

QA/QC procedures implemented by Tetra Tech EBA were in accordance with standard industry protocols. One hundred and twenty three soil samples were collected and submitted for laboratory analysis; five duplicate samples were collected and analyzed for QA/QC purposes.

The field sampling and laboratory testing reproducibility of the sample-duplicate pair was evaluated using the relative percentage difference (RPD) method, involving calculation of RPD when both sample-duplicate concentrations were greater than, or equal to the laboratory reportable detection limit (RDL) as follows:

$$RPD\ (\%) = 100\ x\ |(X - Y)|/(X + Y)/2$$

Where:

X = the measured concentration in the parent sample; and

Y = the measured concentration in the duplicate sample.

RPDs should only be calculated and assessed when both the sample and the duplicate have a concentration that is greater than five times the method detection limit, referred to as the practical quantification limit (PQL).

Duplicate sample analytical data is provided in Appendix B, Table B.2. The target RPD is also affected by soil variability and background concentrations. In general for soil, RPD values of hydrocarbon parameters larger than 40% are flagged as suspect.

Since analytical error increases near the detection limit, only the results five times greater than the detection limit were considered applicable to the RPD assessment. Results that were not applicable to the RPD assessment (those less than five times the detection limit) are considered reliable.

Based upon the RPD assessment all soil parameters collected are considered reliable with the following exception:

- Soil sample duplicate for SS1C-2 (0-20 cm) was above the acceptable deviation for hydrocarbon fractions F4. The samples were above the RPD criteria, but were below the applicable guideline levels. Overall the results are not considered suspect.
- Soil sample duplicate for SS3-6 (20-40 cm) was above the acceptable deviation for soil moisture. Moisture content may affect the hydrocarbon recovery; however, the RPD for hydrocarbons was very low (8 to 3). Overall the results are not considered suspect.

Based upon a review of the data qualifiers, all data is considered within acceptable limits and is considered reliable based upon the QA/QC review.

6.1.16 Soil Summary

The metal contaminated soil volumes are summarized in Table 6.1.16-1 and the PHC contaminated soil volumes are summarized in Table 6.1.16-2.

Table 6.1.16-1: Soil Volume Calculations for Metal Contaminated Soils

APEC	Metal Exceedances	Volume (m^3)
2	Chromium, Nickel, Zinc	2
10	Chromium, Molybdenum, Nickel	25
13	Zinc	37
Total		**64 m^3**

Table 6.1.16-2: Soil Volume Calculations for PHC Contaminated Soils

APEC	BTEX, PHC Fractions and PAH Exceedances	Area (m^2)	Volume (m^3)
1	Benzene, Ethylbenzene, PHC Fractions F2 to F4	415	300
2	PHC Fractions F2, to F4, Benzo(b+j)fluoranthene, Benzo(k)fluoranthene, Fluorene, Phenanthreene and Pyrene	2495	3076
3	PHC Fractions F2 to F3	550	275
4	PHC Fractions F2 to F3	7	3.5
7	PHC Fractions F2 to F4	3376	1688
8	PHC fractions F2 and F3, Acenaphthene, Fluorene ,Phenanthrene and Pyrene,	2533	1267
9	PHC Fractions F1 to F3	277	388
10	PHC Fractions F2 to F4	887	546
13	PHC Fractions F2 to F4	192	155
14	PHC Fractions F2 to F4	130	130
15	PHC Fractions F1 to F3	10	25
Total			**7,854 m^3**

Note: Vertical and Horizontal delineation was assumed for most of these APECs based on soil analytical results and field observations, thus area and volume estimates may be less than or greater than the values indicated.

6.2 Berm Water Testing

Berm water (Appendix C; Table C.1; Photos C.1 to C.6; Figures B.4, B.5, B.11 and B.12) was collected from six locations across the site. Samples were analyzed for BTEX, PHC fractions F1 to F2, routine water chemistry, glycol, and/or dissolved and total metals depending on where it was collected. Table 6.2 summarizes the analytical results.

Table 6.2: Summary of Berm Water Exceedances

Berm Water Locations	Analysis	Exceedance of CCME-FPAL Guidelines	Exceedance of Water License No 2AM-JER1119
SW 1-1	**BTEX, PHC fractions F1 to F2**	Did not exceed guideline	Did not exceed guideline
SW 2-1	**BTEX, PHC fractions F1 to F2, PAHs, Glycol**	Anthracene, Benz(a)anthracene, Benzo(a) pyrene, Fluoranthene, Fluorene, Phenanthrene, Pyrene	No guidelines for PAH
SW 3-1	**BTEX, PHC fractions F1 to F2**	Did not exceed guideline	Did not exceed guideline
SW 7-1	**Routine Water Chemistry, BTEX, PHC fractions F1 to F2, Dissolved and Total Metals**	Copper (total and dissolved), Phosphorus (total and dissolved), Uranium (total and dissolved)	Did not exceed guideline
SW 8-1		Aluminum (total), Copper (total and dissolved), Iron (total and dissolved), Phosphorus (total and dissolved)	No guideline for Iron; Remainder do not exceed guideline
S9 -1	**BTEX, PHC fractions F1 to F2**	Did not exceed guideline	Did not exceed guideline

The water collected from SW 1-1, SW 3-1 and SW 9-1 were below the CCME PFAL guidelines at the time of sampling. Whereas the water collected form SW 2-1 does have PAHs impacts and should be treated before disposal.

The water located in SW 7-1 and SW 8-1 exceeds the CCME PFAL guidelines but meet the water licence No. 2AM-JER1119, except for Iron. The exceedances observed for iron are less than the control wells for both total and dissolved metals. Thus the water in SW7-1 and SW 8-1 do not appear to be impacted.

6.3 Groundwater Monitoring

Groundwater monitoring was conducted at two locations, APEC 2 (Contaminated Soils Storage Area) (Figure B.5) and APEC 4 (Waste Rock Pile) (Figure B.9). Two control wells were also installed on this site to gain background groundwater values. The following sections outline the groundwater samples collected from those areas (Table C.2 and Table C.3).

6.3.1 Control Groundwater Wells

Two control wells 14MWC1 and 14MWC2 (Figure B.9; Table C.2 and C.3) were installed on the site. These wells were sampled and analyzed for routine water analysis and dissolved metals. Only 14MWC1 was analyzed for total metals due to the limiting amount of water at 14MWC2. Table 6.3.1 summarizes the analytical results.

Table 6.3.1: Summary of Groundwater Water Exceedances

Groundwater Monitoring Well	Sample Results	Guideline Level
14MWC1	pH (5.04)	CCME PFAL pH: 6.5 to 9.0
	Aluminum, dissolved (0.60 mg/L) Aluminum, total (210 mg/L)	CCME PFAL Aluminum: 0.005-0.1 mg/L
	Arsenic, total (0.047 mg/L)	CCME PFAL Arsenic: 0.005 mg/L
	Cadmium, total (0.0014 mg/L)	CCME PFAL Cadmium: 0.00009 mg/L
	Copper, dissolved (0.0048 mg/L) Copper, total (0.22 mg/L)	CCME PFAL Copper: 0.002-0.004 mg/L
	Iron, dissolved (0.46 mg/L) Iron, total (240 mg/L)	CCME PFAL Iron: 0.3 mg/L
	Lead, total (0.071 mg/L)	CCME PFAL Lead: 0.001-0.007 mg/L
	Nickel, total (0.23 mg/L)	CCME PFAL Nickel: 0.025-0.150 mg/L
	Phosphorus, dissolved (<0.10 mg/L) Phosphorus, total (21 mg/L)	CCME PFAL Phosphorus: 0.004 mg/L
	Selenium, total (0.0062) mg/L)	CCME PFAL Selenium: 0.001 mg/L
	Silver, total (0.0062 mg/L)	CCME PFAL Silver: 0.0001 mg/L
	Thallium, total (<0.0040 mg/L)	CCME PFAL Thallium: 0.0008 mg/L
	Uranium, total (0.23 mg/L)	CCME PFAL Uranium: 0.015 mg/L
	Zinc, dissolved (0.041 mg/L) Zinc, total (0.75 mg/L)	CCME PFAL Zinc: 0.03 mg/L
14MWC2	Aluminum, dissolved (0.22 mg/L)	CCME PFAL Aluminum: 0.005-0.1 mg/L
	Copper, dissolved (0.0070 mg/L)	CCME PFAL Copper: 0.002 mg/L
	Iron, dissolved (1.2 mg/L)	CCME PFAL Iron: 0.3 mg/L

The values observed in these two monitoring wells for Aluminum, Arsenic, Cadmium, Copper, Iron, Lead, Nickel, Phosphorus, Selenium, Silver, Thallium, Uranium and Zinc are greater than the CCME-FPAL guidelines. Therefore, these values appear to be naturally occurring in this area and should be used as a guide when comparing water results to the CCME PFAL.

6.3.2 APEC 2 Contaminated Soils Storage Area

Three wells, 14MW01, 14MW02, and 14MW03, (Figure B.5; Table C.2 and C.3; Photo C.7) were installed adjacent to the APEC 2 berm area. Only two monitoring wells, 14MW01 and 14MW03, had enough water for analysis of BTEX and PHC fractions F1 to F2. All analytical results were below laboratory detection limits except for toluene at 14MW03 (Table C.3). Toluene was below the CCME PFAL guidelines. Toluene is not typically observed in natural conditions, thus this may be an indicator that contamination is moving from outside of the berm area as monitoring well 14MW03 is located down-gradient of APEC 2.

6.3.3 APEC 4 Waste Rock Pile

Three monitoring wells, 14MW04, 14MW05, and 14MW06 (Figure B.9, Table C.2 and C.3; Photo C.8 to C.10), were installed down-gradient of the waste rock pile in APEC 4 towards Carat Lake. All three monitoring wells were analyzed for routine water chemistry dissolved and total metals. Table 6.3.3-1 summarizes the analytical results.

Table 6.3.3-1: Summary of Groundwater Water Exceedances

Groundwater Monitoring Well	Analysis	Exceedance of CCME-FPAL Guidelines
14MW04	**Routine, Dissolved and Total Metals**	Nitrite, Aluminum (Dissolved and Total), Arsenic (Total), Cadmium (Total), Copper (Dissolved and Total), Iron (Total), Lead (Total), Nickel (Total), Phosphorus (Total), Silver (Total), Thallium (Total), Uranium (Total), Zinc (Dissolved and Total)
14MW05		Aluminum (Dissolved and Total), Arsenic (Total), Cadmium (Total), Copper (Dissolved and Total), Iron (Dissolved and Total), Lead (Total), Nickel (Total), Phosphorus (Total), Selenium (Total), Silver (Total), Thallium (Total), Uranium (Total), Zinc (Dissolved and Total)
14MW06		Aluminum (Dissolved and Total), Arsenic (Total), Cadmium (Total), Copper (Dissolved and Total), Iron (Dissolved and Total), Lead (Total), Nickel (Total), Phosphorus (Total), Silver (Total), Thallium (Total), Zinc (Dissolved and Total)

In monitoring well 14MW04, there are two exceedances, Nitrite and Zinc (dissolved) that were greater than the control monitoring wells. The remainder of the exceedances observed at 14MW04 were below the control monitoring wells, which suggests that these values may be naturally occurring. The elevated value for dissolved Zinc in this sample may be naturally occurring since Zinc is elevated in the control samples for both dissolved and total zinc. The Nitrite value observed (0.10 mg/L) is below the T-NO_2 value of 5 mg/L in the current water licence

No: 2AM-JER1119 for the maximum allowable grab sample concentration. There is no value for dissolved Zinc in the water licence only for total Zn of 0.50 mg/L.

In monitoring well 14MW05, exceedances for Aluminum (dissolved and total), Arsenic (total), Copper (total and dissolved), Iron (total and dissolved), Lead (total), Nickel (total), Phosphorus (total), Selenium (total), Silver (Total), Thallium (total), Uranium (total) and Zinc (total and dissolved) were greater than the control monitoring wells. These values were compared to the water licence No: 2AM-JER1119 for maximum grab samples. See table below (Table 6.3.3-2) for comparison to the water licence.

Table 6.3.3-2: Comparison of Monitoring well 14MW05 Exceedances to the Water Licence

14MW05 Exceedances	Control Well Maximum Values	Water Licence (2AM-JER1119): Maximum Allowable Grab Sample Concentration	Exceedance of Water Licence (2AM-JER1119)
Aluminum, dissolved: 0.61 mg/L	0.60 mg/L	2.0 mg/L	No exceedance
Aluminum, total: 590 mg/L	210 mg/L	3.0 mg/L	Aluminum (total);
Arsenic, total: 0.49 mg/L	0.047 mg/L	0.1 mg/L	Arsenic (total);
Copper, dissolved: 0.048 mg/L	0.0070 mg/L	None	
Copper, total: 3.6 mg/L	0.22 mg/L	0.04 mg/L	Copper (total);
Iron, dissolved: 0.048 mg/L	1.2 mg/L	None	
Iron, total: 1300 mg/L	240 mg/L	None	
Lead, total: 0.24 mg/L	0.071 mg/L	0.02 mg/L	Lead (total);
Nickel, total: 1.3 mg/L	0.23 mg/L	0.1 mg/L	Nickel (total);
Phosphorus, total: 50 mg/L	21 mg/L	0.4 mg/L	Phosphorus (total);
Selenium, total: 0.012 mg/L	0.0062 mg/L	None	
Silver, total: 0.0045 mg/L	0.0062 mg/L	None	
Thallium, total: 0.011 mg/L	<0.0040 mg/L	None	
Uranium, total: 0.39 mg/L	0.23 mg/L	1.0 mg/L	No exceedance
Zinc, dissolved: 0.13 mg/L	0.041 mg/L	None	
Zinc, total: 3.0 mg/L	0.75 mg/L	0.50 mg/L	Zinc (total);

The following metals are in exceedance of the CCME PFAL, control wells and/or the water licence: Aluminum (total), Arsenic (total), Copper (total and dissolved), Iron (total and dissolved), Lead (total), Nickel (total), Phosphorus (total), Selenium (total), Silver (Total), Thallium (total), and Zinc (total and dissolved).

In monitoring well 14MW06, exceedances for Aluminum (dissolved and total), Arsenic (total), Iron (dissolved), and Zinc (dissolved) were greater than the control monitoring wells. These values were compared to the water licence No: 2AM-JER1119 for maximum grab samples. See table below (Table 6.3.3-3) for comparison to the water licence.

Table 6.3.3-3: Comparison of Monitoring well 14MW06 Exceedances to the Water Licence

14MW06 Exceedances	Control Well Maximum Values	Water Licence (2AM-JER1119): Maximum Allowable Grab Sample Concentration	Exceedance of Water Licence (2AM-JER1119)
Aluminum, dissolved: 0.34 mg/L	0.60 mg/L	2.0 mg/L	No exceedance
Aluminum, total: 61 mg/L	210 mg/L	3.0 mg/L	Aluminum (total);
Arsenic, total: 0.071 mg/L	0.047 mg/L	0.1 mg/L	No exceedance
Iron, dissolved: 0.46 mg/L	1.2 mg/L	None	
Zinc, dissolved: 0.0.082 mg/L	0.041 mg/L	None	

Therefore, Aluminum (total), Iron (dissolved), and Zinc (dissolved) are in exceedance of the CCME PFAL, control wells, and/or the water licence.

6.3.3.1 Seepage Testing

Three seeps (Figure B.9, Table C.4, and Photo C.11 to C.13) were observed flowing from the waste rock pile during the August 2014 site assessment shortly after a rainfall event. Two seeps (Seeps 2 and 3) flowed onto the tundra and dried prior to reaching Carat Lake. Seep 1 discharged from the toe of the waste rock pile along the mine access road, creating a small erosion channel along the length of the roadway, and eventually drying out prior to reaching the tundra.

At the time of collection, the surface water was described as relatively clear, with no observable surface sheen or odour, basic (average pH 9.6) with moderate to high EC (average 292 µS/cm), and low water temperatures (average 2.4°C) (Table 6.3.3-4).

Table 6.3.3-4: In Situ Water Chemistry: Seepage Testing

Seep Station	pH	EC (µS/cm)	Water Temperature (°C)
Seep 1	9.2	551	4.5
Seep 2	10.4	110	0.7
Seep 3	9.2	214	1.9
Average	9.6	292	2.4
Min.	9.2	110	0.7
Max.	10.4	551	4.5

The analytical results indicate that the seep water is neutral (pH levels ranging from 7.40 to 7.86), soft to hard (hardness ranging from 52 to 200 mg/L), with moderate levels of total dissolved solids (ranging from 66 to 250 mg/L), moderate to high EC (ranging from 120 to 410 µS/cm), and low nutrients (Table C.4).

The pH levels measured in the field and laboratory differed considerably, possibly due to meter calibration loss and/or sample integrity loss prior to arrival at the laboratory. Several parameters analyzed were reported above the CCME PFAL guidelines including: aluminum, copper, iron, and uranium. In particular, total uranium levels were two to six times higher than the CCME PFAL guideline level. A summary of the guideline exceedances is provided in Table 6.3.3-5.

Table 6.3.3-5: Summary of Surface Water Exceedances: Seepage Testing

Seep Station	Sample Results	Guideline Level
Seep 1	Aluminum, total (1.3 mg/L)	CCME PFAL Aluminum: 0.1 mg/L
	Copper, total (0.012 mg/L) Copper, dissolved (0.0073 mg/L)	CCME PFAL Copper: 0.004 mg/L
	Iron, total (1.9 mg/L)	CCME PFAL Iron: 0.3 mg/L
	Uranium, total (0.069 mg/L) Uranium, dissolved (0.063 mg/L)	CCME PFAL Uranium: 0.015 mg/L
Seep 2	Aluminum, total (0.19 mg/L)	CCME PFAL Aluminum: 0.1 mg/L
	Copper, total (0.0045 mg/L) Copper, dissolved (0.0038 mg/L)	CCME PFAL Copper: 0.002 mg/L
	Uranium, total (0.093 mg/L) Uranium, dissolved (0.089 mg/L)	CCME PFAL Uranium: 0.015 mg/L
Seep 3	Copper, total (0.0039 mg/L) Copper, dissolved (0.0038 mg/L)	CCME PFAL Copper: 0.00212 mg/L
	Uranium, total (0.034 mg/L) Uranium, dissolved (0.032 mg/L)	CCME PFAL Uranium: 0.015 mg/L

The exceedances observed in the seeps are below the water quality values for Aluminum (total), Copper (total and dissolved), Iron (total) and Uranium (total) in the in the control wells. Thus these values exceedances during the sampling may be naturally occurring.

The dissolved Uranium in the seeps (0.032 mg/L to 0.089 mg/L) were greater than both control wells (0.00084 mg/L to 0.0053 mg/L). The water licence No. 2AM-JER1119 has a guideline for uranium for the maximum allowable grab sample at a concentration of 1.0 mg/L. This guideline value is greater than the dissolved Uranium values for the seeps.

The seep water may be impacted from the waste rock pile; however the values observed during this sampling period were below the control monitoring wells and the water licence discharge limits.

6.3.4 Groundwater, Seep and Berm Surface Water Quality Assurance and Quality Control (QA/QC)

To maintain sample integrity, Tetra Tech EBA's QA/QC protocols were followed during sampling. Three duplicate water samples were collected and analyzed for BTEX, PHC fractions F1 and F2, PAHs, dissolved and total metals (Appendix C: Table C.5). Duplicate sample analytical data is provided in Appendix C, Table C.5. In general for water, RPD values of greater than 20% are flagged as suspect.

Since analytical error increases near the detection limit, only the results five times greater than the detection limit were considered applicable to the RPD assessment. Results that were not applicable to the RPD assessment (those less than five times the detection limit) are considered reliable.

The RPD results are as follows:

- Sample 14MW06 (MWDUP2)

- Aluminum (Total) had an RPD value of 22%, above the 20% objective. This result is likely related to variability within the groundwater itself, and not attributable to variability in field or laboratory methods. Both the duplicate and the sample were above the CCME PFAL guidelines;
- Barium (Total) had an RPD value of 23%, above the 20% objective. This result is likely related to variability within the groundwater itself, and not attributable to variability in field or laboratory methods. There is no CCME PFAL guideline for this parameter;
- Beryllium (Total) had an RPD value of 32%, above the 20% objective. This result is likely related to variability within the groundwater itself, and not attributable to variability in field or laboratory methods. There is no CCME PFAL guideline for this parameter;
- Cadmium (Total) had an RPD value of 30%, above the 20% objective. This result is likely related to variability within the groundwater itself, and not attributable to variability in field or laboratory methods. Both the duplicate and the sample were above the CCME PFAL guidelines;
- Calcium (Total) had an RPD value of 30%, above the 20% objective. This result is likely related to variability within the groundwater itself, and not attributable to variability in field or laboratory methods. There is no CCME PFAL guideline for this parameter;
- Chromium (Total) had an RPD value of 22%, above the 20% objective. This result is likely related to variability within the groundwater itself, and not attributable to variability in field or laboratory methods There is no CCME PFAL guideline for this parameter;
- Cobalt (Total) had an RPD value of 20%, equal to the 20% objective. This result is likely related to variability within the groundwater itself, and not attributable to variability in field or laboratory methods. There is no CCME PFAL guideline for this parameter;
- Copper (Total) had an RPD value of 24%, above the 20% objective. This result is likely related to variability within the groundwater itself, and not attributable to variability in field or laboratory methods. Both the duplicate and the sample were above the CCME PFAL guidelines;
- Lithium (Total) had an RPD value of 25%, above the 20% objective. This result is likely related to variability within the groundwater itself, and not attributable to variability in field or laboratory methods. There is no CCME PFAL guideline for this parameter;
- Magnesium (Total) had an RPD value of 20%, equal to the 20% objective. This result is likely related to variability within the groundwater itself, and not attributable to variability in field or laboratory methods. There is no CCME PFAL guideline for this parameter;
- Manganese (Total) had an RPD value of 22%, above the 20% objective. This result is likely related to variability within the groundwater itself, and not attributable to variability in field or laboratory methods. There is no CCME PFAL guideline for this parameter;
- Nickel (Total) had an RPD value of 29%, above the 20% objective. This result is likely related to variability within the groundwater itself, and not attributable to variability in field or laboratory methods. Both the duplicate and the sample were above the CCME PFAL guidelines;
- Phosphorus (Total) had an RPD value of 30%, above the 20% objective. This result is likely related to variability within the groundwater itself, and not attributable to variability in field or laboratory methods. Both the duplicate and the sample were above the CCME PFAL guidelines;

- Potassium (Total) had an RPD value of 22%, above the 20% objective. This result is likely related to variability within the groundwater itself, and not attributable to variability in field or laboratory methods. There is no CCME PFAL guideline for this parameter;
- Sulphur (Total) had an RPD value of 25%, above the 20% objective. This result is likely related to variability within the groundwater itself, and not attributable to variability in field or laboratory methods. There is no CCME PFAL guideline for this parameter;
- Titanium (Total) had an RPD value of 26%, above the 20% objective. This result is likely related to variability within the groundwater itself, and not attributable to variability in field or laboratory methods. There is no CCME PFAL guideline for this parameter;
- Vanadium (Total) had an RPD value of 21%, above the 20% objective. This result is likely related to variability within the groundwater itself, and not attributable to variability in field or laboratory methods. There is no CCME PFAL guideline for this parameter; and
- Zinc (Total) had an RPD value of 20%, equal to the 20% objective. This result is likely related to variability within the groundwater itself, and not attributable to variability in field or laboratory methods. Both the duplicate and the sample were above the CCME PFAL guidelines;

- Sample SW 2-1 (SW Dup 1)
  - Fluoranthene had an RPD value of 109%, above the 20% objective. This result is likely related to variability within the groundwater itself, and not attributable to variability in field or laboratory methods. Both the duplicate and the sample were above the CCME PFAL guidelines;
  - Phenanthrene had an RPD value of 24%, above the 20% objective. This result is likely related to variability within the groundwater itself, and not attributable to variability in field or laboratory methods. Both the duplicate and the sample were above the CCME PFAL guidelines;
  - Pyrene had an RPD value of 32%, equal to the 20% objective. This result is likely related to variability within the groundwater itself, and not attributable to variability in field or laboratory methods. Both the duplicate and the sample were above the CCME PFAL guidelines.

Based upon a review of the data qualifiers all data is considered reliable based upon the QA/QC review.

6.4 Surface Waters

6.4.1 Surface Water Quality Monitoring

Results of the field surface water quality monitoring program are organized based on the different effects pathways from which the mine has the potential to affect the surrounding surface waters. To determine if the Jericho Mine and its operations may have impacted the surrounding surface waters, water quality samples were collected in August 2014 and compared to historical data using a trend analysis of parameters exceeding applicable guidelines.

In summary, results from this assessment indicate evidence of the Jericho Mine and its operations impacting surface waters as a result of seepage from the waste rock piles, the PKCA and its discharge, inside the pit, and surface runoff and windblown materials from the mine and PKCA. Although evidence indicates an effect on surface waters, the August 2014 analytical data implies the water quality at the monitoring stations currently meet the CCME PFAL, CDWQ, and the water licence guidelines with the exception of copper and uranium. Total

copper levels exceeded guideline levels in Key Lake (JER-AEM-23), and uranium levels exceeded guidelines inside the pit (SWQ-02) and East Sump (SWQ-07). Although most water quality parameters meet guideline levels, the trends analysis shows three main parameters, pH, copper, and uranium increased in concentrations across most water monitoring stations since mine start-up; however, the trends are generally stable since the end of mining in 2008. Additional parameters, such as iron, nickel, nitrate, total organic carbon, total suspended solids (TSS), and total dissolved solids also increased in concentrations at select water monitoring stations since mine start-up and have stabilized since the end of mining in 2008.

All of the surface water quality laboratory results are provided in Tables D.1 to D.26, an overview of the sample sites are given in Figure 8, station photos are provided in Photos D.1 to D.18, and key results are depicted in Graphs D.1 to D.73, and the detailed laboratory reports are included in Appendix O.

6.4.1.1 Quality Controls

Field and trip blank samples were collected and analyzed at the time of the field event. Based on the laboratory results of the field and trip blanks, all of the applicable parameters were below the laboratory detection limits (Table D.1), with exception of zinc in the Field Blank. Zinc in the field blank (0.00019 mg/L) was reported 1.5 times above its detection limit (0.0001 mg/L). However, this reported zinc level was attributed to analytical error, as the occurrence of analytical error increases within five times the detection limit (Clark 2003). Therefore, sampling methods employed during the collection, transportation, and analyses of the surface water quality samples were satisfactory and did not lead to the introduction of potential contaminants.

Three duplicate water quality samples were collected with the JER-AEM-04, JER-AEM-24, and SWQ-02 field samples, and their analytical results were compared to their respective field sample results using a RPD assessment (Table D.1). Results from the RPD assessment indicated the duplicate samples were reliable and therefore, the sampling and analytical methods employed were acceptable. With exception, a few parameters may be considered unreliable, since the duplicate sample was 20% or greater different than the field sample.

The following duplicate sample parameter was reportedly different than its field sample:

- Sulphate from Duplicate 1 collected at station JER-AEM-24 was reportedly 42% different than its field sample.
- Ammonia from Duplicate 2 collected at station JER-AEM 04 was reportedly 23% different than its field sample.
- Turbidity, yttrium, and zirconium from Duplicate 3 collected at station SWQ-02 was reportedly 30, 23, and 21% different than the field sample, respectively.

Differences between the duplicates and the field samples may be due to heterogeneity within the sample (e.g., sediment or organic particulate collected), sampling precision, sample bottles, or laboratory error.

Analytical results from the equipment blank, collected from the Kemmerer sampler used for the near bottom water quality sample at JER-AEM-15, indicates seven parameters were found in exceedance of their laboratory detection limit, including total dissolved solids, nitrate, aluminum, copper, mercury, tin, and zinc. Exceedances above the detection limits indicate contamination from the Kemmerer sampler and/or the nitric acid cleaning solution (Table D.1). Therefore, these parameters collected at station JER-AEM-15 (near bottom sample, only) are considered unreliable.

6.4.1.2 Seepage from the Waste Rock Pile to Carat Lake

During the August 2014 field event, surface water seeping from the waste rock pile did not reach the Carat Lake shoreline (Section 5.4 *Seepage Testing*). However, six sampling stations in Carat Lake, including shoreline stations down-gradient from the seeps (stations 2014-CL-S1 and –S2), a surface and a near-bottom depth sample at the lake basin (station JER-AEM-15), and its outlet were used to monitor the quality of water downstream from the waste rock pile into Carat Lake. While at each water monitoring station, the in situ water chemistry was measured at the water surface (i.e., not including the near-bottom station). In summary, the surface water was described as clear, with no observable surface sheen or odour, neutral (average pH 7.53) with low EC (average 21.08 µS/cm), and having moderate DO (average 11.21 mg/L) and water temperatures (average 9.5°C) (Table 6.4.1-1).

Table 6.4.1-1: In Situ Water Chemistry: Seepage from the Waste Rock Pile to Carat Lake

Sampling Station	pH	EC (µS/cm)	DO (mg/L)	Water Temperature (°C)
JER-AEM-12	7.63	18.7	10.82	10.0
JER-AEM-15-S	7.38	18.4	11.22	9.4
JER-AEM-16	7.49	18.5	11.37	9.8
2014-CL-S1	7.60	27.6	11.43	10.6
2014-CL-S2	7.57	22.2	11.19	7.7
Average	7.53	21.08	11.21	9.5
Min.	7.38	18.4	10.82	7.7
Max.	7.63	27.6	11.43	10.6

Note: in situ water chemistry was not measured at station JER-AEM-15-NB.

During the August 2014 field event, DO and water temperatures were measured at 1 m intervals down the water column at stations JER-AEM-15 and -16. Water monitoring stations JER-AEM-15 and JER-AEM-16 were approximately 30.7 m and 8.8 m in depth, respectively. Significant changes in DO content can be linked to changes in lake trophic status, which can alter various components of its water chemistry (e.g., pH, nutrients). Results indicated that station JER-AEM-15 was thermally stratified with the thermocline occurring at 21 m, indicating the lake has yet to complete fall turnover. Temperature and DO generally decreased with water depth, and ranged from 9.7 to 5.6°C and 10.42 to 6.68 mg/L, respectively. Water quality samples were collected above and below this thermocline. The DO and water temperatures at station JER-AEM-16 remained relatively consistent throughout the water column (9.4 to 7.7°C and 10.07 to 9.54 mg/L, respectively), as mixing from wind action occurred throughout most of its depth.

The analytical results indicate that the quality of water is slightly acidic (pH levels ranging from 6.47 to 6.83), soft, with low levels of suspended solids (<3.0 mg/L), nutrients (including nitrates and phosphorus), and total organic carbon (Tables D.7, D.10 to D.12, and D.26). All of the parameters analyzed were below the CCME PFAL and CDWQ guidelines, except pH and total aluminum, copper, mercury, and zinc at station JER-AEM-15-NB (the near bottom sample). However, these exceedances are attributed to the Kemmerer sampler used for sample collection (see Equipment Blank results) and do not represent existing water quality conditions. A summary of the guideline exceedances is provided in Table 6.4.1-2. Uranium concentrations were reported within guideline levels; however, concentrations were highest at the Carat Lake shoreline station (2014-CL-S1) located down-gradient from the waste rock pile and at the freshwater intake (JER-AEM-12) (0.000395 and 0.000203 mg/L, respectively compared to the CCME PFAL guideline 0.015 mg/l).

Table 6.4.1-2: Summary of Surface Water Exceedances: Seepage from the Waste Rock Pile to Carat Lake

Sampling Station	Sample Results	Guideline Level
JER-AEM-15-NB	pH (6.47)	CCME PFAL and CDWQ pH: 6.5-9.0
	Aluminum (0.0134 mg/L)	CCME PFAL Aluminum: 0.005 mg/L
	Copper (0.0626)	CCME PFAL Copper: 0.002 mg/L Water Licence Copper: 0.04 mg/L
	Mercury (0.000041 mg/L)	CCME PFAL Mercury: 0.000026 mg/L
	Zinc (0.129 mg/L)	CCME PFAL Zinc: 0.03 mg/L

Historical water quality monitoring data is available from JER-AEM-15 and -16 from 2005 to 2009 and 2011 and at JER-AEM-12 from 2005 to 2011; however, stations 2014-CL-S1 and –S2 (Carat Lake shoreline) were only sampled in the August 2014 field event. JER-AEM-15 depth samples were collected in 2011 and 2014. Based on the historical data, pH and total aluminum, copper, mercury, and selenium have occasionally been reported above guideline levels (Tables D.7, D.10 to D.12, and D.26). Additional parameters, TSS, zinc, and lead were also reported above the CCME PFAL guidelines in July 2005; however, these are likely anomalies from this single sampling event.

A trend analysis was completed on parameters detected above guideline levels at stations with sufficient sampling data. The result of this analysis indicates the following parameter concentrations are increasing or decreasing. Parameter concentrations that have no discernible trend are not provided:

- JER-AEM-15 (surface): total copper and uranium concentrations are strongly increasing during mine operation and declining since closure (Graphs D.38 and D.43, respectively). Similarly, nitrate and pH are weakly increasing during mine operation and appear to be decreasing since closure (Graphs D.40 to D.41, respectively). Although nitrate concentrations were highest in the late-2008 and 2009's, the concentration has since been declining. Many other parameters have also been declining (Graphs D.37 to D.43).

- JER-AEM-16: pH, total copper, and uranium concentrations are weakly increasing during mine operation and weakly decreasing upon closure (Graphs D.48, D.45, and D.51, respectively). Aluminum is declining (Graph D.44). Since 2005, total organic carbon has a strong increasing concentration (Graph D50), and therefore, the concentrations of major ions such as magnesium and calcium show a positive correlation. Most other parameters show a weak declining concentration since closure (Graphs D.44 to D.51).

- JER-AEM-12: Uranium concentrations are weakly increasing; reaching the highest concentrations in July 2007, and are declining since mine closure (Graph D.27). In contrast, total aluminum and copper (with removal of anomalous data collected in July 2005) concentrations show strong decreasing trends with highest concentrations peaking by 2009 (Graphs D.25 and D.26).

Parameter levels showing increasing concentration trends, primarily total copper and uranium are likely associated with mine impacts; however, these concentrations are well below applicable guideline levels and concentration trends are declining. Total copper and uranium levels are highest at station 2014-CL-S1, down-gradient from the waste rock pile (Table D.26), but are well below the guideline levels.

6.4.1.3 PKCA Discharge

Surface water quality stations SWQ-04 and JER-AEM-04 were used to monitor water chemistry inside the PKCA and at its discharge, respectively. At the time of the 2014 August field event, the in situ water chemistry at these two monitoring stations (JER-AEM-04 and SWQ-04) was slightly turbid with no observable surface sheen or odour, neutral to slightly basic (average pH 8.08) with moderate EC (average 171.1 µS/cm), low DO (average 7.66 mg/L), and moderate water temperatures (average 9.75°C) (Table 6.4.1-3). Algae growth was present on the lake bottom at station JER-AEM-04.

Table 6.4.1-3: In Situ Water Chemistry: PKCA Discharge

Sampling Station	pH	EC (µS/cm)	DO (mg/L)	Water Temperature (°C)
JER-AEM-04	7.86	151.5	5.19	9.6
SWQ-04	8.29	190.7	10.12	9.9
Average	8.08	171.1	7.66	9.75
Min.	7.86	151.5	5.19	9.6
Max.	8.29	190.7	10.12	9.9

Based on the 2014 analytical results, the quality of water is neutral (pH levels ranging from 7.79 to 7.95), soft to moderately soft (ranging from 55.6 to 69.9 mg/L), with low levels of suspended solids (<3.0 mg/L), turbidity (levels ranging from 0.86 to 1.44 NTU), nutrients (except phosphorus at both stations), and total organic carbon (Tables D2 and D24). Phosphorus levels at both monitoring stations were above the CCME PFAL trigger range in an ultra-oligotrophic system (i.e., greater than 0.004 mg/L); however, they did not increase more than 50% over the baseline conditions. All of the parameters analyzed were below the water licence, CCME PFAL, and CDWQ guidelines (Tables D.2 and D.24).

Historical water quality monitoring data is available from 2005 to 2011 for station JER-AEM-04, and from 2006 to 2009 for station SWQ-04. At station JER-AEM-04, pH, nitrite, nitrate, fluoride, aluminum, cadmium, copper, iron, selenium, and silver levels were found above the CCME PFAL guideline levels, and pH and nitrate levels were above the water licence criteria for effluent discharge on a single occurrence (Table D.2). Therefore, the discharged water at station JER-AEM-04 has primarily complied with the water licence effluent quality criteria. Based on the historical data, TSS, ammonia, nitrite, nitrate, aluminum, copper, iron, selenium, mercury, and uranium have been found above the CCME PFAL and water licence levels at station SWQ-04 (Table D.24). Dissolved uranium levels were above guideline levels; however, total uranium levels were well below guidelines (Table D.24). In addition, the majority of the total and dissolved mercury levels were below the laboratory detection limit during most of the sampling events.

A trend analysis was completed on parameters detected above guideline levels. The result of this analysis indicates the following parameter concentrations are increasing or decreasing. Parameter concentrations that have no discernible trend are not provided:

- JER-AEM-04: iron and pH concentrations are strongly increasing since mine operations, but appear to be decreasing upon closure (Graphs D.4 and D.6, respectively). In addition, total uranium concentrations are increasing (Graph D.8), with the highest concentrations seen in June 2008 as well as August 2011. However, by August 2014, uranium levels have decreased to the 2006 and 2007 levels (Graph D.8). The remaining parameters have a strong decreasing trend or no trend in concentrations (Graphs D.1 to D.8).

- SWQ-04: Ammonia and nitrite are strongly decreasing concentrations that peaked in 2007, and currently appear at or below 2005 levels (Graphs D.67 and D.71). Total uranium has a strong increasing trend at station SWQ-04 and has remained stable since mine operation (Graph D.73a). Dissolved uranium also has a strong increasing trend; however, dissolved parameters were not sampled since mine operation (Graph D.73b). Most other parameters show either no trend (e.g., total mercury and selenium) or possibly a weak increasing (e.g., total aluminum and iron) or decreasing (e.g., total copper, nitrate) trend (Graphs D.66 toD.72).

Parameter levels showing increasing concentration trends (e.g., pH, iron, and uranium) are likely associated with mine impacts, but concentration trends are decreasing since mine operations, except at station SWQ-04. Both stations JER-AEM-04 and SWQ-04 are considered impacted by mine operations and/or PKCA discharges; however, existing concentrations of these parameters are below the applicable guidelines and are declining at station JER-AEM-04.

6.4.1.4 Runoff to the C1 Catchment

Three water quality stations (JER-AEM-09, -10, and -11) were sampled to monitor water chemistry down-gradient of the mine into the C1 catchment basin. At the time of the August 2014 field event, the in situ surface water chemistry was described as clear with no observable surface sheen or odour, neutral (average pH 7.62) with low to moderate EC (average 71.63 µS/cm), and moderate DO (average 11.10 mg/L) and water temperatures (average 9.1°C) (Table 6.4.1-4).

Table 6.4.1-4: In Situ Water Chemistry: Runoff to the C1 Catchment

Sampling Station	pH	EC (µS/cm)	DO (mg/L)	Water Temperature (°C)
JER-AEM-09	7.62	109	10.76	8.5
JER-AEM-10	7.75	87.5	11.13	8.6
JER-AEM-11	7.48	18.4	11.42	10.2
Average	7.62	71.63	11.10	9.1
Min.	7.48	18.4	10.76	8.5
Max.	7.75	109	11.42	10.2

The analytical results indicate that the quality of water is neutral to slightly acidic (pH levels ranging from 6.71 to 7.60), soft, with low turbidity (ranging from 0.4 to 0.97 NTU), and low levels of suspended solids (<3.0 mg/L), nutrients (including nitrates), and total organic carbon (Tables D.3, D.5-D.6). Phosphorus levels at stations JER-AEM-09 and -10 were above the CCME PFAL trigger range in an ultra-oligotrophic system (i.e., greater than 0.004 mg/L); however, they did not increase more than 50% over the baseline conditions. All of the parameters analyzed were below the water licence, CCME PFAL, and CDWQ guidelines, except total copper at stations JER-AEM-09 and -10. A summary of the guideline exceedances is provided in Table 6.4.1-5.

Table 6.4.1-5: Summary of Surface Water Exceedances: Runoff to the C1 Catchment

Sampling Station	Sample Results	Guideline Level
JER-AEM-09	Copper (0.00319 mg/L)	CCME PFAL Copper: 0.002 mg/L
JER-AEM-10	Copper (0.00374 mg/L)	CCME PFAL Copper: 0.002 mg/L

Historical water quality monitoring data is available for most of these stations from 2005 to 2011 (Tables D.3 to D.6), with two exceptions: 1) station JER-AEM-09 includes a single depth sample collected in August 2011; and 2) station JER-AEM-11 data extends from 2005-2006 and 2011. Based on this historical data, copper was commonly above the CCME PFAL guideline levels, and pH, TSS, nitrite, nitrate, aluminum, mercury, and zinc were uncommonly (1 to 4 occurrences per station) found above their guideline levels.

A trend analysis was completed on parameters detected above guideline levels at stations with sufficient sampling data. The result of this analysis indicates the following parameter concentrations are increasing or decreasing. Overall, the historical data show strong concentration trends at station JER-AEM-09, and weak trends at the downstream stations JER-AEM-10 and -11. Parameter concentrations that have no discernible trend are not provided:

- JER-AEM-09: total copper, nitrate, and pH concentrations are strongly increasing during mine operation, and are decreasing since mine closure (Graphs D.9, D.13, and D.14, respectively). Total mercury and nitrite concentrations peaked during mine operation and have decreased to 2005 levels (Graphs D.10 and D.12, respectively). Total uranium concentrations are highest in the August 2014 sample (Graph D.16). Additional parameters such as total dissolved solids, total suspended solids, total organic carbon, total nickel, and other major ions (e.g., calcium, magnesium, potassium, sodium) are also increasing in concentrations during mine operation, but decreasing since mine closure (Graphs D.11 to D.15). However, these parameter levels have remained well below applicable guideline levels. Although the levels of total dissolved solids and total organic carbon remain low (levels averaging 51.7 mg/L and 5.41 mg/L, respectively), an increase in these parameters may indicate sediment loading from the mine. Similarly, as the level of total dissolved solids and total organic carbon increase, the level of available metals and other major ions in aquatic systems increase.
- JER-AEM-10: nickel, pH, and uranium levels are increasing during mine operations, but are weakly decreasing or stabilizing since mine closure (Graphs D.18 to D.20). Total copper levels in August 2014 are the highest since mine operation (Graph D.17).
- JER-AEM-11: No trends in parameter concentrations were found due to limited sampling events; however, concentrations appear stable (Graphs D.21 to D.24).

Station JER-AEM-09 shows strong increasing concentration trends for several parameters including pH, total copper, nickel, and uranium during mine operation and is potentially impacted by mine runoff; however, all parameters are decreasing with the exception of uranium. All parameters are currently below the applicable guideline levels with the exception of copper.

6.4.1.5 Surface Runoff to Lake C4

Two monitoring stations, JER-AEM-13 and -14 were sampled to determine the quality of water in Lake C4, and its creek, down-gradient of the waste rock pile. During the August 2014 field event, the water at these two stations were described as clear, with no observable surface sheen or odour, neutral (average pH 7.35) with low EC (average 28.5 µS/cm), and moderate DO (average 10.71 mg/L), and water temperatures (average 8.95°C) (Table 6.4.1-6).

Table 6.4.1-6: In Situ Water Chemistry: Surface Runoff to Lake C4

Sampling Station	pH	EC (µS/cm)	DO (mg/L)	Water Temperature (°C)
JER-AEM-13	7.47	29.2	10.24	9.5
JER-AEM-14	7.22	27.8	11.17	8.4

Table 6.4.1-6: In Situ Water Chemistry: Surface Runoff to Lake C4

Sampling Station	pH	EC (µS/cm)	DO (mg/L)	Water Temperature (°C)
Average	7.35	28.5	10.71	8.95
Min.	7.22	27.8	10.24	8.4
Max.	7.47	29.2	11.17	9.5

The analytical results indicate that the quality of water is neutral (pH levels ranging from 6.93 to 6.94), soft, with low turbidity (ranging from 0.42 to 0.74 NTU), and low levels of suspended solids (<3.0 mg/L), nutrients (including nitrates), and total organic carbon (Tables D8 and D9). All of the parameters analyzed were below the water licence, CCME PFAL, and CDWQ guidelines.

Historical water quality monitoring data is available from 2005 to 2009 and 2011 for both stations (Tables D.8 and E.9). Based on the historical data, concentrations of pH, aluminum, copper, and iron have occasionally (one to four occurrences) been reported above the CCME PFAL guidelines, and pH has twice been reported outside the water licence criteria at station JER-AEM-13 (Table D.8). At the downstream station, JER-AEM-14, pH, copper, and iron were occasionally (one to three occurrences) above the CCME PFAL guidelines, and pH has been reported once outside the water licence criteria (Table D.9).

A trend analysis was completed on parameters detected above guideline levels. The result of this analysis indicates the following parameter concentrations are increasing or decreasing. Parameter concentrations that have no discernible trend are not provided:

- JER-AEM-13: total copper, iron, pH, and uranium concentrations are increasing during mine operation, and are weakly decreasing since mine closure (Graphs D.28 to D.32).
- JER-AEM-14: total copper, iron, and pH concentrations are slightly increasing during mine operation, and are declining after mine closure, except for copper (Graphs D.33 to D.35). Uranium concentrations have continued to slightly increase since mine closure (Graph D.36).

Water quality at station JER-AEM-13 and at the downstream JER-AEM-14 are weakly impacted from surface runoff from the mine (particularly regarding pH, total copper, iron, and uranium); however, all parameters are currently below the applicable guideline levels, including uranium.

6.4.1.6 Surface Runoff and Windblown Materials to the Lynne Lake Group

Five monitoring stations within the Lynne Lake Group (includes Ash, Key, Lynne, Southeast, and Shine lakes) were sampled in August 2014 to monitor the quality of water down-gradient and down-wind from the mine, particularly the PKCA. At this time, the in situ water quality at these five stations were described as clear, with no observable surface sheen or odour, neutral (average pH 7.75) with low EC (average 50.08 µS/cm), moderate DO (average 10.57 mg/L), and moderate water temperatures (average 9.86°C) (Table 6.4.1-8).

Table 6.4.1-8: In Situ Water Chemistry: Surface Runoff and Windblown Materials to the Lynne Lake Group

Sampling Station	pH	EC (µS/cm)	DO (mg/L)	Water Temperature (°C)
JER-AEM-22	7.91	43.6	11.75	10.3

Table 6.4.1-8: In Situ Water Chemistry: Surface Runoff and Windblown Materials to the Lynne Lake Group

Sampling Station	pH	EC (µS/cm)	DO (mg/L)	Water Temperature (°C)
JER-AEM-23	7.74	41.9	11.63	10.0
JER-AEM-24	7.43	27.4	10.35	10.4
JER-AEM-26	8.05	98.7	9.48	9.4
JER-AEM-27	7.61	38.8	9.64	9.2
Average	7.75	50.08	10.57	9.86
Min.	7.43	27.4	9.48	9.2
Max.	8.05	98.7	11.75	10.4

The analytical results indicate that the quality of water is neutral to slightly basic (pH levels ranging from 6.87 to 7.66), soft, with low turbidity (ranging from 0.46 to 1.07 NTU), and low levels of suspended solids (<3.0 mg/L), nutrients (excluding phosphorus), and total organic carbon (Tables D.13, D.15, D.17, D.19, and D.21). Total phosphorus levels at all five monitoring stations were above the CCME PFAL trigger range in an ultra-oligotrophic system (i.e., greater than 0.004 mg/L); however, did not increase more than 50% over the baseline conditions.

Turbidity levels were highest at stations JER-AEM-27 (Shine Lake; 1.07 NTU) and JER-AEM-23 (Key Lake; 0.96 NTU) and lowest at station JER-AEM-24 (Lynne Lake; 0.46 NTU). Turbidity changes temporally and seasonally in response from suspension of bottom sediment (e.g., wind action), phytoplankton and dissolved organic material, erosion and runoff, and input from human sources. Existing turbidity levels may represent both natural and mine-impacted conditions.

All of the parameters analyzed were below the water licence, CCME PFAL, and CDWQ guidelines, except copper at JER-AEM-23. A summary of the guideline exceedances is provided in Table 6.4.1-9.

Table 6.4.1-9: Summary of Surface Water Exceedances: Surface Runoff and Windblown Materials to the Lynne Lake Group

Sampling Station	Sample Results	Guideline Level
JER-AEM-23	Copper (0.00246 mg/L)	CCME PFAL Copper: 0.002 mg/L

Historical water quality monitoring data is available at stations JER-AEM-22, -23, and -24 from 2005 to 2009 and 2011 (Tables D.13 to D.22). The remaining stations, stations JER-AEM-26 and -27 (and samples from JER-AEM-22 to -27 collected at depth) contain water quality data from one to two sampling events in August 2011. Based on this data, the water quality within JER-AEM-26 (Southeast Lake) and JER-AEM-27 met applicable water quality guidelines, and copper was occasionally detected above guidelines at stations JER-AEM-22 (Ash Lake), -23, and -24, and aluminum was detected once above guidelines at station JER-AEM-24.

A trend analysis was completed on parameters detected above guideline levels at stations with sufficient sampling data. The result of this analysis indicates the following parameter concentrations are increasing or decreasing. Parameter concentrations that have no discernible trend are not provided:

- JER-AEM-22, -23, and -24: Total copper and uranium concentrations are increasing or remained stable throughout the mine operation and closure (Graphs D.52 to D.57).

The water quality at stations JER-AEM-22, -23, and -24 are impacted from surface runoff and/or windblown material from the mine (e.g., total copper and uranium); however, all parameters are currently below the applicable guideline levels with the exception of copper at station JER-AEM-23.

6.4.1.7 Runoff from Storage Pads and Inside the Pit

Surface water quality stations SWQ-02 and SWQ-07 were used to monitor water chemistry inside the pit and East Sump (down-gradient from the coarse PK stockpile and mine), respectively. At the time of the 2014 field event, the in situ water chemistry at these two monitoring stations was clear to slightly turbid (turbidity noted at station SWQ-02), with no observable surface sheen or odour, neutral to slightly basic (average pH 8.24) with high EC (average 265.5 µS/cm), and moderate DO (average 10.51 mg/L), and water temperatures (average 9.75°C) (Table 6.4.1-10).

Table 6.4.1-10: In Situ Water Chemistry: Runoff from Storage Pads and Inside the Pit

Sampling Station	pH	EC (µS/cm)	DO (mg/L)	Water Temperature (°C)
SWQ-02	8.19	213.0	10.46	10.2
SWQ-07	8.29	318.0	10.56	9.3
Average	8.24	265.5	10.51	9.75
Min.	8.19	213.0	10.46	9.3
Max.	8.29	318.0	10.56	10.2

The analytical results indicate that the quality of water at stations SWQ-02 and -07 is neutral (pH levels 7.76 and 7.95, respectively), moderately hard, with low turbidity (2.02 and 0.95 NTU, respectively), and low levels of suspended solids (3.1 and <3.0 mg/L, respectively), total organic carbon, and nutrients except for ammonia and nitrates (Tables D.23 and D.25). At station SWQ-02, ammonia (0.0383 mg/L) was above the CCME PFAL guideline, and nitrate (8.86 mg/L) was the highest concentration reported in August 2014. All of the parameters analyzed were below the water licence, CCME PFAL, and CDWQ guidelines, except uranium at both sampling stations. Station SWQ-02 was also sampled for BTEX and PHC fractions F1 to F4, and the analytical results indicate that these parameters were all below the laboratory detection limits and met applicable criteria (Table D.23). A summary of the guideline exceedances is provided in Table 6.4.1-11.

Table 6.4.1-11: Summary of Surface Water Exceedances: Pit and Runoff from Storage Pads

Sampling Station	Sample Results	Guideline Level
SWQ-02	Uranium (0.117 mg/L)	CCME PFAL Uranium: 0.015 mg/L
SWQ-07	Uranium (0.0219 mg/L)	CCME PFAL Uranium: 0.015 mg/L

Historical water quality monitoring data is available only at station SWQ-02 from 2007 to 2008 and 2014; no historical data exists for station SWQ-07 (Tables D.23 and D.25). At station SWQ-02, multiple water quality parameters were detected above the CCME PFAL, CDWQ, and the water licence criteria including: total suspended solids, total dissolved solids, ammonia, nitrate, nitrite, aluminum, copper, iron, manganese, nickel, selenium, and uranium. Although, no concentration trends were detectable using the Mann Kendall test analysis (likely due to the low number of samples collected) (Graphs D58 to D66), parameter concentrations reported in the August 2014 sampling event are lower than compared to October 2008 (with the exception of total aluminum levels).

Based on the water quality analysis both stations are impacted by mine operations and runoff, particularly from uranium which is currently above the applicable guidelines. However, parameter concentrations have decreased since 2008.

6.5 Hazardous Materials inventory

Photos E.1 to E.86 provide a visual representation of the material types inventoried on site. Table E.1 is a detailed list of hazardous and non-hazardous materials, and Table E.2 summarizes the total uncrushed quantities. All material quantities listed in this report are uncrushed values. Drum and tank content analytical data is summarized in Table E.3. Figures 1 to 7 show the aerial view of the site, sample locations, debris, and buildings on the site at the time of assessment. Lab analytical results are in Appendix O.

6.5.1 Lead Containing Paint

One blue paint sample was collected from the site at AST #20 (EC00016029) built in 1988 (Photo E.1 and E.2). Analytical results are provided in the original lab reports in Appendix O.

The sample was submitted for total lead analysis by ICP and was above the applicable guideline of 100 mg/kg. A larger sample size was not possible due to the paint strength, which meant that the sample was not submitted for leachable lead analysis. Tetra Tech EBA recommends that an additional sample is collected and submitted for leachable lead analysis. This will determine if the material contains leachable lead over 5 mg/L, and then will be considered a hazardous material. Table 6.5.1-1 details the analysis completed on the sample and the parameter that was above the applicable guidelines.

Table 6.5.1-1: Paint Analysis Lab Results

Paint Colour	Substrate Description	AREA Description	Total Lead Result (mg/kg)	Sample ID
Blue	Blue AST #20	Airstrip AST 20	**3,960**	PB1-1

Notes:
1. This AST is included in the metals volume in Section 7.7.2.
2. The parameter exceeding the applicable guideline is bolded and underlined.

Table 6.5.1-2 summarizes the types of painted substrates and their volumes that likely contain total lead above the applicable guidelines, based on the Tetra Tech EBA sample.

Table 6.5.1-2: Total lead in paint AST quantities

Painted Substrate	Area Description	Volume (m^3)
Blue AST #15 (62,000 L)	South of Phase 1 tank farm (Figure 3.1)	558
Blue AST #18 (62,000 L)	Adjacent to the gensets in the camp facility area (Figure 3.2)	
Blue AST #16, 17, 19, 22, 23 (62,000 L)	HWTA (Figure 6)	
Blue AST #20 and 21 (62,000 L)	Airstrip area (Figure 7)	

This volume includes nine 62,000 L ASTs at the camp facility area, the HWTA and the airstrip area (ASTs #15-23).

6.5.2 Drum and AST Contents

A total of 388 drums (205 L each) and a variety of smaller tanks, ASTs and containers were inventoried throughout and adjacent to the site that contained a total of 888 litres of organic content. One drum and one tank sample was collected (Photo E.8 and Photo E.9, respectively). These two samples appeared to be organic and therefore were submitted for organic analysis as per the AMSRP. The hydrocarbon product was identified as heavy oil, gasoline or diesel type hydrocarbon on a Canada-Wide Standard Hydrocarbon Distribution Report through gas chromatography analysis. Full analytical results are provided in Table E.3 and the original lab reports in Appendix O.

Table 6.5.2 details the analysis completed on each sample and the parameters that were above and below the applicable guidelines.

Table 6.5.2: Drum/AST Content Analysis and Exceedance

Content Description[1]	Location	Drum/AST Description	Parameters Analyzed[2]	Sample ID
Jet B	HWTA	Blue and yellow drum (205 L)	Metals, PCBs, chlorine, **flashpoint** and gas chromatography	DR2-1
Diesel	HWTA	Silver tank (3400 L)	Metals, PCBs, chlorine, **flashpoint** and gas chromatography	TANK2-1

Notes:
1. Based on gas chromatography analysis or on-site observations
2. The parameter exceeding the applicable guideline is bolded and underlined.

The flashpoint parameter exceeded TDG regulations in both samples. Based on this analytical data, the drum and tank sampled are hazardous according to TDG regulations. This is also consistent with the understanding that this drums and tank contain jet fuel and diesel fuel. The remaining drums, tanks, ASTs, and containers content on-site classified as organic content; is considered by Tetra Tech EBA to be hazardous for handling and transportation. The disposal options will vary depending on the type of material, as per the AMSRP.

A total of twelve large ASTs (#1-12) were inventoried in the Phase 1 and 2 Tank Farms (Photos E.10 to E.14). Minimal organic content (diesel) was visually observed within eight 500,000 L tanks (#1-8). A total of 19,500 L of organic content (diesel) was observed in tanks #9-12. Diesel volumes (as viewed on side gauge) are 5.5 m^3 in Tank #9, 5.0 m^3 in Tank #10, 4.0 m^3 in Tank #11 and 5.0 m^3 in Tank #12. Pipes which may also contain organic content were also observed within the Phase 1 and 2 Tank Farms and are expected to connect underground to the main camp site.

Approximately 100 m^3 of soil in drums was inventoried on site (Photo E.15). A large portion of this is suspected to be soil from oil and fuel spills that were cleaned up. Sampling of this material was not conducted during the field assessment due to limited time on site.

6.5.3 Mercury

Approximately 1,674 fluorescent lights containing small amounts of mercury vapour were inventoried throughout the site (e.g., Photo E.16).

One mercury-containing wall mounted thermostat was observed within the trailer at Borrow Area A2.

Mercury vapour and elemental mercury is to be considered hazardous and should be handled as per the Transportation of Dangerous Goods Act and Regulations and the *Environmental Guidelines for Industrial Waste Discharges* (GN 2002).

6.5.4 Batteries

A total of 109 batteries and 0.060 m^3 (60 L) of battery fluid and battery acid were inventoried throughout the site (e.g., Photos E.17 and E.18). The batteries mostly appeared to be lead acid batteries in pieces or black cased, lead acid car batteries. They were in varying degrees of condition, some were fully intact and enclosed, while others were broken apart or leaking. Battery contents are to be considered dangerous according to the Transportation of Dangerous Goods Act and Regulations and should be handled accordingly.

6.5.5 Ozone Depleting Substances

A total of 284 fire extinguishers (containing ODS, CO_2 and dry chemical) were inventoried throughout the site (e.g., Photo E.19 and E.20). The fire extinguishers were intact, stainless steel or red in colour, and appeared to be full or partially full.

Approximately 20 items containing refrigerant, and therefore ODS, were inventoried throughout the site. These items were fridges, freezers, walk-in coolers (Photo E.21), air conditioning units and beverage machines.

The contents are to be considered dangerous and should be handled accordingly, as per the Transportation of Dangerous Goods Act, which lists ODS as Class 2, Non-flammable Gas.

6.5.6 Compressed Gas Cylinders

Approximately 380 compressed gas cylinders were inventoried within the site (e.g., Photo E.22). The cylinders were intact, most labelled with known contents, but some were unlabelled. No attempt was made to open the cylinders due to the safety concerns associated with unknown pressurized gases. The contents are to be considered hazardous until the contents can be safely identified. Quantities and content descriptions are in Table E.1.

6.5.7 PCBs in Light Ballasts

There is a low likelihood that there are ballasts containing PCBs at the site, due to the relatively new age of the site. A few ballasts were visually checked and did not contain PCBs. Therefore, given this information, no ballasts on site were confirmed as being PCB containing. PCBs are to be considered dangerous and handled accordingly as per the Transportation of Dangerous Goods Act, which lists PCBs under Class 9; Miscellaneous Products, Substances or Organisms.

6.5.8 Miscellaneous Hazardous Liquids and Solids

Approximately 270 m^3 of fluids, powders, solutions and solids present in various containers, flammable cabinets, equipment, pipes and tanks were inventoried throughout the site (Photos E.23 to 26). These material item descriptions are shown on Table E.1 and include items such as glycol, antifreeze, bentonite, paint, etc. These materials are to be considered hazardous, either during handling, transport or disposal, depending on their label instructions and the Transportation of Dangerous Goods Act.

6.5.9 Mould and Bio-hazardous Materials

These materials were not included in the inventory, however, mould and water damage was observed in most rooms in the camp facility, process plant and truck shop (e.g., Photos E.27 to E.29). Evidence of fox habitation within the camp facility was also observed (Photo E.16).

6.6 Non-hazardous Materials Inventory

Photos E.30 to E.84 provide a visual representation of the types of non-hazardous materials inventoried at site. Table E.1 is a detailed list of hazardous and non-hazardous materials, and Table E.2 summarizes the total uncrushed quantities. All material quantities listed in this report are uncrushed values. Drum and tank content analytical data is summarized in Table E.3. Figures 1-7 show the aerial view of the site, sample locations, debris and buildings on the site at the time of assessment. Lab analytical results are in Appendix O.

6.6.1 Wood

Wood volumes are largely composed of the wood shacks and buildings on site. The wood volume is estimated at 980 m^3. The volumes of buildings were calculated as the total standing building volume, not a demolished volume. These shacks and buildings are mostly located at the airstrip and the camp facility area. The volume does not include the major structures in Section 6.7.4. This volume also does not include 702 wood items, such as desks, shelves, beds and tables.

6.6.2 Metals

Metal debris totalling 15,722 m^3 (uncrushed volume) was observed within most buildings, the building's exterior and in debris areas. The volumes of buildings were calculated as the total standing building volume, except the stockpile shed located northwest of the laydown area, which was calculated as a demolished volume. This metal consisted of towers, winch, crusher, pieces, heater, culverts, fence, pipe, sheeting, couplers, heat coils, wire, rebar, pins, empty drums, vents, tubes, sleighs, drums, ASTs, tools, a variety of equipment, etc. It does not include the major structures in Section 6.7.4. It does not include an additional metal volume of approximately 124,000 m^3 of 12 large metal tanks observed in Phase 1 and 2 Tank Farms (Tanks #1-12) and 558 m^3 of 9 metal ASTs with lead paint observed throughout the site. This volume does not include an additional metals items count of 204 items. This consists of furnaces, washers/dryers, kitchen sinks, a kitchen washer, TV's, electrical equipment, filing cabinets, stoves, water tanks, computers and wall heaters. The majority of these items were located in the camp facility.

6.6.3 Other Non-Hazardous Materials

Other materials observed within the site were sea cans, cement, vehicles/machine items, tarp tented shops and miscellaneous inert materials and miscellaneous inert items. The volumes of other non-hazardous materials are provided in Table 6.6.3:

Table 6.6.3: Other Non-Hazardous Materials Volumes

Type of Material	Volume (m^3)	Quantity (units)
Sea cans	1,174	-
Miscellaneous inert materials	596	-
Miscellaneous inert materials items	-	494
Cement	135	-
Vehicles / machine items	-	28

Table 6.6.3: Other Non-Hazardous Materials Volumes

Type of Material	Volume (m^3)	Quantity (units)
Drums: empty	-	587
Large ASTs	124,000	-
Tarp-tented shops	6,186	-

Materials not included in the totals, but included Table E.1, are the drums belonging to the department of Environment and Natural Resources (ENR) and the core samples found throughout the site. The ENR drums are located at the Laydown Area and are to be removed by ENR. The core samples located at the Camp Facility Core Shack, the Truck Shop Shed, and the Core Box Laydown Area were not included in the total volumes because core samples are typically left on mine and exploratory sites.

6.6.4 Major Structures

The truck shop, camp facility, and process plant are the major structures on site. The exterior and interior construction materials volumes, piping, wiring and equipment was included in Table E.1 and E.2 as separate quantities. Select drawings for the truck shop, camp facility, and process plant can be found in Appendix F: Selected Infrastructure Drawings. Additional drawings can be provided upon request.

The truck shop and process plant appear to be in good structural condition, however there is some degradation of the camp facility discussed in Section 6.6.4.2. There is mould observable in all major structures.

6.6.4.1 Truck Shop

The truck shop is approximately 872 m^2 with a total volume of 10,464 m^3. It is metal clad construction and steel structure supports, with a concrete floor slab (reference Figure 3.2, Photos E.47 to E.51, and Appendix F: Selected Infrastructure Drawings). The second floor has drywall, dropped ceiling tile and vinyl sheet flooring finishes. It mostly consists of three large bays and one large welding bay, each with a large overhead door. The various side rooms are a warehouse, tool crib and mechanical room. The second floor consists of an electrical and storage room, two offices, a small women's washroom and larger men's washroom, with a lunchroom at the west end. It is connected to the utilidor/corridor of the main camp facility.

6.6.4.2 Camp Facility

The camp facility is 5,341 m^2 with a total volume of 18,694 m^3. The individual facility areas and volumes can be referenced in Table 6.6.4. The facility is made up of metal clad trailers constructed by Shanco Camp Services Ltd. It consists of three sleeping quarters wings (Halls D, E and F), each containing 33 to 34 rooms on the southwest side. These are connected to recreation facilities, a kitchen and dining area and an office area on the northwest side (reference Figure 3.2 and Photos E.53 to E.78). The recreation facilities included a TV and reading room, a phone booth and foosball/pool table room and an exercise room. The office area was made up of 11 offices, one medical room, one print shop, one miscellaneous safety storage room, one environment lab, one mechanical room, one diamond inspection room, one PPE storage room and one computer server room. Adjacent to the office area was the security area consisting of a security clearance room and an office. Continuing southeast along the corridor/utilidor is a water AST room with five large water tanks (each 1,800 litres), a storage/environmental wing and a parts wing made up of six sea cans. Heading north along the utilidor/corridor is contractor offices and gensets made up of four generators in four sea cans. There was generally vinyl sheet flooring, dropped ceiling tile and drywall finishes. These areas also included various bathrooms, furnace rooms, utility and mechanical rooms.

The camp facilities have started to deteriorate and are not currently considered appropriate for housing work crews. Foxes entered the facility in the winter of 2014 and there is evidence of fox excrement along many of the main hallways and common areas (e.g., Photo E.73). There is also water damage starting to occur in some of the common areas and other rooms of the facility.

Table 6.6.4: Main Camp Facility Volumes

Location	Area (m^2)	Volume (m^3)
Sleeping Quarters	1,770	6,195
Recreation Facilities	387	1,354
Kitchen	454	1,589
Offices	544	1,904
Water ASTs	70	245
Storage/Environmental Wing	133	465
Parts Wing	168	588
Corridor/Utilidor	721	2,523
Area West of Process Plant	395	1,382
Contractor Offices	444	1,554
Gensets	255	892
Total:	5,341	18,694

6.6.4.3 Process Plant

The process plant is 2,048 m^2 with a total volume of 47,104 m^3. It is metal clad construction and steel structure supports, with a concrete base pad. Prior to entering the process plant is an office, lunchroom, locker room and lab area. Most of the plant is an open area filled with diamond processing equipment. The few enclosed areas are a tool crib, mechanical room, HVAC rooms, a security office and diamond inspection room. It was designed to process kimberlite ore using conventional diamond processing techniques. The main steps are as follows:

1. Crushing - breakage of ore to liberate the diamonds;
2. Scrubbing - breakage of soft conglomerates;
3. Dense medium separation - gravity concentration to separate heavy and light particles;
4. Interparticle crushing - reduction of large particles without diamond breakage;
5. X-ray sorting; and
6. Cleaning and sorting.

The plant was designed to process 2,000 tonnes per day of kimberlite ore.

6.7 Summary of Hazardous and Non-Hazardous Materials Totals

Tables 6.7-1 and 6.7-2 summarize the hazardous and non-hazardous materials at the site. Volumes are uncrushed.

Table 6.7-1: Jericho Mine Hazardous Materials Inventory

Material Description	Volume (m^3)	Volume (units)
Total lead in paint on ASTs	558	-
Fluorescent lights	-	1,674
Fire extinguishers	-	284
Miscellaneous compressed gas cylinders	-	380
Refrigerant items	-	20
Drum items: organic content	-	388
Organic content within four tanks at Phase 2 tank farm 500,000 L tanks (#9-12)	19.5	-
Soil in drums and containers	100	-
Organic content in drums, ASTs, tanks, containers, pails	888	-
Materials in ASTs, tanks, containers, flammable cabinets	270	-
Batteries	-	109
Total	**1,816 m^3**	**2,855 items**

Table 6.7-2: Jericho Mine Non-Hazardous Materials Inventory

Material Description	Volume (m^3)	Quantity (units)
Wood	980	-
Wood items	-	702
Metal	15,722	-
Metal items		204
Sea cans	1,174	-
Miscellaneous inert materials	596	-
Miscellaneous inert materials items	-	494
Cement	154	-
Vehicles / machine items	-	28
Drums: empty	-	587
Large ASTs	124,000	-
Tarp-tented shops	6,186	-
Major structures - Truck Shop	10,464	-
Major structures - Camp Facility	18,694	-
Major structures - Process Plant	47,104	-
Total	**225,073 m^3**	**2,015 items**

7.0 GEOTECHNICAL INSPECTION

7.1 Processed Kimberlite Containment Area

The PKCA is located south of the main camp area, as shown in Figure 2. The PKCA is divided into two cells (Cell A and Cell C), separated by a filter dyke (Divider Dyke A). Cell A is the upstream cell, located east of the divider dyke, and Cell C is located downstream of the dyke on its west side. Site photos and inspection notes related to the PKCA are presented in Appendix G.

Containment within Cell A is provided by the East and Southeast Dams, located on the east side of the cell, and by the Saddle Dam located on its south side. Cell C containment is provided by the West Dam, located at the downstream end of the cell, and by the North Cofferdam, located in small draw on the north side of the PKCA.

The PKCA facility was designed to allow for staged construction as PK and water elevations rose within the facility. The current status of the dams and dykes is summarized in Table 7.1

Table 7.1: Summary of Jericho PKCA Structures

Structure	Status	Design Crest Elevation (m)	As-Built Crest Elevation (approx.) (m)	Comment
West Dam	Partially Constructed	528 Crest 524 Core	525 (min.) Crest 520 (min.) Core	
East Dam	Completed	524.5 Crest 523.5 Liner	524.5 Crest 523.5 Liner	A road was constructed on top of the East Dam. The crest of the road is approximately 527 m.
Southeast Dam	Completed	524.5 Crest 523.5 Liner	524.5 Crest 523.5 Liner	
Saddle Dam	Completed	525 Crest 524 Liner	525 Crest 524 Liner	
Divider Dyke A	Partially Constructed	524	Varies – low point 521.5	
North Dam	Not in Place – upstream cofferdam constructed in 2007	528 Crest 524 Core	Coffer Dam Till 521 ROM Crest 522	Natural Ground of North Dam saddle 518.2 m (approx.)

Tailings placement has been isolated to Cell A, where tailings slurry was spigoted from several discharge points along the east side of the cell. This has created an exposed beach which slopes down from the east side of Cell A to Divider Dyke A. A shallow pond has developed upstream of Divider Dyke A where water pools from the upstream catchment area (Photo G.1).

The tailings surface is exposed and localized erosion channels are evident at spigot locations. During operations, prevailing winds from the west blew dry tailings over the east and southeast dams, depositing them on the leeward side of the dams and the upstream tundra. Snow fencing, and later truck tires, were placed to function as a wind break and limit wind blow deposition outside the facility. Under AANDC's direction, the tailings surface was watered in 2013 and 2014 prior to freeze up to prevent desiccation of the tailings over winter. A road and pad was constructed on the upper tailings beach area to facilitate this work (Photo G.2).

PK samples were taken in 2011 to assess remedial options for the windblown PK, and were reported in 2011 PKCA management plan (EBA 2011b). The results showed the FPK to comprise a 2 mm minus sand with variable fines content, ranging from 5 to 80%. In general, the coarsest material was observed in the upper beach slopes, near the spigot points.

Tailings strength is expected to be greatest in the upper beach slopes where the material is relatively well drained and coarsest. The upper tailings could readily support foot traffic and AANDC has constructed a road and pad over the upper beach area, suggesting the tailings have some load carrying capacity.

It is expected that permafrost will have aggraded into the tailings to some degree, based on Tetra Tech EBA's experience at other mine sites; however, the degree of permafrost aggradation was not investigated as part of this site assessment.

The water elevation in Cell C was estimated to be 517.7 m at the time of the site assessment (Photo G.3). This is approximately 1 m higher than the water elevation observed in the 2011 inspection and is approximately 0.5 m below the spill elevation through the North Cofferdam alignment (518.2 m). Tetra Tech EBA has previously recommended to AANDC that the maximum water elevation in the PKCA be maintained at 1 m below the spill point elevation, or 517.2 m. Tetra Tech EBA understands that AANDC has retained a contractor to dewater the PKCA and that the PKCA water elevation was drawn dawn by over 0.5 m in the fall of 2014 to maintain the desired freeboard.

7.1.1 West Dam

The West Dam is a frozen core dam located at the west end of the PKCA, as shown in Figure 2. The dam core comprises frozen saturated gravel with secondary containment provided by a geosynthetic clay liner. The core material is designed to remain in a frozen condition year round, providing the primary water seepage barrier. The existing dam condition is shown in Figure G.1 and Photos G.4 through G.9. Ground temperature profiles are provided in Appendix G (Figures G.18 to G.33).

The core integrity is maintained naturally; although thermosyphon evaporators were installed in the dam base if additional cooling was required. Rockfill thermal protection above, upstream, and downstream of the core is in place to keep the core frozen. The dam design also includes an upstream till zone placed at lower elevations to reduce convective water movement through the open-graded rockfill.

The dam was designed by Tetra Tech EBA in 2005 (EBA, 2005a) and was partially constructed during the winters of 2005/2006 and 2006/2007. At the end of the 2007 season, the core had been constructed to its final elevation at the south abutment; however, the centre portion of the core was only constructed to approximately 520 m instead of its final design elevation of 524 m. The core was subsequently covered with a minimum of approximately 4 m of run-of-mine coarse rockfill for thermal protection.

Interim construction record drawings for the West Dam were prepared by Sub-Artic Surveys Ltd. (SAS) in 2007, and have been reproduced in Appendix G (Figures G.2 to G.4)

Surface Water and Seepage

The water level upstream of the dam was estimated to be 517.7 m, and 514.3 m on the downstream side. The water elevation is approximately 1 m higher than the 2011 values and equates to approximately 3.4 m of head across the dam.

No discharge was occurring at the time of the inspection; however, dewatering piping, consisting of a 5.25-inch ID HDPE pipe, was in place (Photo G.4). Tetra Tech EBA understands that AANDC has periodically retained

contractors to dewater the PKCA and was planning to dewater the PKCA this year prior to freeze up. The discharge consists of a pipe elbow which directs water into the air (Photo G.5). There are no visible signs of erosion around the discharge pipe or downstream of the discharge.

The downstream slope and toe was inspected and no visible evidence of seepage was noted. Some standing water was observed along the downstream toe; however, this is attributed to localized surface ponding and not seepage through the dam.

Ground Temperatures

Horizontal ground temperature cables (GTCs) have been installed through the dam core and downstream shell at base of the key trench, at original ground elevation, and at elevation 522 m. GTC locations are summarized in Table 7.2 and ground temperature plots are presented in Appendix G (Figure G.18 to G.32). Prior to current inspection, the last set of ground temperature readings were completed in July of 2012.

Table 7.2: West Dam GTC Locations

GTC ID	Station	Elevation	Comment
1914	0+035	513 m	Key trench base
1915	0+080	514 m	Key trench base
1916	0+120	518 m	Key trench base
1917	0+035	516 m	Original Ground
1918	0+080	518 m	Original Ground
1919	0+120	520 m	Original Ground
1921	0+080	522 m	Near top of core
1922	0+120	522 m	Near top of core

Measured core temperatures in the key trench base and at original ground ranged from -5°C to -7°C at all elevations. These temperatures are comparable or slightly lower than temperatures measured in July of 2012. The core temperatures at elevation 522 m were slightly warmer than basal temperatures, ranging from -3.4°C to -5°C. This may be a function of ground temperature readings being completed in August when there was greater heat penetration into the core. History plots show an annual warming of the core material to a maximum temperature of -1.5°C. The measured August temperatures appear to be consistent with observed trends in the temperature of the core material.

Stability and Settlement

The dam crest was visually inspected and no sign of stress or instability was noted (Photo G.6). Similarly, the upstream and downstream slopes are generally in good condition (Photos G.7 and G.8). An area of settlement was noted on the downstream slope, near the south end of the dam (Photo G.9). The area is approximately 8 m × 5 m × 0.8 m deep. This area was originally noted in 2009 and does not appear to have worsened from previous inspections. Longitudinal cracking observed in 2009 also remains, but does not threaten the function of the dam.

Discussion

Overall the dam is good condition and no significant issues were noted. The dam is performing within designed parameters and no immediate remedial action is required.

7.1.2 East and Southeast Dams

The East and Southeast dams are impervious geomembrane lined dams at the east end of the PKCA, as shown in Figure 2. The existing dam condition is shown in Figure G.5 and Photos G.10 to G.19.

The dams were designed by Tetra Tech EBA (EBA 2005b) and constructed during the 2006/2007 winter season. The dams are hybrid dams, in which the foundations are keyed into permafrost (rock or till) and superstructure consists of a conventional lined dam. The liner integrity is protected through the use of a 20 mm minus bedding and cover layer.

The east and southeast dams were constructed to design elevation, and the construction documented in EBA, 2007a. Select construction records drawings have been reproduced in Figures G.6 to G.11.

Surface Water and Seepage

Fine PK has been discharged against the upstream face of the dams (Photo G.16). As such, no water was impounded against the dams at the time of the inspection. Some localized ponding was observed along the downstream toe (Photo G.17); however, this is the result of water pooling in a local topographic low and not an indication of seepage through the dam.

Ground Temperatures

Horizontal GTCs have been installed along the key trench base and along the downstream shell. GTC locations are summarized in Table 7.3 and ground temperature plots are presented in Appendix G (Figure G.34 to G43). Prior to current inspection, the last set of ground temperature readings were completed in July of 2012.

Table 7.3: East and Southeast Dam GTC Locations

GTC ID	Dam	Station	Elevation	Comment
1830	East Dam	0+100	517 m	Key trench base
1831	East Dam	0+150	515 m	Key trench base
1832	Southeast Dam	0+150	516 m	Key trench base
1997	Southeast Dam	0+240	520 m	Original Ground
1833	Southeast Dam	0+2	516 m	Original Ground

Two GTCs are installed in the East Dam key trench, at the base of the geomembrane liner. Temperatures at the base of the key trench were between -2.0°C and -5.0°C during the inspection. These measurements are within 1°C of the values measured at the same time in 2012.

Three GTCs are installed in the Southeast Dam key trench at the base of the geomembrane liner. During the inspection, GTC 1997 was missed and only GTCs 1832 and 1833 were read. Readings from these cables indicated temperatures in the key trench ranged from -3.2 to -4.2°C in the base of the key trench. This is approximately 1 to 2°C warmer than ground temperature measurements taken at the same time in 2011, but is comparable to measurements made in 2009.

Stability and Settlement

No areas of instability or settlement were noted along the dam crests (Photos G.10 and G.15), or upstream and downstream slopes (Photos G.11, G.12, G.16, and G.17). There is some localized erosion on the upstream slopes where PK was formerly discharged over the dam crest (Photos G.14, G.18, and G.19). However, the

scour is isolated to the deposited PK and not the underlying dam superstructure. There are no concerns related to the dams' integrity or performance.

Windblown PK was noted on the downstream slopes of both the East (Photo G.13) and Southeast dams (Photos G.13 and G.17). The PK deposition is limited to the downstream slopes and a width of 5 m to 10 m from the downstream toe. Deposition on the tundra is discontinuous and is typically in the order of 20 mm thick where observed.

Discussion

Overall, the dams are in good condition and no significant issues were noted. The reason for the temperature increase in the Southeast Dam key trench is unknown; however, the temperatures fall within historical fluctuations and typical permafrost temperatures at Jericho Mine. The dams are generally performing within designed parameters and no immediate remedial action is required.

7.1.3 Saddle Dam

The Saddle Dam is located at the south end of Cell A, as shown in Figure 2. Inspection photographs for the Saddle Dam are shown in Photos G.20 to G.22.

The Saddle Dam is intended to prevent tailings migration through a low spot in the PKCA topography and was constructed in September 2007. The design consists of a till berm keyed into a till foundation. The berm contains a geosynthetic clay liner to function as a seepage barrier. The design elevation of the liner crest is 524.0 m, with the finished top of the dyke at 525.0 m. An as-built survey was completed by SAS in 2007, and the drawings were reproduced in Figure G.12.

The dam slopes (Photos G.20 and G.21) and crest (G.22) are in good condition with no indication of instability or erosion. There was no water impounded against the structure at the inspection, and it appears as though the dam has never impounded water. There are no issues with the structure and no immediate action is required.

7.1.4 Divider Dyke A

Divider Dyke A divides the PKCA into two areas, as shown in Figure 2. FPK is deposited upstream (east) of Divider Dyke A and the area downstream of the Divider Dyke is used as a polishing pond for the PKCA water. Inspection notes and site photographs are presented on Figure G.13 and Photos G.23 to G.26.

The dyke consists of a sand and gravel filter zone, supported by rockfill superstructure. The filter is protected with a layer of rip-rap on the upstream side. The dyke design is documented in EBA 2005d. The divider dyke has not been fully constructed to design elevation. The rockfill superstructure crest is at the design elevation of 524 m; however, the filter zone of the dyke has only been brought to an elevation of 521.5 m. As-built drawings were prepared by SAS and have been reproduced in Figures G.14 and G.15.

Localized migration of fines through the dyke was observed by Tahera in the fall of 2007. In an attempt to mitigate the migration of the fines, a layer of coarse PK was placed on the lower portion of the dyke face (Photo G.26). Subsequent inspections indicated the dam was performing well and no further problems were noted.

Surface Water and Seepage

The downstream water elevation was estimated to be approximately 1 m higher than the 2011 water levels. This corresponds to a water elevation of 517.7 m. This is within 0.5 m of the spill point through the North Cofferdam. Water was impounded against the upstream face of the dyke at the time of the inspection (Photo G.26). The

2014 water elevations appear approximately 0.5 m to 1.0 m higher than the elevations indicated on the 2011 photograph records.

Stability and Settlement

The dyke crests and slopes appear to be in good condition with no signs of distress noted (Photos G.23 through G.25).

Discussion

Overall, the divider dyke is in good condition and no significant issues were noted.

7.1.5 North Cofferdam

The North Dam is a frozen core dam located on the north side of Cell A, at the location of the North Cofferdam shown in Figure 2. The dam was scheduled to be completed during operations, when water levels in the PKCA were expected to rise above the spill point through the North Dam's alignment (approximately 518.2 m). The design was completed by Tetra Tech EBA (EBA 2007b) and consists of a frozen core dam with an upstream till berm similar to the West Dam. The core consists of frozen saturated gravel keyed into the foundation soils with secondary containment provided by a geosynthetic clay liner. The core material is designed to remain in a frozen condition year round, providing the primary water seepage barrier.

During operations, the upstream till berm was constructed to provide temporary containment in the event of an unexpected water rise. This is the structure that exists at present and is referred to as the North Cofferdam. Site observations and photographs of the North Cofferdam are provided in Figure G.16 and Photos G.27 through G.30.

Water was impounded directly against the upstream face of the cofferdam during the inspection. The water level was comparable to the 2011 inspection and is estimated to be at elevation 517.7 m. Water was also noted downstream of the cofferdam (Photo G.30). The ponded water was below the high water mark and the volume was very small compared to the 2011 photo record. The upstream and downstream water elevations are estimated to be within 0.1 m of each other; therefore, there is little head across the cofferdam.

The cofferdam crests (Photo G.27) and sideslopes (Photos G.28 and G.29) are in good condition with no signs of distress noted.

Overall, the North Cofferdam is in good condition with no significant issues noted. No immediate remedial action is required at this time.

7.2 C1 Diversion

The C1 Diversion was constructed to divert water from the natural C1 stream around the open pit and into Carat Lake, as shown in Figure 5. Site observations are discussed in the following sections. Summary photographs and figures are provided in Appendix H.

The C1 Diversion consists of three reaches: Reach A, Reach B, and Reach C. Reach A collects flow from C1 Lake, routing it through a low-lying inlet area (Photo H.1, H.2) and into a rock cut (Photo H.5). The C1 diversion design was completed by Tetra Tech EBA and is documented in EBA 2005c. The inlet portion of Reach A is lined with an HDPE liner to promote flow into the rock cut. Reach B is a steep, rip-rapped channel intended to transfer flows from Reach A to Reach C (Photo H.9). Immediately upstream of Reach B is a 900 mm diameter culvert, which passes flow under Carat Lake Road. Reach C is a wide channel flanked by two granular berms with frozen

sand and gravel cores to contain high flow events (Photo H.9 and H.10). Low flows meander between the granular berms. Spurs were constructed in Reach C to slow high freshet flow volumes, which were encountered in the first year of operation.

Construction of the C1 diversion began in the summer of 2005 with the blasting of the Reach A rock cut. The remainder of the diversion was constructed during the winter of 2005/2006. The C1 diversion construction is documented in EBA 2011 and select construction record drawings have been reproduced in Figures H.2 and H.3.

Stability and Settlement

Cracking and settlement was observed in the Reach A inlet fill pad, consistent with observations made in previous inspections (Photos H.3 and H.4). A portion of the rip-rap on the east side of the Reach A inlet is also sloughing near the channel edge (Photo H.3). The instability is localized and does not appear to have worsened from the 2011 inspection.

The rock cut in Reach A is performing well with no significant areas of instability noted (Photo H.5 and H.6). Some rock fall was noted in the channel base (Photo H.7), and a check dam has been constructed near the north end of the reach (Photo H.8). Neither of these features is significantly impeding flow through the channel.

Longitudinal cracking was observed at several locations in the Reach C north berm. This is likely a result of settlement of the till material used to construct the berm core (Photo H.15). The cracking is consistent with observations made in previous inspections and does not appear to be impacting the performance of the berm. The berm slopes appear to be in good condition with no problems noted (Photo H.14).

The spurs in Reach C are generally in good condition. Geotextile is exposed on the final spur in Reach C (Photo H.12); however, this does not appear to be impacting their performance.

Surface Water and Seepage

Water was flowing through the diversion at the time of the inspection. The volume was relatively small, but it was sufficient to generate flow through the inlet structures, Reach A and Reach C. Water in Reach B was flowing through the rip-rap cover and was not observed.

No seepage was noted along the downstream slope of the Reach C north berm. Water was flowing through the reach as intended. The flow path through a large portion of Reach C is undefined, with several flow branches and laminar overland flow (Photo H.11). The flow becomes more channelized towards the lower end of the reach where natural scour has developed a preferred flow path (Photos H.12 and H.13). The spurs encourage some flow away from the inside toe of the north berm; however, the berms are not watertight and a portion of the overland flow run through them.

A scour pool has developed around the final spur in Reach C (Photo H.13); the pool is relatively small and does not impact conveyance of water from Reach C to Carat Lake.

The culvert under Carat Lake Road is damaged at the inlet and outlet (Photos H.16 and H.17); however, it does not appear to be impeding culvert performance at this time.

Discussion

Overall, the C1 Diversion is performing as intended. The culvert inlet may be restricting flows somewhat, but does not pose an immediate threat to the diversion performance.

Some areas of local instability were observed in each of the reaches. None of these areas pose an immediate threat to the diversion performance and should be monitored as part of subsequent site visits. Closure design should take into account long-term-performance of the following areas:

- Settlement in Reach A inlet fill pad;
- Sloughing near channel in Reach A inlet; and
- Cracking in north berm (Reach C).

7.3 Coarse Processed Kimberlite and Waste Rock Piles

A visual assessment of the coarse PK stockpile and the waste rock piles was completed. Site photographs are provided in Appendix I.

7.3.1 Coarse Processed Kimberlite

Coarse PK is a waste product generated during ore processing. It comprises gravelly sand and represents approximately 81% of the total PK by mass (EBA, 2006). The coarse PK is stored in a stockpile east of the process plant as shown in Figure 3.

Material testing was completed by Tetra Tech EBA in 2006 and reported in the PKCA Management Plan (EBA, 2006). Testing included particle size analyses, specific gravity, permeability, micro-deval abrasion, and moisture density relationship. The testing results have been reproduced in Appendix I.

The coarse PK properties were found to be variable depending on whether they included finer particles from the process plant high pressure grind circuit (HPGR). The material that contains the HPGR feed is a well graded coarse sand with some fine gravel and traces of silt. Material without the HPGR feed is a uniformly graded medium sand with some fine gravel. During operations, the HPGR circuit was run on a part time basis; therefore, material contained in the coarse PK pile can be expected to be a blend of these two materials.

The hydraulic conductivity of the material at a density of 95% maximum dry density (as determined by ASTM 698) was measured to be 1.4×10^{-2} cm/s. Micro-Deval Abrasion tests on oven dried (110°C) samples showed a loss of 11% and 15% for coarse and fine aggregate, respectively.

Pile Condition

The coarse PK pile has been constructed in two lifts, with sideslopes at the angle of repose (estimated to be 1H:1V). Exposed waste rock was visible on the east side of the pile, suggesting a basal granite layer underlying the coarse PK (Photo I.4). The exposed granite is estimated to be between 0.3 and 1 m thick.

The coarse PK pile encroaches on the East Sump, located on the north side of the pile (Photo I.1). The sump is intended to capture any run off from the pile, prior to its release to the environment.

Overall the coarse PK pile is in good condition. There is no evidence of significant instability, pile settlement, or erosion in most areas (Photo I.2 and I.3). Some sloughing of the slopes was observed at the slope contact with the East Sump (Photo I.5). This does not appear to be causing an immediate threat to the overall stability of the coarse PK pile.

There are no issues or concerns with the coarse PK pile that require immediate attention.

7.3.2 Waste Rock Pile

The waste rock pile is located east of the pit, as shown in Figure 5. The waste rock pile is located largely on IOL; however, a small portion of the pile falls on AANDC land. This portion of the pile was inspected as part of the site work. Inspection photographs are provided in Appendix I (Photos I.6 to I.9).

The waste rock pile was constructed in lifts, with sideslopes constructed at the angle of repose (estimated to be 1.5H:1V). The initial base lift was approximately 5 m, followed by single lift to the current pile elevation.

The crest and slopes of the waste rock pile were observed for signs of instability and none were noted. The waste rock pile is in good condition and no remedial work is required at this time.

7.4 Roads and Pads

7.4.1 Roads

There are four main roads on AANDC land which are shown in Figure 1. Access to the winter road take-off and emulsion building are on IOL and were not inspected as part of the investigation. With the exception of the airport road, all site roads have been constructed with waste rock and capped with surfacing material. The airport road is constructed of esker material, sourced from borrow areas near the airstrip. Fill thicknesses vary depending on local topography and grade requirements. The existing road network is summarized in Table 7.4-1 and select photos are in Photo J.1 to J.4.

Table 7.4-1: Roads

Road	Approximate Length (km)	Crossings
Airport Road	3.1	5 – CSP crossings
Carat Lake Road	2.1	1 – 900 mm dia. CSP at C1 Diversion Crossing
PKCA Roads	1.3	None identified
Ring Road	1.4	1 – 406 mm dia. CSP at East Sump

Five culvert crossings were identified along Airport Road. The crossings are summarized in Table 7-5.

Table 7.4-2: Airport Road Culvert Crossings

Culvert ID	Northing (m)	Easting (m)	Description	Condition
1	7,320,164	478,884	1 – 406 mm dia. CSP culvert	Good condition, no flow obstruction
2	7,320,518	478,925	1 – 305 mm dia. CSP	Slight damage to inlet, outlet submerged
3	7,320,668	478,997	1 – 508 mm dia. CSP	Good condition, no flow obstruction
4	7,321,002	478,938	1 – 406 mm dia. CSP	Slight damage to inlet, does not impact performance
5	7,321,308	478,946	2 – 406 mm dia. CSP, staggered elevations	Lower outlet damaged, flow still passes through

Overall, the roads are in fair to good condition. Potholes and rutting are visible in several locations; however, these do not significantly impact the trafficability of the roads. No significant issues with instability or settlement were observed. The culverts along the airstrip road are in good condition and appear to be functioning adequately. No significant problems or concerns were noted.

7.4.2 Pads

The pad locations are detailed in Section 3.1.7. The pads have been constructed with esker material or waste rock material. Generally, the pads near the airstrip (airstrip apron, reclaimed Carat camp, Carat Lake laydown) have been constructed with either esker material, or directly on the ground surface. Pads near the main camp area have been constructed with waste rock. Photos are shown in Photo J.5 to J.9.

All pads are in good condition with no significant stability or settlement issues noted.

The low grade stockpile area contains several ore stockpiles. These stockpiles do not cause a concern from a geotechnical perspective, but may warrant closure consideration as part of the overall site aesthetics.

7.5 Berms and Containment

Berms and containment areas were visually assessed. Site observations and related figures and photos are provided in Appendix K and discussed in the following sections.

7.5.1 Tank Farm

The primary tank farm for Jericho Mine is located at the main camp area, as shown in Figure 3.1. The tank farm is currently divided into two areas: Phase 1 and Phase 2 (Photo K.1). The Phase 1 area was constructed in winter 2004/2005 and Phase 2 was constructed between May and October 2005. The Phase 1 area contains eight 500,000 L tanks (AST 1-8) and a 62,000 L AST, and Phase 2 contains of four 1,500,000 L tanks (AST 9 – 12).

Both tank farm containment areas are lined with a 60 mil HDPE liner for secondary containment. Tetra Tech EBA understands that the base of the Phase 1 area was constructed of frozen esker fill, while the base of the Phase 2 tank farm was constructed of run-of-mine rockfill.

7.5.1.1 Phase 1 Area

Observations

Ponded water was observed in most of the Phase 1 area during the inspection, as shown in Photo K.2. Tetra Tech EBA understands that AANDC was planning to dewater the tank farm area, pending completion of water quality testing.

Stained soil was observed in areas not inundated with water, consistent with past inspections (Photo K.3). The staining is considered to be related to past events and not a recent release.

Settlements of up to 40 mm have been observed under the tanks in previous inspections; however, the existing condition could not be assessed due to the water in the containment area. Berm settlement was observed in the northeast corner of the tank farm (Photo K.4) as shown in Figure K.1. The settlement does not appear to be impacting the performance of the structure; however, if the liner crest at any point is lower than the design elevation, the capacity of the containment facility will be reduced.

An area of exposed liner was noted on the west berm adjacent to Tank 1 (Photo K.5). The exposed liner was located near the berm crest, but does not appear to be impacting on the berm performance.

A 600 mm level was used to check the approximate list of the tanks in the facility. The list appears to contain measurements made during previous inspections; however, the method used is not considered accurate enough for a direct comparison to be made.

Discussion

At present, there are no immediate geotechnical concerns with the Phase 1 tank farm; however, some assessment would be required if the tank farm were to be put back into service. The integrity of the tanks should be evaluated if they were to go back into service; however, their current condition appears consistent with past inspections and there is no immediate cause for concern.

The liner integrity could not be visually assessed; however, soil testing results show hydrocarbons outside the containment boundary. This suggests either some leaking from the tank farm (Phase 1 or Phase 2) or spills from fuelling or other activities.

A survey of the berm crest should be completed, if the Phase 1 area will be used to store additional fuel, to evaluate if the liner crest elevation has been lowered. A survey of the tanks should also be completed to accurately assess the list angles.

7.5.1.2 Phase 2 Area

Observations

The berms around the Phase 2 area appear to be in good condition (Photos K.6 and K.7). No areas of settlement or other distress were noted.

The Phase 2 area was full of water at the time of inspection, limiting what could be visually assessed; however, gaps of up to 50 mm were visible under Tanks 9 and 10, consistent with the 2011 inspection.

Drums have been stored inside the perimeter of the Phase 2 area. Tetra Tech EBA understands that hydrocarbon contaminated snow was placed in drums which were then placed in the facility. One set of drums was covered and appeared intact. The other set was exposed (Photo K.8).

Discussion

The tanks and containment area appear to be functioning adequately. No remedial action is required at this time.

7.5.2 Generator Tank Containment Area

One 64,000 L fuel tank (AST #18) is located adjacent to the generator area at the plant site (Photo K.9), as shown in Figure H.1. The tank is contained by a lined berm containment area covered with a layer of crushed gravel.

The perimeter berms were inspected and no signs of instability or distress were noted (Photos K.10 and K.11). Similarly, the tank appears to be in good condition and functioning adequately. A low spot in the berm was observed, consistent with previous inspections (Photo K.10).

The depression in the berm could reduce the secondary containment volume of the berm. The secondary containment volume should be assessed if the tank is to be put back in service.

7.5.3 Airstrip Tank Containment Area

Two 64,000 L fuel tanks are located adjacent to the airstrip apron within a lined containment area (Photo K.12). The secondary containment liner is covered with a layer of crushed gravel. No signs of berm instability were found (Photos K.13 and K.14) though some exposure of the HPDE liner was present during the inspection. Figure K.3 shows the current condition of the airstrip tank containment area.

It is understood that a fuel spill occurred within the containment area in the winter of 2006/2007. Stained soil is present inside the base of the containment area. The current inspection deals only with the geotechnical issues of the containment area and does not address the fuel spill.

Shear began constructing a fuel transfer area next to the airstrip tanks in 2012. The area immediately north of the berm was sub excavated and backfilled with 150 mm minus crush in preparation for liner placement (Photo K.15). The work was not completed prior to Shear's departure from Jericho Mine.

The containment area appears to be performing satisfactorily. No remedial action is required at this time.

7.5.4 Hazardous Waste Transfer Area

Construction History

The HWTA is a HDPE lined facility used for the temporary storage of hazardous waste prior to disposal or transfer off site. The facility was constructed by Tahera; however, details pertaining to the facility construction are limited. The current HWTA condition is shown in Figure K.4.

The facility comprises two cells separated by a center berm. Site observation indicates the liner system comprises a HDPE liner placed between layers of nonwoven geotextile. The containment berms appear to be constructed of esker and crush material.

Containerized debris is contained in both cells. Approximately, 1,700 m^3 of hydrocarbon impacted soils have also been stored in the northeast corner of the west cell. Tetra Tech EBA understands that this contaminated soil is from former spills occurring around the airstrip.

Previous inspections have noted several issues with liner integrity in both cells. In 2012, Shear began preparations to reline the east cell of the HWTA. All debris, with the exception of several ASTs, were moved to the west cell. The berms on the east cell were raised and coarse PK was placed on the cell floor. The current condition of the cell is shown in Photo K.16. The work to reline the cell was not completed prior to Shear's departure from Jericho Mine.

Surface Water and Seepage

Some standing water from recent rainfall events was present in the cells; however, not in significant enough quantities to prevent inspection.

No visible seepage outside the containment berms was noted.

Stability and Settlement

The berms appear to generally be in good condition with no areas of instability noted (Photos K.16 and K.17).

Several liner perforations were noted inside the west cell at 0.3 m above the liner base or higher (Photos K.18 and K.19). A large perforation was noted on the southwest berm at the location shown in Figure K.4. A patch

was placed over the hole; however, the patch was not welded and is therefore ineffective. The existing liner condition in the east cell could not be evaluated due to the construction work undertaken by Shear; however, previous inspections have noted several perforations in the east cell liner as well.

Discussion

The liner integrity in the HWTA is compromised. The area should be decommissioned as part of the closure planning, or repaired if there is a requirement to maintain its use in the long term.

7.6 Open Pit

The pit is located south of Carat Lake, as shown in Figures 1 and 5. The pit is approximately 450 m in diameter and 80 m deep at its lowest point (elevation 408.2 m). The pit water elevation was 435.4 m at the time of inspection. Site photos and inspection figures are provided in Appendix L.

The pit is largely excavated in bedrock. Exposed surface bedrock is visible along the southern and eastern edges of the pit (Photos L.1 through L.3). Some overburden is present on the west side of the pit (Photos L.4); however, the first bench appears to be largely seated in rock.

The pit ramp is in good condition, with minor erosion from surface flow (Photo L.6). Some blocky rock structure is observed in the pit walls, and some small rock fall has occurred along the toe of the ramp.

There are localized areas where blocky material has formed a small rubble slope (Photo L.5); however, these areas do not appear to be indicative of large scale instability. There is an area of sloughing overburden on the west side of the pit, near the confluence of the Carat Lake and Ring Roads (Photo L.4 and Figure L.1). The bedrock at this location appears to be slightly deeper (in the order of 5 to 6 m) than the rest of the pit and may correspond to the original C1 stream path. Overburden material at this location has spilled onto the second bench as shown in Figure L.1 and Photo L.4. The area appears consistent with previous inspection records and is not a significant stability concern.

A pit profile is provided in Figure L.2. The profile shows the existing pit profile, as well as the original pit design limits. The water depth at elevation 435.4 m is estimated to range from 5 m to 25 m deep, with a corresponding volume of 487,000 m^3.

The pit is generally stable in the short term; however, the long-term stability should be evaluated as part of the pit closure design, particularly during pit filling.

8.0 BORROW SOURCES

Potential borrow sources were evaluated during the investigation. Site photographs and laboratory test results are provided in Appendix M.

8.1 Existing Borrows

Two borrow sources, referred to as Borrow A1 and A2, were developed during mine construction and operation. The borrow areas were located near the airstrip as shown in Figure 6. Both areas were excavated approximately 1 m to 2 m below the ground surface. The existing borrow condition is shown in Photos M.1 through M.6.

Useable near surface material containing gravel and cobbles was exhausted in both borrows, leaving clean sand in the excavation base. Some cobbles and gravel remain in isolated spots (Photo M.4); however, there is likely insufficient quantity to be further developed during closure.

The existing borrow condition is generally good. Some thermokarst ponds have developed in both borrow areas (Photo M.1 and M.5); however, these are not threatening to the stability of the area. Former ice wedges can be seen in the floor of Borrow Area A.1 (Photo M.2 and M.3). There are no drainage courses in or out of the borrow areas. The water that does accumulate is likely a result of precipitation within the borrow itself.

There are no immediate geotechnical concerns regarding the condition or the borrow areas. Future mine closure planning should consider grading for aesthetics and to promote positive drainage within the borrow areas.

8.2 Till Stockpile

A significant quantity of till was stockpiled in the waste rock pile during operations. The till stockpile is shown in Photos M.7 through M.9 and on Figure M.1. The till stockpile can be roughly divided into two areas: the western portion comprises relatively clean till stockpiled during stripping; in the eastern portion some waste rock was co-disposed with the till.

Two till samples were taken at the locations shown in Figure M.1. Particle size analyses completed on the samples showed the material to comprise sand and gravel with fines contents ranging from 20 to 30%. Lab results have been included in Appendix M.

Till material was also used during construction of the West Dam. Construction records indicate the material generally had a top size of 300 mm. Particle size analyses completed on the 50 mm minus faction indicate the material consists of sand and gravel, with an average fines content of 20%, similar to the samples taken in 2014.

The till could be used as a borrow source for construction. The pile is anticipated to be frozen below the active layer. Some sorting will likely be required to remove oversize; however, the material is readily available and is preferable to developing a quarry. The till is stockpiled on IOL and permission would be required to access this material. The till volume is estimated to be 500,000 m^3, based on a preliminary review of the survey data. This volume will be refined upon detailed review of the survey data.

8.3 Waste Rock

The waste rock pile is a source of granite for use in reclamation activities. In its present state, the material could be sorted and used for rip-rap or armouring. The material could also be processed to develop engineered fill for specific applications.

Most of the waste rock is located on IOL, similar to the till pile. Test results at Jericho Mine indicate relatively few concerns with respect to acid-rock drainage concerns (EBA 2011d). Overall, use of the till and coarse PK is preferred as a borrow material.

8.4 Coarse Processed Kimberlite

Coarse PK could be used in some applications for use as a separator or filter material. The material properties are summarized in Section 7.3 and Appendix I.

8.5 Quarry

New areas could be quarried and used as a borrow source for both till and granite; however, there are sources of both material available on site. The use of the existing materials would likely be more economical than developing a quarry and would eliminate the disturbance footprint associated with quarry development.

9.0 POTENTIAL LANDFILL AND LANDFARM LOCATIONS

Potential landfarm and landfill locations were investigation as part of the site investigation. Four potential sites were identified and are shown on Figures N.1 and N.2. Photographs of each site are also provided in Appendix N.

The Jericho Mine requires a landfill site for the disposal of the non-hazardous materials. A dry environment is preferred to limit water migration into and out of the landfill materials.

The landfarm is necessary for bioremediation of the PHCs identified by the contaminated soil assessment. Landfarms require a relatively large footprint to provide enough area for proper aeration of the soil. Construction near water bodies should be avoided to prevent PHCs from entering local waterways.

Potential sites were selected on AANDC land with the condition that they be close to the tank farm and the main camp facility, which will be the main source of waste and contaminated soil. Required volumes have not been confirmed and the proposed sites will need to be developed in a subsequent stage of the remedial action plan.

9.1 Site 1

Site 1 is located east of the camp area as shown in Figure N.1, and in Photos N.1 to N.6. Site 1 would be suitable for either a landfill or landfarm; however would require significant grading and fill to construct a landfarm in the area.

The site is located on a local topographic high with exposed bedrock over much of the site. Two test pits were excavated in overburden soils, as shown in Figure N.1. Till overburden consists of sand and gravel with fines contents ranging from 30 to 40%. This is slightly higher than fines content measured in other till samples; however, the sample size is relatively small.

There is a small ephemeral pond located within the landfill footprint which would be filled. Surface drainage is through one of two low areas on the north side of the site. It would likely be possible to direct all runoff through one location by constructing a water control structure.

Site 1 is a preferred area for a landfill because of its close proximity, large area, exposed bedrock, and limited flow.

9.2 Site 2

Site 2 is located adjacent to the east sump area, as shown in Figure N.1 and photos N.7 to N.8. Site 2 would be suitable for a landfarm; however, its size is restrictive.

A portion of the coarse PK pile could be excavated to provide additional footprint and the material used as fill. Surface drainage would be maintained within the C1 catchment area and would be directed towards the low grade ore stockpile.

Site 2 has the disadvantage of being relatively small.

9.3 Site 3

Site 3 is located on the low grade ore stockpile area, as shown in Figure N.1 and Photos N.9 and N.10. The stockpile area comprises a minimum 3 m of waste rock fill and would be a good location for a temporary structure such as a landfarm.

The precise landfarm size may require some movement of existing stockpiles; however, the area could be readily graded to provide the necessary slopes within the facility.

Site 3 is a preferred location because of its relatively large area. It would also not involve disturbing any new land.

9.4 Site 4

Site 4 is located north of the low grade ore stockpile as shown in Figure N.2 and Photos N.11 to N.14. The site would be suitable for a landfill or landfarm; however would require grading and fill to make it suitable for a landfarm.

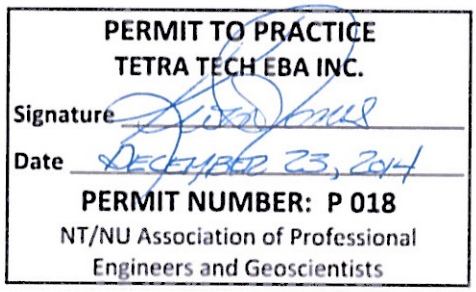
The landfill would be situated within the pit catchment area such that all runoff would be directed to the pit. Site 4 is the smallest of all sites, and the suitability of this location would be dependent on the expected debris volume, and any potential stability concerns with its proximity to the pit.

Site 4 has the disadvantage of being small. Drainage of potential PHCs into the pit is also not considered favourable.

10.0 CLOSURE

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
Tetra Tech EBA Inc.



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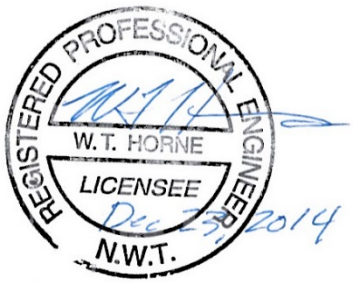

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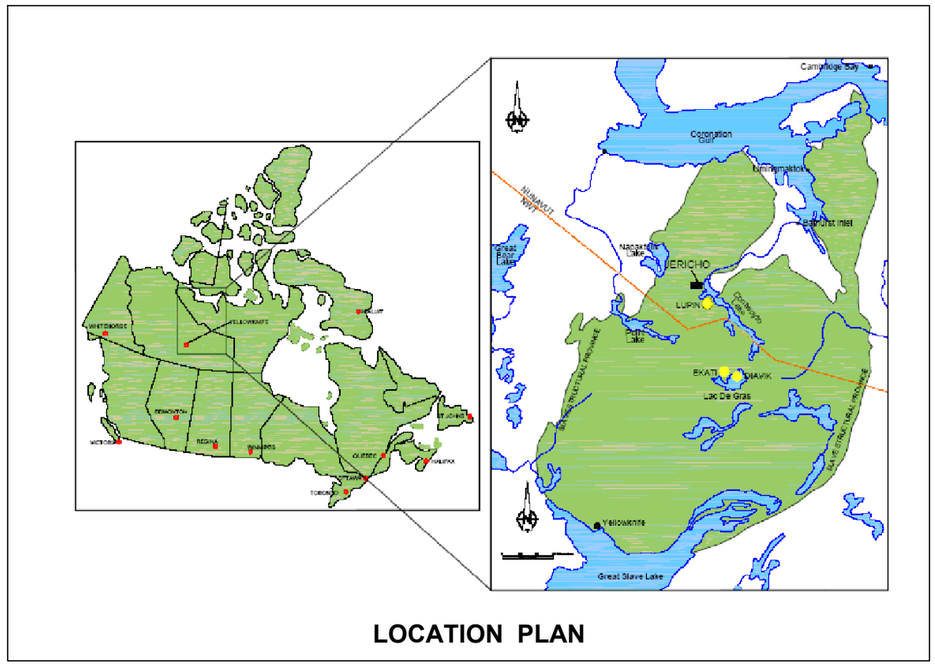
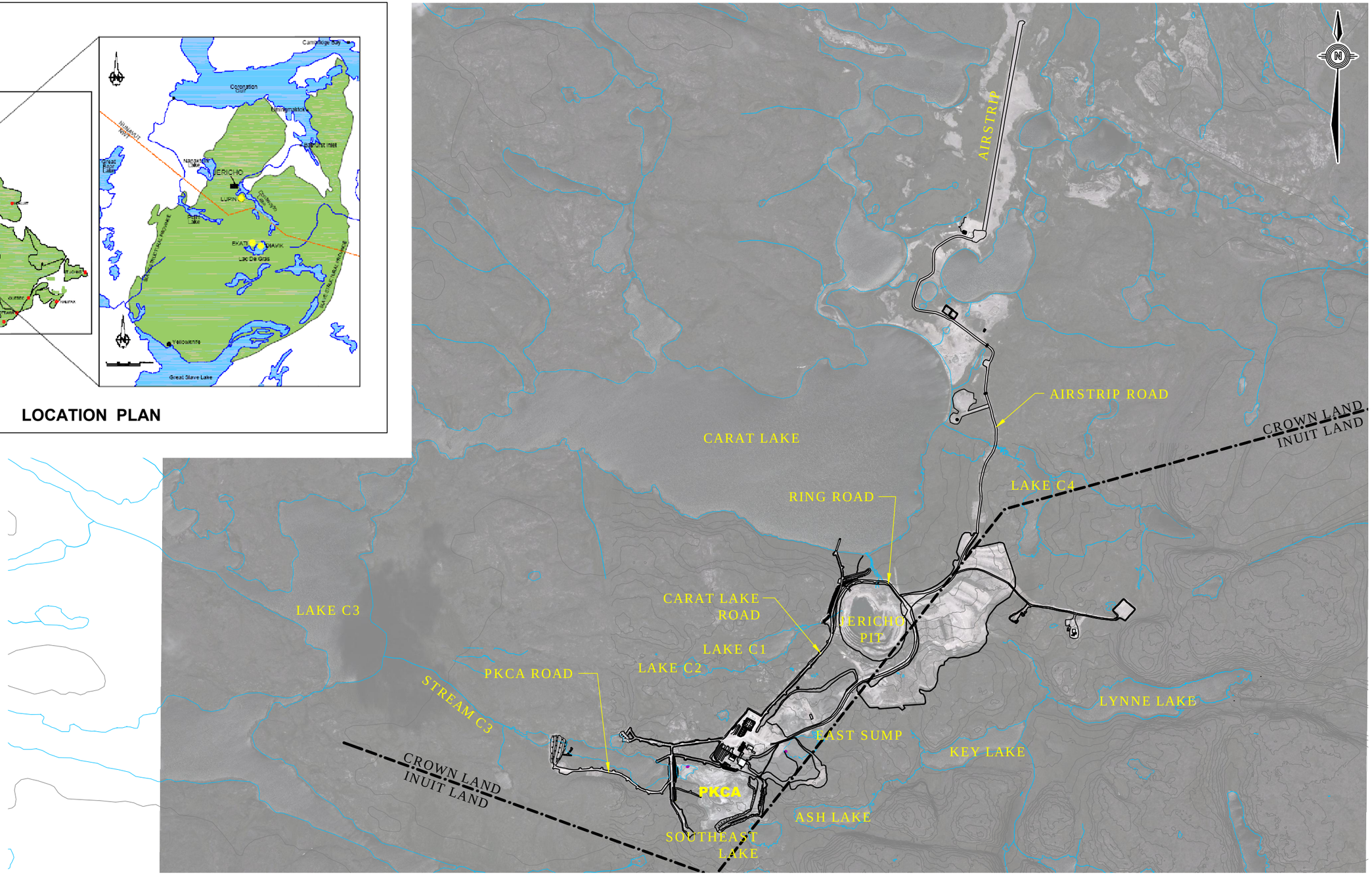
FIGURES

Figure 1 Site Overview
Figure 2 Processed Kimberlite Containment Area
Figure 3 Main Site and Coarse PK Pile
Figure 3.1 Main Site Tank Farm and Laydown Area
Figure 3.2 Main Site Infrastructure
Figure 4 Low Grade Stockpile
Figure 5 Pit and Waste Rock Piles
Figure 6 Carat Lake Infrastructure
Figure 7 Airstrip Area
Figure 7.1 Terminal Building Area
Figure 8 Water Sampling and Drainage Pathways



LOCATION PLAN



0 1,000m

Scale: 1:25,000 @ 11"x17"

NOTE:
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STATUS
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CLIENT

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Closure Assessment
Jericho Diamond Mine, Nunavut

OVERALL SITE PLAN

TETRA TECH EBA

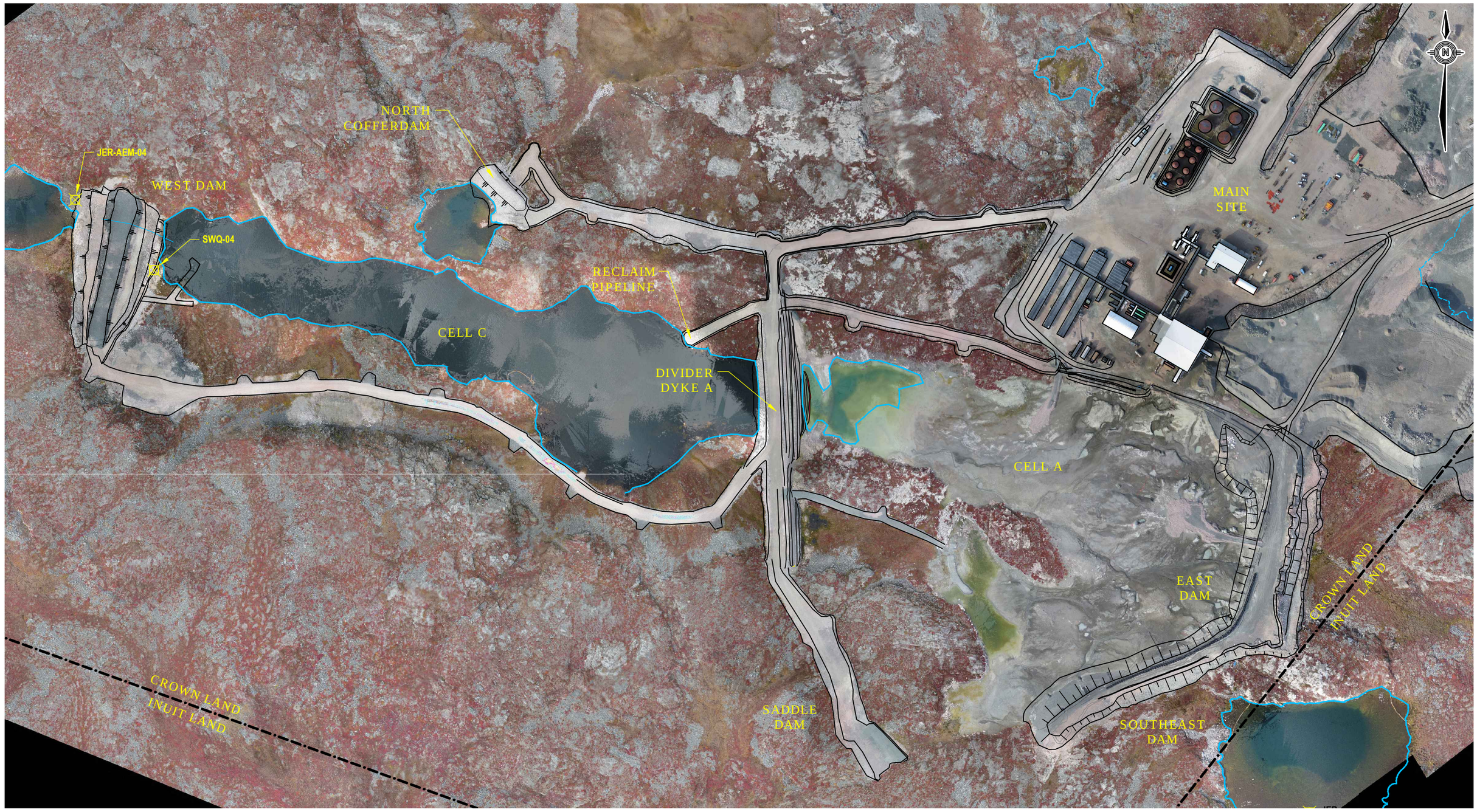
PROJECT NO.	DWN	CKD	REV
E14103202	GDK/DBD	WTH	0

OFFICE: EDM

DATE: December 2014

Figure 1

Q:\Edmonton\Engineering\E1411\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA2.0 Producton Drawings\ESA Figures_Figure 1.dwg [FIGURE 1] December 16, 2014 - 9:41:48 am (BY: STIRLING, JENNIFER)



LEGEND:

- JERICHO SURFACE SAMPLE LOCATION

0 200m

Scale: 1:4,000 @ 11"x17"

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Jericho Diamond Mine, Nunavut

PROCESSED KIMBERLITE CONTAINMENT AREA

TETRA TECH EBA

PROJECT NO.	DWN	CKD	REV
E14103202	GDK/DBD	WTH	0

OFFICE	DATE
EDM	December 2014

Figure 2

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Site Plans.dwg [FIGURE 2] December 15, 2014 - 2:58:57 pm (BY: STIRLING, JENNIFER)

LEGEND:

- JERICHO SURFACE SAMPLE LOCATION

0 100m

Scale: 1:2,500 @ 11"x17"

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Closure Assessment
Jericho Diamond Mine, Nunavut

MAIN SITE AND COARSE PK PILE

TETRA TECH EBA

PROJECT NO.	DWN	CKD	REV
E14103202	GDK/DBD	WTH	0

OFFICE: EDM
DATE: December 2014

Figure 3

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Site Plans.dwg [FIGURE 3] December 15, 2014 - 3:00:06 pm (BY: STIRLING, JENNIFER)

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0 50m
Scale: 1:1,000 @ 11"x17"

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Closure Assessment
Jericho Diamond Mine, Nunavut
MAIN SITE TANK FARM AND LAYDOWN AREA

PROJECT NO.	DWN	CKD	REV
E14103202	GDK/DBD	WTH	0

OFFICE: EDM
DATE: December 2014

Figure 3.1

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Site Plans.dwg [FIGURE 3.1] December 15, 2014 - 3:01:04 pm (BY: STIRLING, JENNIFER)

0 50m

Scale: 1:1,000 @ 11"x17"

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Jericho Diamond Mine, Nunavut

MAIN SITE INFRASTRUCTURE

PROJECT NO.	DWN	CKD	REV
E14103202	GDK/DBD	WTH	0

OFFICE	DATE
EDM	December 2014

Figure 3.2

Q:\Edmonton\Engineering\E14\1Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Site Plans.dwg [FIGURE 3.2] December 15, 2014 - 3:01:52 pm (BY: STIRLING, JENNIFER)

LEGEND:

- JERICHO SURFACE SAMPLE LOCATION

0 100m

Scale: 1:2,500 @ 11"x17"

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Jericho Diamond Mine, Nunavut

LOW GRADE STOCKPILE

TETRA TECH EBA

PROJECT NO.	DWN	CKD	REV
E14103202	GDK.DBD	WTH	0

OFFICE	DATE
EDM	December 2014

Figure 4

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Site Plans.dwg [FIGURE 4] December 15, 2014 - 3:03:22 pm (BY: STIRLING, JENNIFER)

JER-AEM-12
WATER INTAKE CAUSEWAY (JETTY)
JER-AEM-10
STREAM C1
C1 DIVERSION
RING ROAD
LAKE C4
N
SWQ-02
CROWN LAND
INUIT LAND
WASTE ROCK PILE
EXPLOSIVE MAGAZINES
EMULSION PLANT
JER-AEM-09
WASTE ROCK PILE
LOW GRADE STOCKPILE AREA

LEGEND:

- JERICHO SURFACE SAMPLE LOCATION

0 250m

Scale: 1:5,000 @ 11"x17"

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Jericho Diamond Mine, Nunavut

PIT AND WASTE ROCK PILES

TETRA TECH EBA

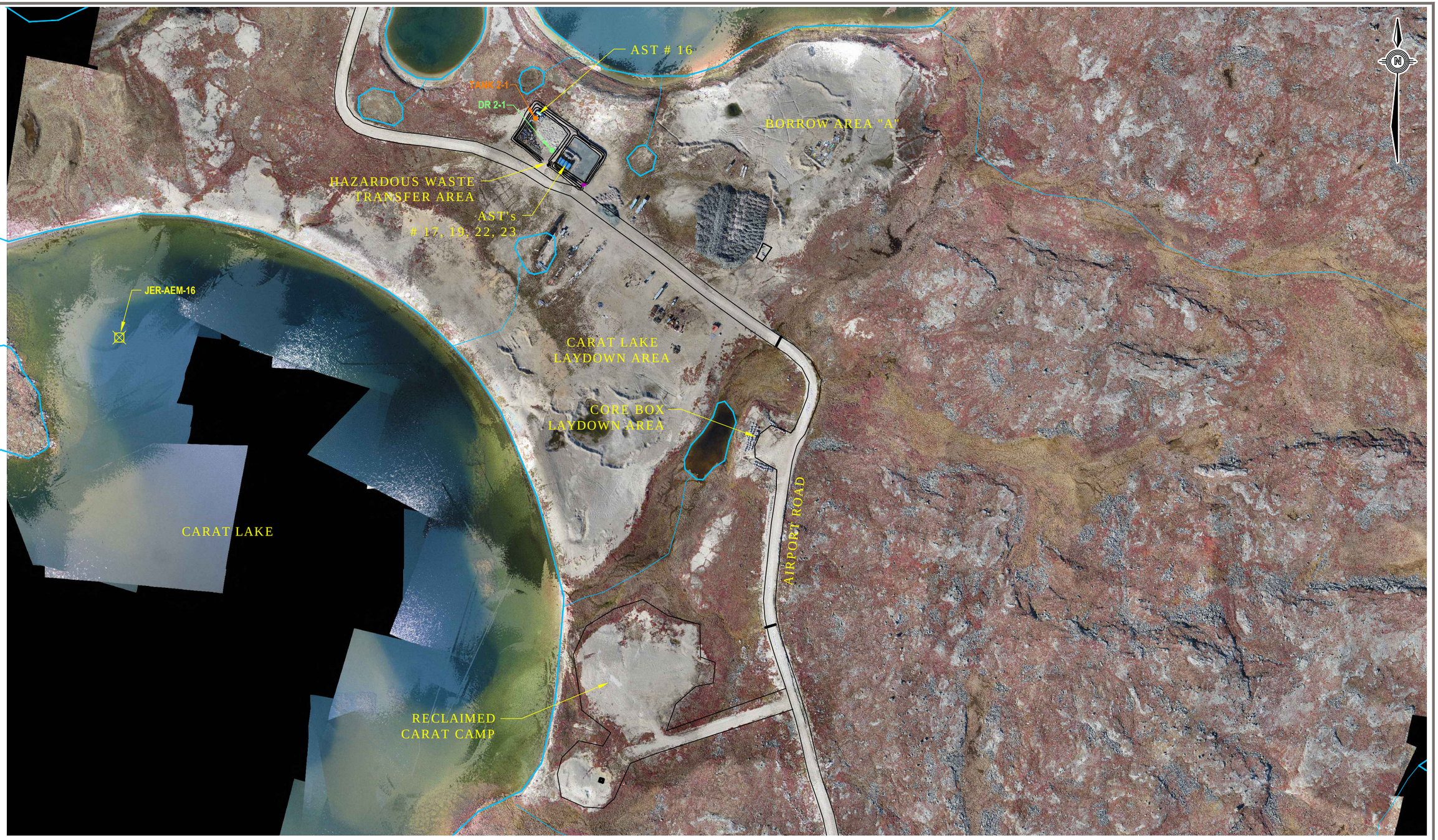
PROJECT NO.	DWN	CKD	REV
E14103202	GDK/DBD	WTH	0

OFFICE: EDM

DATE: December 2014

Figure 5

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Site Plans.dwg [FIGURE 5] December 15, 2014 - 3:04:05 pm (BY: STIRLING, JENNIFER)



LEGEND:

- JERICHO SURFACE SAMPLE LOCATION
- AST CONTENT SAMPLE LOCATION
- DRUM CONTENT SAMPLE LOCATION

0 200m

Scale: 1:4,000 @ 11"x17"

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Jericho Diamond Mine, Nunavut

CARAT LAKE INFRASTRUCTURE

TETRA TECH EBA

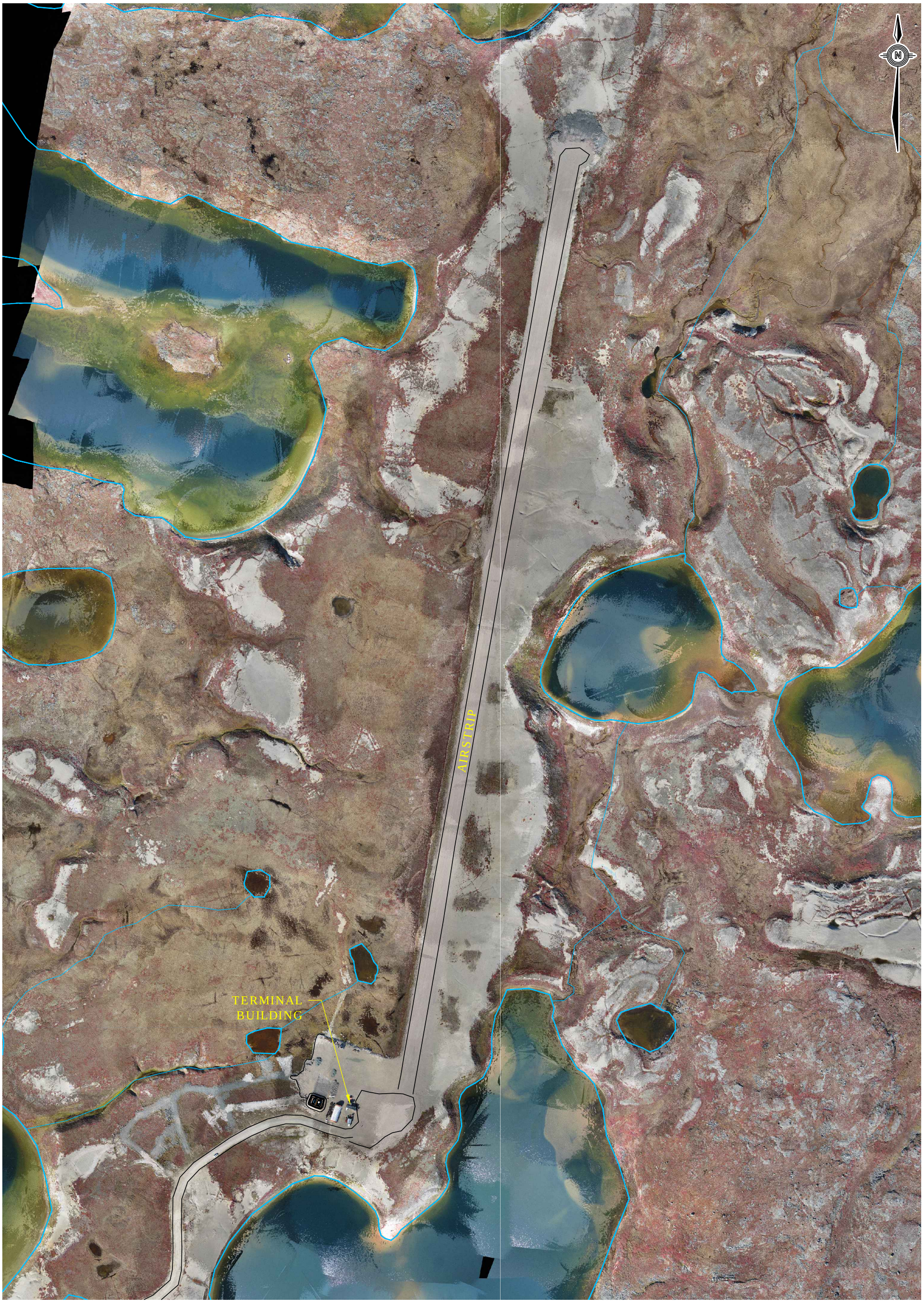
PROJECT NO.	DWN	CKD	REV
E14103202	GDK/DBD	WTH	0

OFFICE: EDM

DATE: December 2014

Figure 6

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Site Plans.dwg [FIGURE 6] December 15, 2014 - 3:04:46 pm (BY: STIRLING, JENNIFER)



NOTE:
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0 250m
Scale: 1:5,000 @ 11"x17"

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Aboriginal Affairs and Northern Development Canada

TETRA TECH EBA

Closure Assessment
Jericho Diamond Mine, Nunavut

AIRSTRIP AREA

PROJECT NO.	DWN	CKD	REV
E14103202	DBD	WTH	0

OFFICE	DATE
EDM	December, 2014

Figure 7

LEGEND:

- TOTAL LEAD PAINT SAMPLE

0 50m

Scale: 1:1,000 @ 11"x17"

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Closure Assessment
Jericho Diamond Mine, Nunavut

TERMINAL BUILDING AREA

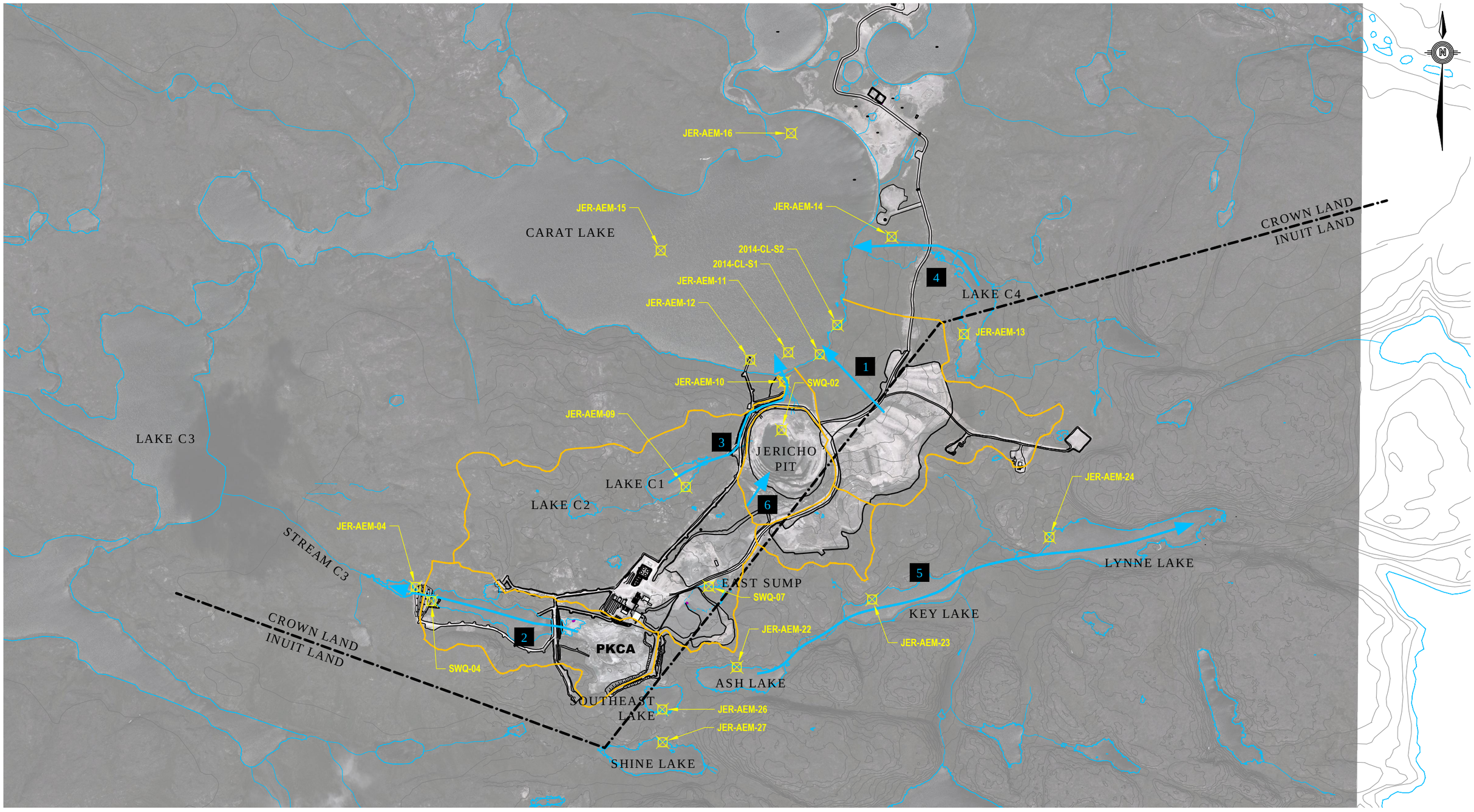
TETRA TECH EBA

PROJECT NO.	DWN	CKD	REV
E14103202	GDK/DBD	WTH	0

OFFICE	DATE
EDM	December 2014

Figure 7.1

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Site Plans.dwg [FIGURE 7.1] December 15, 2014 - 3:06:08 pm (BY: STIRLING, JENNIFER)



LEGEND:

- JERICHO SURFACE SAMPLE LOCATION
- CATCHMENT AREA

0 1,000m

Scale: 1:20,000 @ 11"x17"

DRAINAGE PATHWAYS:

1. WASTE ROCK SEEPAGE TO CARAT LAKE
2. PKCA DISCHARGE
3. LAKE C1 CATCHMENT
4. LAKE C4 CATCHMENT
5. LYNNE LAKE GROUP
6. PIT CATCHMENT

NOTE:
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Jericho Diamond Mine, Nunavut

WATER SAMPLING AND DRAINAGE PATHWAYS

TETRA TECH EBA

PROJECT NO.	DWN	CKD	REV
E14103202	GDK/DBD	WTH	0

OFFICE: EDM

DATE: October 2014

Figure 8

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PHOTOGRAPHS

Photo 1	Aerial view of main camp and the processed kimberlite containment area.
Photo 2	Aerial view of the low grade stockpile and pit.
Photo 3	Aerial view of the pit.
Photo 4	Aerial view of the borrow area and Carat Lake laydown areas. Airstrip infrastructure is visible in the upper right.
Photo 5	Jericho site from the North Cofferdam.
Photo 6	Jericho pit looking southeast.
Photo 7	Main camp laydown area.
Photo 8	Truck shop and process plant.
Photo 9	The processed kimberlite containment area (PKCA) with the process plant in the background.
Photo 10	Tires beside the PKCA to minimize dusting.
Photo 11	The terminal building, which also functions as a small camp along with the small accompanying shacks.
Photo 12	The jetty building on the water intake causeway.
Photo 13	Phase 2 tank farm.
Photo 14	Soil sampling beside the Phase 1 tank farm.
Photo 15	Soil sampling on the tundra.
Photo 16	Water sampling beside the east sump with the coarse processed kimberlite, process plant, and truck shop in the background (facing southeast).
Photo 17	The pit walls and suspected Peregrine nesting site (facing southeast).
Photo 18	2012 photo of the main facility (facing southeast).
Photo 19	2012 photo of the west dam (facing east).
Photo 20	CAT 936E loader in the truck shop.
Photo 21	CAT 322C excavator (left) and CAT 950 loader (right) in the main site laydown area beside the truck shop.
Photo 22	CAT 980G loader in the truck shop.
Photo 23	CAT D6 bulldozer in the main site laydown area.

Photo 24 SuperPac packer in the main site laydown area.
Photo 25 Sterling dump truck in the process plant.
Photo 26 Large Godwin pump in the truck shop.
Photo 27 Small Godwin pump in the main site laydown area.
Photo 28 Light plan in the main site laydown area.
Photo 29 Scissor lift in the process plant.
Photo 30 The Ford van that was used as one of the main site vehicles.

Photo 1: Aerial view of main camp and the processed kimberlite containment area

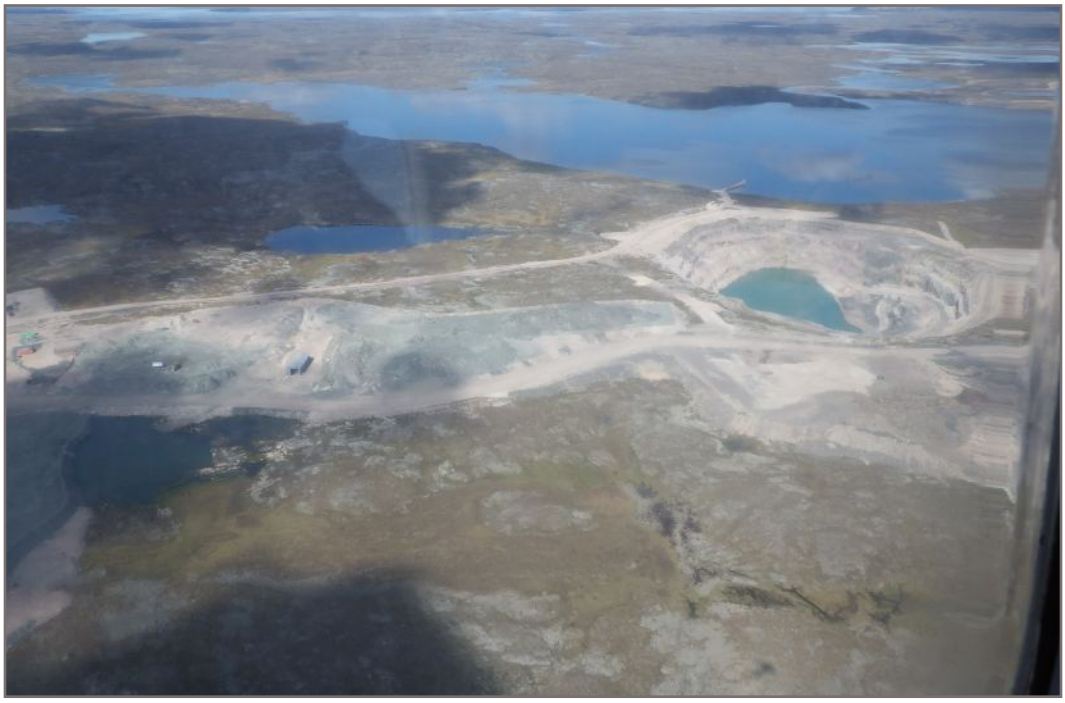

Photo 2: Aerial view of the low grade stockpile and pit

Photo 3: Aerial view of the pit

Photo 4: Aerial view of the borrow area and Carat Lake laydown areas. Airstrip infrastructure is visible in the upper right

Photo 5: Jericho site from the North Cofferdam

Photo 6: Jericho pit looking southeast

Photo 7: Main camp laydown area

Photo 8: Truck shop and process plant

Photo 9: The processed kimberlite containment area (PKCA) with the process plant in the background

Photo 10: Tires beside the PKCA to minimize dusting

Photo 11: The terminal building, which also functions as a small camp along with the small accompanying shacks

Photo 12: The jetty building on the water intake causeway

Photo 13: Phase 2 tank farm

Photo 14: Soil sampling beside the Phase 1 tank farm

Photo 15: Soil sampling on the tundra

Photo 16: Water sampling beside the east sump with the coarse processed kimberlite, process plant, and truck shop in the background (facing southwest)

Photo 17: The pit walls and suspected Peregrine nesting site (facing southeast)

Photo 18: 2012 photo of the main facility (facing southeast)

Photo 19: 2012 photo of the west dam (facing east)

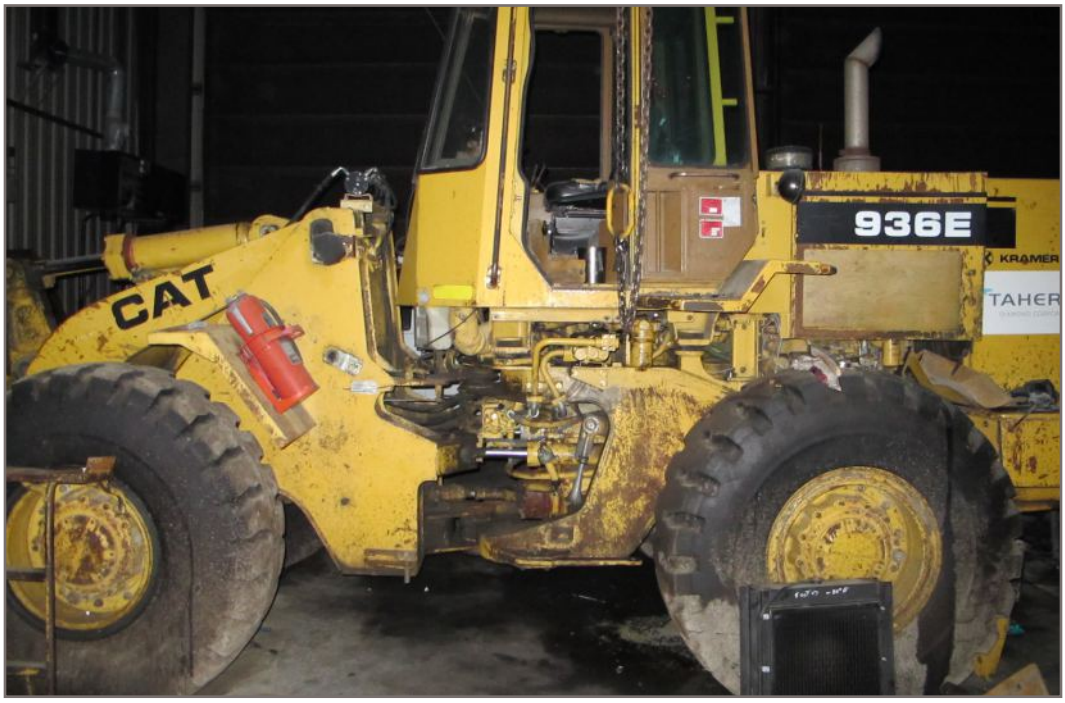

Photo 20: CAT 936E loader in the truck shop

Photo 21: CAT 322C excavator (left) and CAT 950 loader (right) in the main site laydown area beside the truck shop

Photo 22: CAT 980G loader in the truck shop

Photo 23: CAT D6 bulldozer in the main site laydown area

Photo 24: SuperPac packer in the main site laydown area.

Photo 25: Sterling dump truck in the process plant

Photo 26: Large Godwin pump in the truck shop

Photo 27: Small Godwin pump in the main site laydown area

Photo 28: Light plan in the main site laydown area

Photo 29: Scissor lift in the process plant

Photo 30: The Ford van that was used as one of the main site vehicles

APPENDIX A
TETRA TECH EBA'S GENERAL CONDITIONS

GENERAL CONDITIONS

GEOTECHNICAL REPORT

This report incorporates and is subject to these “General Conditions”.

1.0 USE OF REPORT AND OWNERSHIP

This geotechnical report pertains to a specific site, a specific development and a specific scope of work. It is not applicable to any other sites nor should it be relied upon for types of development other than that to which it refers. Any variation from the site or development would necessitate a supplementary geotechnical assessment.

This report and the recommendations contained in it are intended for the sole use of Tetra Tech EBA’s Client. Tetra Tech EBA does not accept any responsibility for the accuracy of any of the data, the analyses or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than Tetra Tech EBA’s Client unless otherwise authorized in writing by Tetra Tech EBA. Any unauthorized use of the report is at the sole risk of the user.

This report is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of Tetra Tech EBA. Additional copies of the report, if required, may be obtained upon request.

2.0 ALTERNATE REPORT FORMAT

Where Tetra Tech EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed Tetra Tech EBA’s instruments of professional service), only the signed and/or sealed versions shall be considered final and legally binding. The original signed and/or sealed version archived by Tetra Tech EBA shall be deemed to be the original for the Project.

Both electronic file and hard copy versions of Tetra Tech EBA’s instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except Tetra Tech EBA. Tetra Tech EBA’s instruments of professional service will be used only and exactly as submitted by Tetra Tech EBA.

Electronic files submitted by Tetra Tech EBA have been prepared and submitted using specific software and hardware systems. Tetra Tech EBA makes no representation about the compatibility of these files with the Client’s current or future software and hardware systems.

3.0 ENVIRONMENTAL AND REGULATORY ISSUES

Unless stipulated in the report, Tetra Tech EBA has not been retained to investigate, address or consider and has not investigated, addressed or considered any environmental or regulatory issues associated with development on the subject site.

4.0 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems and methods employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Where deviations from the system or method prevail, they are specifically mentioned.

Classification and identification of geological units are judgmental in nature as to both type and condition. Tetra Tech EBA does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Where subsurface conditions encountered during development are different from those described in this report, qualified geotechnical personnel should revisit the site and review recommendations in light of the actual conditions encountered.

5.0 LOGS OF TESTHOLES

The testhole logs are a compilation of conditions and classification of soils and rocks as obtained from field observations and laboratory testing of selected samples. Soil and rock zones have been interpreted. Change from one geological zone to the other, indicated on the logs as a distinct line, can be, in fact, transitional. The extent of transition is interpretive. Any circumstance which requires precise definition of soil or rock zone transition elevations may require further investigation and review.

6.0 STRATIGRAPHIC AND GEOLOGICAL INFORMATION

The stratigraphic and geological information indicated on drawings contained in this report are inferred from logs of test holes and/or soil/rock exposures. Stratigraphy is known only at the locations of the test hole or exposure. Actual geology and stratigraphy between test holes and/or exposures may vary from that shown on these drawings. Natural variations in geological conditions are inherent and are a function of the historic environment. Tetra Tech EBA does not represent the conditions illustrated as exact but recognizes that variations will exist. Where knowledge of more precise locations of geological units is necessary, additional investigation and review may be necessary.

7.0 PROTECTION OF EXPOSED GROUND

Excavation and construction operations expose geological materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration. Unless otherwise specifically indicated in this report, the walls and floors of excavations must be protected from the elements, particularly moisture, desiccation, frost action and construction traffic.

8.0 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Unless otherwise specifically advised, support of ground and structures adjacent to the anticipated construction and preservation of adjacent ground and structures from the adverse impact of construction activity is required.

9.0 INFLUENCE OF CONSTRUCTION ACTIVITY

There is a direct correlation between construction activity and structural performance of adjacent buildings and other installations. The influence of all anticipated construction activities should be considered by the contractor, owner, architect and prime engineer in consultation with a geotechnical engineer when the final design and construction techniques are known.

10.0 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, as well as the potential of adverse circumstances arising from construction activity, observations during site preparation, excavation and construction should be carried out by a geotechnical engineer. These observations may then serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein.

11.0 DRAINAGE SYSTEMS

Where temporary or permanent drainage systems are installed within or around a structure, the systems which will be installed must protect the structure from loss of ground due to internal erosion and must be designed so as to assure continued performance of the drains. Specific design detail of such systems should be developed or reviewed by the geotechnical engineer. Unless otherwise specified, it is a condition of this report that effective temporary and permanent drainage systems are required and that they must be considered in relation to project purpose and function.

12.0 BEARING CAPACITY

Design bearing capacities, loads and allowable stresses quoted in this report relate to a specific soil or rock type and condition. Construction activity and environmental circumstances can materially change the condition of soil or rock. The elevation at which a soil or rock type occurs is variable. It is a requirement of this report that structural elements be founded in and/or upon geological materials of the type and in the condition assumed. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions assumed in this report in fact exist at the site.

13.0 SAMPLES

Tetra Tech EBA will retain all soil and rock samples for 30 days after this report is issued. Further storage or transfer of samples can be made at the Client's expense upon written request, otherwise samples will be discarded.

14.0 INFORMATION PROVIDED TO TETRA TECH EBA BY OTHERS

During the performance of the work and the preparation of the report, Tetra Tech EBA may rely on information provided by persons other than the Client. While Tetra Tech EBA endeavours to verify the accuracy of such information when instructed to do so by the Client, Tetra Tech EBA accepts no responsibility for the accuracy or the reliability of such information which may affect the report.

GENERAL CONDITIONS

GEOENVIRONMENTAL REPORT

This report incorporates and is subject to these “General Conditions”.

1.0 USE OF REPORT AND OWNERSHIP

This report pertains to a specific site, a specific development, and a specific scope of work. It is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site or proposed development would necessitate a supplementary investigation and assessment.

This report and the assessments and recommendations contained in it are intended for the sole use of Tetra Tech EBA’s client. Tetra Tech EBA does not accept any responsibility for the accuracy of any of the data, the analysis or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than Tetra Tech EBA’s Client unless otherwise authorized in writing by Tetra Tech EBA. Any unauthorized use of the report is at the sole risk of the user.

This report is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of Tetra Tech EBA. Additional copies of the report, if required, may be obtained upon request.

2.0 ALTERNATE REPORT FORMAT

Where Tetra Tech EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed Tetra Tech EBA’s instruments of professional service), only the signed and/or sealed versions shall be considered final and legally binding. The original signed and/or sealed version archived by Tetra Tech EBA shall be deemed to be the original for the Project.

Both electronic file and hard copy versions of Tetra Tech EBA’s instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except Tetra Tech EBA. The Client warrants that Tetra Tech EBA’s instruments of professional service will be used only and exactly as submitted by Tetra Tech EBA.

Electronic files submitted by Tetra Tech EBA have been prepared and submitted using specific software and hardware systems. Tetra Tech EBA makes no representation about the compatibility of these files with the Client’s current or future software and hardware systems.

3.0 NOTIFICATION OF AUTHORITIES

In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by Tetra Tech EBA in its reasonably exercised discretion.

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During the performance of the work and the preparation of the report, Tetra Tech EBA may rely on information provided by persons other than the Client. While Tetra Tech EBA endeavours to verify the accuracy of such information when instructed to do so by the Client, Tetra Tech EBA accepts no responsibility for the accuracy or the reliability of such information which may affect the report.

APPENDIX B
SOILS

Photo B.1: North view of the airstrip in APEC 1A

Photo B.2: North view of the ASTs in the fuel berm located at APEC 1B

Photo B.3: View of stain at the entrance of the airstrip shop at APEC 1C

Photo B.4: View of the fuel drums with impacted soil in front of the airstrip shop at APEC 1C

Photo B.5: South view of the generator and fuel tank at APEC 1D

Photo B.6: View of the entrance to the generator at APEC 1D

Photo B.7: Stained soil located near the fuel drums at APEC 1E

Photo B.8: View of the fuel drums where the impacted material was located at APEC 1E

Photo B.9: Northwest view of APEC 2 with the drums containing potentially impacted material and the stored soil

Photo B.10: Small pile of black stained soil overflowing a soil bag at APEC 2

Photo B.11: Aoutheast view of APEC 3 illustrating secondary containment berm

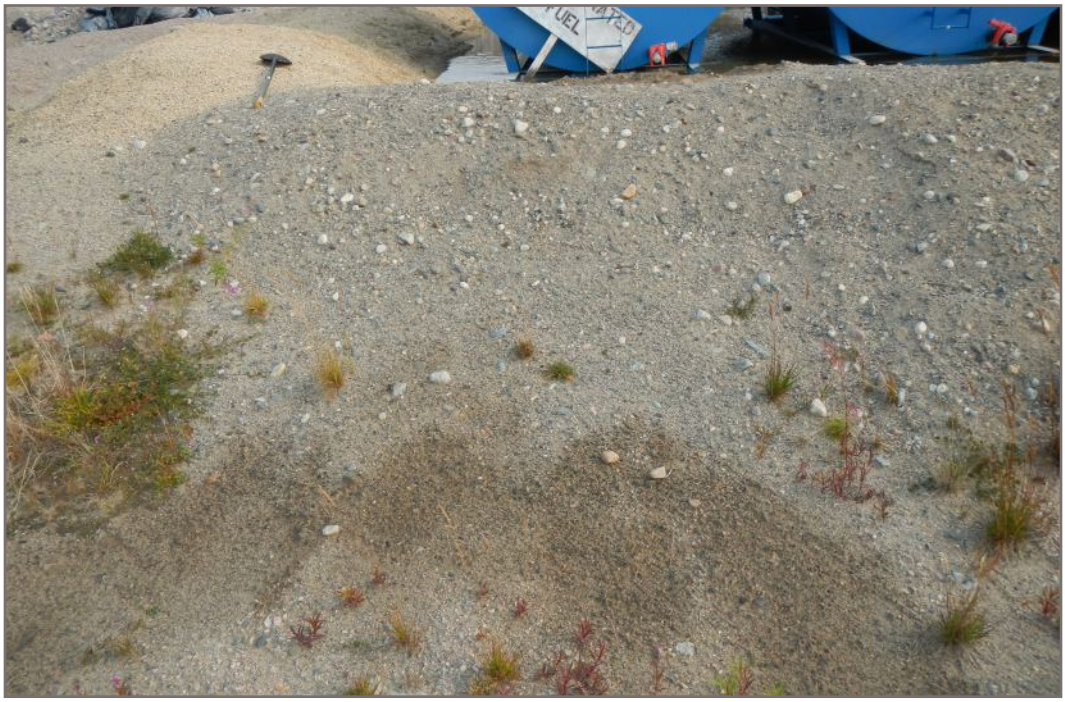


Photo B.12: Stain located on the berm at the SS3-1 sample location in APEC 3

Photo B.13: View of the new crush added to the outer berm in APEC 3

Photo B.14: View of APEC 4 with multiple surficial stains

Photo B.15: View of the stains on the gravel floor inside the stockpile shed at APEC 6

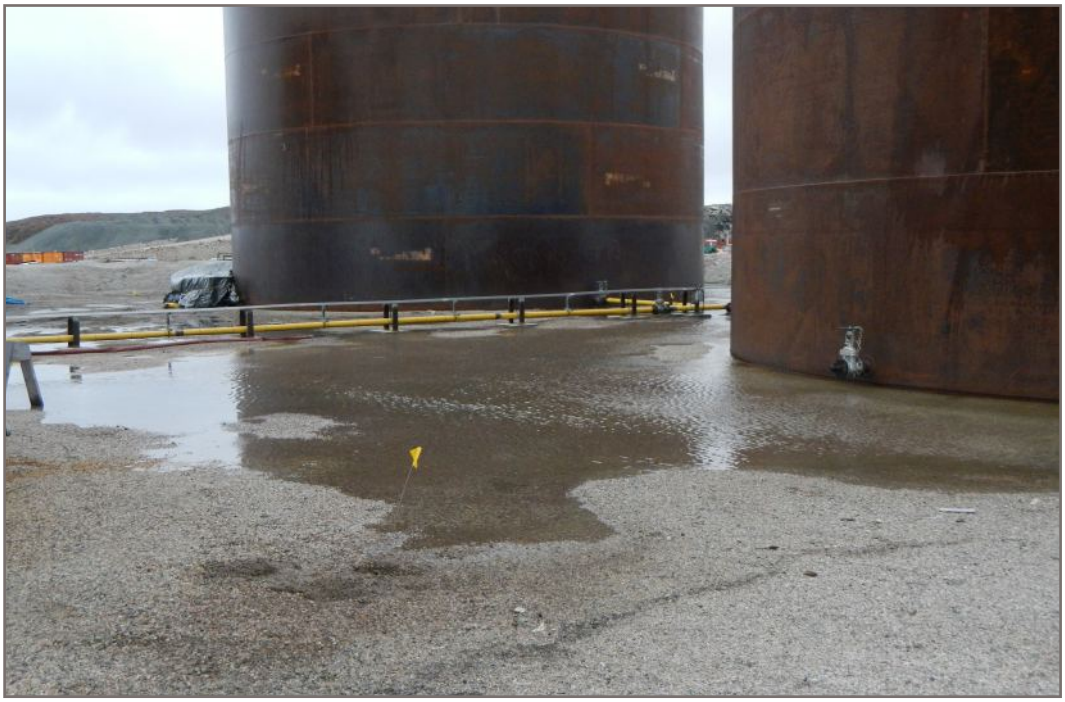


Photo B.16: Southeast view of the phase 1 tank farm at APEC 7

Photo B.17: View of fuel drums with water/soil mix stored in APEC 7

Photo B.18: View of dark stained soil on the south end of APEC 8

Photo B.19: Fuel berm view with the day tank at APEC 9

Photo B.20: View of stained soil at sample location SS9-13 was collected at APEC 9 near the gensets

Photo B.21: View of impacted soil leading to underneath the gensets at sample location SS9-20

Photo B.22: View of the entrance to the incinerator at APEC 10

Photo B.23: View of the two fuel tanks stored on site at APEC 10

Photo B.24: North side of the truck shop at APEC 10

Photo B.25: East side of the truck shop near the concrete pad at APEC 10

Photo B.26: Slip tanks stored on east side of the garage at APEC 10

Photo B.27: Stained soil near the helipad at APEC 10

Photo B.28: Multiple stains located on the northwest side of APEC 13 near sample SS13-2

Photo B.29: Large stain located near the cement truck located at APEC 13

Photo B.30: Large stain at sample location SS13-21 on the south side of APEC 13

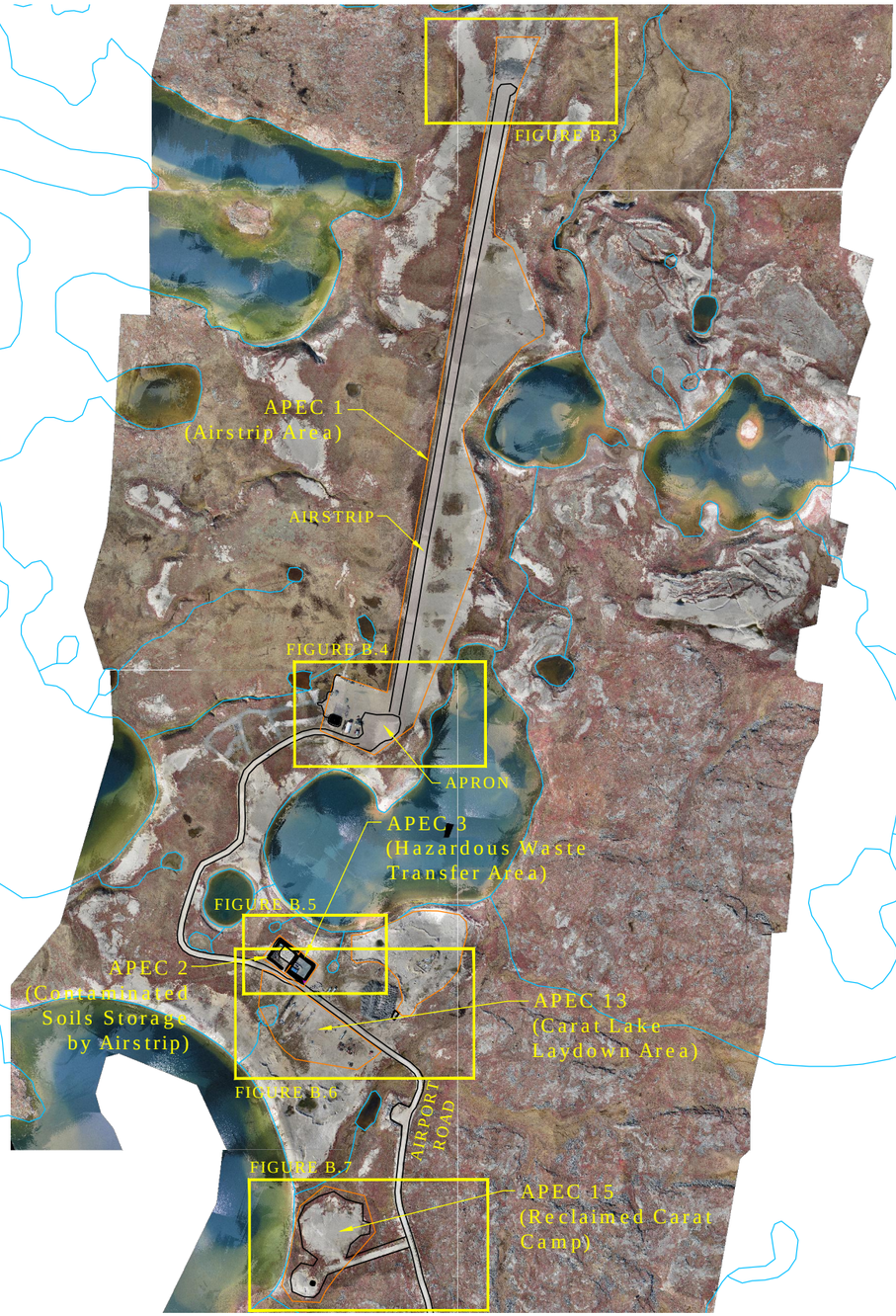
Photo B.31: Secondary containment berm located on the north side of the process plant in APEC 14

Photo B.32: Large stain located on the east side of the main camp storage shed in APEC 14

Photo B.33: Stained material located near sample SS14 - 3 in the main camp storage shed in APEC 14

Photo B.34: Inside of the main camp storage shed in APEC 14

Photo B.35: Stained soil at APEC 15 on the Reclaimed Carat Camp



NOTE:
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0 500m
Scale: 1:12,500 @ 11"x17"

STATUS
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Jericho Diamond Mine, Nunavut

APEC LOCATIONS
PAGE 1 of 2

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E14103202	GDK/DBD	WTH	0

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Figure B.1

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CARAT LAKE

SSC1

CROWN LAND
INUIT LAND

FIGURE B.9

WATER INTAKE
CAUSEWAY (JETTY)

SSC2

LAKE
C4

STREAM C1

RING
ROAD

C1 DIVERSION

AMMONIUM
NITRATE
STORAGE PAD

OPEN
PIT

APEC 4
(Waste Rock Pile)

LAKE
C1

EXPLOSIVE
MAGAZINES

EMULSION
PLANT

APEC 10
(Garage and
Storage)

FIGURE B.10

LAKE C2

APEC 7
(Phase 2 Tank Farm)

APEC 6
(Low Grade Ore
Stockpile Pad)

STREAM C3

APEC 8
(Phase 1 Tank Farm)

RECLAIM
PIPELINE

FIGURE B.11

APEC 9
(Gensets and
Fuel Berm)

LYNNE
LAKE

KEY LAKE

WEST
DAM

CELL C

APEC 12
(PKCA)

FIGURE B.12

FIGURE B.8

SSC3

DIVIDER
DYKE A

FIGURE B.13

CELL A

APEC 5
(Coarse Processed
Kimberlite
Stockpile)

EAST
DAM

CROWN LAND
INUIT LAND

SOUTHEAST
DAM

APEC 11
(Windblown
Processed
Kimberlite)

SHINE LAKE

0 500m

Scale: 1:12,500 @ 11"x17"

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APEC LOCATIONS
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Figure B.2

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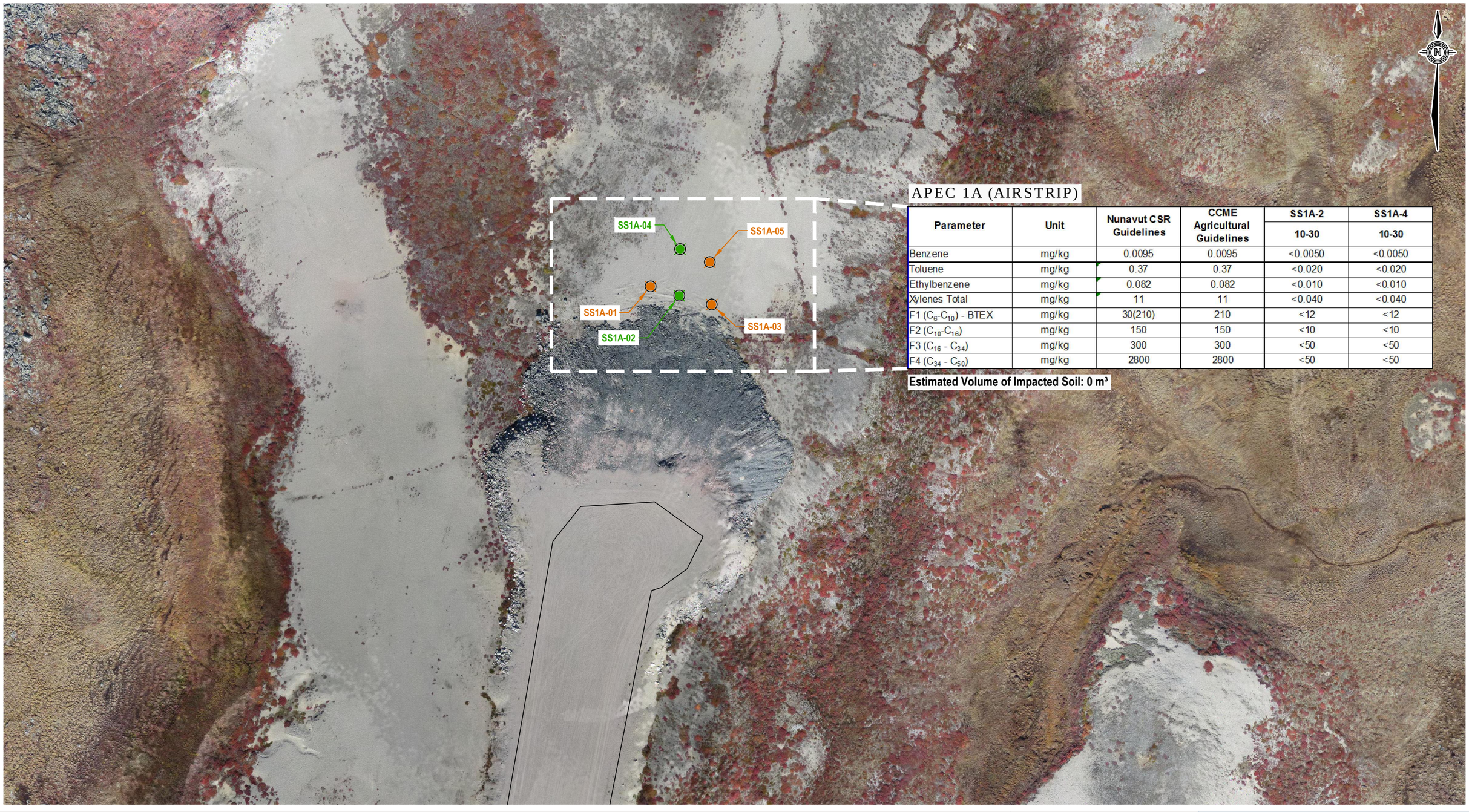

APEC 1A (AIRSTRIP)

Parameter	Unit	Nunavut CSR Guidelines	CCME Agricultural Guidelines	SS1A-2	SS1A-4
				10-30	10-30
Benzene	mg/kg	0.0095	0.0095	<0.0050	<0.0050
Toluene	mg/kg	0.37	0.37	<0.020	<0.020
Ethylbenzene	mg/kg	0.082	0.082	<0.010	<0.010
Xylenes Total	mg/kg	11	11	<0.040	<0.040
F1 (C_6-C_{10}) - BTEX	mg/kg	30(210)	210	<12	<12
F2 (C_{10}-C_{16})	mg/kg	150	150	<10	<10
F3 (C_{16} - C_{34})	mg/kg	300	300	<50	<50
F4 (C_{34} - C_{50})	mg/kg	2800	2800	<50	<50

Estimated Volume of Impacted Soil: 0 m³

LEGEND:

- SOIL SAMPLE LOCATION
- BELOW APPLICABLE GUIDELINES - SOIL
- NOT ANALYSED

0 50m

Scale: 1:1,000 @ 11"x17"

NOTE:
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- Blank - Not analyzed

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Closure Assessment
Jericho Diamond Mine, Nunavut
APEC 1 - AIRSTRIP
SOIL SAMPLE LOCATIONS

PROJECT NO.	DWN	CKD	REV
E14103202	GDK/DBD	WTH	0

OFFICE: EDM

DATE: December 2014

Figure B.3

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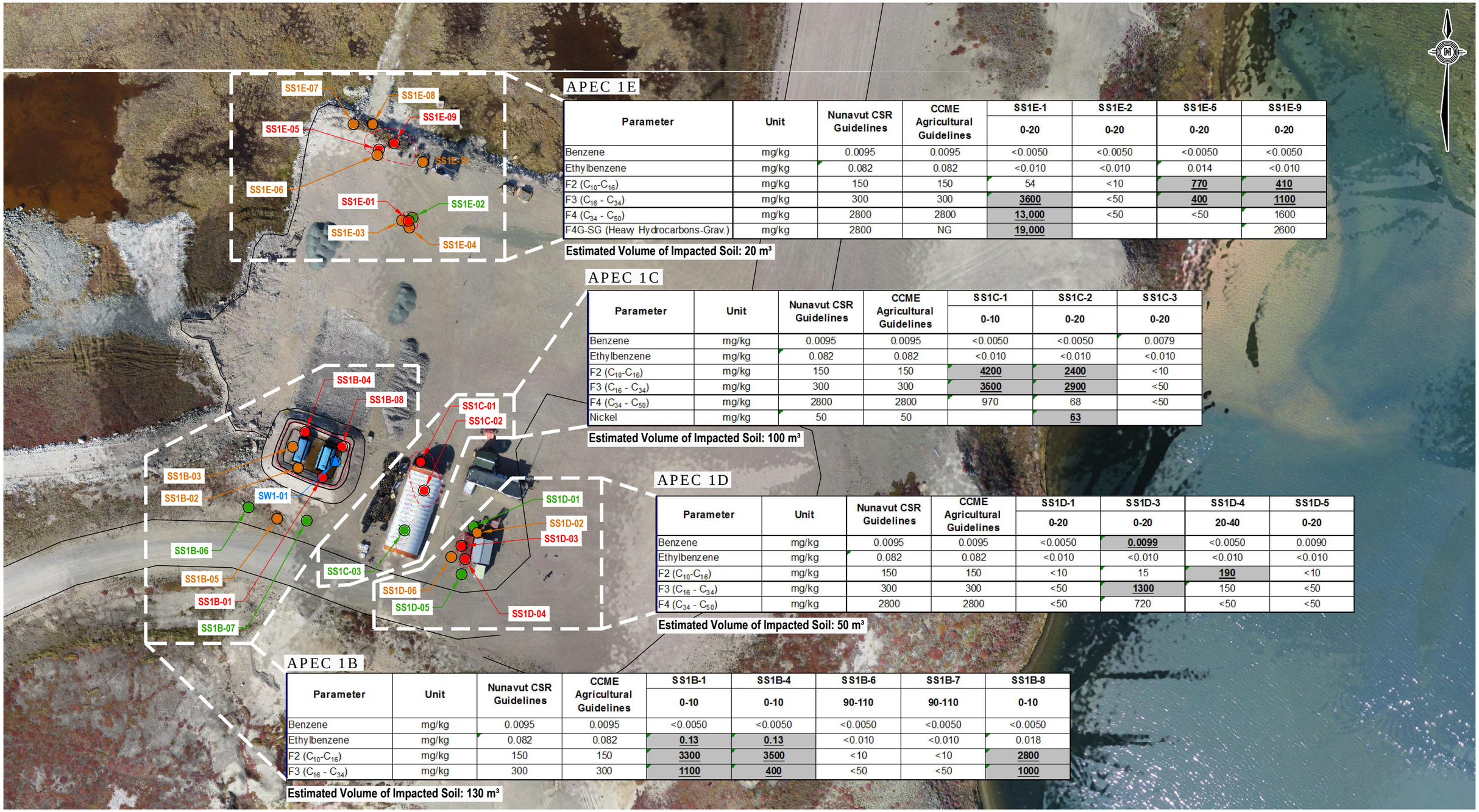

APEC 1E

Parameter	Unit	Nunavut CSR Guidelines	CCME Agricultural Guidelines	SS1E-1	SS1E-2	SS1E-5	SS1E-9
				0-20	0-20	0-20	0-20
Benzene	mg/kg	0.0095	0.0095	<0.0050	<0.0050	<0.0050	<0.0050
Ethylbenzene	mg/kg	0.082	0.082	<0.010	<0.010	0.014	<0.010
F2 (C_{10}-C_{16})	mg/kg	150	150	54	<10	**770**	**410**
F3 (C_{16} - C_{34})	mg/kg	300	300	**3600**	<50	**400**	**1100**
F4 (C_{34} - C_{50})	mg/kg	2800	2800	**13,000**	<50	<50	1600
F4G-SG (Heavy Hydrocarbons-Grav.)	mg/kg	2800	NG	**19,000**			2600

Estimated Volume of Impacted Soil: 20 m³

APEC 1C

Parameter	Unit	Nunavut CSR Guidelines	CCME Agricultural Guidelines	SS1C-1	SS1C-2	SS1C-3
				0-10	0-20	0-20
Benzene	mg/kg	0.0095	0.0095	<0.0050	<0.0050	0.0079
Ethylbenzene	mg/kg	0.082	0.082	<0.010	<0.010	<0.010
F2 (C_{10}-C_{16})	mg/kg	150	150	**4200**	**2400**	<10
F3 (C_{16} - C_{34})	mg/kg	300	300	**3500**	**2900**	<50
F4 (C_{34} - C_{50})	mg/kg	2800	2800	970	68	<50
Nickel	mg/kg	50	50		**63**	

Estimated Volume of Impacted Soil: 100 m³

APEC 1D

Parameter	Unit	Nunavut CSR Guidelines	CCME Agricultural Guidelines	SS1D-1	SS1D-3	SS1D-4	SS1D-5
				0-20	0-20	20-40	0-20
Benzene	mg/kg	0.0095	0.0095	<0.0050	**0.0099**	<0.0050	0.0090
Ethylbenzene	mg/kg	0.082	0.082	<0.010	<0.010	<0.010	<0.010
F2 (C_{10}-C_{16})	mg/kg	150	150	<10	15	**190**	<10
F3 (C_{16} - C_{34})	mg/kg	300	300	<50	**1300**	150	<50
F4 (C_{34} - C_{50})	mg/kg	2800	2800	<50	720	<50	<50

Estimated Volume of Impacted Soil: 50 m³

APEC 1B

Parameter	Unit	Nunavut CSR Guidelines	CCME Agricultural Guidelines	SS1B-1	SS1B-4	SS1B-6	SS1B-7	SS1B-8
				0-10	0-10	90-110	90-110	0-10
Benzene	mg/kg	0.0095	0.0095	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Ethylbenzene	mg/kg	0.082	0.082	**0.13**	**0.13**	<0.010	<0.010	0.018
F2 (C_{10}-C_{16})	mg/kg	150	150	**3300**	**3500**	<10	<10	**2800**
F3 (C_{16} - C_{34})	mg/kg	300	300	**1100**	**400**	<50	<50	**1000**

Estimated Volume of Impacted Soil: 130 m³

LEGEND:

- SOIL SAMPLE LOCATION
- BERM WATER SAMPLE LOCATION
- BELOW APPLICABLE GUIDELINES - SOIL
- ABOVE APPLICABLE GUIDELINES - SOIL
- NOT ANALYSED
- APPROXIMATE EXTENT OF IMPACTED SOIL

0 50m

Scale: 1:1,000 @ 11"x17"

NOTE:
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STATUS
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Jericho Diamond Mine, Nunavut
APEC 1 - AIRSTRIP
SOIL SAMPLE LOCATIONS

PROJECT NO.	DWN	CKD	REV
E14103202	GDK/DBD	WTH	0

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Figure B.4

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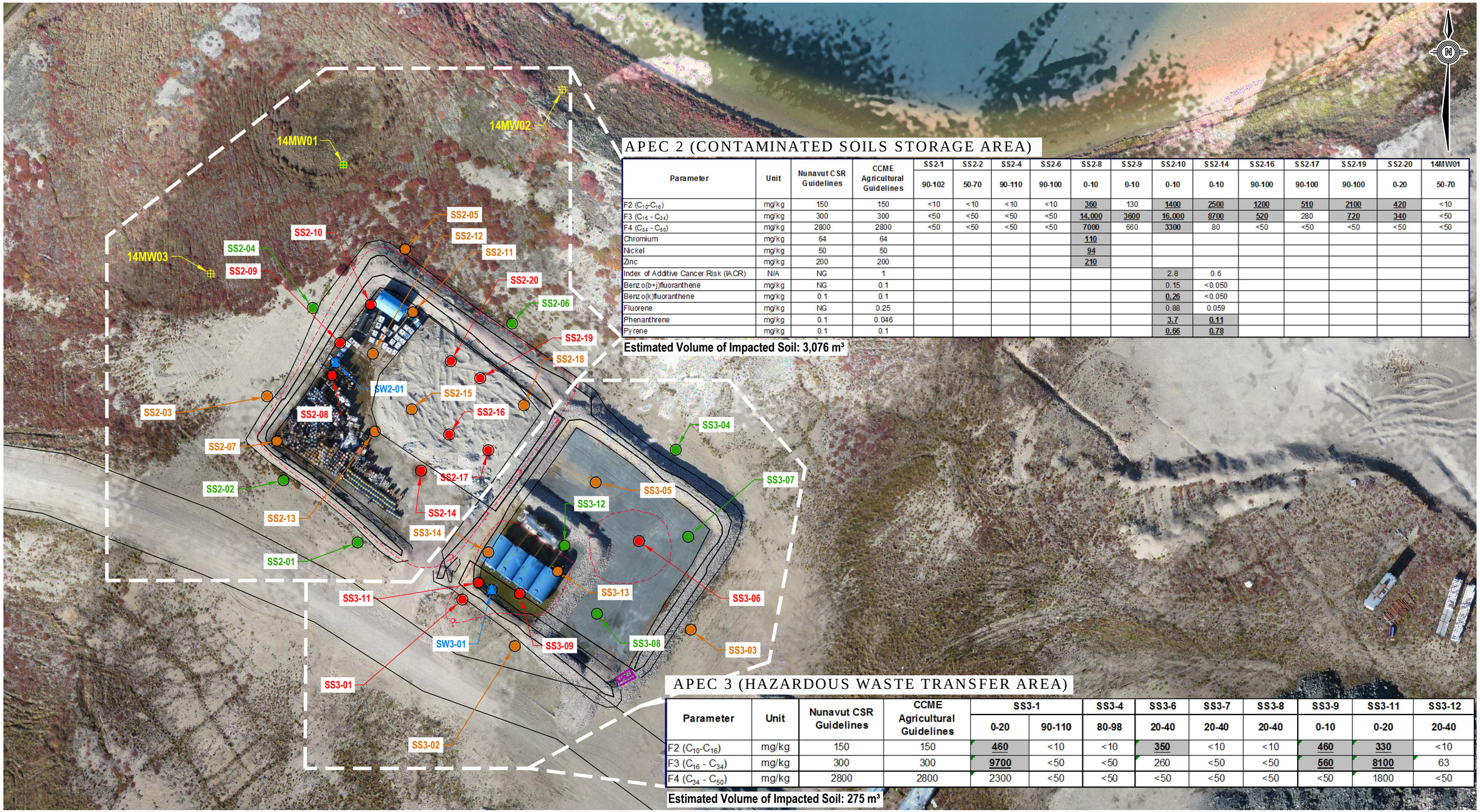

APEC 2 (CONTAMINATED SOILS STORAGE AREA)

Parameter	Unit	Nunavut CSR Guidelines	CCME Agricultural Guidelines	SS2-1	SS2-2	SS2-4	SS2-6	SS2-8	SS2-9	SS2-10	SS2-14	SS2-16	SS2-17	SS2-19	SS2-20	14MW01
				90-102	50-70	90-110	90-100	0-10	0-10	0-10	0-10	90-100	90-100	90-100	0-20	50-70
F2 (C_{10}-C_{16})	mg/kg	150	150	<10	<10	<10	<10	**360**	130	**1400**	**2500**	**1200**	**510**	**2100**	**420**	<10
F3 (C_{16} - C_{34})	mg/kg	300	300	<50	<50	<50	<50	**14,000**	**3600**	**16,000**	**8700**	**520**	280	**720**	**340**	<50
F4 (C_{34} - C_{50})	mg/kg	2800	2800	<50	<50	<50	<50	**7000**	660	**3300**	80	<50	<50	<50	<50	<50
Chromium	mg/kg	64	64					**110**								
Nickel	mg/kg	50	50					**94**								
Zinc	mg/kg	200	200					**210**								
Index of Additive Cancer Risk (IACR)	N/A	NG	1							2.8	0.6					
Benz o(b+j)fluoranthene	mg/kg	NG	0.1							0.15	<0.050					
Benz o(k)fluoranthene	mg/kg	0.1	0.1							**0.26**	<0.050					
Fluorene	mg/kg	NG	0.25							0.88	0.059					
Phenanthrene	mg/kg	0.1	0.046							**3.7**	**0.11**					
Pyrene	mg/kg	0.1	0.1							**0.66**	**0.78**					

Estimated Volume of Impacted Soil: 3,076 m³

APEC 3 (HAZARDOUS WASTE TRANSFER AREA)

Parameter	Unit	Nunavut CSR Guidelines	CCME Agricultural Guidelines	SS3-1		SS3-4	SS3-6	SS3-7	SS3-8	SS3-9	SS3-11	SS3-12
				0-20	90-110	80-98	20-40	20-40	20-40	0-10	0-20	20-40
F2 (C_{10}-C_{16})	mg/kg	150	150	**460**	<10	<10	**350**	<10	<10	**460**	**330**	<10
F3 (C_{16} - C_{34})	mg/kg	300	300	**9700**	<50	<50	260	<50	<50	**560**	**8100**	63
F4 (C_{34} - C_{50})	mg/kg	2800	2800	2300	<50	<50	<50	<50	<50	<50	1800	<50

Estimated Volume of Impacted Soil: 275 m³

LEGEND:

- SOIL SAMPLE LOCATION
- BERM WATER SAMPLE LOCATION
- BELOW APPLICABLE GUIDELINES - SOIL
- MONITORING WELL LOCATION
- ABOVE APPLICABLE GUIDELINES - SOIL
- BELOW APPLICABLE GUIDELINES
- NOT ANALYSED
- APPROXIMATE EXTENT OF IMPACTED SOIL

0 25m

Scale: 1:750 @ 11"x17"

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Closure Assessment
Jericho Diamond Mine, Nunavut

APEC 2 AND 3 - CONTAMINATED SOILS STORAGE AREA AND HAZARDOUS WASTE TRANSFER AREA SOIL SAMPLE LOCATIONS

PROJECT NO.	DWN	CKD	REV
E14103202	GDK/DBD	WTH	0

OFFICE: EDM

DATE: December 2014

Figure B.5

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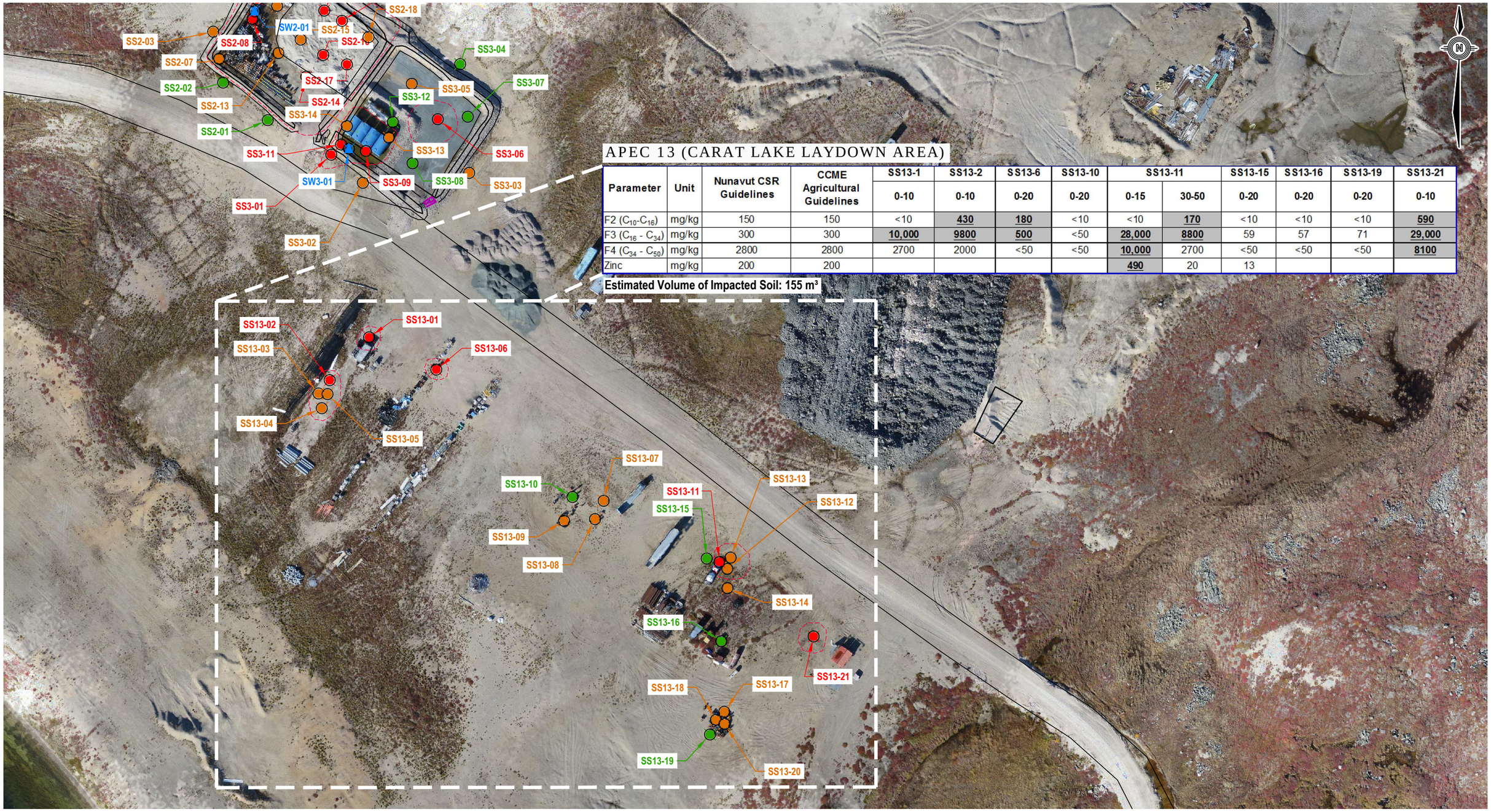

APEC 13 (CARAT LAKE LAYDOWN AREA)

Parameter	Unit	Nunavut CSR Guidelines	CCME Agricultural Guidelines	SS13-1	SS13-2	SS13-6	SS13-10	SS13-11		SS13-15	SS13-16	SS13-19	SS13-21
				0-10	0-10	0-20	0-20	0-15	30-50	0-20	0-20	0-20	0-10
F2 (C_{10}-C_{16})	mg/kg	150	150	<10	**430**	**180**	<10	<10	**170**	<10	<10	<10	**590**
F3 (C_{16} - C_{34})	mg/kg	300	300	**10,000**	**9800**	**500**	<50	**28,000**	**8800**	59	57	71	**29,000**
F4 (C_{34} - C_{50})	mg/kg	2800	2800	2700	2000	<50	<50	**10,000**	2700	<50	<50	<50	**8100**
Zinc	mg/kg	200	200					**490**	20	13			

Estimated Volume of Impacted Soil: 155 m³

LEGEND:

- SOIL SAMPLE LOCATION
- BERM WATER SAMPLE LOCATION
- BELOW APPLICABLE GUIDELINES - SOIL
- ABOVE APPLICABLE GUIDELINES - SOIL
- NOT ANALYSED
- APPROXIMATE EXTENT OF IMPACTED SOIL

0 50m

Scale: 1:1,250 @ 11"x17"

NOTE:
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Closure Assessment
Jericho Diamond Mine, Nunavut
APEC 13 - CARAT LAKE LAYDOWN AREA SOIL SAMPLE LOCATIONS

PROJECT NO.	DWN	CKD	REV
E14103202	GDK/DBD	WTH	0

OFFICE	DATE
EDM	December 2014

Figure B.6

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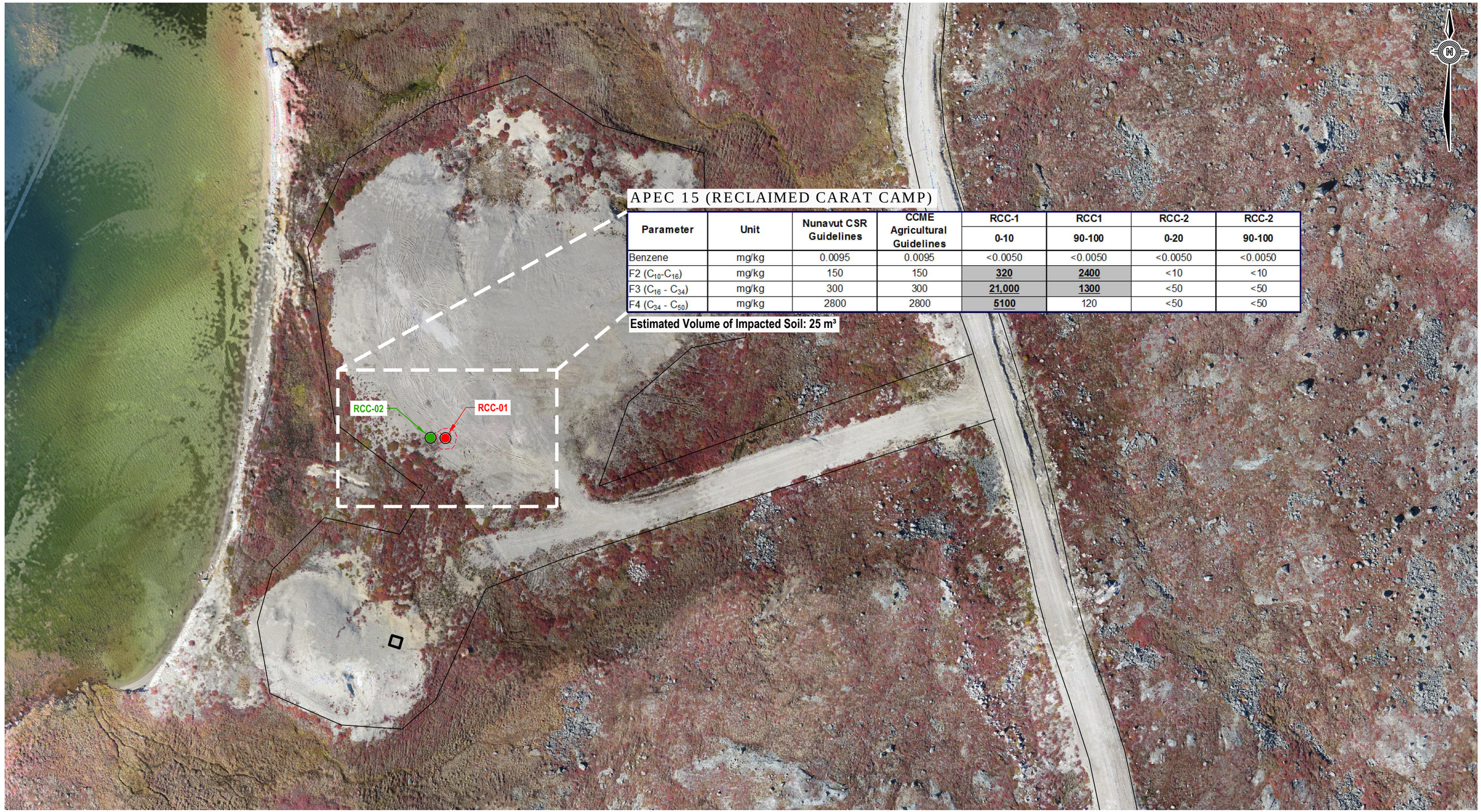


Parameter	Unit	Nunavut CSR Guidelines	CCME Agricultural Guidelines	RCC-1	RCC1	RCC-2	RCC-2
				0-10	90-100	0-20	90-100
Benzene	mg/kg	0.0095	0.0095	<0.0050	<0.0050	<0.0050	<0.0050
F2 (C_{10}-C_{16})	mg/kg	150	150	**320**	**2400**	<10	<10
F3 (C_{16} - C_{34})	mg/kg	300	300	**21,000**	**1300**	<50	<50
F4 (C_{34} - C_{50})	mg/kg	2800	2800	**5100**	120	<50	<50

Estimated Volume of Impacted Soil: 25 m³

LEGEND:

- SOIL SAMPLE LOCATION
- BELOW APPLICABLE GUIDELINES - SOIL
- ABOVE APPLICABLE GUIDELINES - SOIL
- NOT ANALYSED
- APPROXIMATE EXTENT OF IMPACTED SOIL

0 50m

Scale: 1:1,250 @ 11"x17"

NOTE:
BASE AIRPHOTOS PROVIDED BY OLLERHEAD & ASSOCIATES LTD., AUGUST 2014

STATUS
ISSUED FOR USE

Notes:
NG - No guideline
BOLD - Exceeds CSR Guideline
Shaded - Exceeds CCME Guideline
Italic - Detection limit greater than guideline
N/A - Not applicable
Blank - Not analyzed

CLIENT

Aboriginal Affairs and Northern Development Canada

TETRA TECH EBA

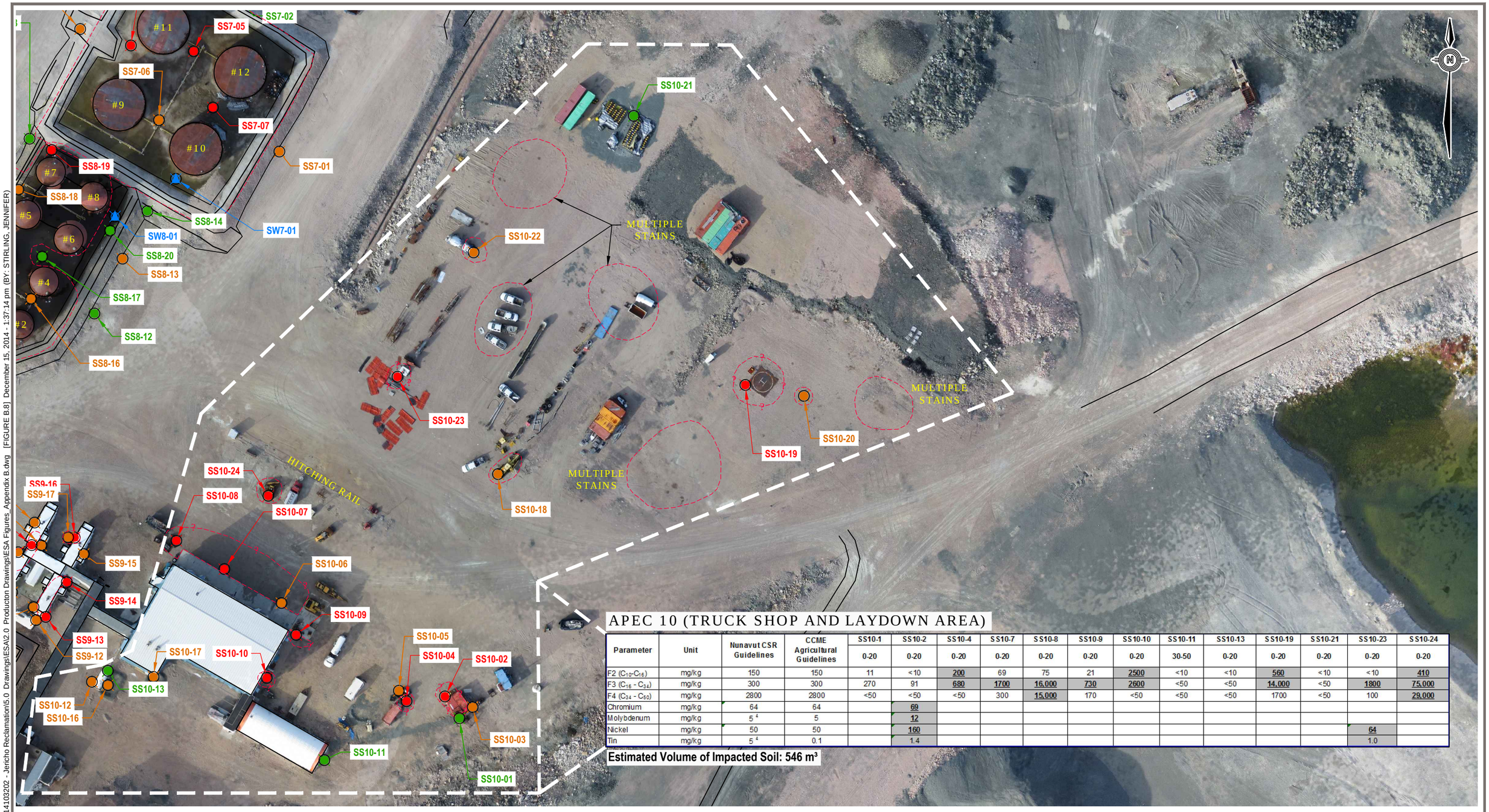
Closure Assessment
Jericho Diamond Mine, Nunavut
APEC 15 - RECLAIMED CARAT CAMP SOIL SAMPLE LOCATIONS

PROJECT NO.	DWN	CKD	REV
E14103202	GDK/DBD	WTH	0

OFFICE	DATE
EDM	December 2014

Figure B.7

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\ESA Figures_Appendix B.dwg [FIGURE B.7] December 15, 2014 - 1:36:23 pm (BY: STIRLING, JENNIFER)



APEC 10 (TRUCK SHOP AND LAYDOWN AREA)

Parameter	Unit	Nunavut CSR Guidelines	CCME Agricultural Guidelines	SS10-1	SS10-2	SS10-4	SS10-7	SS10-8	SS10-9	SS10-10	SS10-11	SS10-13	SS10-19	SS10-21	SS10-23	SS10-24
				0-20	0-20	0-20	0-20	0-20	0-20	0-20	30-50	0-20	0-20	0-20	0-20	0-20
F2 (C_{10}-C_{16})	mg/kg	150	150	11	<10	**200**	69	75	21	**2500**	<10	<10	**560**	<10	<10	**410**
F3 (C_{16} - C_{34})	mg/kg	300	300	270	91	**680**	**1700**	**16,000**	**730**	**2600**	<50	<50	**14,000**	<50	**1800**	**75,000**
F4 (C_{34} - C_{50})	mg/kg	2800	2800	<50	<50	<50	300	**15,000**	170	<50	<50	<50	1700	<50	100	**29,000**
Chromium	mg/kg	64	64		**69**											
Molybdenum	mg/kg	5 [4]	5		**12**											
Nickel	mg/kg	50	50		**160**										**64**	
Tin	mg/kg	5 [4]	0.1		1.4										1.0	

Estimated Volume of Impacted Soil: 546 m³

LEGEND:

- SOIL SAMPLE LOCATION
- BELOW APPLICABLE GUIDELINES - SOIL
- ABOVE APPLICABLE GUIDELINES - SOIL
- NOT ANALYSED
- APPROXIMATE EXTENT OF IMPACTED SOIL

0 50m

Scale: 1:1,000 @ 11"x17"

NOTE:
BASE AIRPHOTOS PROVIDED BY OLLERHEAD & ASSOCIATES LTD., AUGUST 2014

STATUS
ISSUED FOR USE

Notes:

- NG - No guideline
- **BOLD** - Exceeds CSR Guideline
- Shaded - Exceeds CCME Guideline
- *Italic* - Detection limit greater than guideline
- N/A - Not applicable
- Blank - Not analyzed

CLIENT

Aboriginal Affairs and Northern Development Canada

TETRA TECH EBA

Closure Assessment
Jericho Diamond Mine, Nunavut

APEC 10 - TRUCK SHOP AND LAYDOWN AREA SOIL SAMPLE LOCATIONS

PROJECT NO.	DWN	CKD	REV
E14103202	GDK/DBD	WTH	0

OFFICE	DATE
EDM	December 2014

Figure B.8

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\ESA Figures_Appendix B.dwg [FIGURE B.8] December 15, 2014 - 1:37:14 pm (BY: STIRLING, JENNIFER)

APEC 4 (WASTE ROCK PILE)

Parameter	Unit	Nunavut CSR Guidelines	CCME Agricultural Guidelines	SS4-1
				0-20
F2 (C_{10}-C_{16})	mg/kg	150	150	**280**
F3 (C_{16} - C_{34})	mg/kg	300	300	**8300**

Estimated Volume of Impacted Soil: 3.5 m³

LEGEND:

- SOIL SAMPLE LOCATION
- ABOVE APPLICABLE GUIDELINES - SOIL
- APPROXIMATE EXTENT OF IMPACTED SOIL
- SEEP SAMPLE LOCATION
- MONITORING WELL LOCATION

0 250m

Scale: 1:5,000 @ 11"x17"

NOTE:
BASE AIRPHOTOS PROVIDED BY OLLERHEAD & ASSOCIATES LTD., AUGUST 2014

STATUS
ISSUED FOR USE

Notes:

- NG - No guideline
- **BOLD** - Exceeds CSR Guideline
- Shaded - Exceeds CCME Guideline
- *Italic* - Detection limit greater than guideline
- N/A - Not applicable
- Blank - Not analyzed

CLIENT

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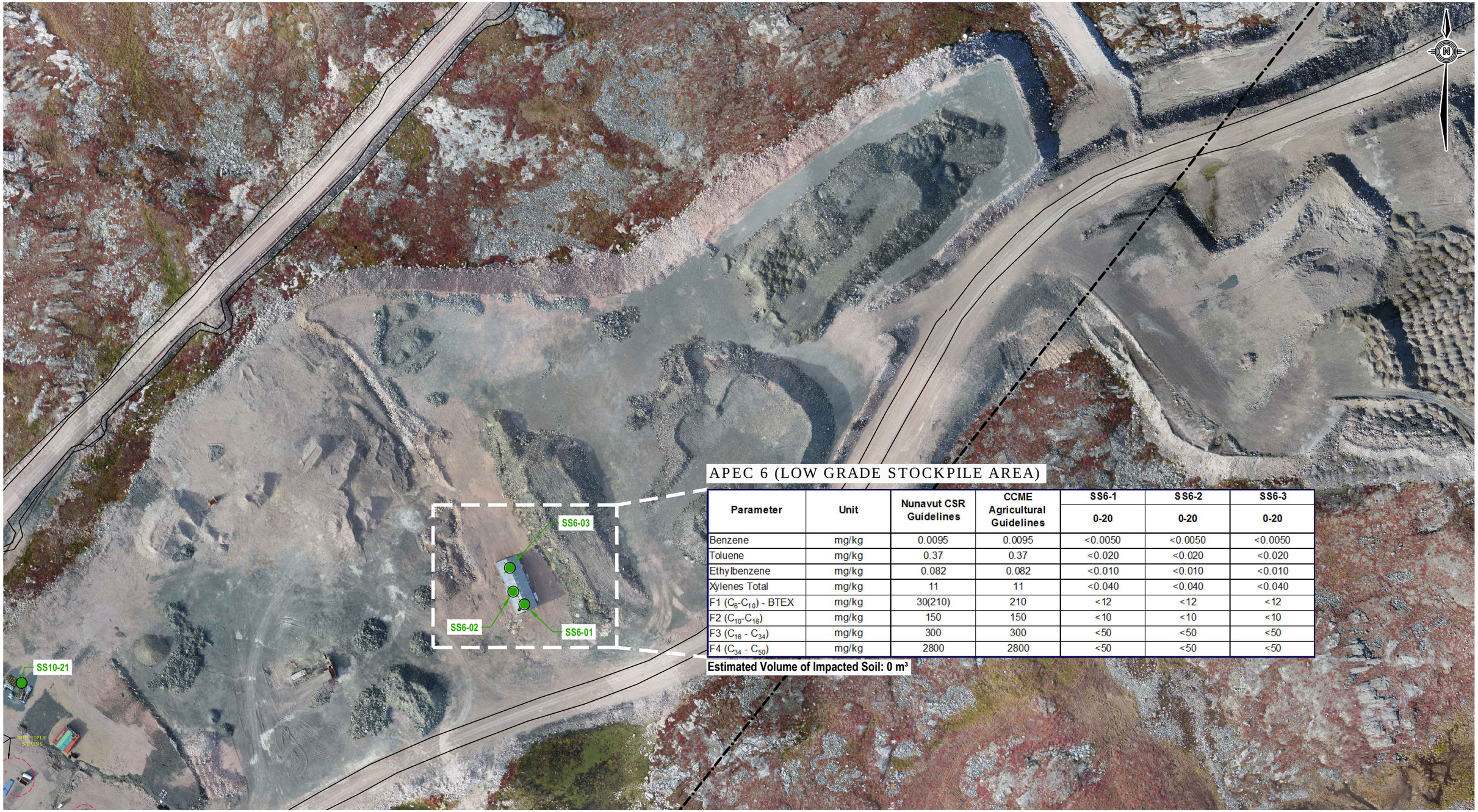
Closure Assessment
Jericho Diamond Mine, Nunavut
APEC 4 - WASTE ROCK PILE SOIL SAMPLE LOCATIONS

PROJECT NO.	DWN	CKD	REV
E14103202	GDK	WTH	0

OFFICE: EDM
DATE: December 2014

Figure B.9

Q:\Edmonton\Engineering\E14\1\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\ESA Figures_Appendix B.dwg [FIGURE B.9] December 22, 2014 - 1:58:33 pm (BY: STIRLING, JENNIFER)



APEC 6 (LOW GRADE STOCKPILE AREA)

Parameter	Unit	Nunavut CSR Guidelines	CCME Agricultural Guidelines	SS6-1 0-20	SS6-2 0-20	SS6-3 0-20
Benzene	mg/kg	0.0095	0.0095	<0.0050	<0.0050	<0.0050
Toluene	mg/kg	0.37	0.37	<0.020	<0.020	<0.020
Ethylbenzene	mg/kg	0.082	0.082	<0.010	<0.010	<0.010
Xylenes Total	mg/kg	11	11	<0.040	<0.040	<0.040
F1 (C_6-C_{10}) - BTEX	mg/kg	30(210)	210	<12	<12	<12
F2 (C_{10}-C_{16})	mg/kg	150	150	<10	<10	<10
F3 (C_{16} - C_{34})	mg/kg	300	300	<50	<50	<50
F4 (C_{34} - C_{50})	mg/kg	2800	2800	<50	<50	<50

Estimated Volume of Impacted Soil: 0 m³

LEGEND:

- SOIL SAMPLE LOCATION
- BELOW APPLICABLE GUIDELINES - SOIL
- APPROXIMATE EXTENT OF IMPACTED SOIL

0 100m

Scale: 1:2,000 @ 11"x17"

NOTE:
BASE AIRPHOTOS PROVIDED BY OLLERHEAD & ASSOCIATES LTD., AUGUST 2014

STATUS
ISSUED FOR USE

Notes:
NG - No guideline
BOLD - Exceeds CSR Guideline
Shaded - Exceeds CCME Guideline
Italic - Detection limit greater than guideline
N/A - Not applicable
Blank - Not analyzed

CLIENT
Aboriginal Affairs and Northern Development Canada

TETRA TECH EBA

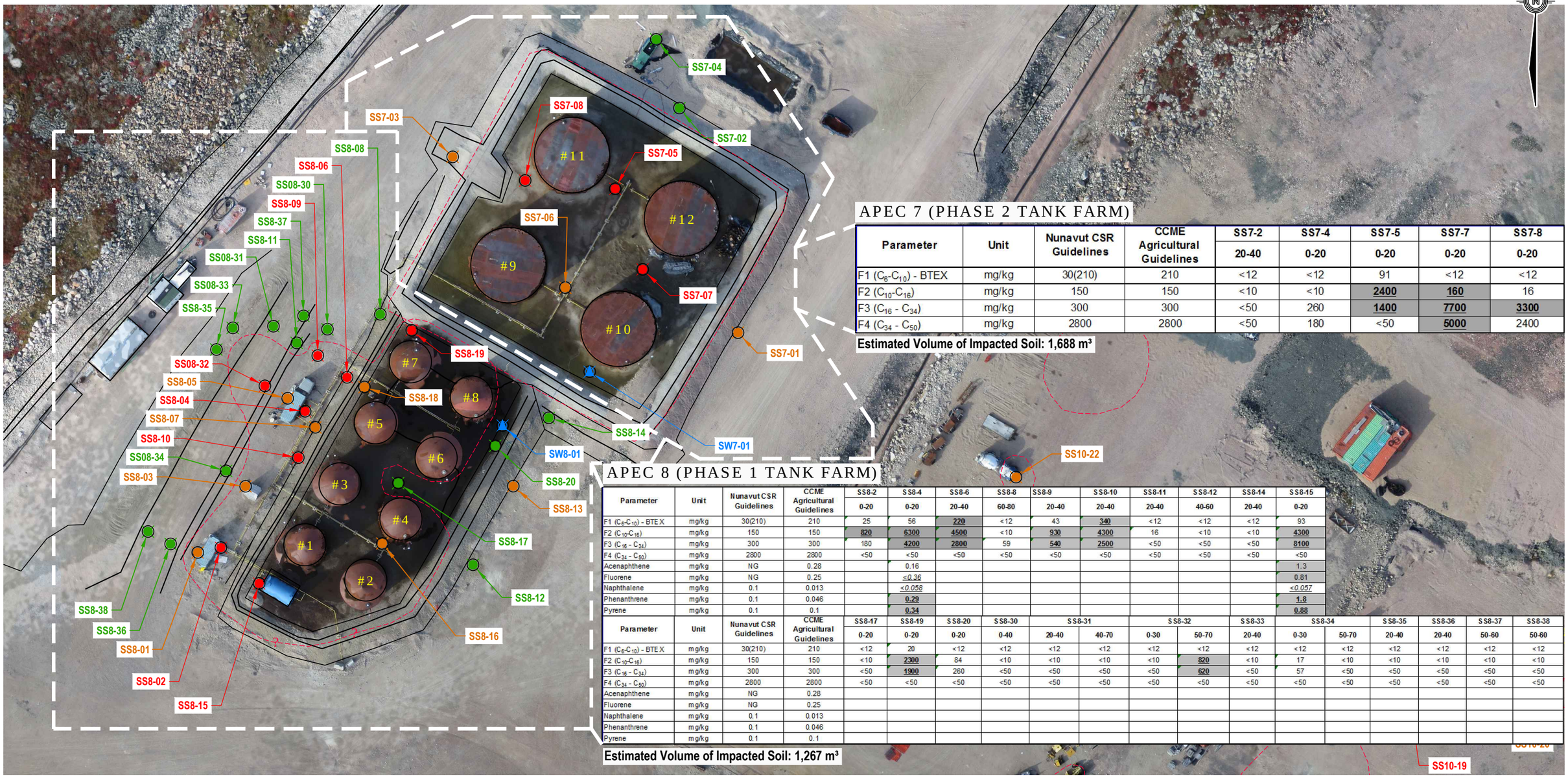
Closure Assessment
Jericho Diamond Mine, Nunavut
APEC 6 - LOW GRADE STOCKPILE AREA SOIL SAMPLE LOCATIONS

PROJECT NO.	DWN	CKD	REV
E14103202	GDK/DBD	WTH	0

OFFICE: EDM
DATE: December 2014

Figure B.10

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA2.0 Producton Drawings\ESA Figures_Appendix B.dwg [FIGURE B.10] December 15, 2014 - 1:38:03 pm (BY: STIRLING, JENNIFER)



APEC 7 (PHASE 2 TANK FARM)

Parameter	Unit	Nunavut CSR Guidelines	CCME Agricultural Guidelines	SS7-2	SS7-4	SS7-5	SS7-7	SS7-8
				20-40	0-20	0-20	0-20	0-20
F1 (C_6-C_{10}) - BTEX	mg/kg	30(210)	210	<12	<12	91	<12	<12
F2 (C_{10}-C_{16})	mg/kg	150	150	<10	<10	**2400**	**160**	16
F3 (C_{16} - C_{34})	mg/kg	300	300	<50	260	**1400**	**7700**	**3300**
F4 (C_{34} - C_{50})	mg/kg	2800	2800	<50	180	<50	**5000**	2400

Estimated Volume of Impacted Soil: 1,688 m³

APEC 8 (PHASE 1 TANK FARM)

Parameter	Unit	Nunavut CSR Guidelines	CCME Agricultural Guidelines	SS8-2	SS8-4	SS8-6	SS8-8	SS8-9	SS8-10	SS8-11	SS8-12	SS8-14	SS8-15
				0-20	0-20	20-40	60-80	20-40	20-40	20-40	40-60	20-40	0-20
F1 (C_6-C_{10}) - BTEX	mg/kg	30(210)	210	25	56	**220**	<12	43	**340**	<12	<12	<12	93
F2 (C_{10}-C_{16})	mg/kg	150	150	**820**	**6300**	**4500**	<10	**930**	**4300**	16	<10	<10	**4300**
F3 (C_{16} - C_{34})	mg/kg	300	300	180	**4200**	**2800**	59	**540**	**2500**	<50	<50	<50	**8100**
F4 (C_{34} - C_{50})	mg/kg	2800	2800	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Acenaphthene	mg/kg	NG	0.28		0.16								1.3
Fluorene	mg/kg	NG	0.25		*<0.36*								0.81
Naphthalene	mg/kg	0.1	0.013		*<0.058*								*<0.057*
Phenanthrene	mg/kg	0.1	0.046		**0.29**								**1.8**
Pyrene	mg/kg	0.1	0.1		**0.34**								**0.88**

Parameter	Unit	Nunavut CSR Guidelines	CCME Agricultural Guidelines	SS8-17	SS8-19	SS8-20	SS8-30	SS8-31		SS8-32		SS8-33	SS8-34		SS8-35	SS8-36	SS8-37	SS8-38
				0-20	0-20	0-20	0-40	20-40	40-70	0-30	50-70	20-40	0-30	50-70	20-40	20-40	50-60	50-60
F1 (C_6-C_{10}) - BTEX	mg/kg	30(210)	210	<12	20	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12
F2 (C_{10}-C_{16})	mg/kg	150	150	<10	**2300**	84	<10	<10	<10	<10	**820**	<10	17	<10	<10	<10	<10	<10
F3 (C_{16} - C_{34})	mg/kg	300	300	<50	**1900**	260	<50	<50	<50	<50	**620**	<50	57	<50	<50	<50	<50	<50
F4 (C_{34} - C_{50})	mg/kg	2800	2800	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Acenaphthene	mg/kg	NG	0.28															
Fluorene	mg/kg	NG	0.25															
Naphthalene	mg/kg	0.1	0.013															
Phenanthrene	mg/kg	0.1	0.046															
Pyrene	mg/kg	0.1	0.1															

Estimated Volume of Impacted Soil: 1,267 m³

LEGEND:

- SOIL SAMPLE LOCATION
- BERM WATER SAMPLE LOCATION
- BELOW APPLICABLE GUIDELINES - SOIL
- ABOVE APPLICABLE GUIDELINES - SOIL
- NOT ANALYSED
- APPROXIMATE EXTENT OF IMPACTED SOIL

0 25m

Scale: 1:750 @ 11"x17"

NOTE:
BASE AIRPHOTOS PROVIDED BY OLLERHEAD & ASSOCIATES LTD., AUGUST 2014

STATUS
ISSUED FOR USE

Notes:

- NG - No guideline
- **BOLD** - Exceeds CSR Guideline
- Shaded - Exceeds CCME Guideline
- *Italic* - Detection limit greater than guideline
- N/A - Not applicable
- Blank - Not analyzed

CLIENT

Aboriginal Affairs and Northern Development Canada

TETRA TECH EBA

Closure Assessment
Jericho Diamond Mine, Nunavut
APEC 7 AND APEC 8 - TANK FARM SOIL SAMPLE LOCATIONS

PROJECT NO.	DWN	CKD	REV
E14103202	GDK/DBD	WTH	0

OFFICE: EDM

DATE: December 2014

Figure B.11

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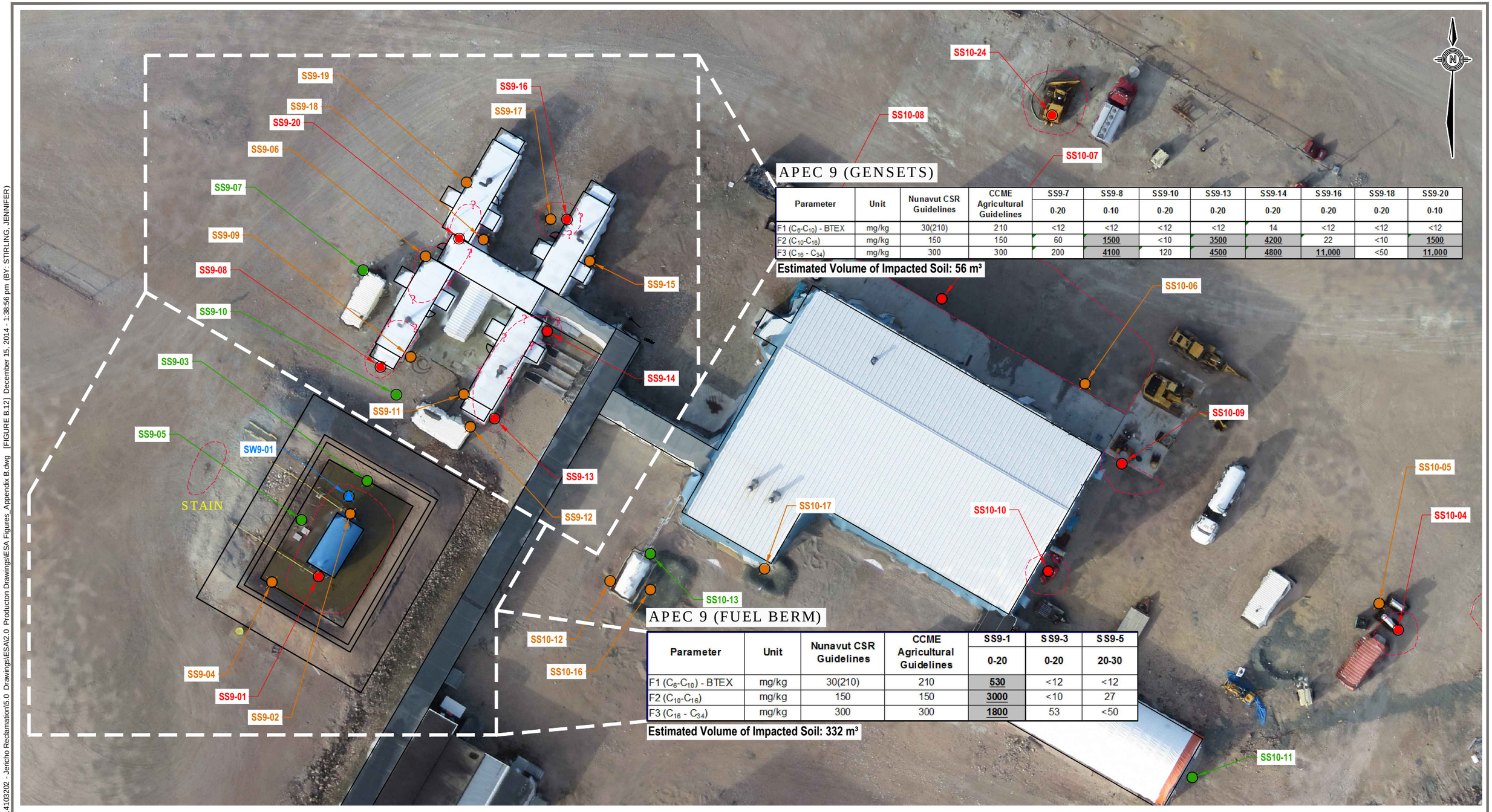

APEC 9 (GENSETS)

Parameter	Unit	Nunavut CSR Guidelines	CCME Agricultural Guidelines	SS9-7	SS9-8	SS9-10	SS9-13	SS9-14	SS9-16	SS9-18	SS9-20
				0-20	0-10	0-20	0-20	0-20	0-20	0-20	0-10
F1 (C_6-C_{10}) - BTEX	mg/kg	30(210)	210	<12	<12	<12	<12	14	<12	<12	<12
F2 (C_{10}-C_{16})	mg/kg	150	150	60	**1500**	<10	**3500**	**4200**	22	<10	**1500**
F3 (C_{16} - C_{34})	mg/kg	300	300	200	**4100**	120	**4500**	**4800**	**11,000**	<50	**11,000**

Estimated Volume of Impacted Soil: 56 m³

APEC 9 (FUEL BERM)

Parameter	Unit	Nunavut CSR Guidelines	CCME Agricultural Guidelines	SS9-1	SS9-3	SS9-5
				0-20	0-20	20-30
F1 (C_6-C_{10}) - BTEX	mg/kg	30(210)	210	**530**	<12	<12
F2 (C_{10}-C_{16})	mg/kg	150	150	**3000**	<10	27
F3 (C_{16} - C_{34})	mg/kg	300	300	**1800**	53	<50

Estimated Volume of Impacted Soil: 332 m³

LEGEND:

- SOIL SAMPLE LOCATION
- BERM WATER SAMPLE LOCATION
- BELOW APPLICABLE GUIDELINES - SOIL
- ABOVE APPLICABLE GUIDELINES - SOIL
- NOT ANALYSED
- APPROXIMATE EXTENT OF IMPACTED SOIL

0 20m

Scale: 1:400 @ 11"x17"

NOTE:
BASE AIRPHOTOS PROVIDED BY OLLERHEAD & ASSOCIATES LTD., AUGUST 2014

STATUS
ISSUED FOR USE

Notes:

- NG - No guideline
- **BOLD** - Exceeds CSR Guideline
- Shaded - Exceeds CCME Guideline
- *Italic* - Detection limit greater than guideline
- N/A - Not applicable
- Blank - Not analyzed

CLIENT

Aboriginal Affairs and Northern Development Canada

TETRA TECH EBA

Closure Assessment
Jericho Diamond Mine, Nunavut
APEC 9 - GENSETS AND FUEL BERM SOIL SAMPLE LOCATIONS

PROJECT NO.	DWN	CKD	REV
E14103202	GDK/DBD	WTH	0

OFFICE: EDM

DATE: December 2014

Figure B.12

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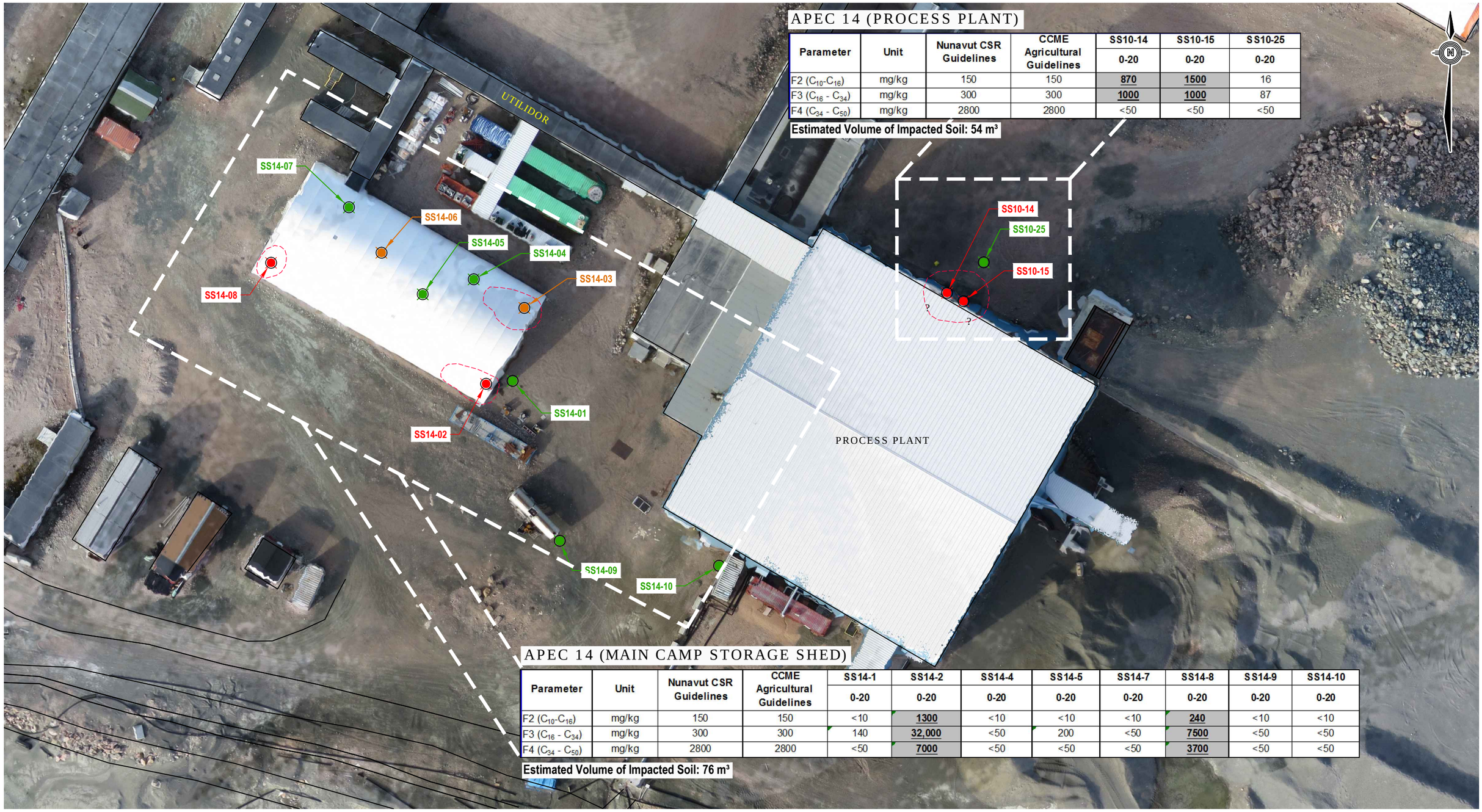

APEC 14 (PROCESS PLANT)

Parameter	Unit	Nunavut CSR Guidelines	CCME Agricultural Guidelines	SS10-14	SS10-15	SS10-25
				0-20	0-20	0-20
F2 (C_{10}-C_{16})	mg/kg	150	150	**870**	**1500**	16
F3 (C_{16} - C_{34})	mg/kg	300	300	**1000**	**1000**	87
F4 (C_{34} - C_{50})	mg/kg	2800	2800	<50	<50	<50

Estimated Volume of Impacted Soil: 54 m³

APEC 14 (MAIN CAMP STORAGE SHED)

Parameter	Unit	Nunavut CSR Guidelines	CCME Agricultural Guidelines	SS14-1	SS14-2	SS14-4	SS14-5	SS14-7	SS14-8	SS14-9	SS14-10
				0-20	0-20	0-20	0-20	0-20	0-20	0-20	0-20
F2 (C_{10}-C_{16})	mg/kg	150	150	<10	**1300**	<10	<10	<10	**240**	<10	<10
F3 (C_{16} - C_{34})	mg/kg	300	300	140	**32,000**	<50	200	<50	**7500**	<50	<50
F4 (C_{34} - C_{50})	mg/kg	2800	2800	<50	**7000**	<50	<50	<50	**3700**	<50	<50

Estimated Volume of Impacted Soil: 76 m³

LEGEND:

- SOIL SAMPLE LOCATION
- BELOW APPLICABLE GUIDELINES - SOIL
- ABOVE APPLICABLE GUIDELINES - SOIL
- NOT ANALYSED
- APPROXIMATE EXTENT OF IMPACTED SOIL

0 25m

Scale: 1:500 @ 11"x17"

NOTE:
BASE AIRPHOTOS PROVIDED BY OLLERHEAD & ASSOCIATES LTD., AUGUST 2014

STATUS
ISSUED FOR USE

Notes:

- NG - No guideline
- **BOLD** - Exceeds CSR Guideline
- Shaded - Exceeds CCME Guideline
- *Italic* - Detection limit greater than guideline
- N/A - Not applicable
- Blank - Not analyzed

CLIENT

Aboriginal Affairs and Northern Development Canada

TETRA TECH EBA

Closure Assessment
Jericho Diamond Mine, Nunavut

APEC 14 - PROCESS PLANT
SOIL SAMPLE LOCATIONS

PROJECT NO.	DWN	CKD	REV
E14103202	GDK/DBD	WTH	0

OFFICE: EDM

DATE: December 2014

Figure B.13

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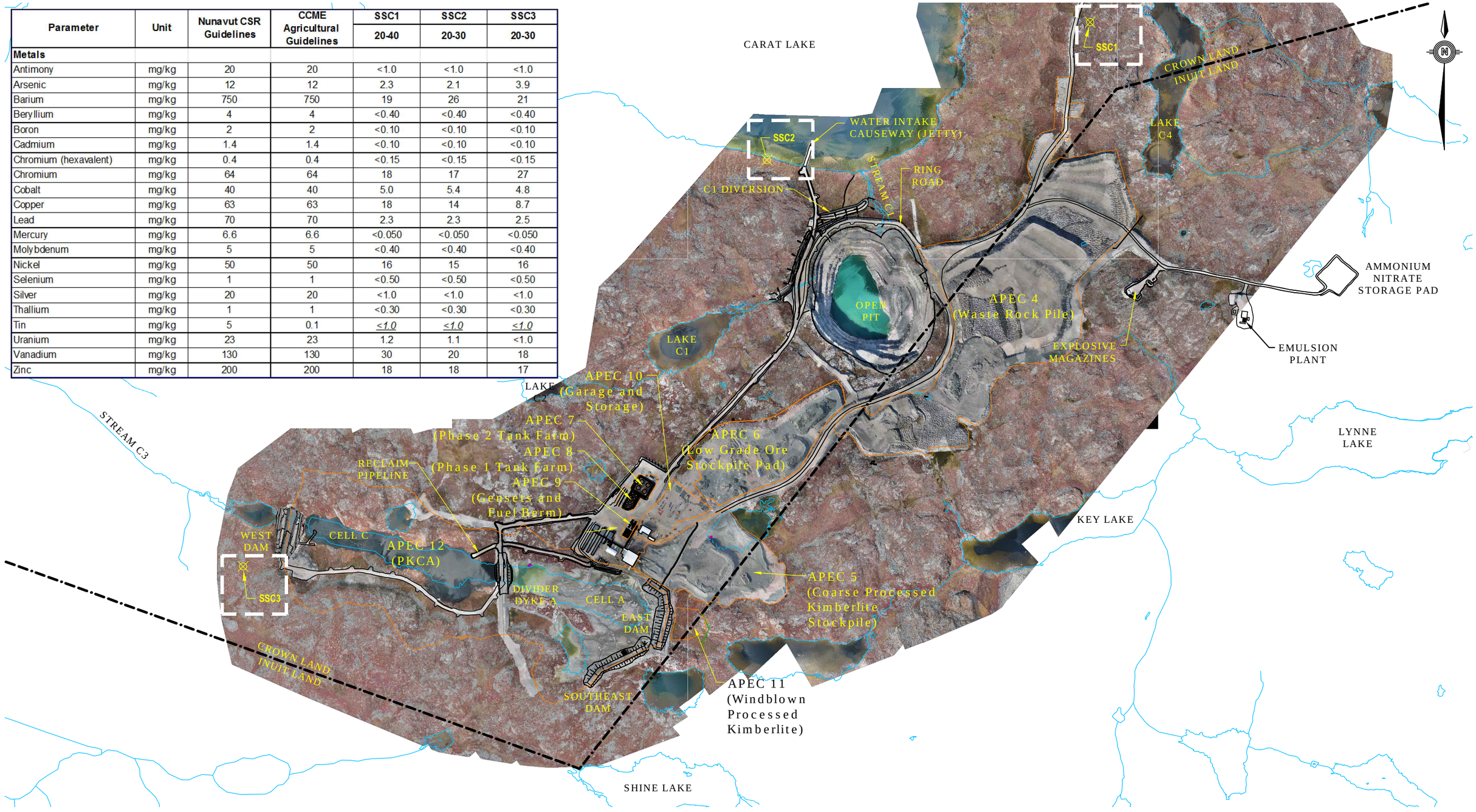
Parameter	Unit	Nunavut CSR Guidelines	CCME Agricultural Guidelines	SSC1	SSC2	SSC3
				20-40	20-30	20-30
Metals						
Antimony	mg/kg	20	20	<1.0	<1.0	<1.0
Arsenic	mg/kg	12	12	2.3	2.1	3.9
Barium	mg/kg	750	750	19	26	21
Beryllium	mg/kg	4	4	<0.40	<0.40	<0.40
Boron	mg/kg	2	2	<0.10	<0.10	<0.10
Cadmium	mg/kg	1.4	1.4	<0.10	<0.10	<0.10
Chromium (hexavalent)	mg/kg	0.4	0.4	<0.15	<0.15	<0.15
Chromium	mg/kg	64	64	18	17	27
Cobalt	mg/kg	40	40	5.0	5.4	4.8
Copper	mg/kg	63	63	18	14	8.7
Lead	mg/kg	70	70	2.3	2.3	2.5
Mercury	mg/kg	6.6	6.6	<0.050	<0.050	<0.050
Molybdenum	mg/kg	5	5	<0.40	<0.40	<0.40
Nickel	mg/kg	50	50	16	15	16
Selenium	mg/kg	1	1	<0.50	<0.50	<0.50
Silver	mg/kg	20	20	<1.0	<1.0	<1.0
Thallium	mg/kg	1	1	<0.30	<0.30	<0.30
Tin	mg/kg	5	0.1	*<1.0*	*<1.0*	*<1.0*
Uranium	mg/kg	23	23	1.2	1.1	<1.0
Vanadium	mg/kg	130	130	30	20	18
Zinc	mg/kg	200	200	18	18	17



LEGEND:

- CONTROL SOIL SAMPLE LOCATION

0 500m

Scale: 1:12,500 @ 11"x17"

NOTE:
BASE AIRPHOTOS PROVIDED BY
OLLERHEAD & ASSOCIATES LTD., AUGUST 2014

STATUS
ISSUED FOR USE

CLIENT
Aboriginal Affairs and Northern Development Canada

TETRA TECH EBA

Closure Assessment
Jericho Diamond Mine, Nunavut

CONTROL SOIL SAMPLE LOCATIONS

PROJECT NO.	DWN	CKD	REV
E14103202	GDK/DBD	WTH	0
OFFICE: EDM	DATE: December 2014		

Figure B.14

Q:\Edmonton\Engineering\E1411\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\ESA Figures_Appendix B.dwg [FIGURE B.14] December 15, 2014 - 1:39:36 pm (BY: STIRLING, JENNIFER)

Table B.1: Soil Analytical Results

Parameter	Unit	Nunavut CSR Guidelines[1]	CCME Agricultural Guidelines[2]	APEC 1- Airstrip																
				SS1A-2	SS1A-4	SS1B-1	SS1B-4	SS1B-6	SS1B-7	SS1B-8	SS1C-1	SS1C-2	SS1C-3	SS1D-1	SS1D-3	SS1D-4	SS1D-5	SS1E-1	SS1E-2	SS1E-5	SS1E-9
				10-30	10-30	0-10	0-10	90-110	90-110	0-10	0-10	0-20	0-20	0-20	0-20	20-40	0-20	0-20	0-20	0-20	0-20
				24-Aug-14	24-Aug-14	24-Aug-14	24-Aug-14	24-Aug-14	24-Aug-14	24-Aug-14	24-Aug-14	24-Aug-14	24-Aug-14	24-Aug-14	24-Aug-14	24-Aug-14	24-Aug-14	24-Aug-14	24-Aug-14	24-Aug-14	24-Aug-14
Particle Size																				
>75µm	%	NG	NG				95									91					
<75µm	%	NG	NG				5.1									9.0					
Grain Size	N/A	NG	NG				Coarse									Coarse					
Hydrocarbons																				
Benzene	mg/kg	0.0095 [3]	0.0095 [3]	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0079	<0.0050	**0.0099**	<0.0050	0.0090	<0.0050	<0.0050	<0.0050	<0.0050
Toluene	mg/kg	0.37	0.37	<0.020	<0.020	0.11	0.034	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Ethylbenzene	mg/kg	0.082	0.082	<0.010	<0.010	**0.13**	**0.13**	<0.010	<0.010	0.018	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.014	<0.010
Xylenes (m & p)	mg/kg	NG	NG	<0.040	<0.040	2.0	0.57	<0.040	<0.040	0.45	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.39	<0.040
Xylene (o)	mg/kg	NG	NG	<0.020	<0.020	2.3	0.47	<0.020	<0.020	0.77	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.72	<0.020
Xylenes Total	mg/kg	11	11	<0.040	<0.040	4.3	1.0	<0.040	<0.040	1.2	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	1.1	<0.040
F1 (C_6 to C_{10})	mg/kg	NG	NG	<12	<12	95	150	<12	<12	81	<12	<12	<12	<12	<12	<12	<12	<12	<12	64	<12
F1 (C_6-C_{10}) - BTEX	mg/kg	30(210[4])	210	<12	<12	90	150	<12	<12	79	<12	<12	<12	<12	<12	<12	<12	<12	<12	63	<12
F2 (C_{10}-C_{16})	mg/kg	150	150	<10	<10	**3300**	**3500**	<10	<10	**2800**	**4200**	**2400**	<10	<10	15	**190**	<10	54	<10	**770**	**410**
F3 (C_{16} - C_{34})	mg/kg	300	300	<50	<50	**1100**	**400**	<50	<50	**1000**	**3500**	**2900**	<50	<50	**1300**	150	<50	**3600**	<50	**400**	**1100**
F4 (C_{34} - C_{50})	mg/kg	2800	2800	<50	<50	<50	<50	<50	<50	<50	970	68	<50	<50	720	<50	<50	**13,000**	<50	<50	1600
Chromatogram Reached Baseline at C_{50}	N/A	NG	NG	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No
F4G-SG (Heavy Hydrocarbons-Grav.)	mg/kg	2800	NG															**19,000**			2600
Moisture	%	NG	NG	4.5	3.9	5.6	11	11	5.6	12	1.9	4.0	2.9	5.6	12	8.1	6.5	4.6	7.1	6.7	7.6
Metals																					
Antimony	mg/kg	20 [4]	20									<1.0									
Arsenic	mg/kg	12	12									<1.0									
Barium	mg/kg	750	750									47									
Beryllium	mg/kg	4 [4]	4									<0.40									
Boron	mg/kg	2 [4]	2									0.38									
Cadmium	mg/kg	1.4	1.4									<0.10									
Chromium (hexavalent)	mg/kg	0.4	0.4									<0.15									
Chromium	mg/kg	64	64									48									
Cobalt	mg/kg	40 [4]	40									7.8									
Copper	mg/kg	63	63									6.6									
Lead	mg/kg	70	70									3.0									
Mercury	mg/kg	6.6	6.6									<0.050									
Molybdenum	mg/kg	5 [4]	5									2.3									
Nickel	mg/kg	50	50									**63**									
Selenium	mg/kg	1	1									<0.50									
Silver	mg/kg	20 [4]	20									<1.0									
Thallium	mg/kg	1	1									<0.30									
Tin	mg/kg	5 [4]	0.1									*<1.0*									
Uranium	mg/kg	23	23									4.3									
Vanadium	mg/kg	130	130									17									
Zinc	mg/kg	200	200									27									
Glycols																					
Diethylene glycol	mg/kg	NG	NG																		
Ethylene glycol	mg/kg	960	960																		
Propylene glycol	mg/kg	NG	NG																		
Tetraethylene Glycol	mg/kg	NG	NG																		
Triethylene Glycol	mg/kg	NG	NG																		
Polycyclic Aromatic Hydrocarbons (PAHs)																					
Index of Additive Cancer Risk (IACR)	N/A	NG	1																		
Benzo[a]pyrene equivalency	mg/kg	NG	0.6 [3]																		
2-methylnaphthalene	mg/kg	NG	NG																		
Acenaphthene	mg/kg	NG	0.28																		
Acenaphthylene	mg/kg	NG	320																		
Acridine	mg/kg	NG	NG																		
Anthracene	mg/kg	NG	2.5																		
Benz(a)anthracene	mg/kg	0.1 [4]	0.1																		
Benzo(a) pyrene	mg/kg	0.1	20																		
Benzo(b+j)fluoranthene	mg/kg	NG	0.1																		
Benzo(c)phenanthrene	mg/kg	NG	NG																		
Benzo(e)pyrene	mg/kg	NG	NG																		
Benzo(g,h,i)perylene	mg/kg	NG	NG																		
Benzo(k)fluoranthene	mg/kg	0.1 [4]	0.1																		
Chrysene	mg/kg	NG	NG																		
Dibenz(a,h)anthracene	mg/kg	0.1 [4]	0.1																		
Fluoranthene	mg/kg	NG	50																		
Fluorene	mg/kg	NG	0.25																		
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1 [4]	0.1																		
Naphthalene	mg/kg	0.1	0.013																		
Perylene	mg/kg	NG	NG																		
Phenanthrene	mg/kg	0.1 [4]	0.046																		
Pyrene	mg/kg	0.1 [4]	0.1																		
Quinoline	mg/kg	0.1 [4]	NG																		
Laboratory Work Order Number				B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838
Laboratory Identification Number				KL1510	KL1511	KL1513	KL1512	KL1515	KL1516	KL1514	KL1517	KL1518	KL1519	KL1521	KL1569	KL1570	KL1571	KL1572	KL1573	KL1574	KL1575
Laboratory Identification Number							KL1388									KL1423					

Notes:

[1] Nunavut Department of Environment. (Revised March 2009). Table A3-1 Summary of Tier 1 Criteria (mg/kg) for PHC for Surface Soil, Table A4-1 Canadian Soil Quality Guidelines (mg/kg soil) and Table A4-2 Interim Remediation Criteria (mg/kg soil)

[2] Canadian Council of Ministers of the Environment (CCME) (Updated 2013). Soil Quality Guidelines for the Protection of Environmental and Human Health (Agricultural)
For PAHs, all pathways considered including soil contact, soil and food ingestion, protection of freshwater life and interim soil quality criteria

[3] Guideline is for 10^{-6} incremental risk

[4] Interim remediation criteria

[5] Nunavut Department of Environment. (Revised March 2009). Table A3-3 Pathway-Specific Tier 1 Levels (mg/kg) for PHC for Course-Grained Surface Soils.

NG - No guideline

BOLD - Exceeds CSR Guideline

Shaded - Exceeds CCME Guideline

Italic - Detection limit greater than guideline

N/A - Not applicable

Blank - Not analyzed

Table B.1: Soil Analytical Results

Parameter	Unit	Nunavut CSR Guidelines[1]	CCME Agricultural Guidelines[2]	APEC 2- Contaminate Soils Storage and 3- Hazardous Waste Transfer Area																				
				SS2-1	SS2-2	SS2-4	SS2-6	SS2-8	SS2-9	SS2-10	SS2-14	SS2-16	SS2-17	SS2-19	SS2-20	SS3-1		SS3-4	SS3-6	SS3-7	SS3-8	SS3-9	SS3-11	SS3-12	14MW01
				90-102	50-70	90-110	90-100	0-10	0-10	0-10	0-10	90-100	90-100	90-100	0-20	0-20	90-110	80-98	20-40	20-40	20-40	0-10	0-20	20-40	50-70
				22-Aug-14	22-Aug-14	22-Aug-14	24-Aug-14	24-Aug-14	24-Aug-14	24-Aug-14	24-Aug-14	22-Aug-14	22-Aug-14	22-Aug-14	22-Aug-14	23-Aug-14	23-Aug-14	23-Aug-14	23-Aug-14	23-Aug-14	23-Aug-14	23-Aug-14	23-Aug-14	23-Aug-14	22-Aug-14
Particle Size																								
>75µm	%	NG	NG																					88
<75µm	%	NG	NG																					12
Grain Size	N/A	NG	NG																					Coarse
Hydrocarbons																								
Benzene	mg/kg	0.0095 [3]	0.0095 [3]	<0.0050	<0.0050	0.0064	<0.0050	<0.0050	<0.0050	0.007	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0066	<0.0050
Toluene	mg/kg	0.37	0.37	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Ethylbenzene	mg/kg	0.082	0.082	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.016	<0.010
Xylenes (m & p)	mg/kg	NG	NG	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Xylene (o)	mg/kg	NG	NG	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Xylenes Total	mg/kg	11	11	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
F1 (C_6 to C_{10})	mg/kg	NG	NG	<12	<12	<12	<12	<12	<12	<12	<12	25	<12	60	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12
F1 (C_6-C_{10}) - BTEX	mg/kg	30(210[5])	210	<12	<12	<12	<12	<12	<12	<12	<12	25	<12	60	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12
F2 (C_{10}-C_{16})	mg/kg	150	150	<10	<10	<10	<10	**360**	130	**1400**	**2500**	**1200**	**510**	**2100**	**420**	**460**	<10	<10	**350**	<10	<10	**460**	**330**	<10	<10
F3 (C_{16} - C_{34})	mg/kg	300	300	<50	<50	<50	<50	**14,000**	**3600**	**16,000**	**8700**	**520**	280	**720**	**340**	**9700**	<50	<50	260	<50	<50	**560**	**8100**	63	<50
F4 (C_{34} - C_{50})	mg/kg	2800	2800	<50	<50	<50	<50	**7000**	660	**3300**	80	<50	<50	<50	<50	2300	<50	<50	<50	<50	<50	<50	1800	<50	<50
Chromatogram Reached Baseline at C_{50}	N/A	NG	NG	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F4G-SG (Heavy Hydrocarbons-Grav.)	mg/kg	2800	NG																						
Moisture	%	NG	NG	8	6.1	6.0	5.9	7.1	13	5.5	11	5.0	5.3	5.7	3.9	4.7	8.7	7.9	5.9	15	8.1	15	14	9.3	16
Metals																									
Antimony	mg/kg	20 [4]	20					<1.0																	
Arsenic	mg/kg	12	12					<1.0																	
Barium	mg/kg	750	750					43																	
Beryllium	mg/kg	4 [4]	4					<0.40																	
Boron	mg/kg	2 [4]	2					0.18																	
Cadmium	mg/kg	1.4	1.4					<0.10																	
Chromium (hexavalent)	mg/kg	0.4	0.4					<0.15																	
Chromium	mg/kg	64	64					**110**																	
Cobalt	mg/kg	40 [4]	40					6.4																	
Copper	mg/kg	63	63					13																	
Lead	mg/kg	70	70					3.8																	
Mercury	mg/kg	6.6	6.6					<0.050																	
Molybdenum	mg/kg	5 [4]	5					3.5																	
Nickel	mg/kg	50	50					**94**																	
Selenium	mg/kg	1	1					<0.50																	
Silver	mg/kg	20 [4]	20					<1.0																	
Thallium	mg/kg	1	1					<0.30																	
Tin	mg/kg	5 [4]	0.1					1.2																	
Uranium	mg/kg	23	23					5.4																	
Vanadium	mg/kg	130	130					11																	
Zinc	mg/kg	200	200					**210**																	
Glycols																									
Diethylene glycol	mg/kg	NG	NG						<10																
Ethylene glycol	mg/kg	960	960						<10																
Propylene glycol	mg/kg	NG	NG						<10																
Tetraethylene Glycol	mg/kg	NG	NG						<10																
Triethylene Glycol	mg/kg	NG	NG						<10																
Polycyclic Aromatic Hydrocarbons (PAHs)																									
Index of Additive Cancer Risk (IACR)	N/A	NG	1							2.8	0.6														
Benzo[a]pyrene equivalency	mg/kg	NG	0.6 [3]							<0.10	<0.10														
2-methylnaphthalene	mg/kg	NG	NG							0.052	<0.050														
Acenaphthene	mg/kg	NG	0.28							0.20	0.10														
Acenaphthylene	mg/kg	NG	320							0.15	<0.050														
Acridine	mg/kg	NG	NG							0.66	<0.31														
Anthracene	mg/kg	NG	2.5							<0.63	<0.33														
Benz(a)anthracene	mg/kg	0.1 [4]	0.1							<0.050	<0.050														
Benzo(a) pyrene	mg/kg	0.1	20							<0.050	<0.050														
Benzo(b+j)fluoranthene	mg/kg	NG	0.1							0.15	<0.050														
Benzo(c)phenanthrene	mg/kg	NG	NG							<0.050	<0.050														
Benzo(e)pyrene	mg/kg	NG	NG							<0.050	<0.050														
Benzo(g,h,i)perylene	mg/kg	NG	NG							<0.050	<0.050														
Benzo(k)fluoranthene	mg/kg	0.1 [4]	0.1							**0.26**	<0.050														
Chrysene	mg/kg	NG	NG							<0.050	<0.050														
Dibenz(a,h)anthracene	mg/kg	0.1 [4]	0.1							<0.050	<0.050														
Fluoranthene	mg/kg	NG	50							0.21	0.11														
Fluorene	mg/kg	NG	0.25							0.88	0.059														
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1 [4]	0.1							<0.050	<0.050														
Naphthalene	mg/kg	0.1	0.013							*<0.050*	*<0.050*														
Perylene	mg/kg	NG	NG							<0.050	<0.050														
Phenanthrene	mg/kg	0.1 [4]	0.046							**3.7**	**0.11**														
Pyrene	mg/kg	0.1 [4]	0.1							**0.66**	**0.78**														
Quinoline	mg/kg	0.1 [4]	NG																						
Laboratory Work Order Number				B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838
Laboratory Identification Number				KL2221	KL2223	KL2228	KL1636	KL1638	KL1639	KL1640	KL1644	KL1750	KL1752	KL1756	KL1757	KL1780	KL1782	KL1791	KL1851	KL1852	KL1853	KL1854	KL1856	KL1857	KL1963
Laboratory Identification Number																									

Notes:

[1] Nunavut Department of Environment. (Revised March 2009). Table A3-1 Summary of Tier 1 Criteria (mg/kg) for PHC for Su

[2] Canadian Council of Ministers of the Environment (CCME) (Updated 2013). Soil Quality Guidelines for the Protection of Env
For PAHs, all pathways considered including soil contact, soil and food ingestion, protection of freshwater life and interim so

[3] Guideline is for 10^{-6} incremental risk

[4] Interim remediation criteria

[5] Nunavut Department of Environment. (Revised March 2009). Table A3-3 Pathway-Specific Tier 1 Levels (mg/kg) for PHC fo

NG - No guideline

BOLD - Exceeds CSR Guideline

Shaded - Exceeds CCME Guideline

Italic - Detection limit greater than guideline

N/A - Not applicable

Blank - Not analyzed

Table B.1: Soil Analytical Results

Parameter	Unit	Nunavut CSR Guidelines[1]	CCME Agricultural Guidelines[2]	APEC 4 Waste Rock Pile	APEC 6 Low Grade Ore Stockpile			APEC 7 and 8- Tank Farm																
				SS4-1	SS6-1	SS6-2	SS6-3	SS7-2	SS7-4	SS7-5	SS7-7	SS7-8	SS8-2	SS8-4	SS8-6	SS8-8	SS8-9	SS8-10	SS8-11	SS8-12	SS8-14	SS8-15	SS8-17	SS8-19	SS8-20
				0-20	0-20	0-20	0-20	20-40	0-20	0-20	0-20	0-20	0-20	0-20	20-40	60-80	20-40	20-40	20-40	40-60	20-40	0-20	0-20	0-20	0-20
				26-Aug-14	26-Aug-14	26-Aug-14	26-Aug-14	27-Aug-14	27-Aug-14	27-Aug-14	27-Aug-14	27-Aug-14	27-Aug-14	27-Aug-14	27-Aug-14	27-Aug-14	27-Aug-14	27-Aug-14	27-Aug-14	27-Aug-14	27-Aug-14	27-Aug-14	27-Aug-14	27-Aug-14	27-Aug-14
Particle Size																								
>75µm	%	NG	NG																			95			
<75µm	%	NG	NG																			5.1			
Grain Size	N/A	NG	NG																			Coarse			
Hydrocarbons																								
Benzene	mg/kg	0.0095 [3]	0.0095 [3]	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Toluene	mg/kg	0.37	0.37	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Ethylbenzene	mg/kg	0.082	0.082	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.018	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Xylenes (m & p)	mg/kg	NG	NG	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.069	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Xylene (o)	mg/kg	NG	NG	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.027	<0.020	0.075	<0.020	<0.020	0.21	<0.020	<0.020	<0.020	0.038	<0.020	0.056	<0.020
Xylenes Total	mg/kg	11	11	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.075	<0.040	<0.040	0.27	<0.040	<0.040	<0.040	<0.040	<0.040	0.056	<0.040
F1 (C_6 to C_{10})	mg/kg	NG	NG	<12	<12	<12	<12	<12	<12	91	<12	<12	25	56	220	<12	43	340	<12	<12	<12	93	<12	20	<12
F1 (C_6-C_{10}) - BTEX	mg/kg	30(210[5])	210	<12	<12	<12	<12	<12	<12	91	<12	<12	25	56	**220**	<12	43	**340**	<12	<12	<12	93	<12	20	<12
F2 (C_{10}-C_{16})	mg/kg	150	150	**280**	<10	<10	<10	<10	<10	**2400**	**160**	16	**820**	**6300**	**4500**	<10	**930**	**4300**	16	<10	<10	**4300**	<10	**2300**	84
F3 (C_{16} - C_{34})	mg/kg	300	300	**8300**	<50	<50	<50	<50	260	**1400**	**7700**	**3300**	180	**4200**	**2800**	59	**540**	**2500**	<50	<50	<50	**8100**	<50	**1900**	260
F4 (C_{34} - C_{50})	mg/kg	2800	2800	1400	<50	<50	<50	<50	180	<50	**5000**	2400	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Chromatogram Reached Baseline at C_{50}	N/A	NG	NG	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F4G-SG (Heavy Hydrocarbons-Grav.)	mg/kg	2800	NG																						
Moisture	%	NG	NG	3.8	4.5	0.90	2.9	4.8	3.6	16	8.4	14	8.7	13	15	4.0	7.9	13	7.0	4.5	3.0	12	16	16	17
Metals																									
Antimony	mg/kg	20 [4]	20											<1.0								<1.0			
Arsenic	mg/kg	12	12											2.0								3.3			
Barium	mg/kg	750	750											25								28			
Beryllium	mg/kg	4 [4]	4											<0.40								<0.40			
Boron	mg/kg	2 [4]	2											<0.10								<0.10			
Cadmium	mg/kg	1.4	1.4											<0.10								<0.10			
Chromium (hexavalent)	mg/kg	0.4	0.4											<0.15								0.33			
Chromium	mg/kg	64	64											37								38			
Cobalt	mg/kg	40 [4]	40											6.1								5.8			
Copper	mg/kg	63	63											31								10			
Lead	mg/kg	70	70											3.4								3.3			
Mercury	mg/kg	6.6	6.6											<0.050								<0.050			
Molybdenum	mg/kg	5 [4]	5											0.69								1.3			
Nickel	mg/kg	50	50											25								35			
Selenium	mg/kg	1	1											<0.50								<0.50			
Silver	mg/kg	20 [4]	20											<1.0								<1.0			
Thallium	mg/kg	1	1											<0.30								<0.30			
Tin	mg/kg	5 [4]	0.1											*<1.0*								*<1.0*			
Uranium	mg/kg	23	23											2.3								2.1			
Vanadium	mg/kg	130	130											32								15			
Zinc	mg/kg	200	200											28								22			
Glycols																									
Diethylene glycol	mg/kg	NG	NG																						
Ethylene glycol	mg/kg	960	960																						
Propylene glycol	mg/kg	NG	NG																						
Tetraethylene Glycol	mg/kg	NG	NG																						
Triethylene Glycol	mg/kg	NG	NG																						
Polycyclic Aromatic Hydrocarbons (PAHs)																									
Index of Additive Cancer Risk (IACR)	N/A	NG	1											0.6								0.6			
Benzo[a]pyrene equivalency	mg/kg	NG	0.6 [3]											<0.10								<0.10			
2-methylnaphthalene	mg/kg	NG	NG											<0.050								<0.050			
Acenaphthene	mg/kg	NG	0.28											0.16								1.3			
Acenaphthylene	mg/kg	NG	320											<0.058								0.095			
Acridine	mg/kg	NG	NG											1.7								7.6			
Anthracene	mg/kg	NG	2.5											<0.18								<0.59			
Benz(a)anthracene	mg/kg	0.1 [4]	0.1											<0.050								<0.050			
Benzo(a) pyrene	mg/kg	0.1	20											<0.050								<0.050			
Benzo(b+j)fluoranthene	mg/kg	NG	0.1											<0.050								<0.050			
Benzo(c)phenanthrene	mg/kg	NG	NG											<0.050								<0.050			
Benzo(e)pyrene	mg/kg	NG	NG											<0.050								<0.050			
Benzo(g,h,i)perylene	mg/kg	NG	NG											<0.050								<0.050			
Benzo(k)fluoranthene	mg/kg	0.1 [4]	0.1											<0.050								<0.050			
Chrysene	mg/kg	NG	NG											<0.050								<0.050			
Dibenz(a,h)anthracene	mg/kg	0.1 [4]	0.1											<0.050								<0.050			
Fluoranthene	mg/kg	NG	50											<0.050								0.29			
Fluorene	mg/kg	NG	0.25											*<0.36*								0.81			
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1 [4]	0.1											<0.050								<0.050			
Naphthalene	mg/kg	0.1	0.013											*<0.058*								*<0.057*			
Perylene	mg/kg	NG	NG											<0.050								<0.050			
Phenanthrene	mg/kg	0.1 [4]	0.046											**0.29**								**1.8**			
Pyrene	mg/kg	0.1 [4]	0.1											**0.34**								**0.88**			
Quinoline	mg/kg	0.1 [4]	NG											<0.10								<0.10			
Laboratory Work Order Number				B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653
Laboratory Identification Number				KM2693	KM2690	KM2691	KM2692	KM2727	KM2729	KM2730	KM2732	KM2733	KM2735	KM2737	KM2739	KM2741	KM2742	KM2744	KM2745	KM2746	KM2748	KM2749	KM2751	KM2753	KM2754
Laboratory Identification Number																									

Notes:

[1] Nunavut Department of Environment. (Revised March 2009). Table A3-1 Summary of Tier 1 Criteria (mg/kg) for PHC for Su

[2] Canadian Council of Ministers of the Environment (CCME) (Updated 2013). Soil Quality Guidelines for the Protection of Env
For PAHs, all pathways considered including soil contact, soil and food ingestion, protection of freshwater life and interim so

[3] Guideline is for 10^{-5} incremental risk

[4] Interim remediation criteria

[5] Nunavut Department of Environment. (Revised March 2009). Table A3-3 Pathway-Specific Tier 1 Levels (mg/kg) for PHC fo

NG - No guideline

BOLD - Exceeds CSR Guideline

Shaded - Exceeds CCME Guideline

Italic - Detection limit greater than guideline

N/A - Not applicable

Blank - Not analyzed

Table B.1: Soil Analytical Results

Parameter	Unit	Nunavut CSR Guidelines[1]	CCME Agricultural Guidelines[2]	APEC 7 and 8- Tank Farm												APEC 9 Genset and Fuel Berm										
				SS8-30	SS8-31			SS8-32		SS8-33	SS8-34			SS8-35	SS8-36	SS8-37	SS8-38	SS9-1	SS9-3	SS9-5	SS9-7	SS9-8	SS9-10	SS9-13	SS9-14	SS9-16	SS9-18	SS9-20
				0-40	20-40	40-70	0-30	50-70	20-40	0-30	50-70	20-40	20-40	50-60	50-60	0-20	0-20	20-30	0-20	0-10	0-20	0-20	0-20	0-20	0-20	0-20	0-10
				30-Aug-14	30-Aug-14	30-Aug-14	30-Aug-14	30-Aug-14	30-Aug-14	30-Aug-14	30-Aug-14	31-Aug-14	31-Aug-14	31-Aug-14	31-Aug-14	26-Aug-14	26-Aug-14	27-Aug-14	27-Aug-14	27-Aug-14	27-Aug-14	27-Aug-14	27-Aug-14	27-Aug-14	27-Aug-14	27-Aug-14	27-Aug-14	27-Aug-14
Particle Size																												
>75µm	%	NG	NG																									
<75µm	%	NG	NG																									
Grain Size	N/A	NG	NG																									
Hydrocarbons																												
Benzene	mg/kg	0.0095 [3]	0.0095 [3]	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Toluene	mg/kg	0.37	0.37	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.043	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.083
Ethylbenzene	mg/kg	0.082	0.082	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Xylenes (m & p)	mg/kg	NG	NG	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	2.6	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Xylene (o)	mg/kg	NG	NG	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	3.7	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Xylenes Total	mg/kg	11	11	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	6.3	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
F1 (C_6 to C_{10})	mg/kg	NG	NG	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	540	<12	<12	<12	<12	<12	<12	14	<12	<12	<12
F1 (C_6-C_{10}) - BTEX	mg/kg	30(210[4])	210	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	**530**	<12	<12	<12	<12	<12	<12	14	<12	<12	<12
F2 (C_{10}-C_{16})	mg/kg	150	150	<10	<10	<10	<10	**820**	<10	17	<10	<10	<10	<10	<10	<10	<10	**3000**	<10	27	60	**1500**	<10	**3500**	**4200**	22	<10	**1500**
F3 (C_{16} - C_{34})	mg/kg	300	300	<50	<50	<50	<50	**620**	<50	57	<50	<50	<50	<50	<50	<50	<50	**1800**	53	<50	200	**4100**	120	**4500**	**4800**	**11,000**	<50	**11,000**
F4 (C_{34} - C_{50})	mg/kg	2800	2800	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	1900	<50	<50
Chromatogram Reached Baseline at C_{50}	N/A	NG	NG	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F4G-SG (Heavy Hydrocarbons-Grav.)	mg/kg	2800	NG																									
Moisture	%	NG	NG	3.9	7.7	17	5.6	17	5.4	4.1	15	5.6	6.4	5.0	5.7	14	19	12	5.7	6.5	4.6	7.9	7.7	4.9	5.3	9.9		
Metals																												
Antimony	mg/kg	20 [4]	20																									
Arsenic	mg/kg	12	12																									
Barium	mg/kg	750	750																									
Beryllium	mg/kg	4 [4]	4																									
Boron	mg/kg	2 [4]	2																									
Cadmium	mg/kg	1.4	1.4																									
Chromium (hexavalent)	mg/kg	0.4	0.4																									
Chromium	mg/kg	64	64																									
Cobalt	mg/kg	40 [4]	40																									
Copper	mg/kg	63	63																									
Lead	mg/kg	70	70																									
Mercury	mg/kg	6.6	6.6																									
Molybdenum	mg/kg	5 [4]	5																									
Nickel	mg/kg	50	50																									
Selenium	mg/kg	1	1																									
Silver	mg/kg	20 [4]	20																									
Thallium	mg/kg	1	1																									
Tin	mg/kg	5 [4]	0.1																									
Uranium	mg/kg	23	23																									
Vanadium	mg/kg	130	130																									
Zinc	mg/kg	200	200																									
Glycols																												
Diethylene glycol	mg/kg	NG	NG																									
Ethylene glycol	mg/kg	960	960																									
Propylene glycol	mg/kg	NG	NG																									
Tetraethylene Glycol	mg/kg	NG	NG																									
Triethylene Glycol	mg/kg	NG	NG																									
Polycyclic Aromatic Hydrocarbons (PAHs)																												
Index of Additive Cancer Risk (IACR)	N/A	NG	1																									
Benzo[a]pyrene equivalency	mg/kg	NG	0.6 [3]																									
2-methylnaphthalene	mg/kg	NG	NG																									
Acenaphthene	mg/kg	NG	0.28																									
Acenaphthylene	mg/kg	NG	320																									
Acridine	mg/kg	NG	NG																									
Anthracene	mg/kg	NG	2.5																									
Benz(a)anthracene	mg/kg	0.1 [4]	0.1																									
Benzo(a) pyrene	mg/kg	0.1	20																									
Benzo(b+j)fluoranthene	mg/kg	NG	0.1																									
Benzo(c)phenanthrene	mg/kg	NG	NG																									
Benzo(e)pyrene	mg/kg	NG	NG																									
Benzo(g,h,i)perylene	mg/kg	NG	NG																									
Benzo(k)fluoranthene	mg/kg	0.1 [4]	0.1																									
Chrysene	mg/kg	NG	NG																									
Dibenz(a,h)anthracene	mg/kg	0.1 [4]	0.1																									
Fluoranthene	mg/kg	NG	50																									
Fluorene	mg/kg	NG	0.25																									
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1 [4]	0.1																									
Naphthalene	mg/kg	0.1	0.013																									
Perylene	mg/kg	NG	NG																									
Phenanthrene	mg/kg	0.1 [4]	0.046																									
Pyrene	mg/kg	0.1 [4]	0.1																									
Quinoline	mg/kg	0.1 [4]	NG																									
Laboratory Work Order Number				B477081	B477081	B477081	B477081	B477081	B477081	B477081	B477081	B477081	B477081	B477081	B477081	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653		
Laboratory Identification Number				KM5560	KM5562	KM5563	KM5564	KM5566	KM5568	KM5597	KM5599	KM5601	KM5603	KM5605	KM5607	KM2694	KM2696	KM2709	KM2711	KM2712	KM2714	KM2717	KM2719	KM2721	KM2723	KM2725		
Laboratory Identification Number																												

Notes:

[1] Nunavut Department of Environment. (Revised March 2009). Table A3-1 Summary of Tier 1 Criteria (mg/kg) for PHC for S

[2] Canadian Council of Ministers of the Environment (CCME) (Updated 2013). Soil Quality Guidelines for the Protection of Env
For PAHs, all pathways considered including soil contact, soil and food ingestion, protection of freshwater life and interim s

[3] Guideline is for 10^{-6} incremental risk

[4] Interim remediation criteria

[5] Nunavut Department of Environment. (Revised March 2009). Table A3-3 Pathway-Specific Tier 1 Levels (mg/kg) for PHC f

NG - No guideline

BOLD - Exceeds CSR Guideline

Shaded - Exceeds CCME Guideline

Italic - Detection limit greater than guideline

N/A - Not applicable

Blank - Not analyzed

Table B.1: Soil Analytical Results

Parameter	Unit	Nunavut CSR Guidelines[1]	CCME Agricultural Guidelines[2]	APEC 10-Garage and Laydown Area												APEC 13- Laydown Area									
				SS10-1	SS10-2	SS10-4	SS10-7	SS10-8	SS10-9	SS10-10	SS10-11	SS10-13	SS10-19	SS10-21	SS10-23	SS10-24	SS13-1	SS13-2	SS13-6	SS13-10	SS13-11		SS13-15	SS13-16	SS13-19	SS13-21
				0-20	0-20	0-20	0-20	0-20	0-20	0-20	30-50	0-20	0-20	0-20	0-20	0-20	0-10	0-10	0-20	0-20	0-15	30-50	0-20	0-20	0-20	0-10
				28-Aug-14	28-Aug-14	28-Aug-14	28-Aug-14	28-Aug-14	28-Aug-14	28-Aug-14	28-Aug-14	28-Aug-14	28-Aug-14	28-Aug-14	28-Aug-14	28-Aug-14	21-Aug-14	21-Aug-14	21-Aug-14	21-Aug-14	21-Aug-14	21-Aug-14	21-Aug-14	21-Aug-14	21-Aug-14	21-Aug-14
Particle Size																										
>75µm	%	NG	NG																							83
<75µm	%	NG	NG																							17
Grain Size	N/A	NG	NG																							Coarse
Hydrocarbons																										
Benzene	mg/kg	0.0095 [3]	0.0095 [3]	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Toluene	mg/kg	0.37	0.37	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Ethylbenzene	mg/kg	0.082	0.082	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Xylenes (m & p)	mg/kg	NG	NG	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Xylene (o)	mg/kg	NG	NG	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Xylenes Total	mg/kg	11	11	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
F1 (C_6 to C_{10})	mg/kg	NG	NG	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12
F1 (C_6-C_{10}) - BTEX	mg/kg	30(210[4])	210	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12
F2 (C_{10}-C_{16})	mg/kg	150	150	11	<10	**200**	69	75	21	**2500**	<10	<10	**560**	<10	<10	**410**	<10	**430**	**180**	<10	<10	**170**	<10	<10	<10	**590**
F3 (C_{16} - C_{34})	mg/kg	300	300	270	91	**680**	**1700**	**16,000**	**730**	**2600**	<50	<50	**14,000**	<50	**1800**	**75,000**	**10,000**	**9800**	**500**	<50	**28,000**	**8800**	59	57	71	**29,000**
F4 (C_{34} - C_{50})	mg/kg	2800	2800	<50	<50	<50	300	**15,000**	170	<50	<50	<50	1700	<50	100	**29,000**	2700	2000	<50	<50	**10,000**	2700	<50	<50	<50	**8100**
Chromatogram Reached Baseline at C_{50}	N/A	NG	NG	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F4G-SG (Heavy Hydrocarbons-Grav.)	mg/kg	2800	NG																							
Moisture	%	NG	NG	5.8	5.0	5.6	5.9	3.8	4.9	5.9	3.9	4.0	5.8	5.2	5.0	5.4	5.0	5.1	6.3	8.3	7.8	2.1	11	9.0	13	4.8
Metals																										
Antimony	mg/kg	20 [4]	20		<1.0										<1.0						<1.0	<1.0	<1.0			
Arsenic	mg/kg	12	12		<1.0										1.1						4.1	3.8	2.9			
Barium	mg/kg	750	750		63										39						18	21	13			
Beryllium	mg/kg	4 [4]	4		<0.40										0.47						<0.40	<0.40	<0.40			
Boron	mg/kg	2 [4]	2		0.12										0.73						0.39	0.12	<0.10			
Cadmium	mg/kg	1.4	1.4		<0.10										<0.10						0.72	<0.10	<0.10			
Chromium (hexavalent)	mg/kg	0.4	0.4		<0.15										<0.15						<0.15	<0.15	<0.15			
Chromium	mg/kg	64	64		**69**										37						13	14	12			
Cobalt	mg/kg	40 [4]	40		13										13						3.0	4.1	1.8			
Copper	mg/kg	63	63		15										17						7.7	6.2	<5.0			
Lead	mg/kg	70	70		4.9										21						2.0	1.9	1.8			
Mercury	mg/kg	6.6	6.6		<0.050										<0.050						<0.050	<0.050	<0.050			
Molybdenum	mg/kg	5 [4]	5		**12**										2.7						<0.40	<0.40	<0.40			
Nickel	mg/kg	50	50		**160**										**64**						8.8	9.6	5.5			
Selenium	mg/kg	1	1		<0.50										<0.50						<0.50	<0.50	<0.50			
Silver	mg/kg	20 [4]	20		<1.0										<1.0						<1.0	<1.0	<1.0			
Thallium	mg/kg	1	1		<0.30										<0.30						<0.30	<0.30	<0.30			
Tin	mg/kg	5 [4]	0.1		1.4										1.0						*<1.0*	*<1.0*	*<1.0*			
Uranium	mg/kg	23	23		5.4										5.1						<1.0	<1.0	<1.0			
Vanadium	mg/kg	130	130		23										14						14	16	14			
Zinc	mg/kg	200	200		40										24						**490**	20	13			
Glycols																										
Diethylene glycol	mg/kg	NG	NG																							
Ethylene glycol	mg/kg	960	960																							
Propylene glycol	mg/kg	NG	NG																							
Tetraethylene Glycol	mg/kg	NG	NG																							
Triethylene Glycol	mg/kg	NG	NG																							
Polycyclic Aromatic Hydrocarbons (PAHs)																										
Index of Additive Cancer Risk (IACR)	N/A	NG	1												0.1											
Benzo[a]pyrene equivalency	mg/kg	NG	0.6 [3]												<0.10											
2-methylnaphthalene	mg/kg	NG	NG												<0.0050											
Acenaphthene	mg/kg	NG	0.28												<0.0050											
Acenaphthylene	mg/kg	NG	320												<0.0050											
Acridine	mg/kg	NG	NG												<0.010											
Anthracene	mg/kg	NG	2.5												<0.0040											
Benz(a)anthracene	mg/kg	0.1 [4]	0.1												<0.0050											
Benzo(a) pyrene	mg/kg	0.1	20												<0.0050											
Benzo(b+j)fluoranthene	mg/kg	NG	0.1												<0.0050											
Benzo(c)phenanthrene	mg/kg	NG	NG												<0.0050											
Benzo(e)pyrene	mg/kg	NG	NG												<0.0050											
Benzo(g,h,i)perylene	mg/kg	NG	NG												<0.0050											
Benzo(k)fluoranthene	mg/kg	0.1 [4]	0.1												<0.0050											
Chrysene	mg/kg	NG	NG												<0.0050											
Dibenz(a,h)anthracene	mg/kg	0.1 [4]	0.1												<0.0050											
Fluoranthene	mg/kg	NG	50												<0.0050											
Fluorene	mg/kg	NG	0.25												<0.0050											
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1 [4]	0.1												<0.0050											
Naphthalene	mg/kg	0.1	0.013												0.0092											
Perylene	mg/kg	NG	NG												<0.0050											
Phenanthrene	mg/kg	0.1 [4]	0.046												<0.0050											
Pyrene	mg/kg	0.1 [4]	0.1												<0.0050											
Quinoline	mg/kg	0.1 [4]	NG												<0.010											
Laboratory Work Order Number				B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838	B474838
Laboratory Identification Number				KM2758	KM2759	KM2761	KM2764	KM2765	KM2766	KM2767	KM2796	KM2770	KM2776	KM2778	KM2780	KM2781	KL1897	KL1898	KL1902	KL1906	KL1907	KL1908	KL1947	KL1948	KL1951	KL1953
Laboratory Identification Number																										

Notes:

[1] Nunavut Department of Environment. (Revised March 2009). Table A3-1 Summary of Tier 1 Criteria (mg/kg) for PHC for S

[2] Canadian Council of Ministers of the Environment (CCME) (Updated 2013). Soil Quality Guidelines for the Protection of Env
For PAHs, all pathways considered including soil contact, soil and food ingestion, protection of freshwater life and interim s

[3] Guideline is for 10^{-6} incremental risk

[4] Interim remediation criteria

[5] Nunavut Department of Environment. (Revised March 2009). Table A3-3 Pathway-Specific Tier 1 Levels (mg/kg) for PHC f

NG - No guideline

BOLD - Exceeds CSR Guideline

Shaded - Exceeds CCME Guideline

Italic - Detection limit greater than guideline

N/A - Not applicable

Blank - Not analyzed

Table B.1: Soil Analytical Results

Parameter	Unit	Nunavut CSR Guidelines[1]	CCME Agricultural Guidelines[2]	APEC 14- Proccess Plant											APEC 15- Reclaimed Carat Camp				Controls		
				SS10-14	SS10-15	SS10-25	SS14-1	SS14-2	SS14-4	SS14-5	SS14-7	SS14-8	SS14-9	SS14-10	RCC-1	RCC1	RCC-2	RCC-2	SSC1	SSC2	SSC3
				0-20	0-20	0-20	0-20	0-20	0-20	0-20	0-20	0-20	0-20	0-20	0-10	90-100	0-20	90-100	20-40	20-30	20-30
				28-Aug-14	28-Aug-14	29-Aug-14	28-Aug-14	28-Aug-14	28-Aug-14	28-Aug-14	28-Aug-14	28-Aug-14	28-Aug-14	28-Aug-14	24-Aug-14	27-Aug-14	24-Aug-14	24-Aug-14	26-Aug-14	28-Aug-14	28-Aug-14
Particle Size																					
>75µm	%	NG	NG																		
<75µm	%	NG	NG																		
Grain Size	N/A	NG	NG																		
Hydrocarbons																					
Benzene	mg/kg	0.0095 [3]	0.0095 [3]	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050			
Toluene	mg/kg	0.37	0.37	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020			
Ethylbenzene	mg/kg	0.082	0.082	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			
Xylenes (m & p)	mg/kg	NG	NG	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040			
Xylene (o)	mg/kg	NG	NG	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020			
Xylenes Total	mg/kg	11	11	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040			
F1 (C_6 to C_{10})	mg/kg	NG	NG	<12	22	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	190	<12	<12			
F1 (C_6-C_{10}) - BTEX	mg/kg	30(210[4])	210	<12	22	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	190	<12	<12			
F2 (C_{10}-C_{16})	mg/kg	150	150	**870**	**1500**	16	<10	**1300**	<10	<10	<10	**240**	<10	<10	**320**	**2400**	<10	<10			
F3 (C_{16} - C_{34})	mg/kg	300	300	**1000**	**1000**	87	140	**32,000**	<50	200	<50	**7500**	<50	<50	**21,000**	**1300**	<50	<50			
F4 (C_{34} - C_{50})	mg/kg	2800	2800	<50	<50	<50	<50	**7000**	<50	<50	<50	**3700**	<50	<50	**5100**	120	<50	<50			
Chromatogram Reached Baseline at C_{50}	N/A	NG	NG	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			
F4G-SG (Heavy Hydrocarbons-Grav.)	mg/kg	2800	NG																		
Moisture	%	NG	NG	8.0	7.5	4.8	6.1	3.8	4.0	6.9	4.2	4.6	5.0	6.5	3.1	4.7	8.1	2.9	10	15	7.3
Metals																					
Antimony	mg/kg	20 [4]	20												2.3		<1.0		<1.0	<1.0	<1.0
Arsenic	mg/kg	12	12												4.4		2.8		2.3	2.1	3.9
Barium	mg/kg	750	750												28		15		19	26	21
Beryllium	mg/kg	4 [4]	4												<0.40		<0.40		<0.40	<0.40	<0.40
Boron	mg/kg	2 [4]	2												0.25		<0.10		<0.10	<0.10	<0.10
Cadmium	mg/kg	1.4	1.4												<0.10		<0.10		<0.10	<0.10	<0.10
Chromium (hexavalent)	mg/kg	0.4	0.4												<0.15		<0.15		<0.15	<0.15	<0.15
Chromium	mg/kg	64	64												22		15		18	17	27
Cobalt	mg/kg	40 [4]	40												4.2		3.5		5.0	5.4	4.8
Copper	mg/kg	63	63												26		5.2		18	14	8.7
Lead	mg/kg	70	70												6.6		2.1		2.3	2.3	2.5
Mercury	mg/kg	6.6	6.6												<0.050		<0.050		<0.050	<0.050	<0.050
Molybdenum	mg/kg	5 [4]	5												2.1		<0.40		<0.40	<0.40	<0.40
Nickel	mg/kg	50	50												24		8.6		16	15	16
Selenium	mg/kg	1	1												<0.50		<0.50		<0.50	<0.50	<0.50
Silver	mg/kg	20 [4]	20												<1.0		<1.0		<1.0	<1.0	<1.0
Thallium	mg/kg	1	1												<0.30		<0.30		<0.30	<0.30	<0.30
Tin	mg/kg	5 [4]	0.1												3.1		*<1.0*		*<1.0*	*<1.0*	*<1.0*
Uranium	mg/kg	23	23												<1.0		<1.0		1.2	1.1	<1.0
Vanadium	mg/kg	130	130												15		22		30	20	18
Zinc	mg/kg	200	200												190		17		18	18	17
Glycols																					
Diethylene glycol	mg/kg	NG	NG																		
Ethylene glycol	mg/kg	960	960																		
Propylene glycol	mg/kg	NG	NG																		
Tetraethylene Glycol	mg/kg	NG	NG																		
Triethylene Glycol	mg/kg	NG	NG																		
Polycyclic Aromatic Hydrocarbons (PAHs)																					
Index of Additive Cancer Risk (IACR)	N/A	NG	1																		
Benzo[a]pyrene equivalency	mg/kg	NG	0.6 [3]																		
2-methylnaphthalene	mg/kg	NG	NG																		
Acenaphthene	mg/kg	NG	0.28																		
Acenaphthylene	mg/kg	NG	320																		
Acridine	mg/kg	NG	NG																		
Anthracene	mg/kg	NG	2.5																		
Benz(a)anthracene	mg/kg	0.1 [4]	0.1																		
Benzo(a) pyrene	mg/kg	0.1	20																		
Benzo(b+j)fluoranthene	mg/kg	NG	0.1																		
Benzo(c)phenanthrene	mg/kg	NG	NG																		
Benzo(e)pyrene	mg/kg	NG	NG																		
Benzo(g,h,i)perylene	mg/kg	NG	NG																		
Benzo(k)fluoranthene	mg/kg	0.1 [4]	0.1																		
Chrysene	mg/kg	NG	NG																		
Dibenz(a,h)anthracene	mg/kg	0.1 [4]	0.1																		
Fluoranthene	mg/kg	NG	50																		
Fluorene	mg/kg	NG	0.25																		
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1 [4]	0.1																		
Naphthalene	mg/kg	0.1	0.013																		
Perylene	mg/kg	NG	NG																		
Phenanthrene	mg/kg	0.1 [4]	0.046																		
Pyrene	mg/kg	0.1 [4]	0.1																		
Quinoline	mg/kg	0.1 [4]	NG																		
Laboratory Work Order Number				B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B476653	B474838	B476653	B474838	B474838	B476653	B476653	B476653
Laboratory Identification Number				KM2771	KM2772	KM2795	KM2782	KM2783	KM2785	KM2786	KM2788	KM2789	KM2790	KM2791	KL1957	KM2757	KL1960	KL1961	KM2689	KM2793	KM2794
Laboratory Identification Number																					

Notes:

[1] Nunavut Department of Environment. (Revised March 2009). Table A3-1 Summary of Tier 1 Criteria (mg/kg) for PHC for Se

[2] Canadian Council of Ministers of the Environment (CCME) (Updated 2013). Soil Quality Guidelines for the Protection of Env
For PAHs, all pathways considered including soil contact, soil and food ingestion, protection of freshwater life and interim so

[3] Guideline is for 10^{-6} incremental risk

[4] Interim remediation criteria

[5] Nunavut Department of Environment. (Revised March 2009). Table A3-3 Pathway-Specific Tier 1 Levels (mg/kg) for PHC fo

NG - No guideline

BOLD - Exceeds CSR Guideline

Shaded - Exceeds CCME Guideline

Italic - Detection limit greater than guideline

N/A - Not applicable

Blank - Not analyzed

Table B.2: Soil Quality Assurance/Quality Control Analytical Results

Parameter	Unit	RDL	SS1C-2	DUP1	RPD (%)	SS13-11	DUP 2	RPD (%)	SS3-6	DUP 3	RPD (%)	SS9-13	DUP4	RPD (%)	SS8-19	DUP5	RPD (%)
			0-20	0-20		0-15	0-15		20-40	20-40		0-20	0-20		0-20	0-20	
			24-Aug-14			21-Aug-14			23-Aug-14			27-Aug-14			27-Aug-14		
Hydrocarbons																	
Benzene	mg/kg	0.005	<0.0050	<0.0050	-	<0.0050	<0.0050	-	<0.0050	<0.0050	-	<0.0050	<0.0050	-	<0.0050	<0.0050	-
Toluene	mg/kg	0.02	<0.020	<0.020	-	<0.020	<0.020	-	<0.020	<0.020	-	<0.020	<0.020	-	<0.020	<0.020	-
Ethylbenzene	mg/kg	0.01	<0.010	<0.010	-	<0.010	<0.010	-	<0.010	<0.010	-	<0.010	<0.010	-	<0.010	<0.010	-
Xylenes (m & p)	mg/kg	0.04	<0.040	<0.040	-	<0.040	<0.040	-	<0.040	<0.040	-	<0.040	<0.040	-	<0.040	<0.040	-
Xylene (o)	mg/kg	0.02	<0.020	<0.020	-	<0.020	<0.020	-	<0.020	<0.020	-	<0.020	<0.020	-	0.056	0.045	-
Xylenes Total	mg/kg	0.04	<0.040	<0.040	-	<0.040	<0.040	-	<0.040	<0.040	-	<0.040	<0.040	-	0.056	0.045	-
F1 (C_6 to C_{10})	mg/kg	12	<12	<12	-	<12	<12	-	<12	<12	-	<12	<12	-	20	16	-
F1 (C_6-C_{10}) - BTEX	mg/kg	12	<12	<12	-	<12	<12	-	<12	<12	-	<12	<12	-	20	16	-
F2 (C_{10}-C_{16})	mg/kg	10	2400	2600	8	<10	340	-	350	360	3	3500	3500	-	2300	2000	14
F3 (C_{16} - C_{34})	mg/kg	50	2900	3500	19	28,000	27,000	4	260	240	8	4500	5900	27	1900	1800	5
F4 (C_{34} - C_{50})	mg/kg	50	68	140	**69**	10,000	9400	6	<50	<50	-	<50	<50	-	<50	<50	-
Moisture	%	0.3	4.0	5.8	37	7.8	8.4	7	5.9	11	**60**	7.9	8.2	4	16	15	6
Laboratory Work Order Number			B474838	B474838		B474838	B474838		B474838	B474838		B476653	B476653		B476653	B476653	
Laboratory Identification Number			KL1518	KL1520		KL1907	KL1955		KL1851	KL1860		KM2717	KM2718		KM2753	KM2756	

Notes:

RDL - Reportable detection limit

RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100

"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.

Bold - Indicates RPD value greater than 40% for hydrocarbon parameters

Table B.3: Field Soil Observations

APEC	Sample Identification	Excavation Depth (cm)	Sample Depth (cm)	PID (ppm)	Comments
APEC 1- Airstrip	SS1A-1	38	10-30	1.0	
	SS1A-2	35	10-30	2.6	
	SS1A-3	38	10-30	1.6	
	SS1A-4	48	10-30	1.3	
	SS1A-5	44	10-30	0.0	
	SS1B-1	11	0-10	6.0	diesel odour, water in berm
	SS1B-2	10	0-10	8.0	diesel odour, water in berm
	SS1B-3	10	0-10	8.0	diesel odour, water in berm
	SS1B-4	10	0-10	30.9	diesel odour, water in berm
	SS1B-5	110	0-20	0.0	
			50-70	0.0	
			90-110	0.0	
	SS1B-6	112	0-20	0.0	
			50-70	0.0	
			90-110	0.0	
	SS1B-7	115	0-20	0.0	
			50-70	0.0	
			90-110	0.0	
	SS1C-1	15	0-10	1.2	surficial stain, diesel odour
	SS1C-2	25	0-20	8.4	surficial stain, diesel odour
	SS1C-3	23	0-20	0.0	surficial stain, diesel odour
	SS1D-1	25	0-20	0.0	
	SS1D-2	26	0-20	0.0	
	SS1D-3	24	0-20	0.0	
	SS1D-4	40	0-20	21.4	diesel odour
			20-40	16.7	diesel odour
	SS1D-5	29	0-20	0.0	
	SS1D-6	34	0-20	0.0	
	SS1E-1	32	0-20	0.3	dark surficial stain, deisel odour
	SS1E-2	20	0-20	0.0	
	SS1E-3	20	0-20	0.0	
	SS1E-4	20	0-20	0.0	
	SS1E-5	21	0-20	22.9	surficial stain, diesel odour
	SS1E-6	21	0-20	0.0	
	SS1E-7	24	0-20	0.0	
	SS1E-8	21	0-20	0.0	
	SS1E-9	26	0-20	0.0	
	SS1E-10	28	0-20	0.0	
APEC 2 and 3- Hazardous Waste Transfer Area	SS2-1	102	0-20	0.0	
			50-70	0.0	
			90-102	0.0	
	SS2-2	72	0-20	0.0	
			50-70	0.0	
	SS2-3	44	20-40	0.0	
	SS2-4	115	0-16	0.0	
			50-70	0.0	
			90-110	0.0	
	SS2-5	112	0-20	0.0	
			50-70	0.0	
			90-112	0.0	
	SS2-6	100	0-20	0.0	
			50-70	0.0	
			90-100	0.0	
	SS2-7	10	0-10	0.0	diesel odour, water in berm
	SS2-8	10	0-10	0.0	diesel odour, water in berm
	SS2-9	10	0-10	0.0	diesel odour, water in berm
	SS2-10	10	0-10	6.9	diesel odour, water in berm
	SS2-11	10	0-10	12.7	diesel odour, water in berm
	SS2-12	10	0-10	10.0	diesel odour, water in berm
	SS2-13	10	0-10	0.0	diesel odour, water in berm
	SS2-14	10	0-10	11.3	diesel odour, water in berm
	SS2-15	104	0-20	0.0	
			90-100	20.3	diesel odour
	SS2-16	110	0-20	0.0	
			90-100	75.6	diesel odour
	SS2-17	118	0-20	0.0	
			90-100	13.0	diesel odour
	SS2-18	106	0-20	0.0	
			90-100	32.7	diesel odour
	SS2-19	100	0-20	0.0	
			90-100	81.7	diesel odour
	SS2-20	105	0-20	0.0	
			90-100	66.6	diesel odour
	SS3-1	110	0-20	0.0	surficial stain
			50-70	0.0	
			90-110	0.0	
	SS3-2	108	0-20	0.0	
			50-70	0.0	
			90-100	0.0	
	SS3-3	102	0-20	0.0	
			50-70	0.0	
			90-100	0.0	
	SS3-4	98	0-20	0.0	
			50-70	0.0	
			80-98	0.0	
	SS3-5	38	25-38	0.0	water in hole
	SS3-6	44	20-40	18.7	diesel odour, water at bottom of hole
	SS3-7	44	20-40	0.0	water in hole
	SS3-8	40	20-40	0.0	water in hole
	SS3-9	15	0-10	0.0	diesel odour, water in berm
	SS3-10	15	0-10	0.0	water in berm
	SS3-11	20	0-20	0.0	surficial stain
	SS3-12	45	20-40	0.0	water in hole
	SS3-13	35	0-20	0.0	water in hole
	SS3-14	15	0-10	0.0	water in berm

Table B.3: Field Soil Observations

APEC	Sample Identification	Excavation Depth (cm)	Sample Depth (cm)	PID (ppm)	Comments
APEC 13-Laydown Area	SS13-1	15	0-10	0.0	surficial stain
	SS13-2	14	0-10	0.0	surficial stain
	SS13-3	12	0-10	0.0	surficial stain
	SS13-4	14	0-10	0.0	surficial stain
	SS13-5	15	0-10	0.0	
	SS13-6	28	0-20	0.0	near a slip tank and an AST
	SS13-7	45	0-20	0.0	near fuel drums
	SS13-8	46	0-20	0.0	near fuel drums
	SS13-9	41	0-20	0.0	near fuel drums
	SS13-10	48	0-20	0.0	near fuel drums
	SS13-11	52	0-15	0.0	surficial stain, near cement truck
			30-50	0.0	
	SS13-12	35	0-15	0.0	surficial stain, near cement truck
	SS13-13	31	0-20	0.0	
	SS13-14	32	0-20	0.0	
	SS13-15	34	0-20	0.0	
	SS13-16	26	0-20	0.0	
	SS13-17	20	0-20	0.0	
	SS13-18	31	0-20	0.0	
	SS13-19	27	0-20	0.0	stain, organic soil mixed
	SS13-20	29	0-20	0.0	
	SS13-21	45	0-10	0.0	surficial stain
			30-40	0.0	
APEC 15- Reclaimed Carat Camp	RCC-1	110	0-10	0.0	stain, diesel odour
			20-40	27.2	diesel odour
			90-100	109.0	diesel odour
	RCC-2	102	0-20	0.0	
			90-100	0.0	
APEC 4- Waste Rock Pile	SS4-1	20	0-20	0.0	surficial stain, 14 stained areas
APEC 6- Low Grade Ore Stockpile	SS6-1	22	0-20	7.1	surficial stain
	SS6-2	24	0-20	0.0	
	SS6-3	21	0-20	0.0	surficial stain
APEC 7 and 8- Tank Farm	SS7-1	42	20-40	38.9	
	SS7-2	43	20-40	65.2	
	SS7-3	44	20-40	23.6	
	SS7-4	52	0-20	0.0	surficial stain
	SS7-5	21	0-20	45.6	diesel odour, water in berm
	SS7-6	25	0-20	45.8	diesel odour, water in berm
	SS7-7	23	0-20	83.9	diesel odour, water in berm
	SS7-8	21	0-20	20.5	water in berm
	SS8-1	21	0-20	7.1	dark stain, diesel odour
	SS8-2	28	0-20	116.0	diesel odour
	SS8-3	49	0-20	0.0	wodden shack has stained wooden boards
	SS8-4	29	0-20	35.3	stain, diesel odour
	SS8-5	31	0-20	47.9	stain, diesel odour
	SS8-6	41	20-40	92.6	water in excavation, liner of berm observed
	SS8-7	52	20-40	97.2	stain, diesel odour
	SS8-8	80	60-80	25.6	
	SS8-9	46	0-20	0.0	
			20-40	13.3	diesel odour, water in hole
	SS8-10	46	20-40	235.0	diesel odour, water in hole
	SS8-11	52	20-40	0.0	
			40-50	123.0	diesel odour
	SS8-12	62	40-60	0.0	
	SS8-13	31	0-20	0.0	
	SS8-14	46	20-40	0.0	
	SS8-15	30	0-20	1.5	dark stain, diesel odour
	SS8-16	21	0-20	7.6	water in berm
	SS8-17	23	0-20	0.0	water in berm
	SS8-18	40	20-40	0.0	diesel odour, water in berm
	SS8-19	32	0-20	3.8	diesel odour, water in berm
	SS8-20	20	0-20	0.0	diesel odour, water in berm
	SS8-30	40	0-40	0.0	
	SS8-31	70	0-20	0.0	
			20-40	8.8	
			40-70	0.0	water at 57 cm
	SS8-32	70	0-30	0.0	
			30-50	17.6	
			50-70	26.0	water at 65 cm, diesel odour
	SS8-33	40	0-20	0.0	
			20-40	20.6	
	SS8-34	70	0-30	1.0	
			30-50	0.0	
			50-70	0.0	water at 67 cm, diesel odour
	SS8-35	40	0-20	0.0	
			20-40	0.0	
	SS8-36	40	0-20	0.0	
			20-40	0.0	
	SS8-37	60	0-50	0.0	
			50-60	0.0	
	SS8-38	60	0-50	0.0	
			50-60	10.1	
APEC 9- Genset and Fuel Berm	SS9-1	23	0-20	181.0	diesel odour, water in berm
	SS9-2	21	0-20	10.5	diesel odour, water in berm
	SS9-3	20	0-20	0.0	water in berm
	SS9-4	21	0-20	0.0	water in berm
	SS9-5	33	0-20	0.0	
			20-30	8.8	diesel odour, water in berm
	SS9-6	22	0-20	13.9	dark stain, diesel odour
	SS9-7	21	0-20	0.0	dark stain, diesel odour
	SS9-8	11	0-10	12.7	dark stain, diesel odour
	SS9-9	31	0-20	2.0	diesel odour
	SS9-10	25	0-20	0.0	
	SS9-11	32	0-20	0.0	
	SS9-12	27	0-20	0.0	
	SS9-13	34	0-20	0.0	dark stain, diesel odour
	SS9-14	20	0-20	0.0	dark stain, diesel odour
	SS9-15	21	0-20	0.0	
	SS9-16	24	0-20	0.0	dark stain
	SS9-17	25	0-20	0.0	dark stain
	SS9-18	32	0-20	0.0	

Table B.3: Field Soil Observations

APEC	Sample Identification	Excavation Depth (cm)	Sample Depth (cm)	PID (ppm)	Comments
	SS9-19	31	0-20	0.0	
	SS9-20	10	0-10	0.0	dark stain, diesel odour
APEC 10- Garage and Laydown Area	SS10-1	32	0-20	0.6	
	SS10-2	21	0-20	6.2	
	SS10-3	32	0-20	0.0	
	SS10-4	20	0-20	5.5	diesel odour
	SS10-5	21	0-20	0.0	
	SS10-6	28	0-20	44.2	
	SS10-7	27	0-20	52.3	
	SS10-8	32	0-20	35.6	stain near gear motor
	SS10-9	31	0-20	49.9	dark stain
	SS10-10	35	0-20	60.5	stain and diesel odour
	SS10-11	51	30-50	186.0	
	SS10-12	55	30-50	0.0	
	SS10-13	46	20-40	0.0	
	SS10-16	41	20-40	0.0	
	SS10-17	42	20-40	0.0	
	SS10-18	10	0-10	0.0	large stain that goes under equipment
	SS10-19	21	0-20	0.0	stained soil, 17 other small stains
	SS10-20	24	0-20	22.1	stained soil
	SS10-21	23	0-20	38.6	
	SS10-22	25	0-20	0.0	stain soil near equpiment
	SS10-23	21	0-20	2.6	stain near stroage bin
	SS10-24	26	0-20	21.2	stain soil under equpiment
APEC 14- Processing Plant	SS14-1	36	0-20	0.0	
	SS14-2	37	0-20	0.0	dark stain
	SS14-3	30	0-20	0.0	dark stain
	SS14-4	28	0-20	0.0	stained soil
	SS14-5	26	0-20	0.0	
	SS14-6	30	0-20	0.0	stained soil
	SS14-7	32	0-20	0.0	stained soil
	SS14-8	32	0-20	0.0	stained soil
	SS14-9	21	0-20	0.0	
	SS14-10	31	0-20	0.0	
	SS10-25	23	0-20	0.0	
	SS10-14	50	0-20	0.6	stain and diesel odour
	SS10-15	42	20-40	0.4	diesel odour

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: HAND AUGER	E14103202-01-14MW01

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	14MW01	Depth (ft)
0	ORGANICS - moist, black, (50 mm thick)			Pipe stickup = 1.05 metres		0
	SAND - some silt, fine to medium grained, moist, loose, brown, no discernible odour - wet					
1	END OF BOREHOLE (0.95 metres) Monitoring well installed to 0.94 metres Note: Stopped due to auger refusal.					
1.5						5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.95 m
REVIEWED BY: GK	COMPLETE: 14/08/22
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: HAND AUGER	E14103202-01-14MW02

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	14MW02	Depth (ft)
0	ORGANICS - moist, black, (50 mm thick)			Pipe stickup = 1.19 metres		0
	SAND - trace of silt, moist, loose, red brown, ni discernible odour					
	- wet					
	END OF BOREHOLE (0.76 metres) Monitoring well installed to 0.75 metres Note: Stopped due to auger refusal.					
1						
1.5						5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.76 m
REVIEWED BY: GK	COMPLETE: 14/08/22
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: HAND AUGER	E14103202-01-14MW03

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	14MW03	Depth (ft)
0	ORGANICS - damp, black - trace of sand, trace of gravel, moist, dark brown			Pipe stickup = 1.24 metres		0
	- wet					
	END OF BOREHOLE (0.91 metres) Monitoring well installed to 0.94 metres					
1						
1.5						5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.91 m
REVIEWED BY: GK	COMPLETE: 14/08/22
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: HAND AUGER	E14103202-01-14MW04

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	14MW04	Depth (ft)
0	ORGANICS - medium gravel, damp, brown, (110 mm thick)			Pipe stickup = 1.17 metres		0
	SAND - some fine to coarse gravel, fine grained, wet, grey					
	END OF BOREHOLE (0.62 metres) Monitoring well installed to 0.69 metres					
1						
1.5						5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.62 m
REVIEWED BY: GK	COMPLETE: 14/08/26
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: HAND AUGER	E14103202-01-14MW05

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	14MW05	Depth (ft)
0	ORGANICS - black, (20 mm thick) SAND - trace of silt, fine grained, moist, loose, grey			Pipe stickup = 1.18 metres		0
1	END OF BOREHOLE (1.02 metres) Monitoring well installed to 1.00 metre					
1.5						5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 1.02 m
REVIEWED BY: GK	COMPLETE: 14/08/25
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: HAND AUGER	E14103202-01-14MW06

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	14MW06	Depth (ft)
0	ORGANICS - moist, black, (90 mm thick)			Pipe stickup = 1.20 metres		0
	SAND - some fine to coarse gravel, trace of silt, coarse grained, wet, brown					
	END OF BOREHOLE (0.82 metres) Monitoring well installed to 0.78 metres					
1						
1.5						5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.82 m
REVIEWED BY: GK	COMPLETE: 14/08/26
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: HAND AUGER	E14103202-01-14MWC1

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	14MWC1	Depth (ft)
0	ORGANICS - wet, dark brown			Pipe stickup = 1.21 metres		0
	SAND - fine grained, wet, loose, grey brown, no discernible odour					
1						
	END OF BOREHOLE (1.05 metres) Monitoring well installed to 0.99 metres Note: Stopped due to auger refusal					
1.5						5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 1.05 m
REVIEWED BY: GK	COMPLETE: 14/08/26
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: HAND AUGER	E14103202-01-14MWC2

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	14MWC2	Depth (ft)
0	ORGANICS - brown, (150 mm thick)			Pipe stickup = 1.06 metres		0
	SAND - some silt, some gravel, fine grained, brown					
	END OF BOREHOLE (0.67 metres) Monitoring well installed to 0.67 metres					
1						
1.5						5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.67 m
REVIEWED BY: GK	COMPLETE: 14/08/29
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-14RCC1
APEC 15		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	SAND - some fine to coarse gravel, fine to coarse grained, moist, black staining, odour				0
	- trace of cobbles, fine to coarse grained, yellowish brown, diesel odour				
1					
	END OF BOREHOLE (1.10 metres) Note: Stopped due to excavation collapsing				
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 1.1 m
REVIEWED BY: GK	COMPLETE: 14/08/24
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-14RCC2
APEC 15		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	SAND - some fine to coarse gravel, fine to coarse grained sand, moist, black staining, odour				0
	- yellowish brown, no discernible odour				
1	END OF BOREHOLE (1.02 metres) Note: Stopped due to excavation collapsing				
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 1.02 m
REVIEWED BY: GK	COMPLETE: 14/08/24
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-14SSC1
APEC 1		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	SAND - some fine to coarse gravel, trace of silt, damp, loose, yellowish brown				0
	- grey				
	- moist				
	END OF BOREHOLE (0.62 metres) Note: Stopped due to auger refusal				
1					
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.62 m
REVIEWED BY: GK	COMPLETE: 14/08/26
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-14SSC2
APEC 1		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	SAND - some fine to coarse gravel, trace of silt, damp, loose, yellowish brown				0
	END OF BOREHOLE (0.32 metres) Note: Stopped due to auger refusal				
1					
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.32 m
REVIEWED BY: GK	COMPLETE: 14/08/28
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-14SSC3
APEC 1		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	SAND - some silt, some fine to coarse gravel, fine to medium grained				0
	END OF BOREHOLE (0.46 metres) Note: Stopped due to auger refusal				
1					
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.46 m
REVIEWED BY: GK	COMPLETE: 14/08/28
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS10-1
APEC 10		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	GRAVEL (FILL) - some fine to coarse grained sand, some fine to coarse cobbles, fine to coarse gavel, damp, compact, brown				0
	END OF BOREHOLE (0.32 metres) Note: Stopped due to refusal. BHSS10-2 to BHSS10-25 have similar stratigraphy.				
1					
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.32 m
REVIEWED BY: GK	COMPLETE: 14/08/28
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS13-1
APEC 13		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	GRAVEL (FILL) _ sandy, trace of fine cobbles, fine to coarse grained sand, fine to coarse gravel, compact, grey brown, dark black staining				0
	END OF BOREHOLE (0.15 metres) Note: Stopped due to refusal. BHSS13-2 to BHSS13-6 have similar stratigraphy.				
1					
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.15 m
REVIEWED BY: GK	COMPLETE: 14/08/26
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS13-11
APEC 13		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	SAND - some fine to coarse gravel, trace of silt, fine to medium grained, damp, loose, dark staining for 250 mm, no discernible odour				0
	END OF BOREHOLE (0.52 metres) Note: BHSS13-12 to BHSS13-15 have similar stratigraphy.				
1					
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.52 m
REVIEWED BY: GK	COMPLETE: 14/08/26
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS13-19
APEC 13		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	SAND - trace of silt, fine to medium grained, damp, very loose, light brown, dark organic staining		●		0
	END OF BOREHOLE (0.31 metres)				
1					
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.31 m
REVIEWED BY: GK	COMPLETE: 14/08/26
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS13-7
APEC 13		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	SAND - trace of silt, trace of gravel, fine to medium grained, damp, brown to red brown, no discernible odour				0
	END OF BOREHOLE (0.45 metres) Note: BHSS13-8 to BHSS13-10 and BHSS13-20 to BHSS13-21 have similar stratigraphy.				
1					
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.45 m
REVIEWED BY: GK	COMPLETE: 14/08/26
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS14-1
APEC 14		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	GRAVEL (FILL) - some fine to coarse grained sand, some fine to coarse cobbles, fine to coarse gavel, damp, compact, brown				0
	END OF BOREHOLE (0.36 metres) Note: Stopped due to refusal. BHSS14-2 to BHSS14-10 have similar stratigraphy.				
1					
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.36 m
REVIEWED BY: GK	COMPLETE: 14/08/20
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS1A-1
APEC 1		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	SAND AND GRAVEL (TILL) - fine to coarse grained sand, fine to coarse gravel, moist, loose, brown, no discernible odour				0
	END OF BOREHOLE (0.38 metres) Note: Stopped due to refusal. BHSS1A-2 to BHSS1A-5 and BHSS1C-1 to BHSS1C-3 have similar stratigraphy.				
1					
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.38 m
REVIEWED BY: GK	COMPLETE: 14/08/20
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS1B-1
APEC 1		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	GRAVEL (FILL) - some sand, wet, loose, grey, sheen on water, diesel odour				0
	END OF BOREHOLE (0.20 metres) Note: Stopped due to water in berm. BHSS1B-2 to BHSS1B-4 have similar stratigraphy.				
1					
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.2 m
REVIEWED BY: GK	COMPLETE: 14/08/20
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS1B-5
APEC 1		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	SAND - trace of fine to medium gravel, medium to coarse grained, moist, loose, yellowish brown				0
1					
1.5	END OF BOREHOLE (1.10 metres) Note: Stopped due to excavation collapsing. BHSS1B-6 has similar stratigraphy.				5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 1.1 m
REVIEWED BY: GK	COMPLETE: 14/08/20
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS1B-7
APEC 1		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	GRAVEL (FILL) - sandy, compact, brown, (300 mm thick)				0
	ORGANICS - damp, black				
	SAND - trace of fine to medium gravel, fine to coarse grained, brown to red brown - no visible gravel				
1					
	END OF BOREHOLE (1.15 metres) Note: Stopped due to excavation collapsing.				
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 1.15 m
REVIEWED BY: GK	COMPLETE: 14/08/20
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS1D-1
APEC 1		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	GRAVEL AND SAND (FILL) - fine to coarse grained sand, fine to coarse gravel, damp, compact, brown, no discernible odour				0
	END OF BOREHOLE (0.25 metres) Note: BHSS1D-2 to BHSS1D-6 have similar stratigraphy except BHSS1D-4. BHSS1D-4 has 300 mm of sand with some gravel at the surface.				
1					
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.25 m
REVIEWED BY: GK	COMPLETE: 14/08/20
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS1E-1
APEC 1		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	GRAVEL AND SAND (FILL) - trace of cobbles and boulders, fine to coarse gravel, fine to coarse grained sand, damp, loose, black, diesel odour				0
	END OF BOREHOLE (0.32 metres) Note: Stopped due to refusal. BHSS1E-2 to BHSS1E-10 have similar stratigraphy. Soil colour ranged from brown to grey.				
1					
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.32 m
REVIEWED BY: GK	COMPLETE: 14/08/20
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS2-1
APEC 2 and 3		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	SAND - some fine to coarse gravel, trace of fine cobbles, fine to coarse grained, damp, red brown to brown				0
1	END OF BOREHOLE (1.02 metres)				
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 1.02 m
REVIEWED BY: GK	COMPLETE: 14/08/22
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS2-15
APEC 2 and 3		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	GRAVEL AND SAND - some cobbles, trace of boulders, fine to coarse grained sand, fine to coarse gravel, damp to moist, grey brown				0
	- diesel odour				
1	END OF BOREHOLE (1.09 metres) Note: BHSS2-16 to BHSS2-20 have similar stratigraphy.				
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 1.09 m
REVIEWED BY: GK	COMPLETE: 14/08/22
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS2-2
APEC 2 and 3		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	SAND - some fine to coarse gravel, trace of fine cobbles, fine to coarse grained, damp, red brown to brown				0
	END OF BOREHOLE (0.72 metres) Note: Stopped due to refusal.				
1					
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.72 m
REVIEWED BY: GK	COMPLETE: 14/08/22
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS2-3
APEC 2 and 3		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	SAND - some fine to coarse gravel, some fine cobbles, fine to coarse grained, damp, red brown to brown				0
	END OF BOREHOLE (0.44 metres) Note: Stopped due to refusal				
1					
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.44 m
REVIEWED BY: GK	COMPLETE: 14/08/22
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS2-4
APEC 2 and 3		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	SAND - trace of fine gravel, coarse grained, dry, brown				0
	ORGANICS - black				
	SAND - trace of silt, fine to medium grained, moist, brown to red brown				
1					
	END OF BOREHOLE (1.15 metres) Note: Stopped due to auger refusal				
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 1.15 m
REVIEWED BY: GK	COMPLETE: 14/08/22
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS2-5
APEC 2 and 3		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	ORGANICS - black, (20 mm thick)				0
	SAND - trace of silt, fine to medium grained, damp, brown to red brown, no discernible odour				
1					
	END OF BOREHOLE (1.12 metres) Note: Stopped due to auger refusal				
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 1.12 m
REVIEWED BY: GK	COMPLETE: 14/08/22
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS2-6
APEC 2 and 3		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	SAND - some fine to coarse gravel, trace of fine cobbles, fine to coarse grained, damp, red brown to brown				0
1	END OF BOREHOLE (1.00 metres) Note: Stopped due to auger refusal				
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 1 m
REVIEWED BY: GK	COMPLETE: 14/08/22
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS2-7
APEC 2 and 3		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	SAND AND GRAVEL - trace of fine to medium cobbles, fine to coarse grained sand, fine to coarse gravel, wet, brown, diesel odour				0
	END OF BOREHOLE (0.15 metres) Note: Stopped due to water in berm. BHSS2-8 to BHSS2-14 have similar stratigraphy.				
1					
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.15 m
REVIEWED BY: GK	COMPLETE: 14/08/22
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS3-1
APEC 2 and 3		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	SAND - some fine to coarse gravel, trace of fine cobbles, fine to coarse grained, loose, brown, staining, faint odour				0
	- no visible staining, no discernible odour				
1					
	END OF BOREHOLE (1.10 metres) Note: Stopped due to refusal. BHSS3-2 to BHSS3-4 have similar stratigraphy.				
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 1.1 m
REVIEWED BY: GK	COMPLETE: 14/08/23
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS3-5
APEC 2 and 3		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	GRAVEL - some coarse grained sand, fine to coarse gravel, moist, loose, grey				0
	- trace of fine cobbles, wet, light brown, water filled in excavation				
	- sandy, sand is fine grained, dark brown		●		
	END OF BOREHOLE (0.38 metres) Note: Stopped due to water in excavation. BHSS3-6 to BHSS3-8 have similar stratigraphy.				
1					
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.38 m
REVIEWED BY: GK	COMPLETE: 14/08/23
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS3-9
APEC 2 and 3		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	GRAVEL - some coarse grained sand, fine to coarse gravel, wet, loose, brown, diesel odour				0
	END OF BOREHOLE (0.15 metres) Note: Stopped due to water in berm. BHSS3-10 to BHSS3-14 have similar stratigraphy.				
1					
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.15 m
REVIEWED BY: GK	COMPLETE: 14/08/23
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS4-1
APEC 4		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	GRAVEL (FILL) - sandy, some fine to coarse cobbles, fine to coarse grained sand, fine to coarse gravel, black, stained, diesel odour				0
	END OF BOREHOLE (0.20 metres) Note: Stopped due to refusal				
1					
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.2 m
REVIEWED BY: GK	COMPLETE: 14/08/26
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS6-1
APEC 6		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	GAVEL (FILL) - sandy, medium to coarse grained sand, fine to coarse gravel, brown, grey staining				0
	END OF BOREHOLE (0.22 metres) Note: Stopped due to refusal. BHSS6-2 to BHSS6-3 have similar stratigraphy.				
1					
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.22 m
REVIEWED BY: GK	COMPLETE: 14/08/26
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS7-1
APEC 7 AND 8		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	GRAVEL AND SAND (FILL) - some fine to coarse cobbles, fine to coarse grained sand, fine to coarse gravel, damp, compact, brown				0
	END OF BOREHOLE (0.42 metres) Note: Stopped due to refusal. BHSS7-2 to BHSS7-3 have similar stratigraphy.				
1					
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.42 m
REVIEWED BY: GK	COMPLETE: 14/08/27
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS8-1
APEC 7 AND 8		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	GRAVEL (FILL) - some medium to coarse grained and, some fine to coarse cobbles, fine to coarse gravel, compact, black, stained, diesel odour				0
	END OF BOREHOLE (0.24 metres) Note: Stopped due to refusal. BHSS8-2, BHSS8-5, BHSS8-9 and BHSS8-30 to BHSS8-36 have similar stratigraphy.				
1					
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.24 m
REVIEWED BY: GK	COMPLETE: 14/08/27
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS8-11
APEC 7 AND 8		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	GRAVEL (FILL) - some medium to coarse grained and, some fine to coarse cobbles, fine to coarse gravel, compact, black, stained, diesel odour				0
	SAND AND GRAVEL (FILL) - fine to coarse grained sand, fine to coarse gravel, damp, brown				
	END OF BOREHOLE (0.54 metres) Note: Stopped due to refusal				
1					
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.54 m
REVIEWED BY: GK	COMPLETE: 14/08/27
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS8-15
APEC 7 AND 8		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	GRAVEL AND SAND - trace of silt, fine to coarse grained sand, fine to coarse gravel, wet, loose, dark staining, diesel odour				0
	END OF BOREHOLE (0.30 metres) Note: Stopped due to water in berm. Soil in non stained area is brown. BHSS8-16 to BHSS8-20 and BHSS7-5 to BHSS7-8 have similar stratigraphy.				
1					
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.3 m
REVIEWED BY: GK	COMPLETE: 14/08/27
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS8-3
APEC 7 AND 8		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	SAND AND GRAVEL (FILL)- fine to coarse grained sand, fine to coarse gravel, damp, brown				0
	END OF BOREHOLE (0.49 metres) Note: Stopped due to refusal. BHSS8-4, BHSS8-6 to BHSS8-8, BHSS8-10 and BHSS8-12 to BHSS8-13 have similar stratigraphy.				
1					
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.59 m
REVIEWED BY: GK	COMPLETE: 14/08/27
DRAWING NO:	Page 1 of 2

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS8-3
APEC 7 AND 8		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
1.5					5
2					
3					10

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.59 m
REVIEWED BY: GK	COMPLETE: 14/08/27
DRAWING NO:	Page 2 of 2

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS9-1
APEC 9		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	GRAVEL - sandy, trace of fine cobbles, fine to coarse grained and, fine to coarse gravel, compact, grey brown, diesel odour				0
	END OF BOREHOLE (0.28 metres) Note: Stopped due to water in berm. BHSS9-2 to BHSS9-5 have similar stratigraphy.				
1					
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.23 m
REVIEWED BY: GK	COMPLETE: 14/08/26
DRAWING NO:	Page 1 of 1

PHASE II ENVIRONMENTAL SITE ASSESSMENT	AANDC	PROJECT NO. - BOREHOLE NO.
JERICHO MINE	DRILL: SHOVEL	E14103202-01-SS9-6
APEC 9		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	HYDROCARBONS (ppm) 200 400 600 800	NOTES & COMMENTS	Depth (ft)
0	GRAVEL (FILL) - some coarse grained sand, some fine to coarse cobbles, fine to coarse gravel, damp, compact, brown, black staining, diesel odour				0
	END OF BOREHOLE (0.21 metres) Note: Stopped due to refusal. BHSS9-7 to BHSS9-20 have similar stratigraphy.				
1					
1.5					5

TETRA TECH EBA

LOGGED BY: TH	COMPLETION DEPTH: 0.21 m
REVIEWED BY: GK	COMPLETE: 14/08/26
DRAWING NO:	Page 1 of 1

APPENDIX C
GROUNDWATER, BERMS, AND SEEPS

Photo C.1: Water located in the airstrip fuel storage berm at APEC 1B

Photo C.2: Water located in the contaminated soils storage area in APEC 2

Photo C.3: Water located in the hazardous waste transfer Area at APEC 3

Photo C.4: Water located in the fuel berm at APEC 9

Photo C.5: Water located in the phase 2 tank farm berm at APEC 8

Photo C.6: Water located in the phase 1 tank farm berm at APEC 7

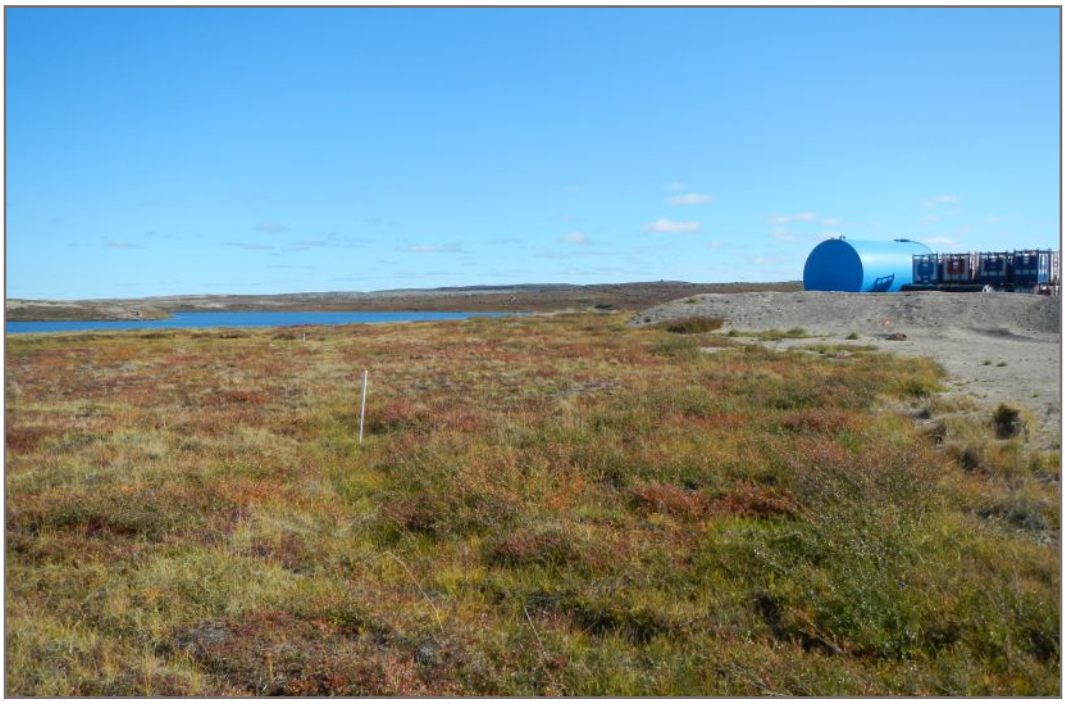


Photo C.7: Location of monitoring well 1 and 3 adjacent to APEC 2

Photo C.8: View from monitoring well 14MW04 towards APEC 4

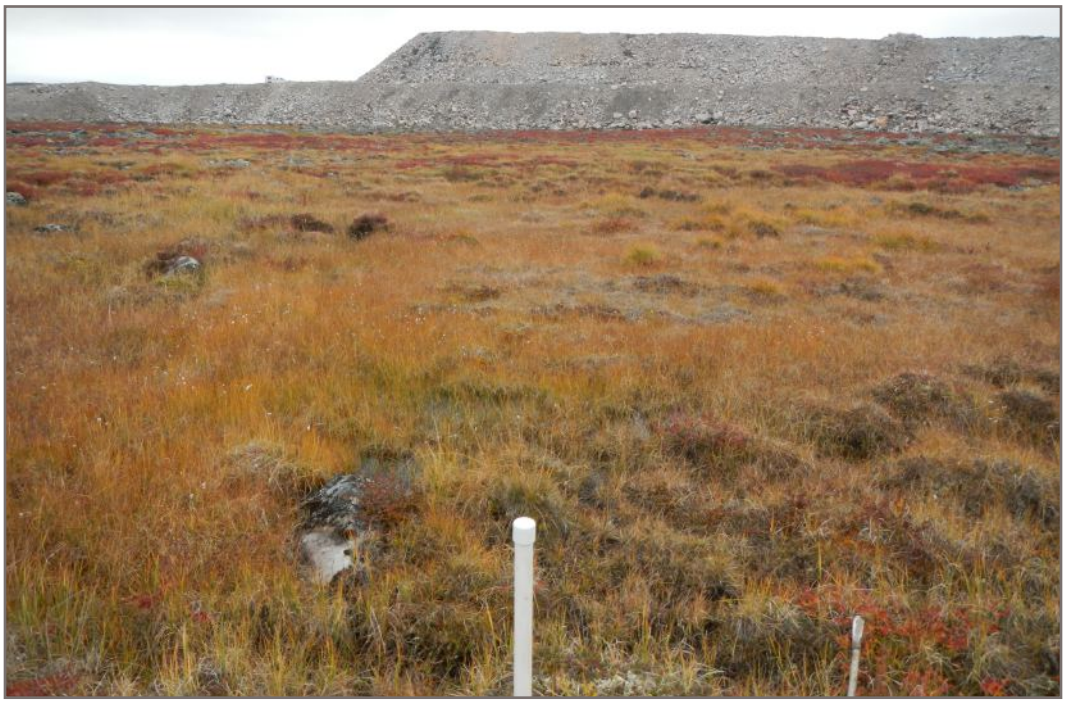


Photo C.9: View from monitoring well 14MW05 towards APEC 4

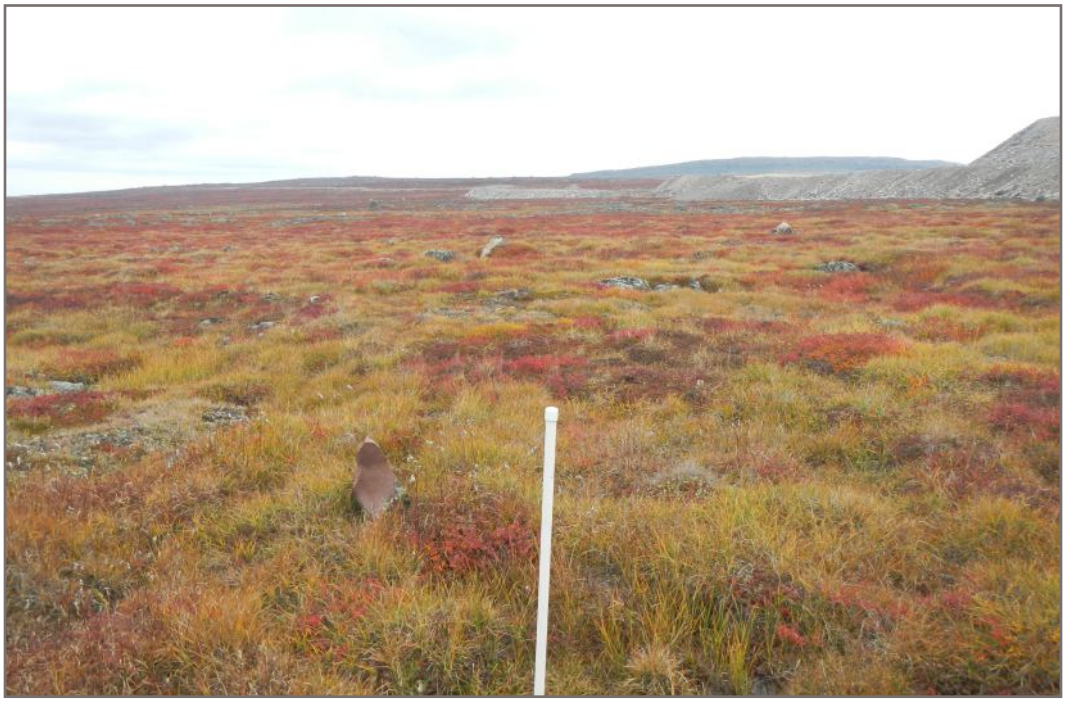


Photo C.10: View from monitoring well 14MW06 towards APEC 4

Photo C.11: Seep 1 coming out of the waste rock at APEC 4

Photo C.12: Seep 2 coming out of the base of the waste rock pile at APEC 4

Photo C.13: Seep 3 coming out of the base of the waste rock pile in APEC 4

Table C.1: Fuel Berm Water Analytical Results

Parameter	Unit	CCME - PFAL[1]	14MWC1	14MWC2	SW 1-1	SW 2-1	SW 3-1	SW 7-1	SW 8-1	SW 9-1
			31-Aug-14	31-Aug-14	25-Aug-14	25-Aug-14	25-Aug-14	24-Aug-14	24-Aug-14	24-Aug-14
Routine										
pH	pH Units	6.5-9.0	**5.04**	7.55				7.89	7.45	
Electrical Conductivity (EC)	uS/cm	NG	33	130				130	66	
Alkalinity (total as $CaCO_3$)	mg/L	NG	<0.50	64				63	29	
Alkalinity (pp as $CaCO_3$)	mg/L	NG	<0.50	<0.50				<0.50	<0.50	
Total Dissolved Solids (TDS)	mg/L	NG	18	80				72	33	
Hardness as $CaCO_3$	mg/L	NG	11	91				61	33	
Bicarbonate	mg/L	NG	<0.5	78				77	36	
Carbonate	mg/L	NG	<0.50	<0.50				<0.50	<0.50	
Hydroxide	mg/L	NG	<0.50	<0.50				<0.50	<0.50	
Calcium	mg/L	NG	3.5	22				16	8.6	
Magnesium	mg/L	NG	0.52	8.8				4.9	2.7	
Potassium	mg/L	NG	<0.30	2.5				4.0	1.5	
Sodium	mg/L	NG	1.3	2.3				3.8	1.0	
Chloride	mg/L	120	1.3	1.1				1.3	<1.0	
Sulphate	mg/L	NG	1.1	3.3				3.7	<1.0	
Nitrate (as N)	mg/L	13	2.1	<0.010				0.011	0.080	
Nitrite (as N)	mg/L	0.06	<0.010	<0.010				<0.010	<0.010	
Nitrate and Nitrite (as N)	mg/L	NG	2.1	<0.010				0.011	0.080	
Anions Total	meq/L	NG	0.21	1.4				1.4	0.59	
Cations Total	meq/L	NG	0.30	2.1				1.5	0.76	
Ionic Balance	N/A	NG	1.4	1.5				1.1	1.3	
Hydrocarbons										
Benzene	mg/L	0.37			<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.002			<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00053
Ethylbenzene	mg/L	0.09			<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylenes (m & p)	mg/L	NG			<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.00088
Xylene (o)	mg/L	NG			<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00052
Xylenes Total	mg/L	NG			<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.0014
F1 (C_6 to C_{10})	mg/L	NG			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L	NG			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (C_{10}-C_{16})	mg/L	NG			0.51	4.5	<0.10	<0.10	<0.10	<0.10
Dissolved Metals										
Aluminium	mg/L	0.005-0.1 [2]	**0.60**	**0.22**				0.010	0.036	
Antimony	mg/L	NG	<0.00060	<0.00060				<0.00060	<0.00060	
Arsenic	mg/L	0.005	0.00034	0.0012				0.00056	0.0040	
Barium	mg/L	NG	0.020	0.022				<0.010	<0.010	
Beryllium	mg/L	NG	<0.0010	<0.0010				<0.0010	<0.0010	
Boron	mg/L	1.5	<0.020	<0.020				<0.020	<0.020	
Cadmium	mg/L	0.00009	0.000021	0.000027				<0.000020	0.000051	
Chromium	mg/L	NG	<0.0010	<0.0010				<0.0010	<0.0010	
Cobalt	mg/L	NG	0.0028	0.0020				<0.00030	0.0017	
Copper	mg/L	0.002-0.004 [3]	**0.0048**	**0.0070**				**0.0039**	**0.012**	
Iron	mg/L	0.3	**0.46**	**1.2**				<0.060	**0.39**	
Lead	mg/L	0.001-0.007 [3]	<0.00020	0.00028				<0.00020	0.00024	
Lithium	mg/L	NG	<0.020	<0.020				<0.020	<0.020	
Manganese	mg/L	NG	0.012	0.97				<0.0040	0.40	
Molybdenum	mg/L	0.073	<0.00020	0.00084				0.0043	0.00058	
Nickel	mg/L	0.025-0.150 [3]	0.0018	0.0017				0.0018	0.0079	
Phosphorus	mg/L	0.004 [4]	*<0.10*	*<0.10*				*<0.10*	*<0.10*	
Selenium	mg/L	0.001	<0.00020	<0.00020				<0.00020	<0.00020	
Silicon	mg/L	NG	6.0	5.1				2.2	2.4	
Silver	mg/L	0.0001	<0.00010	<0.00010				<0.00010	<0.00010	
Strontium	mg/L	NG	<0.020	0.035				0.045	0.037	
Sulphur	mg/L	NG	0.99	1.0				0.94	0.58	
Thallium	mg/L	0.0008	<0.00020	<0.00020				<0.00020	<0.00020	
Tin	mg/L	NG	<0.0010	<0.0010				<0.0010	<0.0010	
Titanium	mg/L	NG	0.014	0.0056				<0.0010	<0.0010	
Uranium	mg/L	0.015	0.00084	0.0053				**0.036**	0.00059	
Vanadium	mg/L	NG	0.0022	0.0017				<0.0010	<0.0010	
Zinc	mg/L	0.03	**0.041**	0.0097				0.0032	0.0067	

Notes:

[1] Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Aquatic Life (PFAL)

[2] Guideline varies with pH

[3] Guideline varies with hardness

[4] Guideline applied is for the most conservative ultra-oligotrophic

NG - No guideline

BOLD - Exceeds Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table C.1: Fuel Berm Water Analytical Results

Parameter	Unit	CCME - PFAL[1]	14MWC1	14MWC2	SW 1-1	SW 2-1	SW 3-1	SW 7-1	SW 8-1	SW 9-1
			31-Aug-14	31-Aug-14	25-Aug-14	25-Aug-14	25-Aug-14	24-Aug-14	24-Aug-14	24-Aug-14
Total Metals										
Aluminium	mg/L	0.005-0.1 [2]	**210**					0.032	**0.11**	
Antimony	mg/L	NG	<0.012					<0.00060	<0.00060	
Arsenic	mg/L	0.005	**0.047**					0.00057	0.0047	
Barium	mg/L	NG	0.91					0.013	<0.010	
Beryllium	mg/L	NG	<0.020					<0.0010	<0.0010	
Boron	mg/L	1.5	<0.020					<0.020	<0.020	
Cadmium	mg/L	0.00009	**0.0014**					<0.000020	0.000055	
Calcium	mg/L	NG	54					16	8.4	
Chromium	mg/L	NG	0.29					<0.0010	<0.0010	
Cobalt	mg/L	NG	0.087					<0.00030	0.0020	
Copper	mg/L	0.002-0.004 [3]	**0.75**					**0.0043**	**0.014**	
Iron	mg/L	0.3	**240**					<0.060	**0.79**	
Lead	mg/L	0.001-0.007 [3]	**0.071**					<0.00020	0.00055	
Lithium	mg/L	NG	0.16					<0.020	<0.020	
Magnesium	mg/L	NG	39					4.8	2.8	
Manganese	mg/L	NG	0.96					0.0079	0.41	
Molybdenum	mg/L	0.073	<0.0040					0.0044	0.00060	
Nickel	mg/L	0.025-0.150 [3]	**0.23**					0.0021	0.0088	
Phosphorus	mg/L	0.004 [4]	**21**					*<0.10*	*<0.10*	
Potassium	mg/L	NG	7.1					3.9	1.5	
Selenium	mg/L	0.001	**0.0062**					<0.00020	<0.00020	
Silicon	mg/L	NG	120					2.2	2.6	
Silver	mg/L	0.0001	**0.0023**					<0.00010	<0.00010	
Sodium	mg/L	NG	7.2					3.7	0.95	
Strontium	mg/L	NG	0.21					0.045	0.038	
Sulphur	mg/L	NG	20					0.90	0.60	
Thallium	mg/L	0.0008	*<0.0040*					<0.00020	<0.00020	
Tin	mg/L	NG	<0.020					<0.0010	<0.0010	
Titanium	mg/L	NG	3.3					<0.0010	0.0059	
Uranium	mg/L	0.015	**0.23**					**0.038**	0.00068	
Vanadium	mg/L	NG	0.41					<0.0010	<0.0010	
Zinc	mg/L	0.03	**0.75**					0.0053	0.0098	
Glycols										
Diethylene glycol	mg/L	NG				<5.0				
Ethylene glycol	mg/L	192				<10				
Propylene glycol	mg/L	500				<10				
Tetraethylene Glycol	mg/L	NG				<10				
Triethylene Glycol	mg/L	NG				<10				
Polycyclic Aromatic Hydrocarbons (PAHs)										
2-methylnaphthalene	mg/L	NG				<0.0010				
Acenaphthene	mg/L	0.0058				<0.0010				
Acenaphthylene	mg/L	NG				<0.0010				
Acridine	mg/L	0.0044				<0.0020				
Anthracene	mg/L	0.000012				*<0.0020*				
Benz(a)anthracene	mg/L	0.000018				*<0.000085*				
Benzo(a) pyrene	mg/L	0.000015				*<0.000075*				
Benzo(b+j)fluoranthene	mg/L	NG				<0.000085				
Benzo(c)phenanthrene	mg/L	NG				<0.00050				
Benzo(e)pyrene	mg/L	NG				<0.00050				
Benzo(g,h,i)perylene	mg/L	NG				<0.000085				
Benzo(k)fluoranthene	mg/L	NG				<0.000085				
Benzo[a]pyrene equivalency	mg/L	NG				0.000093				
Chrysene	mg/L	NG				<0.000085				
Dibenz(a,h)anthracene	mg/L	NG				<0.000075				
Fluoranthene	mg/L	0.00004				**0.00082**				
Fluorene	mg/L	0.003				**0.0047**				
Indeno(1,2,3-c,d)pyrene	mg/L	NG				<0.000085				
Naphthalene	mg/L	0.0011				<0.0010				
Perylene	mg/L	NG				<0.00056				
Phenanthrene	mg/L	0.0004				**0.014**				
Pyrene	mg/L	0.000025				**0.0033**				
Quinoline	mg/L	0.0034				<0.0020				
Laboratory Work Order Number			B477081	B477081	B474838	B474838	B474838	B474838	B474838	B474838
Laboratory Identification Number			KM5924	KM5925	KL1994	KL1993	KL1992	KL1991	KL1990	KL1989

Notes:

[1] Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Aquatic Life (Freshwater)
[2] Guideline varies with pH
[3] Guideline varies with hardness
[4] Guideline applied is for the most conservative ultra-oligotrophic
NG - No guideline
BOLD - Exceeds Guideline
Italic - Detection limit greater than guideline
Blank - Not analyzed

Table C.2: Summary of Monitoring Well Completion and Groundwater Level Data-Jericho Mine

Well ID	Installation Summary								Physical Groundwater Measurements							
	Date Installed	Ground Elevation[1] (m)	Depth of Monitoring Well	Pipe Stickup (m)	Monitoring Well Elevation[1]	Slotted Interval Elevation (m)		Screen Length (m)	Date Collected	Water Level (mbtoc)[2]	Water Level (mbg)[3]	Water Elevation (m)	pH (Units)	Electrical Conductivity (µS/m)	Temperature (°C)	Comments
						from	to									
14MW-01	22-Aug-14	479.716	0.94	1.050	480.766	479.83	480.73	0.90	31-Aug-14	1.18	0.131	479.59	6.5	60	4.4	Turbid with lots of sand
14MW-02	22-Aug-14	478.309	0.75	1.190	479.499	478.75	479.42	0.67	31-Aug-14	1.87	0.684	477.63	Not Enough Water			Dry, not sampled
14MW-03	22-Aug-14	480.087	0.94	1.240	481.327	480.39	481.23	0.84	31-Aug-14	1.63	0.387	479.70	Not Enough Water			Turbid with sand
14MW-04	26-Aug-14	480.441	0.69	1.172	481.613	480.92	481.51	0.59	31-Aug-14	1.257	0.085	480.36	7.1	75	7.1	Turbid
14MW-05	26-Aug-14	478.069	1.00	1.175	479.244	478.24	479.14	0.90	31-Aug-14	1.30	0.123	477.95	6.9	114.0	5.2	Turbid
14MW-06	26-Aug-14	480.77	0.78	1.200	481.970	481.19	481.92	0.73	31-Aug-14	1.27	0.074	480.70	6.8	38	5.2	Turbid
14MW-C1	26-Aug-14	490.309	0.99	1.210	491.519	490.53	491.47	0.94	31-Aug-14	1.41	0.200	490.11	Not Enough Water			Turbid
14MW-C2	29-Aug-14	N/A	0.67	1.055	N/A	N/A	N/A	0.59	31-Aug-14	1.12	0.065	N/A	Not Enough Water			Turbid

Notes:

[1] This information is based on survey data provided. Monitoring well 14MWC2 was not surveyed in for elevation

[2] mbtoc-meters below top of casing

[3] mbg- meters below grade

Table C.3: GroundWater Analytical Results

Parameter	Unit	CCME - PFAL[1]	14MW01	14MW03	14MW04	14MW05	14MW06	14MWC1	14MWC2
			31-Aug-14	31-Aug-14	31-Aug-14	31-Aug-14	31-Aug-14	31-Aug-14	31-Aug-14
Routine									
pH	pH Units	6.5-9.0			7.43	6.60	6.83	**5.04**	7.55
Electrical Conductivity (EC)	uS/cm	NG			160	63	97	33	130
Alkalinity (total as $CaCO_3$)	mg/L	NG			24	24	35	<0.50	64
Alkalinity (pp as $CaCO_3$)	mg/L	NG			<0.50	<0.50	<0.50	<0.50	<0.50
Total Dissolved Solids (TDS)	mg/L	NG			100	36	57	18	80
Hardness as $CaCO_3$	mg/L	NG			67	28	38	11	91
Bicarbonate	mg/L	NG			29	29	43	<0.5	78
Carbonate	mg/L	NG			<0.50	<0.50	<0.50	<0.50	<0.50
Hydroxide	mg/L	NG			<0.50	<0.50	<0.50	<0.50	<0.50
Calcium	mg/L	NG			16	7.5	8.2	3.5	22
Magnesium	mg/L	NG			6.9	2.1	4.3	0.52	8.8
Potassium	mg/L	NG			1.1	1.1	1.0	<0.30	2.5
Sodium	mg/L	NG			5.4	2.5	6.1	1.3	2.3
Chloride	mg/L	120			2.6	3.1	3.9	1.3	1.1
Sulphate	mg/L	NG			22	<1.0	6.6	1.1	3.3
Nitrate (as N)	mg/L	13			7.4	0.14	0.24	2.1	<0.010
Nitrite (as N)	mg/L	0.06			**0.10**	*<0.10*	0.012	<0.010	<0.010
Nitrate and Nitrite (as N)	mg/L	NG			7.6	0.14	0.25	2.1	<0.010
Anions Total	meq/L	NG			1.6	0.57	0.97	0.21	1.4
Cations Total	meq/L	NG			1.6	0.86	1.2	0.30	2.1
Ionic Balance	N/A	NG			1.0	1.5	1.3	1.4	1.5
Hydrocarbons									
Benzene	mg/L	0.37	<0.00040	<0.00040					
Toluene	mg/L	0.002	<0.00040	0.0020					
Ethylbenzene	mg/L	0.09	<0.00040	<0.00040					
Xylenes (m & p)	mg/L	NG	<0.00080	<0.00080					
Xylene (o)	mg/L	NG	<0.00040	<0.00040					
Xylenes Total	mg/L	NG	<0.00080	<0.00080					
F1 (C_6 to C_{10})	mg/L	NG	<0.10	<0.10					
F1 (C_6-C_{10}) - BTEX	mg/L	NG	<0.10	<0.10					
F2 (C_{10}-C_{16})	mg/L	NG	<0.10	<0.10					
Dissolved Metals									
Aluminium	mg/L	0.005-0.1 [2]			**0.17**	**0.61**	**0.34**	**0.60**	**0.22**
Antimony	mg/L	NG			<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005			0.00031	0.0039	0.0021	0.00034	0.0012
Barium	mg/L	NG			0.023	0.017	0.020	0.020	0.022
Beryllium	mg/L	NG			<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.5			0.039	<0.020	<0.020	<0.020	<0.020
Cadmium	mg/L	0.00009			0.000038	0.000056	<0.000020	0.000021	0.000027
Chromium	mg/L	NG			<0.0010	0.0027	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	NG			0.00085	0.0022	0.0065	0.0028	0.0020
Copper	mg/L	0.002-0.004 [3]			**0.0046**	**0.048**	**0.0033**	**0.0048**	**0.0070**
Iron	mg/L	0.3			0.13	**4.9**	**4.1**	**0.46**	**1.2**
Lead	mg/L	0.001-0.007 [3]			<0.00020	0.00061	0.00023	<0.00020	0.00028
Lithium	mg/L	NG			<0.020	<0.020	<0.020	<0.020	<0.020
Manganese	mg/L	NG			0.079	0.096	0.33	0.012	0.97
Molybdenum	mg/L	0.073			0.0015	0.0020	0.00026	<0.00020	0.00084
Nickel	mg/L	0.025-0.150 [3]			0.0014	0.0077	0.0029	0.0018	0.0017
Phosphorus	mg/L	0.004 [4]			*<0.10*	*<0.10*	*<0.10*	*<0.10*	*<0.10*
Selenium	mg/L	0.001			<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon	mg/L	NG			3.6	12	3.7	6.0	5.1
Silver	mg/L	0.0001			<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Strontium	mg/L	NG			0.065	0.024	0.043	<0.020	0.035
Sulphur	mg/L	NG			6.4	0.97	2.7	0.99	1.0
Thallium	mg/L	0.0008			<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	NG			0.0020	0.0013	<0.0010	<0.0010	<0.0010
Titanium	mg/L	NG			0.012	0.022	0.0076	0.014	0.0056
Uranium	mg/L	0.015			0.00036	0.0025	0.00022	0.00084	0.0053
Vanadium	mg/L	NG			0.0014	0.014	0.0024	0.0022	0.0017
Zinc	mg/L	0.03			**0.069**	**0.13**	**0.082**	**0.041**	0.0097

Notes:

[1] Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Aquatic Life (PFAL)

[2] Guideline varies with pH

[3] Guideline varies with hardness

[4] Guideline applied is for the most conservative ultra-oligotrophic

NG - No guideline

BOLD - Exceeds Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table C.3: GroundWater Analytical Results

Parameter	Unit	CCME - PFAL[1]	14MW01	14MW03	14MW04	14MW05	14MW06	14MWC1	14MWC2
			31-Aug-14	31-Aug-14	31-Aug-14	31-Aug-14	31-Aug-14	31-Aug-14	31-Aug-14
Total Metals									
Aluminium	mg/L	0.005-0.1 [2]			**75**	**590**	**61**	**210**	
Antimony	mg/L	NG			<0.00060	<0.012	<0.00060	<0.012	
Arsenic	mg/L	0.005			**0.024**	**0.49**	**0.071**	**0.047**	
Barium	mg/L	NG			0.47	3.4	0.47	0.91	
Beryllium	mg/L	NG			0.0028	0.026	0.0024	<0.020	
Boron	mg/L	1.5			0.045	0.064	<0.020	<0.020	
Cadmium	mg/L	0.00009			**0.00048**	**0.0058**	**0.00068**	**0.0014**	
Calcium	mg/L	NG			34	180	45	54	
Chromium	mg/L	NG			0.22	2.2	0.16	0.29	
Cobalt	mg/L	NG			0.046	0.40	0.057	0.087	
Copper	mg/L	0.002-0.004 [3]			**0.30**	**3.6**	**0.22**	**0.75**	
Iron	mg/L	0.3			**79**	**1300**	**91**	**240**	
Lead	mg/L	0.001-0.007 [3]			**0.035**	**0.24**	**0.035**	**0.071**	
Lithium	mg/L	NG			0.16	1.6	0.14	0.16	
Magnesium	mg/L	NG			39	310	31	39	
Manganese	mg/L	NG			0.79	7.4	1.6	0.96	
Molybdenum	mg/L	0.073			0.0028	0.016	0.0030	<0.0040	
Nickel	mg/L	0.025-0.150 [3]			**0.17**	**1.3**	**0.12**	**0.23**	
Phosphorus	mg/L	0.004 [4]			**6.3**	**50**	**14**	**21**	
Potassium	mg/L	NG			14	89	12	7.1	
Selenium	mg/L	0.001			0.00081	**0.012**	0.00072	**0.0062**	
Silicon	mg/L	NG			58	340	55	120	
Silver	mg/L	0.0001			**0.00038**	**0.0045**	**0.00028**	**0.0023**	
Sodium	mg/L	NG			7.1	15	7.9	7.2	
Strontium	mg/L	NG			0.13	0.59	0.14	0.21	
Sulphur	mg/L	NG			7.9	18	3.1	20	
Thallium	mg/L	0.0008			**0.0012**	**0.011**	**0.00086**	*<0.0040*	
Tin	mg/L	NG			0.014	0.069	0.0037	<0.020	
Titanium	mg/L	NG			3.5	29	2.7	3.3	
Uranium	mg/L	0.015			**0.042**	**0.39**	0.010	**0.23**	
Vanadium	mg/L	NG			0.22	2.8	0.21	0.41	
Zinc	mg/L	0.03			**0.55**	**3.0**	**0.67**	**0.75**	
Laboratory Work Order Number			B477081	B477081	B477081	B477081	B477081	B477081	B477081
Laboratory Identification Number			KM5919	KM5920	KM5921	KM5922	KM5923	KM5924	KM5925

Notes:

[1] Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Aquatic Life (Freshwater)
[2] Guideline varies with pH
[3] Guideline varies with hardness
[4] Guideline applied is for the most conservative ultra-oligotrophic
NG - No guideline
BOLD - Exceeds Guideline
Italic - Detection limit greater than guideline
Blank - Not analyzed

Table C.4: Seep Water Analytical Results

Parameter	Unit	CCME - PFAL[1]	14MWC1	14MWC2	SEEP 1	SEEP 2	SEEP 3
			31-Aug-14	31-Aug-14	20-Aug-14	24-Aug-14	24-Aug-14
Routine							
pH	pH Units	6.5-9.0	**5.04**	7.55	7.86	7.67	7.40
Electrical Conductivity (EC)	uS/cm	NG	33	130	410	120	200
Alkalinity (total as $CaCO_3$)	mg/L	NG	<0.50	64	110	42	49
Alkalinity (pp as $CaCO_3$)	mg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50
Total Dissolved Solids (TDS)	mg/L	NG	18	80	250	66	120
Hardness as $CaCO_3$	mg/L	NG	11	91	200	52	88
Bicarbonate	mg/L	NG	<0.5	78	130	52	59
Carbonate	mg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50
Hydroxide	mg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50
Calcium	mg/L	NG	3.5	22	47	11	17
Magnesium	mg/L	NG	0.52	8.8	19	5.9	11
Potassium	mg/L	NG	<0.30	2.5	5.5	1.7	2.0
Sodium	mg/L	NG	1.3	2.3	7.1	4.3	7.4
Chloride	mg/L	120	1.3	1.1	2.4	1.1	4.6
Sulphate	mg/L	NG	1.1	3.3	52	7.3	25
Nitrate (as N)	mg/L	13	2.1	<0.010	11	2.0	5.3
Nitrite (as N)	mg/L	0.06	<0.010	<0.010	<0.010	<0.010	0.013
Nitrate and Nitrite (as N)	mg/L	NG	2.1	<0.010	11	2.0	5.3
Anions Total	meq/L	NG	0.21	1.4	4.1	1.2	2.0
Cations Total	meq/L	NG	0.30	2.1	4.4	1.3	2.1
Ionic Balance	N/A	NG	1.4	1.5	1.1	1.1	1.1
Hydrocarbons							
Benzene	mg/L	0.37					
Toluene	mg/L	0.002					
Ethylbenzene	mg/L	0.09					
Xylenes (m & p)	mg/L	NG					
Xylene (o)	mg/L	NG					
Xylenes Total	mg/L	NG					
F1 (C_6 to C_{10})	mg/L	NG					
F1 (C_6-C_{10}) - BTEX	mg/L	NG					
F2 (C_{10}-C_{16})	mg/L	NG					
Dissolved Metals							
Aluminium	mg/L	0.005-0.1 [2]	**0.60**	**0.22**	0.0084	0.066	0.059
Antimony	mg/L	NG	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	0.00034	0.0012	0.00083	0.00045	0.00028
Barium	mg/L	NG	0.020	0.022	0.037	0.012	0.022
Beryllium	mg/L	NG	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.5	<0.020	<0.020	0.046	0.041	0.070
Cadmium	mg/L	0.00009	0.000021	0.000027	0.000021	<0.000020	<0.000020
Chromium	mg/L	NG	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	NG	0.0028	0.0020	<0.00030	<0.00030	0.00049
Copper	mg/L	0.002-0.004 [3]	**0.0048**	**0.0070**	**0.0073**	**0.0038**	**0.0038**
Iron	mg/L	0.3	**0.46**	**1.2**	<0.060	0.13	0.11
Lead	mg/L	0.001-0.007 [3]	<0.00020	0.00028	<0.00020	<0.00020	<0.00020
Lithium	mg/L	NG	<0.020	<0.020	<0.020	<0.020	<0.020
Manganese	mg/L	NG	0.012	0.97	0.017	0.025	0.058
Molybdenum	mg/L	0.073	<0.00020	0.00084	0.0057	0.0043	0.0050
Nickel	mg/L	0.025-0.150 [3]	0.0018	0.0017	0.0033	0.0027	0.0039
Phosphorus	mg/L	0.004 [4]	*<0.10*	*<0.10*	*<0.10*	*<0.10*	*<0.10*
Selenium	mg/L	0.001	<0.00020	<0.00020	0.00026	0.00023	0.00027
Silicon	mg/L	NG	6.0	5.1	3.9	4.1	5.1
Silver	mg/L	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Strontium	mg/L	NG	<0.020	0.035	0.19	0.057	0.090
Sulphur	mg/L	NG	0.99	1.0	17	2.5	7.8
Thallium	mg/L	0.0008	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	NG	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium	mg/L	NG	0.014	0.0056	<0.0010	0.0015	0.0022
Uranium	mg/L	0.015	0.00084	0.0053	**0.063**	**0.089**	**0.032**
Vanadium	mg/L	NG	0.0022	0.0017	<0.0010	<0.0010	<0.0010
Zinc	mg/L	0.03	**0.041**	0.0097	0.0044	0.0092	<0.0030

Notes:

[1] Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Aquatic Life (Freshwater)
[2] Guideline varies with pH
[3] Guideline varies with hardness
[4] Guideline applied is for the most conservative ultra-oligotrophic
NG - No guideline
BOLD - Exceeds Guideline
Italic - Detection limit greater than guideline
Blank - Not analyzed

Table C.4: Seep Water Analytical Results

Parameter	Unit	CCME - PFAL[1]	14MWC1	14MWC2	SEEP 1	SEEP 2	SEEP 3
			31-Aug-14	31-Aug-14	20-Aug-14	24-Aug-14	24-Aug-14
Total Metals							
Aluminium	mg/L	0.005-0.1 [2]	**210**		**1.3**	**0.19**	0.091
Antimony	mg/L	NG	<0.012		<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	**0.047**		0.0010	0.00057	0.00039
Barium	mg/L	NG	0.91		0.052	0.017	0.027
Beryllium	mg/L	NG	<0.020		<0.0010	<0.0010	<0.0010
Boron	mg/L	1.5	<0.020		0.048	0.039	0.069
Cadmium	mg/L	0.00009	**0.0014**		<0.000020	<0.000020	<0.000020
Calcium	mg/L	NG	54		46	11	17
Chromium	mg/L	NG	0.29		0.0027	<0.0010	<0.0010
Cobalt	mg/L	NG	0.087		0.0012	<0.00030	0.00057
Copper	mg/L	0.002-0.004 [3]	**0.75**		**0.012**	**0.0045**	**0.0039**
Iron	mg/L	0.3	**240**		**1.9**	0.28	0.14
Lead	mg/L	0.001-0.007 [3]	**0.071**		0.00072	0.00020	<0.00020
Lithium	mg/L	NG	0.16		<0.020	<0.020	<0.020
Magnesium	mg/L	NG	39		20	5.8	11
Manganese	mg/L	NG	0.96		0.061	0.028	0.057
Molybdenum	mg/L	0.073	<0.0040		0.0061	0.0046	0.0051
Nickel	mg/L	0.025-0.150 [3]	**0.23**		0.0072	0.0030	0.0036
Phosphorus	mg/L	0.004 [4]	**21**		*<0.10*	*<0.10*	*<0.10*
Potassium	mg/L	NG	7.1		5.8	1.7	2.0
Selenium	mg/L	0.001	**0.0062**		0.00038	0.00027	0.00026
Silicon	mg/L	NG	120		6.2	4.3	5.0
Silver	mg/L	0.0001	**0.0023**		<0.00010	<0.00010	<0.00010
Sodium	mg/L	NG	7.2		7.1	4.2	7.4
Strontium	mg/L	NG	0.21		0.20	0.057	0.090
Sulphur	mg/L	NG	20		17	2.3	7.5
Thallium	mg/L	0.0008	*<0.0040*		<0.00020	<0.00020	<0.00020
Tin	mg/L	NG	<0.020		<0.0010	<0.0010	<0.0010
Titanium	mg/L	NG	3.3		0.054	0.0037	0.0011
Uranium	mg/L	0.015	**0.23**		**0.069**	**0.093**	**0.034**
Vanadium	mg/L	NG	0.41		0.0039	0.0012	<0.0010
Zinc	mg/L	0.03	**0.75**		0.012	0.012	<0.0030
Laboratory Work Order Number			B477081	B477081	B474838	B474838	B474838
Laboratory Identification Number			KM5924	KM5925	KL1986	KL1987	KL1988

Notes:

[1] Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Aquatic Life (PFAL)
[2] Guideline varies with pH
[3] Guideline varies with hardness
[4] Guideline applied is for the most conservative ultra-oligotrophic
NG - No guideline
BOLD - Exceeds Guideline
Italic - Detection limit greater than guideline
Blank - Not analyzed

Table C.5: Water Quality Assurance/Quality Control Analytical Results

Parameter	Unit	RDL	14MW01	MWDUP1	RPD (%)	14MW06	MWDUP2	RPD (%)	SW 2-1	SW DUP 1	RPD (%)
			31-Aug-14			31-Aug-14			25-Aug-14		
Routine											
pH	pH Units					6.83	6.88	1			
Electrical Conductivity (EC)	uS/cm	1				97	98	1			
Alkalinity (total as $CaCO_3$)	mg/L	0.5				35	36	3			
Alkalinity (pp as $CaCO_3$)	mg/L	0.5				<0.50	<0.50	-			
Total Dissolved Solids (TDS)	mg/L	10				57	58	2			
Hardness as $CaCO_3$	mg/L	0.5				38	39	3			
Bicarbonate	mg/L	0.5				43	44	2			
Carbonate	mg/L	0.5				<0.50	<0.50	-			
Hydroxide	mg/L	0.5				<0.50	<0.50	-			
Calcium	mg/L	0.3				8.2	8.3	1			
Magnesium	mg/L	0.2				4.3	4.3	0			
Potassium	mg/L	0.3				1.0	1.0	-			
Sodium	mg/L	0.5				6.1	6.0	2			
Chloride	mg/L	1				3.9	3.2	-			
Sulphate	mg/L	1				6.6	8.0	19			
Nitrate (as N)	mg/L	0.01				0.24	0.23	4			
Nitrite (as N)	mg/L	0.01				0.012	0.013	-			
Nitrate and Nitrite (as N)	mg/L	0.01				0.25	0.24	4			
Anions Total	meq/L					0.97	1.0	3			
Cations Total	meq/L					1.2	1.2	0			
Ionic Balance	N/A	0.01				1.3	1.2	8			
Hydrocarbons											
Benzene	mg/L	0.0004	<0.00040	<0.00040	-				<0.00040	<0.00040	-
Toluene	mg/L	0.0004	<0.00040	<0.00040	-				<0.00040	<0.00040	-
Ethylbenzene	mg/L	0.0004	<0.00040	<0.00040	-				<0.00040	<0.00040	-
Xylenes (m & p)	mg/L	0.0008	<0.00080	<0.00080	-				<0.00080	<0.00080	-
Xylene (o)	mg/L	0.0004	<0.00040	<0.00040	-				<0.00040	<0.00040	-
Xylenes Total	mg/L	0.0008	<0.00080	<0.00080	-				<0.00080	<0.00080	-
F1 (C_6 to C_{10})	mg/L	0.1	<0.10	<0.10	-				<0.10	<0.10	-
F1 (C_6-C_{10}) - BTEX	mg/L	0.1	<0.10	<0.10	-				<0.10	<0.10	-
F2 (C_{10}-C_{16})	mg/L	0.1	<0.10	<0.10	-				4.5	5.2	14
Dissolved Metals											
Aluminium	mg/L	0.003				0.34	0.37	8			
Antimony	mg/L	0.0006				<0.00060	<0.00060	-			
Arsenic	mg/L	0.0002				0.0021	0.0025	17			
Barium	mg/L	0.01				0.020	0.020	-			
Beryllium	mg/L	0.001				<0.0010	<0.0010	-			
Boron	mg/L	0.02				<0.020	0.020	-			
Cadmium	mg/L	0.00002				<0.000020	<0.000020	-			
Chromium	mg/L	0.001				<0.0010	<0.0010	-			
Cobalt	mg/L	0.0003				0.0065	0.0070	7			
Copper	mg/L	0.0002				0.0033	0.0031	6			
Iron	mg/L	0.06				4.1	4.4	7			
Lead	mg/L	0.0002				0.00023	<0.00020	-			
Lithium	mg/L	0.02				<0.020	<0.020	-			
Manganese	mg/L	0.004				0.33	0.33	0			
Molybdenum	mg/L	0.0002				0.00026	0.00026	-			
Nickel	mg/L	0.0005				0.0029	0.0031	7			
Phosphorus	mg/L	0.1				<0.10	<0.10	-			
Selenium	mg/L	0.0002				<0.00020	<0.00020	-			
Silicon	mg/L	0.1				3.7	3.7	0			
Silver	mg/L	0.0001				<0.00010	<0.00010	-			
Strontium	mg/L	0.02				0.043	0.044	-			
Sulphur	mg/L	0.2				2.7	2.8	4			
Thallium	mg/L	0.0002				<0.00020	<0.00020	-			
Tin	mg/L	0.001				<0.0010	<0.0010	-			
Titanium	mg/L	0.001				0.0076	0.0086	12			
Uranium	mg/L	0.0001				0.00022	0.00022	-			
Vanadium	mg/L	0.001				0.0024	0.0024	-			
Zinc	mg/L	0.003				0.082	0.087	6			
Total Metals											
Aluminium	mg/L	0.003				61	76	**22**			
Antimony	mg/L	0.0006				<0.00060	<0.00060	-			
Arsenic	mg/L	0.0002				0.071	0.086	19			
Barium	mg/L	0.01				0.47	0.59	**23**			
Beryllium	mg/L	0.001				0.0024	0.0033	**32**			
Boron	mg/L	0.02				<0.020	<0.020	-			
Cadmium	mg/L	0.00002				0.00068	0.00092	**30**			
Calcium	mg/L	0.3				45	61	**30**			
Chromium	mg/L	0.001				0.16	0.20	**22**			
Cobalt	mg/L	0.0003				0.057	0.070	**20**			
Copper	mg/L	0.0002				0.22	0.28	**24**			
Iron	mg/L	0.06				91	110	19			
Lead	mg/L	0.0002				0.035	0.041	16			
Lithium	mg/L	0.02				0.14	0.18	**25**			
Magnesium	mg/L	0.2				31	38	**20**			
Manganese	mg/L	0.004				1.6	2.0	**22**			
Molybdenum	mg/L	0.0002				0.0030	0.0035	15			
Nickel	mg/L	0.0005				0.12	0.16	**29**			
Phosphorus	mg/L	0.1				14	19	**30**			
Potassium	mg/L	0.3				12	15	**22**			
Selenium	mg/L	0.0002				0.00072	0.00090	-			
Silicon	mg/L	0.1				55	61	10			
Silver	mg/L	0.0001				0.00028	0.00034	-			
Sodium	mg/L	0.5				7.9	8.2	4			
Strontium	mg/L	0.02				0.14	0.18	**25**			
Sulphur	mg/L	0.2				3.1	3.3	6			
Thallium	mg/L	0.0002				0.00086	0.0011	-			
Tin	mg/L	0.001				0.0037	0.0044	-			
Titanium	mg/L	0.001				2.7	3.5	**26**			
Uranium	mg/L	0.0001				0.010	0.012	18			
Vanadium	mg/L	0.001				0.21	0.26	**21**			
Zinc	mg/L	0.003				0.67	0.82	**20**			
Polycyclic Aromatic Hydrocarbons (PAHs)											
2-methylnaphthalene	mg/L	0.0001							<0.0010	<0.0010	-
Acenaphthene	mg/L	0.0001							<0.0010	<0.0010	-
Acenaphthylene	mg/L	0.0001							<0.0010	<0.0010	-
Acridine	mg/L	0.0002							<0.0020	<0.0020	-
Anthracene	mg/L	0.00001							<0.0020	<0.0014	-
Benz(a)anthracene	mg/L	0.0000085							<0.000085	<0.000085	-
Benzo(a) pyrene	mg/L	0.0000075							<0.000075	<0.000075	-
Benzo(b+j)fluoranthene	mg/L	0.0000085							<0.000085	<0.000085	-
Benzo(c)phenanthrene	mg/L	0.00005							<0.00050	<0.00050	-
Benzo(e)pyrene	mg/L	0.00005							<0.00050	<0.00050	-
Benzo(g,h,i)perylene	mg/L	0.0000085							<0.000085	0.00017	-
Benzo(k)fluoranthene	mg/L	0.0000085							<0.000085	<0.000085	-
Benzo[a]pyrene equivalency	mg/L	0.00001							0.000093	0.000094	1
Chrysene	mg/L	0.0000085							<0.000085	<0.000085	-
Dibenz(a,h)anthracene	mg/L	0.0000075							<0.000075	<0.000075	-
Fluoranthene	mg/L	0.00001							0.00082	0.00024	**109**
Fluorene	mg/L	0.00005							0.0047	<0.0048	-
Indeno(1,2,3-c,d)pyrene	mg/L	0.0000085							<0.000085	<0.000085	-
Naphthalene	mg/L	0.0001							<0.0010	<0.0010	-
Perylene	mg/L	0.00005							<0.00056	<0.00050	-
Phenanthrene	mg/L	0.00005							0.014	0.011	**24**
Pyrene	mg/L	0.00002							0.0033	0.0024	**32**
Quinoline	mg/L	0.0002							<0.0020	<0.0020	-
Laboratory Work Order Number			B477081	B477081		B477081	B477081		B474838	B474838	
Laboratory Identification Number			KM5919	KM5926		KM5923	KM5927		KL1993	KL1995	

Notes:

RDL - Reportable detection limit

RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100

"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.

Bold - Indicates RPD value greater than 20%.

APPENDIX D
SURFACE WATER

Photo D.1: Station JER-AEM-04 at the PKCA discharge point of the West Dam

Photo D.2: Station JER-AEM-09 on Lake C1 looking north

Photo D.3: Station JER-AEM-10 at Stream C1 looking downstream to Carat Lake

Photo D.4: Station JER-AEM-12 at the Carat Lake freshwater intake causeway

Photo D.5: Station JER-AEM-13 at Lake C4 looking southwest towards the mine site

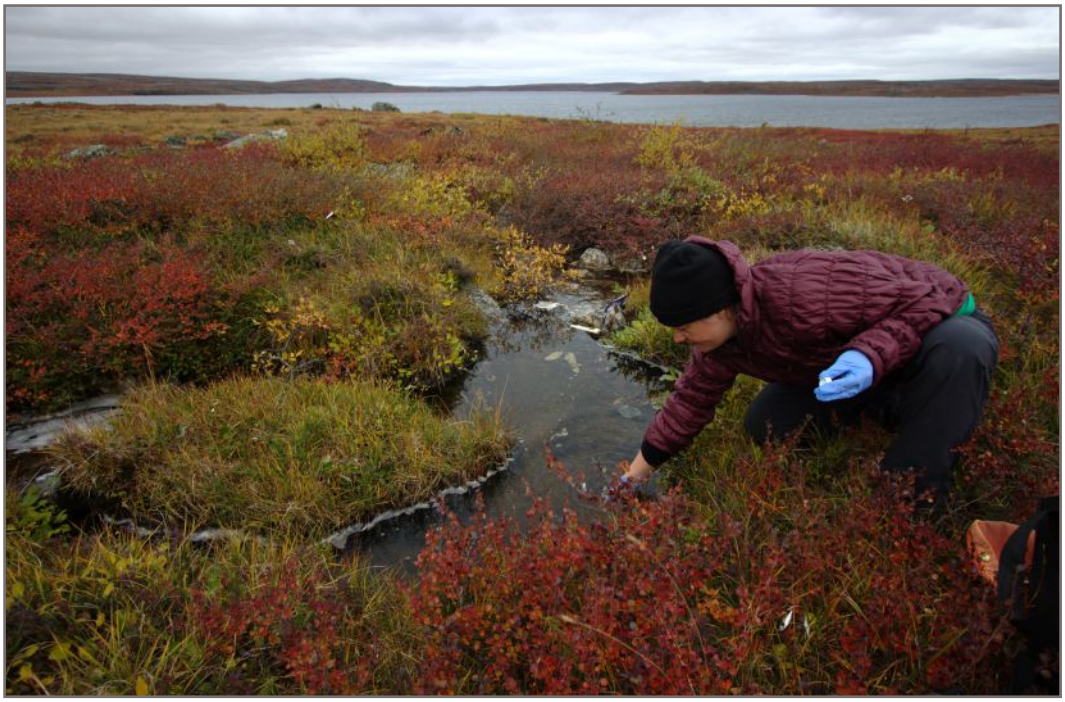


Photo D.6: Station JER-AEM-14 at Lake C4 Stream looking downstream to Carat Lake

Photo D.7: Station JER-AEM-15 at Carat Lake basin

Photo D.8: Station JER-AEM-16 at Carat Lake outlet looking southeast

Photo D.9: Station JER-AEM-22 at Ash Lake

Photo D.10: Station JER-AEM-23 at Key Lake

Photo D.11: Station JER-AEM-24 at Lynne Lake

Photo D.12: Station JER-AEM-26 at Southeast Lake looking west towards the PKCA

Photo D.13: Station JER-AEM-27 at Shine Lake

Photo D.14: Station SWQ-02 at the mine pit

Photo D.15: Station SWQ-04 at the PKCA pond up-gradient from the West Dam

Photo D.16: Station SWQ-07 at the East Sump looking west towards the Coarse PK stockpile and the mine

Photo D.17: Station 2014-CL-S1 along the Carat Lake shoreline down-gradient from the waste rock pile

Photo D.18: Station 2014-CL-S2 along the Carat Lake shoreline down-gradient from the waste rock pile

Table D.1: Water Quality Assurance/Quality Control Results

Parameter	Units	RDL	BLANKS			DUPLICATES								
			FIELD BLANK	TRIP BLANK	Equipment Blank	JER-AEM-24	DUP 1	RPD (%)	JER-AEM-04	DUP 2	RPD (%)	SWQ-02	DUP 3	RPD (%)
			26-Aug-14	29-Aug-14	10-Oct-14	25-Aug-14			26-Aug-14			26-Aug-14		
Physical Parameters														
pH	pH Units	0.1	5.36	5.36	5.20	6.87	6.95	1	7.79	7.78	0	7.76	7.71	1
Electrical Conductivity (EC)	uS/cm	0.2	1.37	1.38	17.3	26.3	26.5	1	148	147	1	209	209	0
Hardness	mg/L	1.3	<1	<1	<1	10.5	10.5	0	55.6	56.1	1	75.7	75	1
Total Organic Carbon (TOC)	mg/L	1	<1	<1	<1	4.6	4.9	-	6.7	6.7	0	2	1.8	-
Total Suspended Solids (TSS)	mg/L	3	<3	<3	<3	<3	<3	-	<3	<3	-	3.1	<3	-
Total Dissolved Solids (TDS)	mg/L	1	<1	<1	3.2	12.7	11.3	12	73.4	73.5	0	117	117	0
Turbidity	NTU	0.1	<0.1	<0.1	<0.1	0.46	0.47	-	1.44	1.38	4	2.02	2.74	**30**
Anions														
Alkalinity - $CaCO_3$	mg/L	2	<2	<2	<2	10	10.1	1	57.8	57.7	0	42.2	42.1	0.2
Carbonate - $CaCO_3$	mg/L	5	<5	<5	<5	<5	<5	-	<5	<5	-	<5	<5	-
Bicarbonate - $CaCO_3$	mg/L	5	<5	<5	<5	12.2	12.3	-	70.5	70.4	0	51.5	51.4	0.2
Ammonia as N	mg/L	0.005	<0.005	<0.005	<0.005	0.0221	0.018	-	0.0262	0.0331	**23**	0.0383	0.0365	5
Nitrite - N	mg/L	0.002	<0.002	<0.002	<0.002	0.0021	0.0025	-	<0.002	0.0059	-	0.0384	0.0384	0
Nitrate - N	mg/L	0.006	<0.006	<0.006	0.733	0.0234	0.0264	-	0.0495	0.0481	3	8.86	8.95	1
Fluoride - F	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	0.068	0.059	14	0.059	0.067	13
Chloride - Cl	mg/L	0.5	<0.5	<0.5	<0.5	0.69	<0.5	-	3.07	3.17	3	6.06	6.03	0.5
Hydroxide - OH	mg/L	5	<5	<5	<5	<5	<5	-	<5	<5	-	<5	<5	-
Sulphate - SO_4	mg/L	0.05	<0.05	<0.05	<0.05	2.07	1.35	**42**	7.62	7.64	0.3	10	9.86	1
Ionic Balance	N/A	-							105	105	0	103	102	1
Total Metals														
Aluminum	mg/l	0.0002	<0.0002	<0.0002	0.00064	0.0276	0.0301	9	0.033	0.0275	18	0.0898	0.0998	11
Antimony	mg/l	0.00005	<0.000005	<0.000005	<0.000005	0.000008	0.0000095	-	<0.00005	<0.00005	-	0.000287	0.000302	5
Arsenic	mg/l	0.00002	<0.00002	<0.00002	<0.00002	0.000228	0.000245	7	0.00065	0.000642	1	0.000484	0.000486	0.4
Barium	mg/l	0.00002	<0.00002	<0.00002	<0.00002	0.00201	0.002	0.5	0.012	0.0117	3	0.0414	0.0434	5
Beryllium	mg/l	0.000002	<0.000002	<0.000002	<0.000002	0.000005	0.0000055	-	<0.000005	0.000005	-	0.000008	0.0000081	-
Bismuth	mg/l	0.000001	<0.000001	<0.000001	<0.000001	<0.000001	<0.000001	-	<0.00005	<0.00005	-	<0.00005	<0.00005	-
Boron	mg/l	0.005	<0.005	<0.005	<0.005	<0.005	0.0063	-	0.0259	0.0258	0.4	0.0463	0.0463	0
Cadmium	mg/l	0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	-	<0.000005	<0.000005	-	<0.000005	<0.000005	-
Calcium	mg/l	0.053	<0.03	<0.03	<0.03	2.34	2.36	1	10.9	10.5	4	17.6	17.8	1
Cesium	mg/l	0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	-	0.0000256	0.000025	2	0.0000655	0.0000671	2
Chromium	mg/l	0.00005	<0.00005	<0.00005	<0.00005	0.000104	0.000118	-	<0.0005	<0.0005	-	<0.0005	<0.0005	-
Cobalt	mg/l	0.000005	<0.000005	<0.000005	<0.000005	0.0000317	0.0000341	7	0.000113	0.000109	4	0.00008	0.000091	13
Copper	mg/l	0.00005	<0.00005	<0.00005	0.0157	0.00155	0.00167	7	0.00117	0.00116	1	0.00146	0.00152	4
Gallium	mg/l	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	-	<0.00005	<0.00005	-	<0.00005	0.000056	-
Iron	mg/l	0.01	<0.01	<0.01	<0.01	0.04	0.043	-	0.287	0.273	5	0.089	0.099	11
Lead	mg/l	0.000005	<0.000005	<0.000005	<0.000005	0.000007	0.0000075	-	<0.00005	<0.00005	-	0.000224	0.000242	8
Lithium	mg/l	0.0002	<0.0002	<0.0002	<0.0002	0.00035	0.00037	-	0.00109	0.00105	4	0.00341	0.0034	0
Magnesium	mg/l	0.103	<0.03	<0.03	<0.03	1.21	1.22	1	7.1	6.6	7	7.66	7.76	1
Manganese	mg/l	0.000005	<0.000005	<0.000005	<0.000005	0.00334	0.00344	3	0.0369	0.0374	1	0.00176	0.00201	13
Mercury	mg/l	0.000005	<0.000005	<0.000005	0.0000142	<0.000005	<0.000005	-	0.0000055	<0.000005	-	<0.000005	<0.000005	-
Molybdenum	mg/l	0.00001	<0.00001	<0.00001	<0.00001	0.000029	0.000042	-	0.00107	0.00109	2	0.00708	0.00754	6
Nickel	mg/l	0.00005	<0.00005	<0.00005	<0.00005	0.000436	0.000471	8	0.00083	0.00078	6	0.00169	0.00179	6
Phosphorus	mg/l	0.001	<0.001	<0.001	<0.001	<0.05	<0.05	-	<0.3	<0.3	-	<0.3	<0.3	-
Potassium	mg/l	0.05	<0.05	<0.05	<0.05	0.35	0.355	1	4.2	3.8	10	3.5	3.6	3
Rhenium	mg/l	0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	-	0.0000063	0.0000064	-	0.0000083	0.0000088	-
Rubidium	mg/l	0.000005	<0.000005	<0.000005	<0.000005	0.000755	0.000757	0.3	0.00961	0.00988	3	0.0093	0.00911	2
Selenium	mg/l	0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	-	<0.0002	<0.0002	-	0.00026	0.00031	18
Silicon	mg/l	0.05	<0.05	<0.05	<0.05	0.471	0.469	0	1.07	0.998	7	2.32	2.37	2
Silver	mg/l	0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	-	<0.000005	<0.000005	-	<0.000005	<0.000005	-
Sodium	mg/l	0.2	<0.2	<0.2	<0.2	0.82	0.83	1	5.7	5.2	9	7.1	7.1	0
Strontium	mg/l	0.00001	<0.00001	<0.00001	<0.00001	0.00686	0.00702	2	0.177	0.17	4	0.244	0.248	2
Tellurium	mg/l	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	-	<0.00001	<0.00001	-	<0.00001	<0.00001	-
Thallium	mg/l	0.000001	<0.000001	<0.000001	<0.000001	<0.000001	<0.000001	-	0.0000029	0.0000028	-	0.000007	0.0000073	4
Thorium	mg/l	0.000005	<0.000005	<0.000005	<0.000005	0.0000177	0.0000175	-	0.0000279	0.0000206	-	0.0000357	0.0000353	1
Tin	mg/l	0.00001	<0.00001	<0.00001	0.0184	<0.00001	<0.00001	-	<0.0002	<0.0002	-	<0.0002	<0.0002	-
Titanium	mg/l	0.00005	<0.00005	<0.00005	<0.00005	0.000333	0.000321	4	0.00093	0.00086	8	0.00281	0.00301	7
Tungsten	mg/l	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	-	0.000012	0.000012	-	0.000496	0.000526	6
Uranium	mg/l	0.000001	<0.000001	<0.000001	<0.000001	0.000132	0.000138	4	0.00169	0.00157	7	0.117	0.122	4
Vanadium	mg/l	0.00001	<0.00001	<0.00001	<0.00001	0.000076	0.000082	8	0.00013	0.000129	1	0.000785	0.000826	5
Yttrium	mg/l	0.000005	<0.000005	<0.000005	<0.000005	0.000098	0.000102	4	0.000101	0.0001	1	0.000171	0.000216	**23**
Zinc	mg/l	0.0001	0.00019	<0.0001	0.0007	0.00035	0.00039	-	<0.003	<0.003	-	<0.003	<0.003	-
Zirconium	mg/l	0.00001	<0.00001	<0.00001	<0.00001	0.000038	0.00004	-	0.00009	0.000083	8	0.000145	0.000179	**21**
Dissolved Metals														
Calcium	mg/l	0.5	<0.5	<0.5	<0.5	2.27	2.26	-	10.7	10.6	1	17.7	17.5	1
Magnesium	mg/l	0.1	<0.1	<0.1	<0.1	1.18	1.18	0	7.03	7.22	3	7.63	7.58	1
Phosphorus	mg/l	0.001	<0.001	<0.001	<0.001	0.0041	0.0036	-	0.0054	0.0056	4	0.0033	0.0025	-
Potassium	mg/l	0.1	<0.1	<0.1	<0.1	0.35	0.34	-	4.08	4.11	1	3.39	3.37	1
Sodium	mg/l	1	<1	<1	<1	<1	<1	-	5.9	5.8	2	7.2	7.1	1
Hydrocarbons														
Benzene	mg/l	0.0005	<0.0005									<0.0005	<0.0005	-
Toluene	mg/l	0.0005	<0.0005									<0.0005	<0.0005	-
Ethylbenzene	mg/l	0.0005	<0.0005									<0.0005	<0.0005	-
Xylenes (m & p)	mg/l	0.0005	<0.0005									<0.0005	<0.0005	-
Xylene (o)	mg/l	0.0005	<0.0005									<0.0005	<0.0005	-
Xylenes Total	mg/l	0.00071	<0.00071									<0.00071	<0.00071	-
F1 (C_6 to C_{10})	mg/l	0.1	<0.1									<0.1	<0.1	-
F1 (C_6-C_{10}) - BTEX	mg/l	0.1	<0.1									<0.1	<0.1	-
F2 (C_{10}-C_{16})	mg/l	0.25	<0.25									<0.25	<0.25	-
F3 (C_{16} - C_{34})	mg/l	0.25	<0.25									<0.25	<0.25	-
F4 (C_{34} - C_{50})	mg/l	0.25	<0.25									<0.25	<0.25	-

Notes:

RDL - Reportable detection limit. If multiple RDL values exist, most conservative value shown

RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100

"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.

Bold - Indicates RPD value greater than 20%

Table D.2: Water Quality Station Analytical Results - JER-AEM-04

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-A	
		AO	MAC		Max. Average	Max. Grab	30-Jun-05	24-Jul-05
Physical Parameters								
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	5.75	6.69
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	25	20
Hardness	mg/L	NG	NG	NG	NG	NG		6.1
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	2	3
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	2	2
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<2	10
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	<10	<10
Turbidity	NTU	NG	NG	NG	NG	NG	2	3
Anions								
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	3	3
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	10	8
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	12	10
Ammonia as N	mg/L	NG	NG	1.26-125 [5]	6	12	<0.1	<0.1
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	<0.05	<0.05
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	0.07	<0.05
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG		
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	0.04	0.06
Chloride - Cl	mg/L	250	NG	120	500	1000	0.7	0.9
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<1	<1
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.2	<0.2
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	3.9	<0.5
Ionic Balance	N/A	NG	NG	NG	NG	NG		0.98
Total Metals								
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1.5	3	0.026	0.08
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0004	<0.0001
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	<0.0004	0.0004
Barium	mg/L	NG	1	NG	NG	NG	<0.005	<0.005
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG		
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	*<0.0002*	*<0.0002*
Calcium	mg/L	NG	NG	NG	NG	NG	1.15	1.31
Cesium	mg/L	NG	NG	NG	NG	NG		
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0009	<0.0009
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002-0.00383 [9]	0.02	0.04	<0.001	0.0048
Gallium	mg/L	NG	NG	NG	NG	NG		
Iron	mg/L	0.3	NG	0.3	NG	NG		
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	0.01	0.02	<0.0001	0.0003
Lithium	mg/L	NG	NG	NG	NG	NG		
Magnesium	mg/L	NG	NG	NG	NG	NG	0.61	0.7
Manganese	mg/L	0.05	NG	NG	NG	NG		
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.0002*	*<0.0002*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.0005	<0.0005
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	0.05	0.1	<0.0006	<0.0006
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	*<0.05*	*<0.05*
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5
Rhenium	mg/L	NG	NG	NG	NG	NG		
Rubidium	mg/L	NG	NG	NG	NG	NG		
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0008	<0.0008
Silicon	mg/L	NG	NG	NG	NG	NG	0.18	0.2
Silver	mg/L	NG	NG	0.0001	NG	NG	*<0.0002*	*<0.0002*
Sodium	mg/L	200	NG	NG	NG	NG	1	1.3
Strontium	mg/L	NG	NG	NG	NG	NG		
Tellurium	mg/L	NG	NG	NG	NG	NG		
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	<0.00005
Thorium	mg/L	NG	NG	NG	NG	NG		
Tin	mg/L	NG	NG	NG	NG	NG		
Titanium	mg/L	NG	NG	NG	NG	NG		
Tungsten	mg/L	NG	NG	NG	NG	NG		
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.0001	0.00019
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.0001	0.0004
Yttrium	mg/L	NG	NG	NG	NG	NG		
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.002	0.003
Zirconium	mg/L	NG	NG	NG	NG	NG		
Dissolved Metals								
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1	2	0.013	0.013
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	NG	NG	<0.0001	0.0001
Barium	mg/L	NG	1	NG	NG	NG	<0.003	<0.003
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001
Boron	mg/L	NG	5	1.5	NG	NG	0.006	<0.004
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	1.3	1.4
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0004	<0.0004
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.00005	<0.00005
Copper	mg/L	1	NG	0.002-0.00383 [9]	NG	NG	0.0061	0.0044
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.01	0.12
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	NG	NG	<0.00005	0.00007
Magnesium	mg/L	NG	NG	NG	NG	NG	0.6	0.7
Manganese	mg/L	0.05	NG	NG	NG	NG	0.001	0.002
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.0002*	*<0.0002*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.0003	<0.0003
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	NG	NG	0.0004	<0.0001
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	*<0.005*	*<0.005*
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0004	<0.0004
Silicon	mg/L	NG	NG	NG	NG	NG	0.18	0.21
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00005	<0.00005
Sodium	mg/L	200	NG	NG	NG	NG	0.8	1.4
Strontium	mg/L	NG	NG	NG	NG	NG		
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00002	<0.00002
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.0001	0.00013
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005
Zinc	mg/L	5	NG	0.03	NG	NG	0.006	<0.002

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term exposures (for clear flow)
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background levels when backgroun

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.2: Water Quality Station Analytical Results - JER-AEM-04

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		EM-04		JER-A	
		AO	MAC		Max. Average	Max. Grab	31-Aug-05	28-Sep-05	19-Jun-06	12-Jul-06
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	6.77	7.27	7.64	7.63
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	25	36	116	122
Hardness	mg/L	NG	NG	NG	NG	NG	7.2	<0.1	30	37
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	4	5	3.6	3.9
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	4	2	5.2	5.3
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<2	<2	4.4	2
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	<10	24	72	76
Turbidity	NTU	NG	NG	NG	NG	NG	1	2		
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	3	3	3	7
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	12	11	32	33
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	15	14	39	40
Ammonia as N	mg/L	NG	NG	1.26-125 [5]	6	12	<0.1	<0.1	1.46	0.82
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	<0.05	<0.05	<0.05	0.19
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	0.11	0.6	1.62	3.53
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	0.02	0.05	*<1*	*<1*
Chloride - Cl	mg/L	250	NG	120	500	1000	1.2	1.7	3.2	4.8
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<1	<1	0.08	0.09
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.2	<0.2	<0.2	<0.2
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	0.5	1.3	3.6	5.1
Ionic Balance	N/A	NG	NG	NG	NG	NG	0.74	0.58	1	0.87
Total Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1.5	3	0.027	0.012	0.0889	0.0577
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.0001	0.00033	0.00024
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	<0.0004	<0.0004	0.0005	0.0006
Barium	mg/L	NG	1	NG	NG	NG	<0.005	<0.005	0.0126	0.0158
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0001	<0.0001
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.01	0.009	0.012
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	*<0.0001*	*<0.0001*	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	1.79	2.63	5.91	7.23
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0009	<0.0009	0.001	0.0016
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	0.00016	0.0001
Copper	mg/L	1	NG	0.002-0.00383 [9]	0.02	0.04	0.002	0.0018	<0.001	0.0024
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG		<0.1	<0.1	<0.1
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	0.01	0.02	<0.0001	<0.0001	0.00016	0.00012
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	0.81	1.11	3.32	3.55
Manganese	mg/L	0.05	NG	NG	NG	NG		<0.01	0.02	<0.01
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.0001*	*<0.0001*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.0005	<0.0005	0.00155	0.00145
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	0.05	0.1	<0.0006	<0.0006	0.0021	0.0019
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	0.055	*<0.05*	0.03	*<0.02*
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	2.5	2.5
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0008	<0.0008	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.16	0.22	1.24	1.14
Silver	mg/L	NG	NG	0.0001	NG	NG	*<0.0002*	*<0.0002*	<0.0001	<0.0001
Sodium	mg/L	200	NG	NG	NG	NG	1.5	1.5	4.7	4.7
Strontium	mg/L	NG	NG	NG	NG	NG	0.0049	0.0069	0.0522	0.0638
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.0003	0.00033	0.00121	0.00136
Vanadium	mg/L	NG	NG	NG	NG	NG	0.0004	0.0005	0.0007	<0.0005
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.006	0.006	0.002	0.004
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1	2	0.006	0.006	0.071	0.013
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.0001	0.0003	0.00025
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.0002	0.0003	0.0007	0.0006
Barium	mg/L	NG	1	NG	NG	NG	<0.003	<0.003	0.0144	0.0261
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Boron	mg/L	NG	5	1.5	NG	NG	<0.004	<0.004	0.009	0.012
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	1.8	1.7	6.1	8
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0004	<0.0004	0.0006	<0.0003
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.00005	<0.00005	0.00011	0.00009
Copper	mg/L	1	NG	0.002-0.00383 [9]	NG	NG	0.0027	0.0043	0.0012	0.0049
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.1	<0.01	<0.1	<0.1
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	NG	NG	<0.00005	<0.00005	0.00008	0.00007
Magnesium	mg/L	NG	NG	NG	NG	NG	0.7	<0.5	3.6	4.1
Manganese	mg/L	0.05	NG	NG	NG	NG	<0.01	<0.001	<0.01	<0.01
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.0001*	*<0.0001*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.0003	<0.0003	0.00149	0.00165
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	NG	NG	0.0003	0.0011	0.00204	0.00182
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	*<0.005*	*<0.005*		0.005
Potassium	mg/L	NG	NG	NG	NG	NG	0.6	<0.5	3.1	2.7
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0004	<0.0004	<0.0006	<0.0006
Silicon	mg/L	NG	NG	NG	NG	NG	0.12	0.2	1.44	1.13
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Sodium	mg/L	200	NG	NG	NG	NG	1.4	1.7	5.4	4.9
Strontium	mg/L	NG	NG	NG	NG	NG	0.0062	0.0079	0.0572	0.0744
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00002	<0.00002	<0.00005	<0.00005
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00021	0.00016	0.00102	0.00123
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	0.0013	0.0006
Zinc	mg/L	5	NG	0.03	NG	NG	0.007	0.004	<0.001	0.008

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level fd
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10%round is >250 mg/L (high f

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.2: Water Quality Station Analytical Results - JER-AEM-04

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		EM-04		JER-A	
		AO	MAC		Max. Average	Max. Grab	19-Jul-06	26-Jul-06	4-Aug-06	17-Aug-06
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.53	7.59	7.66	7.16
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	136	123	147	161
Hardness	mg/L	NG	NG	NG	NG	NG	40	36	46	58
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3.6	3.8	3.8	4.2
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	4.2	3.9	4.6	8.9
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	2.2	<2	<2	<2
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	100	104	60	92
Turbidity	NTU	NG	NG	NG	NG	NG				
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	2	2	2	4
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	32	31	35	36
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	40	38	43	44
Ammonia as N	mg/L	NG	NG	1.26-125 [5]	6	12	0.35	0.26	0.08	0.18
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	0.11	<0.05	0.09	<0.05
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	4.2	3.9	5.13	5.83
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG			0.6	0.6
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	*<1*	*<1*	*<1*	*<1*
Chloride - Cl	mg/L	250	NG	120	500	1000	5.3	5.5	5.8	6.2
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	0.09	0.08	0.1	0.12
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.2	<0.2	<0.2	<0.2
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	6.2	5.4	7.1	8.4
Ionic Balance	N/A	NG	NG	NG	NG	NG	0.85	0.9	0.9	0.99
Total Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1.5	3	0.02	0.0246	0.0229	0.0113
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.00005	0.00025	0.00008	0.00064
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	<0.0002	<0.0002	0.0006	0.0005
Barium	mg/L	NG	1	NG	NG	NG	0.0001	0.00943	0.0217	0.0259
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	0.005	0.009	0.014	0.02
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.00005	<0.00002	<0.00002
Calcium	mg/L	NG	NG	NG	NG	NG	9.14	8.55	10.4	12.8
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	0.0008	0.0017	0.0023	0.0042
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.00005	0.00011	0.00005	0.00016
Copper	mg/L	1	NG	0.002-0.00383 [9]	0.02	0.04	<0.001	<0.001	<0.001	0.0025
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.1	<0.1	<0.1	<0.1
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	0.01	0.02	<0.00005	0.0001	0.00006	0.00009
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	4.56	4.28	5.11	5.9
Manganese	mg/L	0.05	NG	NG	NG	NG	0.02	<0.01	0.01	0.02
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.00005	0.00144	0.00185	0.00225
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	0.05	0.1	<0.0001	0.002	0.0019	0.0024
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	0.071	0.062	*<0.02*	*<0.02*
Potassium	mg/L	NG	NG	NG	NG	NG	3	2.7	3.2	3.5
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	1.29	1.02	1.14	1.17
Silver	mg/L	NG	NG	0.0001	NG	NG	0.0019	<0.0001	<0.0001	<0.0001
Sodium	mg/L	200	NG	NG	NG	NG	5.6	9.1	5.4	5
Strontium	mg/L	NG	NG	NG	NG	NG	<0.0005	0.0504	0.0809	0.0936
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	<0.00005	0.00087	0.00146	0.00133
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.0005	0.0011	0.0008	0.0016
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.007	0.002	0.002	0.003
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1	2	<0.002	0.016	0.006	0.009
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.00005	0.00027	<0.00005	0.00024
Arsenic	mg/L	NG	0.01	0.005	NG	NG	<0.0001	0.0004	0.0002	0.0002
Barium	mg/L	NG	1	NG	NG	NG	<0.00005	0.00823	0.0186	0.0277
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Boron	mg/L	NG	5	1.5	NG	NG	<0.001	0.01	0.015	0.022
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.00002	<0.00002
Calcium	mg/L	NG	NG	NG	NG	NG	8.7	7.4	10.2	12.8
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0003	0.0019	0.001	0.0041
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.00002	0.00015	0.00003	0.00012
Copper	mg/L	1	NG	0.002-0.00383 [9]	NG	NG	<0.0001	0.0017	<0.0001	0.0026
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.1	<0.1	<0.1	<0.1
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	4.3	4.2	5.1	6.3
Manganese	mg/L	0.05	NG	NG	NG	NG	<0.01	<0.01	0.011	0.019
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.00005	0.0015	0.00207	0.00243
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	NG	NG	<0.00005	0.00146	0.00142	0.0018
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	*<0.005*	0.014	0.02	*<0.01*
Potassium	mg/L	NG	NG	NG	NG	NG	2.7	3	3.5	3.7
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0006	<0.0006	<0.0006	<0.0006
Silicon	mg/L	NG	NG	NG	NG	NG	1.19	1.04	0.98	1.2
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Sodium	mg/L	200	NG	NG	NG	NG	4.5	5.8	5.4	5.4
Strontium	mg/L	NG	NG	NG	NG	NG	<0.0001	0.0457	0.0844	0.0959
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Uranium	mg/L	NG	0.02	0.015	0.5	1	<0.00005	0.00068	0.00076	0.00139
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.0001	0.0013	0.002	0.0014
Zinc	mg/L	5	NG	0.03	NG	NG	<0.001	<0.001	<0.001	0.001

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level fc
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10%

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.2: Water Quality Station Analytical Results - JER-AEM-04

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		EM-04			JER-A
		AO	MAC		Max. Average	Max. Grab	28-Aug-06	1-Sep-06	8-Sep-06	11-Sep-06
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.71	7.46		7.73
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	164	161		176
Hardness	mg/L	NG	NG	NG	NG	NG	59	58		59
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3.9	4		3.5
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	8.8	9.5		8.8
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25		2	<2	<2
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	116	108		120
Turbidity	NTU	NG	NG	NG	NG	NG				
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	3	3		4
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	39	41		41
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1		<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	47	50		50
Ammonia as N	mg/L	NG	NG	1.26-125 [5]	6	12	0.03	0.03	0.03	0.02
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	<0.05	<0.05		<0.05
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	5.95	6.02		7.4
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG	0.7	0.6		
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	*<1*	*<1*		*<1*
Chloride - Cl	mg/L	250	NG	120	500	1000	6.9	7.2		7.2
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	0.1	0.1		0.11
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.2	<0.2		<0.2
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	8	8.3		8.5
Ionic Balance	N/A	NG	NG	NG	NG	NG	0.96	0.92		0.87
Total Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1.5	3	0.0376	0.0105	0.0143	0.016
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00105	0.00124	0.0013	0.00021
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.0004	0.0009	<0.0002	<0.0002
Barium	mg/L	NG	1	NG	NG	NG	0.028	0.0273	0.0372	0.0362
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	0.017	0.018	0.016	0.02
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	0.00006	<0.00002	<0.00002	0.00002
Calcium	mg/L	NG	NG	NG	NG	NG	12.6	12.9	13.2	13.4
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	0.0066	0.0047	0.0102	0.0091
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00014	0.00015	0.00008	0.00009
Copper	mg/L	1	NG	0.002-0.00383 [9]	0.02	0.04	0.0057	0.0039	<0.001	<0.001
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	0.12	<0.1	<0.1	<0.1
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	0.01	0.02	0.0004	0.00025	0.00008	0.00011
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	6.43	6.62	7.16	7.4
Manganese	mg/L	0.05	NG	NG	NG	NG	0.03	0.02	0.014	0.01
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.00263	0.00273	0.00352	0.00285
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	0.05	0.1	0.0025	0.0023	0.0024	0.0021
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	*<0.02*	*<0.02*	*<0.02*	*<0.02*
Potassium	mg/L	NG	NG	NG	NG	NG	3.8	3.9	4.1	4.2
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	0.0015	0.002	0.0022	0.001
Silicon	mg/L	NG	NG	NG	NG	NG	1.25	1.06	1.11	1.12
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Sodium	mg/L	200	NG	NG	NG	NG	5	5.3	5.6	5.8
Strontium	mg/L	NG	NG	NG	NG	NG	0.105	0.111	0.129	0.119
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00122	0.00134	0.00148	0.00127
Vanadium	mg/L	NG	NG	NG	NG	NG	0.0019	0.0019	0.0042	0.0044
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.017	0.004	0.003	0.006
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1	2	0.008	0.003		0.018
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00033	0.00048	0.00045	0.0004
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.0005	0.0008	<0.0001	<0.0001
Barium	mg/L	NG	1	NG	NG	NG	0.0283	0.0241	0.0358	0.0318
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Boron	mg/L	NG	5	1.5	NG	NG	0.016	0.012	0.017	0.015
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00002	<0.00002	<0.00002	0.00003
Calcium	mg/L	NG	NG	NG	NG	NG	13	12.7	11.4	12.6
Chromium	mg/L	NG	0.05	NG	NG	NG	0.0062	0.0041	0.0073	0.0059
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00017	0.0001	0.0001	0.00009
Copper	mg/L	1	NG	0.002-0.00383 [9]	NG	NG	0.0064	0.0018	<0.0001	0.0002
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.1	<0.1	<0.1	<0.1
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	NG	NG	0.00012	0.00014	0.00013	0.0001
Magnesium	mg/L	NG	NG	NG	NG	NG	6.6	6.4	6.6	6.6
Manganese	mg/L	0.05	NG	NG	NG	NG	0.019	0.015	<0.01	<0.01
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.00208	<0.00005	0.00249	0.00231
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	NG	NG	0.00191	0.00172	0.00196	0.00194
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	*<0.01*	0.01	*<0.01*	*<0.01*
Potassium	mg/L	NG	NG	NG	NG	NG	3.8	4.1	3	3.9
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0006	<0.0006	<0.0006	<0.0006
Silicon	mg/L	NG	NG	NG	NG	NG	1.16	1.03	1.09	1.05
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Sodium	mg/L	200	NG	NG	NG	NG	5.1	5.3	5.2	5.5
Strontium	mg/L	NG	NG	NG	NG	NG	0.11	0.0895	0.113	0.105
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	0.00005	<0.00005	<0.00005
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00132	0.00108	0.00112	0.00115
Vanadium	mg/L	NG	NG	NG	NG	NG	0.0012	0.0011	0.0027	0.0026
Zinc	mg/L	5	NG	0.03	NG	NG	0.001	0.001	0.003	0.005

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
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[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level fo
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10%

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.2: Water Quality Station Analytical Results - JER-AEM-04

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		EM-04			JER-A
		AO	MAC		Max. Average	Max. Grab	2-Oct-06	9-Oct-06	16-Oct-06	23-Oct-06
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.78	7.63	7.39	7.44
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	195	206	213	212
Hardness	mg/L	NG	NG	NG	NG	NG	63.4	68.9	69.2	72.7
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3.2	3.1	3.2	3.3
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	8.8	9.2	9	11
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	4	<2	11	2
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	124	112	136	128
Turbidity	NTU	NG	NG	NG	NG	NG	3	2	18	2
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	3	4	2	2
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	44	45	36	46
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	53	55	44	56
Ammonia as N	mg/L	NG	NG	1.26-125 [5]	6	12	0.03	0.01	0.13	0.17
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	<0.05	<0.05	<0.05	<0.05
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	7.03	8.29	7.69	7.84
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	0.14	0.13	0.15	0.14
Chloride - Cl	mg/L	250	NG	120	500	1000	7	8.8	9	9.4
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.2	<0.2	<0.2	<0.2
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	8.8	10	10.6	11.3
Ionic Balance	N/A	NG	NG	NG	NG	NG	0.92	0.91	1.01	0.94
Total Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1.5	3	0.0561	0.0181	**0.328**	0.0338
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.00005	0.00032	0.0003	0.00055
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.0008	0.0004	0.0006	0.0006
Barium	mg/L	NG	1	NG	NG	NG	0.0427	0.0416	0.0359	0.0457
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	0.02	0.023	0.023	0.025
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	0.0001	<0.00002	<0.00002	0.00007
Calcium	mg/L	NG	NG	NG	NG	NG	14.5	14	13.9	14.7
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	0.0008	<0.0005	0.002
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00036	0.00015	0.00027	0.00019
Copper	mg/L	1	NG	0.002-0.00383 [9]	0.02	0.04	0.0058	0.0025	0.0025	0.005
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	**0.34**	0.1	**0.31**	<0.1
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	0.01	0.02	0.00075	0.00005	0.00016	0.00062
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	8.42	8.43	8.45	8.77
Manganese	mg/L	0.05	NG	NG	NG	NG	**0.06**	0.02	0.015	0.02
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.00282	0.00261	0.0026	0.00281
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	0.05	0.1	0.0022	0.0006	0.0019	0.0023
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	*<0.02*	*<0.02*	*<0.02*	*<0.02*
Potassium	mg/L	NG	NG	NG	NG	NG	4.8	5.1	5	5.4
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	1.1	1	1.81	1.06
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Sodium	mg/L	200	NG	NG	NG	NG	6	6.4	7	6.8
Strontium	mg/L	NG	NG	NG	NG	NG	0.136	0.141	0.138	0.156
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00118	0.00133	0.00093	0.0013
Vanadium	mg/L	NG	NG	NG	NG	NG	0.0005	<0.0005	0.0011	0.0008
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.008	0.003	0.004	0.029
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1	2	0.002	<0.002	0.004	0.004
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00036	0.00029	0.0003	0.0004
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.0005	0.0005	0.0005	0.0006
Barium	mg/L	NG	1	NG	NG	NG	0.0404	0.0406	0.0329	0.0437
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Boron	mg/L	NG	5	1.5	NG	NG	0.021	0.021	0.02	0.026
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00002	<0.00002	<0.00002	0.00004
Calcium	mg/L	NG	NG	NG	NG	NG	13	13.8	14.1	14.8
Chromium	mg/L	NG	0.05	NG	NG	NG	0.0007	<0.0003	0.0005	<0.0003
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00017	0.00008	0.00009	0.00012
Copper	mg/L	1	NG	0.002-0.00383 [9]	NG	NG	0.0026	0.0029	0.0019	0.0037
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.1	<0.1	<0.1	<0.1
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	NG	NG	0.00007	<0.00005	<0.00005	0.00007
Magnesium	mg/L	NG	NG	NG	NG	NG	7.5	8.4	8.26	8.7
Manganese	mg/L	0.05	NG	NG	NG	NG	0.027	<0.01	<0.01	0.011
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.0027	0.00257	0.00254	0.00272
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	NG	NG	0.00157	0.00154	0.00137	0.00174
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	*<0.01*	*<0.01*	*<0.01*	*<0.01*
Potassium	mg/L	NG	NG	NG	NG	NG	4.2	5	5	5.3
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0006	<0.0006	<0.0006	<0.0006
Silicon	mg/L	NG	NG	NG	NG	NG	0.91	0.97	1.02	0.89
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Sodium	mg/L	200	NG	NG	NG	NG	5.7	6.3	6.2	6.7
Strontium	mg/L	NG	NG	NG	NG	NG	0.138	0.142	0.136	0.157
Thallium	mg/L	NG	NG	0.0008	NG	NG	0.00007	<0.00005	<0.00005	<0.00005
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00114	0.00129	0.00075	0.00129
Vanadium	mg/L	NG	NG	NG	NG	NG	0.0009	0.001	0.0008	<0.0001
Zinc	mg/L	5	NG	0.03	NG	NG	0.005	0.003	0.001	0.017

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level fc
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10%

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.2: Water Quality Station Analytical Results - JER-AEM-04

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		EM-04			JER-A
		AO	MAC		Max. Average	Max. Grab	30-Oct-06	9-May-07	20-Jun-07	25-Jun-07
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.33	7.58		7.58
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	222	288	179	173
Hardness	mg/L	NG	NG	NG	NG	NG	77.6	95	55.8	55.7
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3.3	2.57	3.97	4.09
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	10.7	8.18	7.91	8.48
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<2	<3	3.5	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	136	174	114	111
Turbidity	NTU	NG	NG	NG	NG	NG	2			
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	3.4	2.1	2.5
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	47	54.9	36.1	35.6
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	57	54.9	36.1	35.6
Ammonia as N	mg/L	NG	NG	1.26-125 [5]	6	12	0.24	0.958	0.25	0.211
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	<0.05	0.0899	0.0498	0.0429
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	7.92	**12.1**	6.91	6.95
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	0.13			
Chloride - Cl	mg/L	250	NG	120	500	1000	9.2	14.4	7.3	7.48
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<1			
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.2	0.0068	<0.001	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	11	19.9	12.6	12.7
Ionic Balance	N/A	NG	NG	NG	NG	NG	1.02			
Total Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1.5	3	0.0288	0.0213	0.0515	0.0461
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0003	0.00048	0.00034	0.0003
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.0004	0.00058	0.00036	0.00033
Barium	mg/L	NG	1	NG	NG	NG	0.0388	0.0653	0.0376	0.0354
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	0.024	0.062	0.032	0.027
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00002	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	14.8	20.1	12.3	11.2
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00014	0.00018	0.00025	0.00016
Copper	mg/L	1	NG	0.002-0.00383 [9]	0.02	0.04	0.0022	0.00224	0.00205	0.00171
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.1	0.05	0.066	0.067
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	0.01	0.02	<0.00005	<0.00005	0.000276	0.00007
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	8.89	11.1	7.04	6.69
Manganese	mg/L	0.05	NG	NG	NG	NG	0.02	**0.0669**	**0.0803**	0.046
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.00244	0.00336	0.00305	0.00265
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	0.05	0.1	0.0014	0.00399	0.00297	0.00247
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	*<0.02*	0.0169	0.017	0.0148
Potassium	mg/L	NG	NG	NG	NG	NG	5.3	10.2	6.36	5.8
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	1.11	2.17	1.39	1.25
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.0001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	7.3	13.8	8.74	7.93
Strontium	mg/L	NG	NG	NG	NG	NG	0.197	0.26	0.174	0.159
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00107	0.00109	0.00137	0.00143
Vanadium	mg/L	NG	NG	NG	NG	NG	0.0005	<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.001	0.0015	0.0032	<0.001
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1	2	0.003	0.0017	0.005	0.0062
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00034	0.00052	0.00033	0.00031
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.0006	0.00055	0.00034	0.0003
Barium	mg/L	NG	1	NG	NG	NG	0.0406	0.066	0.0354	0.0344
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0005	<0.0005	<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	0.025	0.066	0.03	0.027
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00002	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	15.6	20	11.4	11.3
Chromium	mg/L	NG	0.05	NG	NG	NG	0.0009	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00012	0.00012	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002-0.00383 [9]	NG	NG	0.0025	0.00195	0.00133	0.00124
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.1	<0.03	<0.03	<0.03
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	9.4	11	6.65	6.68
Manganese	mg/L	0.05	NG	NG	NG	NG	0.016	**0.0644**	0.00034	0.000304
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.00235	0.00365	0.00277	0.00273
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	NG	NG	0.00173	0.00456	0.00169	0.0014
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	0.02	0.0097	0.0031	0.003
Potassium	mg/L	NG	NG	NG	NG	NG	5.8	10.4	6.03	5.8
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0006	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	1.1	2.11	1.28	1.14
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00005	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	7.8	13.7	8.36	8
Strontium	mg/L	NG	NG	NG	NG	NG	0.214	0.271	0.165	0.16
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	<0.0001	<0.0001	<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00091	0.00108	0.00106	0.00121
Vanadium	mg/L	NG	NG	NG	NG	NG	0.0011	<0.001	<0.001	<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	0.004	0.0012	<0.001	<0.001

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
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[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level fo
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10%

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.2: Water Quality Station Analytical Results - JER-AEM-04

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		EM-04			JER-A
		AO	MAC		Max. Average	Max. Grab	2-Jul-07	9-Jul-07	15-Jul-07	23-Jul-07
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.68	7.81	7.71	7.82
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	171	187	192	298
Hardness	mg/L	NG	NG	NG	NG	NG	57.6	62.3	61.3	96.3
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	5.27	3.91	3.42	3.31
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	7.88	8.26	8.27	8.6
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	8.2	<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	109	120	115	214
Turbidity	NTU	NG	NG	NG	NG	NG				
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	4.4	<1	1.4	1.6
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	35.7	35.4	36.1	38.9
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	35.7	35.4	36.1	38.9
Ammonia as N	mg/L	NG	NG	1.26-125 [5]	6	12	0.153	0.116	0.136	0.0076
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	0.0627	0.0771	0.0773	0.156
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	7.61	7.8	8.17	**16.2**
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG				
Chloride - Cl	mg/L	250	NG	120	500	1000	6.88	7.11	7.42	11.6
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG				
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	12	12	12.9	20.8
Ionic Balance	N/A	NG	NG	NG	NG	NG				
Total Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1.5	3	0.0727	0.0238	0.0152	0.0159
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00033	0.00031	0.00033	0.00046
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00041	0.00041	0.00043	0.00051
Barium	mg/L	NG	1	NG	NG	NG	0.0365	0.0334	0.0324	0.0575
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	0.027	0.023	0.028	0.036
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	13	11.6	12.3	20
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00021	0.00013	0.00013	0.00021
Copper	mg/L	1	NG	0.002-0.00383 [9]	0.02	0.04	0.0029	0.00188	0.00205	0.00225
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	0.1	0.059	0.034	0.034
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	0.01	0.02	0.000163	<0.00005	<0.00005	<0.00005
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	6.81	6.94	7.19	11
Manganese	mg/L	0.05	NG	NG	NG	NG	0.0352	0.0185	0.0137	0.0124
Mercury	mg/L	NG	0.001	0.000026	NG	NG	0.000061	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.00312	0.00288	0.00325	0.0053
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	0.05	0.1	0.0027	0.00184	0.00164	0.00315
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	0.0171	0.0106	0.006	0.0058
Potassium	mg/L	NG	NG	NG	NG	NG	5.78	5.41	5.66	8.28
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	1.07	0.97	0.96	1.54
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	7.92	7.87	8.14	12
Strontium	mg/L	NG	NG	NG	NG	NG	0.161	0.149	0.157	0.319
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.0017	0.00136	0.00132	0.00222
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.0197	0.0013	<0.001	0.0023
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1	2	0.0038	0.0096	0.0093	0.0059
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00031	0.00032	0.00034	0.00045
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.0004	0.00038	0.00041	0.00048
Barium	mg/L	NG	1	NG	NG	NG	0.0332	0.033	0.0326	0.0558
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	0.025	0.028	0.028	0.035
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	12	13	12.6	20.4
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001	0.00016
Copper	mg/L	1	NG	0.002-0.00383 [9]	NG	NG	0.00158	0.00142	0.00186	0.00192
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	<0.03	<0.03
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	6.71	7.24	7.28	11
Manganese	mg/L	0.05	NG	NG	NG	NG	0.000415	0.000307	0.00889	0.000375
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.00283	0.00316	0.00327	0.00539
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	NG	NG	0.0013	0.00175	0.00153	0.00254
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	0.0035	0.0031	0.0028	0.03
Potassium	mg/L	NG	NG	NG	NG	NG	5.5	5.79	5.72	8.3
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.8	0.9	0.92	1.47
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	7.76	8.16	8.17	12
Strontium	mg/L	NG	NG	NG	NG	NG	0.159	0.166	0.159	0.316
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00101	0.00142	0.00132	0.0022
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	<0.001	0.002	<0.001	<0.001

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level fo
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10%

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.2: Water Quality Station Analytical Results - JER-AEM-04

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		EM-04			JER-A
		AO	MAC		Max. Average	Max. Grab	30-Jul-07	8-Aug-07	11-Aug-07	15-Aug-07
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.87	7.88	7.82	7.83
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	297	293	289	291
Hardness	mg/L	NG	NG	NG	NG	NG	96.4	89	81.8	81.7
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3.27	3.35	2.67	2.7
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	7.8	7.18	6.2	6.18
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	214	220	199	202
Turbidity	NTU	NG	NG	NG	NG	NG				
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	1.1	1.5	<1	1
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	37.8	34.8	32.8	32.4
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	37.8	34.8	32.8	32.4
Ammonia as N	mg/L	NG	NG	1.26-125 [5]	6	12	0.181	0.113	0.102	0.113
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	0.158	0.134	0.12	0.111
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	**16.2**	**16.2**	**15.6**	**15.6**
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG				
Chloride - Cl	mg/L	250	NG	120	500	1000	11.7	11.7	13.3	13.3
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG				
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	0.001	<0.001	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	20.5	21.5	21.8	22.5
Ionic Balance	N/A	NG	NG	NG	NG	NG				
Total Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1.5	3	0.0101	0.0169	0.0203	0.0142
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00043	0.00044	0.00047	0.00046
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00047	0.00045	0.00047	0.00046
Barium	mg/L	NG	1	NG	NG	NG	0.055	0.0507	0.0543	0.0556
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	0.034	0.033	0.032	0.032
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	19.5	19.2	18.3	18.5
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00018	0.00017	0.00018	0.00015
Copper	mg/L	1	NG	0.002-0.00383 [9]	0.02	0.04	0.00174	0.00162	0.00141	0.00131
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	0.037	<0.03
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	0.01	0.02	<0.00005	<0.00005	0.000058	<0.00005
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	9.87	9.17	8.77	8.59
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00702	0.00899	0.00864	0.00639
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.00522	0.00579	0.0063	0.00667
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	0.05	0.1	0.00201	0.00204	0.00222	0.00222
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	0.0044	0.0153	0.0141	0.005
Potassium	mg/L	NG	NG	NG	NG	NG	8.27	8.88	8.8	9.11
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	1.6	1.55	1.79	1.78
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	12.1	13.2	13.6	14.4
Strontium	mg/L	NG	NG	NG	NG	NG	0.3	0.327	0.359	0.379
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00185	0.00157	0.00136	0.00129
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.0018	0.0016	<0.001	0.0011
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1	2	<0.005	*<0.006*		0.0045
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00046	0.00046		0.00047
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00043	0.00045		0.00048
Barium	mg/L	NG	1	NG	NG	NG	0.0552	0.0517		0.0557
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005		<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	0.035	0.034		0.033
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005		<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	20.6	19.9		18.4
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	<0.0005		<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00015	0.00013		0.00012
Copper	mg/L	1	NG	0.002-0.00383 [9]	NG	NG	0.00134	0.00137		<0.0011
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03		<0.03
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	NG	NG	<0.00005	<0.00005		<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	10.9	9.52		8.66
Manganese	mg/L	0.05	NG	NG	NG	NG	<0.00011	<0.0004		<0.0003
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*		*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.0054	0.00606		0.00683
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	NG	NG	0.00181	0.00176		<0.002
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	<0.002	0.0027	0.0021	0.0023
Potassium	mg/L	NG	NG	NG	NG	NG	8.48	9.23		9.28
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001		<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	1.64	1.52		1.78
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001		<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	12.6	13.8		14.6
Strontium	mg/L	NG	NG	NG	NG	NG	0.335	0.34		0.38
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001		<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00193	0.00155		0.00126
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001		<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	0.0012	<0.001		<0.001

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
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2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level fc
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10%

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.2: Water Quality Station Analytical Results - JER-AEM-04

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		EM-04			JER-A
		AO	MAC		Max. Average	Max. Grab	20-Aug-07	27-Aug-07	4-Sep-07	9-Sep-07
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.82	7.76	7.1	7.33
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	286	313	325	325
Hardness	mg/L	NG	NG	NG	NG	NG	85.9	82.2	78.6	87.6
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	2.85	2.7	2.76	2.47
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	6.59	6.37	5.95	5.28
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	212	216	217	231
Turbidity	NTU	NG	NG	NG	NG	NG				
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	3.5	3.3	4.1	2.9
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	30.9	31.5	33.3	33.2
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	30.9	31.5	33.3	33.2
Ammonia as N	mg/L	NG	NG	1.26-125 [5]	6	12	0.169	0.297	0.338	0.354
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	0.117	0.169	0.185	0.176
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	**15.9**	**17.5**	**17.8**	**17.8**
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG				
Chloride - Cl	mg/L	250	NG	120	500	1000	13.5	14.6	14.8	14.7
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG				
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	0.0012	<0.001	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	22.5	25	26.1	26
Ionic Balance	N/A	NG	NG	NG	NG	NG				
Total Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1.5	3	0.0128	0.0259	0.0248	0.0094
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00048	0.00048	0.00045	0.00047
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00051	0.0005	0.00042	0.00041
Barium	mg/L	NG	1	NG	NG	NG	0.0607	0.079	0.077	0.0849
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	0.034	0.039	0.037	0.037
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	20	20.5	20.3	21.9
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00015	0.00019	0.00015	0.00015
Copper	mg/L	1	NG	0.002-0.00383 [9]	0.02	0.04	0.00203	0.00102	0.00089	0.00099
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	0.045	0.052	0.033
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	0.01	0.02	0.0001	0.00005	0.000171	<0.00005
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	8.43	7.73	6.89	8.31
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00423	0.00531	0.0081	0.00748
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.00747	0.00781	0.0078	0.00761
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	0.05	0.1	0.00267	0.0038	0.00364	0.00331
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	0.0059	0.106	0.0035	0.0054
Potassium	mg/L	NG	NG	NG	NG	NG	10	11.2	11.5	11.5
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	2.04	2.34	2.54	2.39
Silver	mg/L	NG	NG	0.0001	NG	NG	0.000012	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	16	16.4	17.1	17.5
Strontium	mg/L	NG	NG	NG	NG	NG	0.424	0.511	0.501	0.568
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00117	0.00075	0.00077	0.00083
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.0029	<0.001	<0.001	<0.001
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1	2	0.0036	<0.002	<0.002	0.0077
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00048	0.00047	0.00048	0.00046
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00048	0.00052	0.00041	0.0004
Barium	mg/L	NG	1	NG	NG	NG	0.0608	0.0777	0.0767	0.0829
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	0.034	0.038	0.036	0.036
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	20.3	20.3	20.2	21.5
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0001	0.00011	0.00011	0.00014
Copper	mg/L	1	NG	0.002-0.00383 [9]	NG	NG	0.0013	<0.0008	<0.0007	0.00096
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	<0.03	<0.03
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	8.54	7.63	6.81	8.22
Manganese	mg/L	0.05	NG	NG	NG	NG	0.000181	0.000173	0.000188	0.0074
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.00738	0.0077	0.00789	0.00745
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	NG	NG	0.00222	0.00297	0.00295	0.00323
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	0.0028	0.0029	0.0021	0.0081
Potassium	mg/L	NG	NG	NG	NG	NG	10.2	11.2	11.5	11.4
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	2.05	2.3	2.47	2.38
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	16.1	16.5	17.3	16.9
Strontium	mg/L	NG	NG	NG	NG	NG	0.428	0.51	0.503	0.556
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00111	0.00072	0.00077	0.00077
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	0.0011	<0.001	<0.001	<0.001

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level fo
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10%

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.2: Water Quality Station Analytical Results - JER-AEM-04

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		EM-04			JER-A
		AO	MAC		Max. Average	Max. Grab	24-Sep-07	21-Apr-08	19-Jun-08	10-Jul-08
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.48	7.58		7.43
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	327	633	218	260
Hardness	mg/L	NG	NG	NG	NG	NG	92	176	69.3	68.6
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	2.89	4.54	2.47	2.99
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	7.69	8.87	7.15	6.57
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3	9.3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	203	351	145	150
Turbidity	NTU	NG	NG	NG	NG	NG				
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	4.4	10.9	2.1	1.5
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	38.1	88.4	41.6	36.7
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	38.1	88.4	41.6	36.7
Ammonia as N	mg/L	NG	NG	1.26-125 [5]	6	12	0.0927	4.26	0.414	0.269
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	0.0315	0.355	0.0609	0.092
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	**16.8**	**32.4**	9.82	**11.7**
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG				
Chloride - Cl	mg/L	250	NG	120	500	1000	16.3	30.9	9.77	12.6
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG				
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	0.0011	<0.001	0.0013	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	26	42.5	15.1	19.5
Ionic Balance	N/A	NG	NG	NG	NG	NG				
Total Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1.5	3	0.0094	0.0031	**0.272**	0.0138
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00028	0.00067	0.00025	0.00034
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00034	0.0007	0.00044	0.00036
Barium	mg/L	NG	1	NG	NG	NG	0.0678	0.14	0.0457	0.0453
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	0.032	0.065	0.026	0.028
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	21.4	35.9	16	15.7
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00017	0.00022	0.00025	<0.0001
Copper	mg/L	1	NG	0.002-0.00383 [9]	0.02	0.04	0.00161	0.00168	0.00251	0.00147
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	0.243	<0.03
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	0.01	0.02	0.000076	0.000093	0.000823	<0.00005
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	8.73	20.2	7.82	7.16
Manganese	mg/L	0.05	NG	NG	NG	NG	0.0258	0.0352	0.0251	0.00479
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.00233	0.00898	0.00344	0.00386
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	0.05	0.1	0.00157	0.00892	0.0037	0.00235
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	0.0066	0.0086	0.0242	0.0056
Potassium	mg/L	NG	NG	NG	NG	NG	9.86	20	7.27	7.99
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	2.98	4.31	1.94	0.88
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	16.4	28.3	11	11.7
Strontium	mg/L	NG	NG	NG	NG	NG	0.447	0.9	0.278	0.304
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00061	0.00396	0.00677	0.00273
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.0016	<0.001	<0.003	<0.001
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1	2	0.0026	0.0035	**0.247**	0.0128
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00027	0.00068	0.00028	0.00034
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00031	0.00069	0.00046	0.00035
Barium	mg/L	NG	1	NG	NG	NG	0.0671	0.138	0.0478	0.0447
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	0.033	0.066	0.025	0.028
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	22	36.1	15.4	15.5
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00012	0.00022	0.00027	<0.0001
Copper	mg/L	1	NG	0.002-0.00383 [9]	NG	NG	0.00204	0.00177	0.00234	0.00141
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	0.25	<0.03
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	NG	NG	<0.00005	0.000094	0.000727	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	9.02	20.8	7.5	7.24
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00201	0.0355	0.024	0.00476
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.00213	0.00899	0.00338	0.00385
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	NG	NG	0.00146	0.00899	0.00383	0.00234
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	0.0021	0.0034	0.0038	<0.002
Potassium	mg/L	NG	NG	NG	NG	NG	10	20	7.25	8.11
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	2.95	4.4	2	0.87
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	16.7	27.7	10.6	12
Strontium	mg/L	NG	NG	NG	NG	NG	0.441	0.893	0.293	0.305
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00058	0.004	0.00616	0.00269
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	0.0016	<0.001	0.002	<0.001

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
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2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level fo
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10%

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.2: Water Quality Station Analytical Results - JER-AEM-04

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		EM-04			JER-A
		AO	MAC		Max. Average	Max. Grab	24-Jul-08	31-Jul-08	6-Aug-08	14-Aug-08
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.51		7.05	7.79
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	247	263	257	249
Hardness	mg/L	NG	NG	NG	NG	NG	79.6	74.6	78.9	73.3
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3.49	3.83	3.4	4.02
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	7.69	8.22	8.51	7.96
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	3.7	<3	<3	3.1
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	171	162	186	154
Turbidity	NTU	NG	NG	NG	NG	NG				
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	2.5	2.5	4.8	2.5
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	35.2	36.5	37.9	36.4
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	35.2	36.5	37.9	36.4
Ammonia as N	mg/L	NG	NG	1.26-125 [5]	6	12	0.084	0.13	0.117	0.0506
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	0.0642	0.0731	0.0867	0.0569
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	**10.9**	**11.2**	**11.1**	**10.5**
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG				
Chloride - Cl	mg/L	250	NG	120	500	1000	13.2	12.6	12.8	12.2
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG				
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	0.0011	<0.001	0.0039
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	17.2	19.7	20.1	19.1
Ionic Balance	N/A	NG	NG	NG	NG	NG				
Total Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1.5	3	0.0813	0.0123	0.0085	0.076
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00028	0.00035	0.00037	0.00034
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00048	0.00041	0.00048	<0.0005
Barium	mg/L	NG	1	NG	NG	NG	0.043	0.0427	0.0447	0.0407
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	0.031	0.03	0.033	0.032
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	0.000158	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	17.2	17.3	17.3	16.2
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00038	<0.0001	<0.0001	0.00016
Copper	mg/L	1	NG	0.002-0.00383 [9]	0.02	0.04	0.00211	0.00158	0.00137	0.00177
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	0.139	<0.03	<0.03	0.077
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	0.01	0.02	0.000065	<0.00005	<0.00005	0.000116
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	8.91	7.37	8.49	7.99
Manganese	mg/L	0.05	NG	NG	NG	NG	0.021	0.00549	0.000998	0.00761
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.00337	0.00429	0.00464	0.00395
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	0.05	0.1	0.00192	0.00212	0.00191	0.00202
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	0.0151	0.0061	0.0054	0.0082
Potassium	mg/L	NG	NG	NG	NG	NG	7.38	8.79	9.32	8.91
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	1.26	0.58	0.6	0.93
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	12.3	12.4	13.7	12.9
Strontium	mg/L	NG	NG	NG	NG	NG	0.341	0.358	0.354	0.305
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00097	0.00262	0.00201	0.0017
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.003	0.0035	<0.001	0.0012
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1	2		0.0084	0.0088	
Antimony	mg/L	NG	0.006	NG	NG	NG		0.00035	0.00038	
Arsenic	mg/L	NG	0.01	0.005	NG	NG		0.00038	0.00042	
Barium	mg/L	NG	1	NG	NG	NG		0.0435	0.0443	
Beryllium	mg/L	NG	NG	NG	NG	NG		<0.0005	<0.0005	
Boron	mg/L	NG	5	1.5	NG	NG		0.03	0.034	
Cadmium	mg/L	NG	0.005	0.00009	NG	NG		<0.00005	<0.00005	
Calcium	mg/L	NG	NG	NG	NG	NG		17.6	17.3	
Chromium	mg/L	NG	0.05	NG	NG	NG		<0.0005	<0.0005	
Cobalt	mg/L	NG	NG	NG	NG	NG		<0.0001	<0.0001	
Copper	mg/L	1	NG	0.002-0.00383 [9]	NG	NG		0.00147	0.00153	
Iron	mg/L	0.3	NG	0.3	NG	NG		<0.03	<0.03	
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	NG	NG		<0.00005	<0.00005	
Magnesium	mg/L	NG	NG	NG	NG	NG		7.48	8.68	
Manganese	mg/L	0.05	NG	NG	NG	NG		0.000261	0.000382	
Mercury	mg/L	NG	0.001	0.000026	NG	NG		*<0.00005*	*<0.00005*	
Molybdenum	mg/L	NG	NG	0.073	NG	NG		0.00446	0.00461	
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	NG	NG		0.00204	0.00219	
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	0.0048	0.0055	0.0031	0.0027
Potassium	mg/L	NG	NG	NG	NG	NG		9	9.44	
Selenium	mg/L	NG	0.01	0.001	NG	NG		<0.001	<0.001	
Silicon	mg/L	NG	NG	NG	NG	NG		0.55	0.56	
Silver	mg/L	NG	NG	0.0001	NG	NG		<0.00001	<0.00001	
Sodium	mg/L	200	NG	NG	NG	NG		12.4	14	
Strontium	mg/L	NG	NG	NG	NG	NG		0.358	0.356	
Thallium	mg/L	NG	NG	0.0008	NG	NG		<0.0001	<0.0001	
Uranium	mg/L	NG	0.02	0.015	0.5	1		0.00277	0.00243	
Vanadium	mg/L	NG	NG	NG	NG	NG		<0.001	<0.001	
Zinc	mg/L	5	NG	0.03	NG	NG		<0.001	<0.001	

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level fc
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10%

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.2: Water Quality Station Analytical Results - JER-AEM-04

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		EM-04			JER-A
		AO	MAC		Max. Average	Max. Grab	21-Aug-08	28-Aug-08	4-Sep-08	11-Sep-08
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.81	7.83	7.82	7.85
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	250	239	234	235
Hardness	mg/L	NG	NG	NG	NG	NG	70.9	68.1	67.2	67.8
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3.91	4.16		3.39
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	9.24	7.9	8.23	8.4
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	153	148	156	146
Turbidity	NTU	NG	NG	NG	NG	NG				
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	1.6	3.1	2.2	<1
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	38.8	38.8	38.1	39.7
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	38.8	38.8	38.1	39.7
Ammonia as N	mg/L	NG	NG	1.26-125 [5]	6	12	0.0848	0.113	0.272	0.101
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	0.0805	0.0626	0.0528	0.0461
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	**10.1**	9.86	9.55	9.43
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG				
Chloride - Cl	mg/L	250	NG	120	500	1000	12.3	11.9	11.7	11.9
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG				
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	19.1	18.7	17.9	19
Ionic Balance	N/A	NG	NG	NG	NG	NG				
Total Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1.5	3	0.0237	0.0424	0.0443	0.0247
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00034	0.00031	0.0003	0.00032
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00044	0.00045	0.00044	0.00039
Barium	mg/L	NG	1	NG	NG	NG	0.0421	0.0394	0.0393	0.0408
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	0.029	0.027	0.031	0.027
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	15.6	14.3	15.1	15.5
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00016	0.00019	0.00015	0.00013
Copper	mg/L	1	NG	0.002-0.00383 [9]	0.02	0.04	0.00192	0.00179	0.00194	0.00169
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	0.047	0.081	0.078	0.046
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	0.01	0.02	0.00005	0.000054	0.000056	0.000051
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	7.23	6.55	7.69	7.14
Manganese	mg/L	0.05	NG	NG	NG	NG	0.0158	0.0183	0.0147	0.0128
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.00418	0.00398	0.00383	0.00382
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	0.05	0.1	0.00236	0.00207	0.00218	0.00245
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	0.0066	0.007	0.0074	0.0059
Potassium	mg/L	NG	NG	NG	NG	NG	8.66	7.64	7.8	8.01
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.77	0.93	1.06	1
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	11.8	10.7	11.4	11.2
Strontium	mg/L	NG	NG	NG	NG	NG	0.297	0.26	0.277	0.26
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00241	0.00266	0.00296	0.00279
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.0013	0.0011	<0.001	0.0022
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1	2	0.0128	0.0136	0.0174	0.013
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00035	0.00031	0.00028	0.0003
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00038	0.0004	0.00036	0.00037
Barium	mg/L	NG	1	NG	NG	NG	0.0428	0.0399	0.0391	0.0405
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	0.031	0.03	0.028	0.028
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	16.2	15.5	15.1	15.4
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002-0.00383 [9]	NG	NG	0.00154	0.00156	0.00166	0.00151
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	<0.03	<0.03
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	7.4	7.17	7.17	7.16
Manganese	mg/L	0.05	NG	NG	NG	NG	0.000384	0.00138	0.00551	0.00683
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.00453	0.00425	0.00406	0.00421
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	NG	NG	0.00222	0.00202	0.00231	0.00236
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	0.0029	0.0023	0.0039	0.0039
Potassium	mg/L	NG	NG	NG	NG	NG	8.78	8.31	7.58	8.09
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.71	0.8	0.92	0.93
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	12.3	11.8	10.7	11.5
Strontium	mg/L	NG	NG	NG	NG	NG	0.303	0.274	0.277	0.257
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00256	0.00274	0.00293	0.00279
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	<0.001	<0.001	0.001	0.0011

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
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[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level fo
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10%

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.2: Water Quality Station Analytical Results - JER-AEM-04

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		EM-04			JER-A
		AO	MAC		Max. Average	Max. Grab	18-Sep-08	20-May-09	18-Jun-09	2-Jul-09
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.9	7.53	7.72	7.21
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	258	369	116	170
Hardness	mg/L	NG	NG	NG	NG	NG	75.6	115	36.6	55.9
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3.94	4.2	3.33	2.97
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	9	14.5	5.45	7.19
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	143	221	65	98
Turbidity	NTU	NG	NG	NG	NG	NG		0.37	1.97	1.36
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	4.1	4.3	1.8	4.1
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	42.9	65.6	26.9	37.5
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	42.9	65.6	26.9	37.5
Ammonia as N	mg/L	NG	NG	1.26-125 [5]	6	12	0.0983	0.0554	0.0329	0.0181
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	0.025	0.0309	0.0062	0.0072
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	9.85	**13.3**	3.11	4.98
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG				
Chloride - Cl	mg/L	250	NG	120	500	1000	11.7	18.7	4.83	7.55
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG		<1	<1	<1
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	0.0013
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	19.1	32.9	10.2	14.6
Ionic Balance	N/A	NG	NG	NG	NG	NG				
Total Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1.5	3	0.0182	*<u>≤0.008</u>*	0.091	0.0317
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0003	0.00034	0.00011	0.00016
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00035	0.00041	0.00028	0.00025
Barium	mg/L	NG	1	NG	NG	NG	0.0408	0.0893	0.0262	0.0361
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	0.03	0.045	0.016	0.023
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	16.3	26.7	8.82	12.7
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00013	0.00014	0.00019	0.00011
Copper	mg/L	1	NG	0.002-0.00383 [9]	0.02	0.04	0.00194	0.00323	0.00177	0.00169
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	0.044	<0.03	0.081	<0.03
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	0.01	0.02	<0.00005	0.00016	0.000119	<0.00005
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	8.43	12.5	4.59	6.42
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00901	0.016	0.0384	0.0161
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<u>≤0.00005</u>*	*<u>≤0.00005</u>*	*<u>≤0.00005</u>*	*<u>≤0.00005</u>*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.00426	0.00456	0.00196	0.00241
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	0.05	0.1	0.00236	0.00443	0.00267	0.0023
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	0.0064	0.0083	0.0132	0.0088
Potassium	mg/L	NG	NG	NG	NG	NG	8.09	12.2	4.12	5.6
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.99	2.04	1.11	0.965
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	11.4	16.6	5.62	8.11
Strontium	mg/L	NG	NG	NG	NG	NG	0.309	0.553	0.158	0.256
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00416	0.00303	0.00262	0.00237
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.001	0.0023	0.0038	<0.004
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1	2	0.0204	0.0061		0.0115
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00029	0.00035		0.00018
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00034	0.00047		0.00026
Barium	mg/L	NG	1	NG	NG	NG	0.0406	0.0877		0.0345
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	0.031	0.042	0.015	0.021
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	16.2	24.8	7.79	12
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00011	0.00011	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002-0.00383 [9]	NG	NG	0.00173	0.00218	0.00095	0.00131
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	<0.03	<0.03
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	NG	NG	<0.00005	0.000063	<0.00005	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	8.51	12.9	4.16	6.3
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00538	0.00841	0.0225	0.0036
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<u>≤0.00005</u>*	*<u>≤0.00005</u>*	*<u>≤0.00005</u>*	*<u>≤0.00005</u>*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.00419	0.0043	0.00168	0.0021
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	NG	NG	0.00225	0.00412	0.00198	0.00202
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	0.003	0.005	0.0036	0.004
Potassium	mg/L	NG	NG	NG	NG	NG	8.19	11	3.66	5.34
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.95	2.07	0.979	0.971
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	11.6	17.1	5.11	7.82
Strontium	mg/L	NG	NG	NG	NG	NG	0.31	0.523	0.141	0.243
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00405	0.00271	0.00215	0.00201
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	<0.001	0.0014	0.0014	0.0011

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level fc
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10%

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.2: Water Quality Station Analytical Results - JER-AEM-04

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		EM-04			JER-A
		AO	MAC		Max. Average	Max. Grab	9-Jul-09	16-Jul-09	23-Jul-09	30-Jul-09
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.7	7.95	7.91	7.93
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	198	201	199	200
Hardness	mg/L	NG	NG	NG	NG	NG	64.4	66.4	65.8	65.7
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3.09	3.02	2.87	3.24
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	8.98	8.93	7.33	7.4
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	111	117	117	114
Turbidity	NTU	NG	NG	NG	NG	NG	0.55	0.45	0.28	0.29
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	5.6	4.7	1.1	1.1
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	41.2	41.7	45	45.2
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	41.2	41.7	45	45.2
Ammonia as N	mg/L	NG	NG	1.26-125 [5]	6	12	0.0181	0.0056	0.0349	0.0312
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	0.0025	0.0061	0.0164	0.0161
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	5.63	5.43	5.71	5.62
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG				
Chloride - Cl	mg/L	250	NG	120	500	1000	8.6	8.56	9.47	9.55
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	17	17	18.3	18.8
Ionic Balance	N/A	NG	NG	NG	NG	NG				
Total Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1.5	3	0.0243	0.0199	0.015	0.0162
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0002	0.00022	0.00022	0.00024
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00031	0.00032	0.00032	0.00035
Barium	mg/L	NG	1	NG	NG	NG	0.0412	0.042	0.0341	0.0334
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	0.023	0.025	0.023	0.025
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	13.6	14.9	13.5	14.4
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00011	<0.0001	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002-0.00383 [9]	0.02	0.04	0.00182	0.00188	0.00174	0.00162
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	0.039	<0.03	0.03	<0.03
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	0.01	0.02	<0.00005	<0.00005	<0.00005	<0.00005
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	7.57	8.33	7.03	7.41
Manganese	mg/L	0.05	NG	NG	NG	NG	0.012	0.00748	0.00689	0.00768
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.00295	0.00337	0.0034	0.00388
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	0.05	0.1	0.00227	0.00235	0.00171	0.00173
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	0.0075	0.0067	0.0044	0.004
Potassium	mg/L	NG	NG	NG	NG	NG	6.12	6.89	6.42	6.83
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.958	0.808	0.632	0.594
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	8.75	9.75	8.75	9.33
Strontium	mg/L	NG	NG	NG	NG	NG	0.289	0.311	0.273	0.286
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00315	0.00334	0.00293	0.0031
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.005	<0.005	<0.001	<0.001
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1	2	0.0105	0.0102	0.012	0.0132
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00021	0.00023	0.00022	0.00022
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00035	0.00036	0.00031	0.00031
Barium	mg/L	NG	1	NG	NG	NG	0.0425	0.042	0.034	0.0329
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	0.022	0.023	0.024	0.025
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	13.6	13.8	14.3	14.3
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002-0.00383 [9]	NG	NG	0.00055	0.00117	0.00143	0.00152
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	<0.03	<0.03
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	7.38	7.74	7.32	7.29
Manganese	mg/L	0.05	NG	NG	NG	NG	0.000517	0.000645	0.000197	0.00343
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.00296	0.00334	0.0036	0.00386
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	NG	NG	0.00191	0.00183	0.00214	0.00171
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	<0.002	<0.002	<0.002	<0.002
Potassium	mg/L	NG	NG	NG	NG	NG	5.98	6.29	6.62	6.62
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	1.01	0.817	0.588	0.578
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	8.34	9.01	9.12	9.27
Strontium	mg/L	NG	NG	NG	NG	NG	0.306	0.312	0.282	0.283
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00331	0.00334	0.00309	0.00312
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	0.0026	<0.001	<0.001	<0.001

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
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[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level fo
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10%

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.2: Water Quality Station Analytical Results - JER-AEM-04

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		EM-04			JER-A
		AO	MAC		Max. Average	Max. Grab	23-Aug-10	14-Sep-10	21-Sep-10	29-Sep-10
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.58	8.09	8.05	8
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	169	182	188	189
Hardness	mg/L	NG	NG	NG	NG	NG	60	56.9	57.5	60.2
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3.9	4.3	3.4	3.5
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	11.7	9.6		
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	99	120	111	101
Turbidity	NTU	NG	NG	NG	NG	NG	0.41	0.47	0.44	0.48
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	3.1	<5	<5	<5
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	49.7	50.5	51	48.4
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<5	<5	<5
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	49.7	61.6	62.3	59
Ammonia as N	mg/L	NG	NG	1.26-125 [5]	6	12	0.0153	0.0097	0.0222	0.0228
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	0.0099	<0.05	<0.05	<0.05
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	2.1	1.98	1.84	1.93
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG		0.103	0.079	0.097
Chloride - Cl	mg/L	250	NG	120	500	1000	6.47	6.76	6.51	6.64
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<1		<5	<5
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	<0.005	<0.005	<0.005
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	18.5	19.3	18.1	19.3
Ionic Balance	N/A	NG	NG	NG	NG	NG		91	92.4	99.3
Total Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1.5	3	0.0196	*<0.02*	*<0.02*	*<0.02*
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00023	<0.0004	<0.0004	<0.0004
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00042	<0.0004	0.00041	<0.0004
Barium	mg/L	NG	1	NG	NG	NG	0.0285	0.0273	0.0279	0.0253
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.001	<0.001	<0.001
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	0.029	0.023	<0.02	<0.02
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	*<0.0002*	*<0.0002*	*<0.0002*
Calcium	mg/L	NG	NG	NG	NG	NG	13.4	13.7	11.1	11.7
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	<0.0008	<0.0008	<0.0008
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00024	<0.0002	<0.0002	<0.0002
Copper	mg/L	1	NG	0.002-0.00383 [9]	0.02	0.04	0.0021	0.0016	0.0018	0.0018
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	0.048	0.051	0.057	0.051
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	0.01	0.02	0.000051	<0.0001	<0.0001	<0.0001
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	7.71	8.1	6.79	7.1
Manganese	mg/L	0.05	NG	NG	NG	NG	0.0163	0.0139	0.0213	0.0136
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.0001*	*<0.0001*	*<0.0001*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.00452	0.00422	0.0038	0.0043
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	0.05	0.1	0.00176	0.00194	0.00162	0.00198
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	0.0053			
Potassium	mg/L	NG	NG	NG	NG	NG	6.07	6.12	5.01	4.9
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.0004	<0.0004	<0.0004
Silicon	mg/L	NG	NG	NG	NG	NG	0.407			
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	*<0.0004*	*<0.0004*	*<0.0004*
Sodium	mg/L	200	NG	NG	NG	NG	8.39	8.3	6.9	7.1
Strontium	mg/L	NG	NG	NG	NG	NG	0.266	0.232	0.238	0.227
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00356	0.00384	0.00318	0.00322
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.0005	<0.0005	<0.0005
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.001	<0.004	<0.004	<0.004
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1	2	0.0169	0.013	*<0.01*	*<0.01*
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00018	<0.0004	<0.0004	<0.0004
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00041	0.00041	<0.0004	<0.0004
Barium	mg/L	NG	1	NG	NG	NG	0.027	0.0272	0.028	0.0249
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	0.022	0.0234	0.0195	0.0242
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	*<0.0001*	*<0.0001*	*<0.0001*
Calcium	mg/L	NG	NG	NG	NG	NG	12.2	11.5	11.5	12.2
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	<0.0004	<0.0004	<0.0004
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0001	0.0001	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002-0.00383 [9]	NG	NG	0.00194	0.00165	0.00166	0.00161
Iron	mg/L	0.3	NG	0.3	NG	NG	0.04	0.037	0.016	0.012
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	NG	NG	0.000076	<0.0001	<0.0001	<0.0001
Magnesium	mg/L	NG	NG	NG	NG	NG	7.18	6.81	6.96	7.23
Manganese	mg/L	0.05	NG	NG	NG	NG	0.015	0.0133	0.0128	0.008
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.0001*	*<0.0001*	*<0.0001*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.00398	0.00425	0.0039	0.00405
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	NG	NG	0.00161	0.00177	0.00154	0.00181
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	0.0028			
Potassium	mg/L	NG	NG	NG	NG	NG	5.68	5.2	4.83	5.34
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.0004	<0.0004	<0.0004
Silicon	mg/L	NG	NG	NG	NG	NG	0.403			
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	*<0.0002*	*<0.0002*	*<0.0002*
Sodium	mg/L	200	NG	NG	NG	NG	7.78	7.44	7.25	7.92
Strontium	mg/L	NG	NG	NG	NG	NG	0.239	0.228	0.241	0.23
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.00005	<0.00005	<0.00005
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00324	0.00325	0.0031	0.0034
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	0.00016	<0.0001	0.0001
Zinc	mg/L	5	NG	0.03	NG	NG	<0.001	0.0022	<0.001	<0.001

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level fo
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10%

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.2: Water Quality Station Analytical Results - JER-AEM-04

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		EM-04	JER-AEM-04			
		AO	MAC		Max. Average	Max. Grab	11-Jul-11	1-Aug-11	10-Aug-11	17-Aug-11	24-Aug-11
Physical Parameters											
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	8.02	8.12	8.04	7.92	7.97
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	151	162	161	180	186
Hardness	mg/L	NG	NG	NG	NG	NG	53.5	55.7	57.8	62.5	64.4
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	4.3	4.6	5	4.7	7.2
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	11.3	12.7	12.2	13	12.6
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3	5	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	93	95	96	111	114
Turbidity	NTU	NG	NG	NG	NG	NG	0.92	0.3	0.95	0.58	0.7
Anions											
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5	<5	<5	<5	<5
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	46.4	51.2	53	48.9	50.5
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5	<5	<5	<5	<5
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	56.6	62.5	64.7	59.7	61.7
Ammonia as N	mg/L	NG	NG	1.26-125[5]	6	12	0.0138	0.0165	0.012	0.0157	
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	0.0049	0.0055	0.0055	<0.05	0.0085
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	0.656	0.589	0.362	2.79	2.44
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG					
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	0.081	0.073	0.084	0.101	0.083
Chloride - Cl	mg/L	250	NG	120	500	1000	5.15	5.17	4.92	6.35	6.31
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<5	<5	<5	<5	<5
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	15.2	14.9	14.1	16.1	15.8
Ionic Balance	N/A	NG	NG	NG	NG	NG	98.7	105	99.2	97	98.1
Total Metals											
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1.5	3	0.0159	0.0106	0.0136	0.017	0.0215
Antimony	mg/L	NG	0.006	NG	NG	NG	0.000115	0.000113	0.000102	0.00014	0.000147
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.000494	0.000437	0.000727	0.000445	0.000383
Barium	mg/L	NG	1	NG	NG	NG	0.0207	0.0203	0.0176	0.0254	0.0228
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.000002	<0.000002	<0.000002	0.0000021	<0.000002
Bismuth	mg/L	NG	NG	NG	NG	NG					
Boron	mg/L	NG	5	1.5	NG	NG	0.0203	0.0207	0.0203	0.0268	0.0296
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.000005	<0.000005	<0.000005	0.0000336	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	10.4	11.5	11.7	12.8	13.2
Cesium	mg/L	NG	NG	NG	NG	NG					
Chromium	mg/L	NG	0.05	NG	0.087	0.17	0.000106	0.00006	0.000066	0.000089	0.000066
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0000757	0.0000631	0.000176	0.0000966	0.0000696
Copper	mg/L	1	NG	0.002-0.00383[9]	0.02	0.04	0.00157	0.00144	0.00146	0.00152	0.00145
Gallium	mg/L	NG	NG	NG	NG	NG					
Iron	mg/L	0.3	NG	0.3	NG	NG	0.149	0.093	**0.325**	0.104	0.063
Lead	mg/L	NG	0.01	0.001-0.00653[9]	0.01	0.02	0.0000203	0.0000112	0.000012	0.0000237	0.0000155
Lithium	mg/L	NG	NG	NG	NG	NG					
Magnesium	mg/L	NG	NG	NG	NG	NG	6.3	7.18	7.06	7.57	7.74
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00816	0.0105	0.0389	0.0112	0.00743
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.00257	0.00299	0.00265	0.0039	0.00418
Nickel	mg/L	NG	NG	0.025-0.1469[9]	0.05	0.1	0.00121	0.000986	0.00107	0.00132	0.00119
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	0.0053	0.0059	0.0057	0.0064	0.0053
Potassium	mg/L	NG	NG	NG	NG	NG	4.6	5.26	4.97	5.14	5.3
Rhenium	mg/L	NG	NG	NG	NG	NG					
Rubidium	mg/L	NG	NG	NG	NG	NG					
Selenium	mg/L	NG	0.01	0.001	NG	NG	0.000062	0.00009	0.000087	0.000102	<0.00004
Silicon	mg/L	NG	NG	NG	NG	NG	0.27	0.258	0.31	0.51	0.428
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	6.46	6.96	7.04	7.64	8.21
Strontium	mg/L	NG	NG	NG	NG	NG	0.172	0.185	0.182	0.221	0.234
Tellurium	mg/L	NG	NG	NG	NG	NG					
Thallium	mg/L	NG	NG	0.0008	NG	NG	0.0000049	0.0000073	0.0000047	0.0000055	0.000004
Thorium	mg/L	NG	NG	NG	NG	NG					
Tin	mg/L	NG	NG	NG	NG	NG					
Titanium	mg/L	NG	NG	NG	NG	NG					
Tungsten	mg/L	NG	NG	NG	NG	NG					
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00185	0.00206	0.0019	0.00627	0.0064
Vanadium	mg/L	NG	NG	NG	NG	NG	0.000138	0.000109	0.000133	0.000151	0.000111
Yttrium	mg/L	NG	NG	NG	NG	NG					
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.00086	0.00027	0.00029	0.00044	0.00035
Zirconium	mg/L	NG	NG	NG	NG	NG					
Dissolved Metals											
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1	2	0.0111	0.00771	0.00892	0.00741	0.0104
Antimony	mg/L	NG	0.006	NG	NG	NG	0.000105	0.00011	0.000107	0.00014	0.00014
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.000475	0.00041	0.000632	0.000396	0.000326
Barium	mg/L	NG	1	NG	NG	NG	0.0208	0.0191	0.0176	0.024	0.0213
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.000002	<0.000002	<0.000002	<0.000002	<0.000002
Boron	mg/L	NG	5	1.5	NG	NG	0.0221	0.0211	0.0208	0.028	0.0341
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.000005	<0.000005	<0.000005	0.000105	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	10.3	11	11.6	12.6	13.1
Chromium	mg/L	NG	0.05	NG	NG	NG	0.000081	0.000053	0.000056	0.000089	0.000052
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0000686	0.0000435	0.00014	0.0000737	0.0000452
Copper	mg/L	1	NG	0.002-0.00383[9]	NG	NG	0.00149	0.00134	0.00122	0.00129	0.00118
Iron	mg/L	0.3	NG	0.3	NG	NG	0.106	0.057	0.143	0.036	0.025
Lead	mg/L	NG	0.01	0.001-0.00653[9]	NG	NG	0.0000141	0.0000059	0.0000094	0.000008	0.0000063
Magnesium	mg/L	NG	NG	NG	NG	NG	6.24	6.88	6.99	7.52	7.7
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00688	0.00176	0.0281	0.00621	0.0011
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.0025	0.00288	0.00273	0.00392	0.0043
Nickel	mg/L	NG	NG	0.025-0.1469[9]	NG	NG	0.00117	0.000962	0.000966	0.00124	0.00114
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	0.0016	0.0023	0.0022	0.0021	0.0015
Potassium	mg/L	NG	NG	NG	NG	NG	4.53	4.78	4.97	5.14	5.28
Selenium	mg/L	NG	0.01	0.001	NG	NG	0.000065	0.000085	0.000046	0.0001	<0.00004
Silicon	mg/L	NG	NG	NG	NG	NG	0.249	0.24	0.281	0.481	0.396
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	6.37	6.8	7.01	7.66	8.14
Strontium	mg/L	NG	NG	NG	NG	NG	0.174	0.177	0.18	0.215	0.227
Thallium	mg/L	NG	NG	0.0008	NG	NG	0.0000046	<0.000005	0.0000046	0.0000054	0.0000043
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.0018	0.0021	0.00187	0.00632	0.00633
Vanadium	mg/L	NG	NG	NG	NG	NG	0.000109	0.000086	0.000083	0.000089	0.000079
Zinc	mg/L	5	NG	0.03	NG	NG	0.00067	0.00091	0.00146	0.00151	0.00077

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level fo
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10%

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.2: Water Quality Station Analytical Results - JER-AEM-04

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-04	
		AO	MAC		Max. Average	Max. Grab	31-Aug-11	26-Aug-14
Physical Parameters								
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.99	7.79
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	187	148
Hardness	mg/L	NG	NG	NG	NG	NG	65.3	55.6
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	4.5	6.7
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	13.2	
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	101	73.4
Turbidity	NTU	NG	NG	NG	NG	NG	0.68	1.44
Anions								
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5	
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	51.6	57.8
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5	<5
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	63	70.5
Ammonia as N	mg/L	NG	NG	1.26-125 [5]	6	12	0.0411	0.0262
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	0.0125	<0.002
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	2.84	0.0495
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG		
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	0.079	0.068
Chloride - Cl	mg/L	250	NG	120	500	1000	6.34	3.07
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<5	<5
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	15.9	7.62
Ionic Balance	N/A	NG	NG	NG	NG	NG	105	105
Total Metals								
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1.5	3	0.0131	0.033
Antimony	mg/L	NG	0.006	NG	NG	NG	0.000149	<0.00005
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.000398	0.00065
Barium	mg/L	NG	1	NG	NG	NG	0.0242	0.012
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.000002	<0.000005
Bismuth	mg/L	NG	NG	NG	NG	NG		<0.00005
Boron	mg/L	NG	5	1.5	NG	NG	0.0268	0.0259
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.000005	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	14.1	10.9
Cesium	mg/L	NG	NG	NG	NG	NG		0.0000256
Chromium	mg/L	NG	0.05	NG	0.087	0.17	0.000078	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0000828	0.000113
Copper	mg/L	1	NG	0.002-0.00383 [9]	0.02	0.04	0.00168	0.00117
Gallium	mg/L	NG	NG	NG	NG	NG		<0.00005
Iron	mg/L	0.3	NG	0.3	NG	NG	0.101	0.287
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	0.01	0.02	0.0000194	<0.00005
Lithium	mg/L	NG	NG	NG	NG	NG		0.00109
Magnesium	mg/L	NG	NG	NG	NG	NG	8.04	7.1
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00802	0.0369
Mercury	mg/L	NG	0.001	0.000026	NG	NG		0.0000055
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.00383	0.00107
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	0.05	0.1	0.00186	0.00083
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	0.0071	*<u>0.3</u>*
Potassium	mg/L	NG	NG	NG	NG	NG	5.41	4.2
Rhenium	mg/L	NG	NG	NG	NG	NG		0.0000063
Rubidium	mg/L	NG	NG	NG	NG	NG		0.00961
Selenium	mg/L	NG	0.01	0.001	NG	NG	0.000099	<0.0002
Silicon	mg/L	NG	NG	NG	NG	NG	0.411	1.07
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	8.07	5.7
Strontium	mg/L	NG	NG	NG	NG	NG	0.236	0.177
Tellurium	mg/L	NG	NG	NG	NG	NG		<0.00001
Thallium	mg/L	NG	NG	0.0008	NG	NG	0.0000043	0.0000029
Thorium	mg/L	NG	NG	NG	NG	NG		0.0000279
Tin	mg/L	NG	NG	NG	NG	NG		<0.0002
Titanium	mg/L	NG	NG	NG	NG	NG		0.00093
Tungsten	mg/L	NG	NG	NG	NG	NG		0.000012
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00776	0.00169
Vanadium	mg/L	NG	NG	NG	NG	NG	0.000108	0.00013
Yttrium	mg/L	NG	NG	NG	NG	NG		0.000101
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.00097	<0.003
Zirconium	mg/L	NG	NG	NG	NG	NG		0.00009
Dissolved Metals								
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1	2	0.0091	
Antimony	mg/L	NG	0.006	NG	NG	NG	0.000155	
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00039	
Barium	mg/L	NG	1	NG	NG	NG	0.0248	
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.000002	
Boron	mg/L	NG	5	1.5	NG	NG	0.0287	
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.000005	
Calcium	mg/L	NG	NG	NG	NG	NG	14	10.7
Chromium	mg/L	NG	0.05	NG	NG	NG	0.000069	
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0000609	
Copper	mg/L	1	NG	0.002-0.00383 [9]	NG	NG	0.00149	
Iron	mg/L	0.3	NG	0.3	NG	NG	0.062	
Lead	mg/L	NG	0.01	0.001-0.00653 [9]	NG	NG	0.000008	
Magnesium	mg/L	NG	NG	NG	NG	NG	7.95	7.03
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00222	
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<u>0.00005</u>*	
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.00389	
Nickel	mg/L	NG	NG	0.025-0.1469 [9]	NG	NG	0.00117	
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	0.0039	0.0054
Potassium	mg/L	NG	NG	NG	NG	NG	5.41	4.08
Selenium	mg/L	NG	0.01	0.001	NG	NG	0.00009	
Silicon	mg/L	NG	NG	NG	NG	NG	0.41	
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005	
Sodium	mg/L	200	NG	NG	NG	NG	8.01	5.9
Strontium	mg/L	NG	NG	NG	NG	NG	0.236	
Thallium	mg/L	NG	NG	0.0008	NG	NG	0.0000044	
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.0078	
Vanadium	mg/L	NG	NG	NG	NG	NG	0.000079	
Zinc	mg/L	5	NG	0.03	NG	NG	0.0011	

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level fc
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10%

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

<u>Red and Underlined</u> - Exceeds Water Licence Guideline

<u>Italic</u> - Detection limit greater than guideline

Blank - Not analyzed

Table D.3: Water Quality Station Analytical Results - JER-AEM-09

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-09																								
		AO	MAC		Max. Average	Max. Grab	26-May-05	30-Jun-05	29-Jul-05	26-Aug-05	10-Apr-06	21-Jun-06	11-Jul-06	6-Aug-06	5-Sep-06	17-Dec-06	27-Apr-07	1-Jul-07	17-Jul-07	25-Aug-07	23-Sep-07	30-Sep-07	8-Dec-07	19-Apr-08	16-Jul-08	6-Aug-08	18-Sep-08	20-Jan-09	22-Apr-09	14-Jun-09	12-Jul-09	23-Aug-10	15-Aug-11	26-Aug-14
Physical Parameters																															
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.1	5.71	5.89	7.05	7.03	6.92	7.03		7.14	7.07	7.51	7.35	7.06	7.45	7.7		7.37	7.88	6.92	6.76	7.74	7.24	7.26	7.04	7.89	7.16	7.72	7.6
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	27.7	20	17	22	33	26	37		48	74.7	85.5	55	67.7	78.3	85.4	84.6	93.8	131	85.8	91.5	136	134	148	22.1	85.8	87.5	66	104
Hardness	mg/L	NG	NG	NG	NG	NG	12	6	6.4	8.9	9	<5	12		17	29.7	33.3	21.8	22.8	28.2	30.3	31.1	36	48.8	29.2	33.2	39.5	54.6	53.3	8.26	34.1	32.5	25.2	42.4
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	6.7	4	4	6	4	3.5	3.7		3.6	5.92	6.22	4.72	5.08	5.25	5.12	5.34	5.24	6.52	4.07	4.83	6.97	7.28	8.33	5.51	5.39	5.31	5.6	7.8
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	2.7	2	2	<1	1	0.4	0.4		2.4	3.91	4.76	2.67	3.16	3.14	3.5	3.88	3.8	4.69	3.65	3.85	2.73	3.01	3.65	0.91	2.3	4.67	5.1	
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<2	<2	<2	2	2	2		<2	<2.3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	3	<3	<3	<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	40	<10	<10	<10		16	31		38	53	44	39	42	59	37	57	66	73	58	71	106	119	122	22	64	61	48	52.3
Turbidity	NTU	NG	NG	NG	NG	NG	0.3	3	2	1																		0.54	0.29	0.9	0.42	0.81	0.28	0.97
Anions																																		
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5	2	3	2	3	4	3		2	2.4	1.3	6	2.4	2.7	2.2	2	2.3	4.1	3.5	4.6	4.2	2.5	1.5	2.1	4.1	2.9	<5	
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG																												34.3
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5	<1	<1	<1	<1	<1	<1		<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	<1	<1	<1	<5	<5
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	12	13	8	10	17	13	12		16	23.2	22.8	13.6	15.8	15.7	16.9	16.6	21.5	36.9	17.3	17.4	15.3	16.7	17.6	6.7	12.4	23.9	26.8	41.9
Ammonia as N	mg/L	NG	NG	1.26-125[5]	6	12	0.019	<0.1	<0.1	<0.1	<0.1	0.01	0.02	0.01	0.01	0.0255	0.0433	0.0144	0.0183	0.0112	0.0167	0.0088	0.0388	0.0655	0.0202	0.0304	0.186	0.0283	0.161	0.0507	0.0175	0.007	0.0211	0.0184
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	<0.002	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05	0.002	0.002	<0.001	0.0062	0.0051	0.0064	0.0062	0.0045	0.0042	0.0085	0.0116	0.0694	0.046	0.0425	<0.001	0.0068	0.0017	0.0051	0.0033
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	0.014	0.06	0.08	0.23	0.3	0.3	0.61		0.78	1.36	1.55	1.01	1.19	1.99	2.33	2.29	2.59	3.32	2.14	2.64	7.15	7.42	8.13	0.388	3.93	2.93	0.771	0.958
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG							0.2		0.3																			
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG		0.03	0.05	0.02	<4	<4	<4		<4																		<0.05	0.03
Chloride - Cl	mg/L	250	NG	120	500	1000	1	0.6	0.6	1.2	1.6	1.6	2.6		3.3	5.7	6.35	3.68	4.06	5.07	5.54	5.2	6.26	7.99	5.57	5.97	5.72	6.01	6.82	0.56	3.2	2.71	1.6	1.26
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<5	<1	<1	<1	0.04	0.03	0.03		0.03																			
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0018	0.001	0.0021	<0.001	<0.001	<0.001	
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	0.97	2.5	0.5	0.5	0.6	1.6	0.7		2.6	4.42	5.04	3.19	3.47	4.73	5.46	5.02	5.99	7.85	5.1	5.71	6.89	7.34	8.83	0.99	5.04	5.72	3.95	8.08
Ionic Balance	N/A	NG	NG	NG	NG	NG			0.93	0.94	0.61	0.45	0.85		0.88																			106
Total Metals																																		
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1.5	3	0.052	0.06	0.05	0.038	0.025	0.0949	0.0414	0.0293	0.024	0.0092	0.0119	0.0375	0.0265	0.0135	0.0367	0.0129	0.007	0.0113	0.019	0.0168	0.0568	0.0947	0.0713	0.0761	0.0454	0.0611	0.0222	0.0467
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00022	0.0001	0.0005	<0.0001	<0.0001	<0.00005	<0.00005	0.00003	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00068	<0.0001	<0.0001	<0.0001	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.000042	0.0000629
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.0002	<0.0004	<0.0004	<0.0004	<0.0004	<0.0002	<0.0002	0.0002	0.0004	0.0002	0.00024	0.00017	0.00019	0.00019	0.00018	0.00019	0.0002	0.00045	0.00017	0.0002	0.00018	0.00022	0.00025	0.00014	0.00018	0.00022	0.000235	0.000309
Barium	mg/L	1	1.0	NG	NG	NG	0.00245	<0.005	<0.005	<0.005	<0.005	0.00399	0.00365	0.00376	0.00399	0.00555	0.00638	0.00554	0.00511	0.00487	0.00499	0.00501	0.00583	0.00851	0.00544	0.00556	0.0101	0.0123	0.0138	0.00391	0.00754	0.0108	0.00487	0.00773
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0001	<0.0001	0	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.0005	<0.0005	<0.0005	0.000004	0.0000124
Bismuth	mg/L	NG	NG	NG	NG	NG																												<0.000001
Boron	mg/L	NG	5	1.5	NG	NG	<0.001	<0.01	<0.01	<0.01	<0.01	<0.01	0.004	0.002	0.109	0.003	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.011	<0.01	<0.01	0.013	0.0078	0.0154
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.00005	NG	<0.00005	0	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000005	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	2.36	1.5	1.67	2.07	2.97	1.9	2.35	3.04	3.99	6.4	6.9	4.66	4.89	5.98	6.51	6.52	7.48	10	6.06	6.74	8.33	11.5	12.2	1.99	6.98	8.31	5.66	9.02
Cesium	mg/L	NG	NG	NG	NG	NG																												0.0000189
Chromium	mg/L	NG	0.05	NG	0.087	0.17	0.00025	<0.0009	<0.0009	<0.0009	<0.0009	0.0015	0.0013	0.0004	0.0045	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00067	<0.0005	<0.0005	<0.0005	<0.0005	0.00066	<0.0005	<0.0005	<0.0005	0.00012	0.000262
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00016	0.00018	0.0001	0.0001	0.0001	0.000519	0.0000891
Copper	mg/L	1	NG	0.002[9]	0.02	0.04	0.0024	0.0013	0.0014	0.0018	<0.001	0.002	0.0012	0.0022	0.0011	0.00238	0.00232	0.00187	0.00168	0.00156	0.00175	0.00189	0.00178	0.00276	0.00169	0.00181	0.00323	0.00349	0.00336	0.00136	0.00226	0.00428	0.0022	0.00319
Gallium	mg/L	NG	NG	NG	NG	NG																												<0.00005
Iron	mg/L	0.3	NG	0.3	NG	NG				<0.1	<0.1	<0.1	<0.1	0.03	<0.1	<0.03	<0.03	0.048	0.068	0.051	0.039	0.039	<0.03	<0.03	<0.03	<0.03	0.062	0.048	0.044	0.057	0.034	0.043	0.074	0.093
Lead	mg/L	NG	0.01	0.001[9]	0.01	0.02	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	0.00015	<0.00005	0.00006	0.0001	<0.00005	<0.00005	0.00045	<0.00005	<0.00005	0.0002	0.000139	0.000055	0.000113	<0.00005	<0.00005	0.000052	<0.00005	0.000092	<0.00005	0.000148	0.000259	0.0000117	0.0000627
Lithium	mg/L	NG	NG	NG	NG	NG																												0.00073
Magnesium	mg/L	NG	NG	NG	NG	NG	1.21	0.73	0.82	1	1.46	0.96	0.96	1.38	2.11	3.26	3.8	2.36	2.54	3.22	3.5	3.54	4.08	6.02	3.18	3.73	4.46	6.92	6.41	0.953	4.32	3.86	3.14	4.97
Manganese	mg/L	0.05	NG	NG	NG	NG	0.0015			<0.01	<0.01	<0.01	<0.01	0.004	<0.01	0.00286	0.00272	0.00319	0.00627	0.0035	0.00293	0.00228	0.00132	0.00123	0.00254	0.00188	0.00445	0.00274	0.0025	0.0153	0.0025	0.00137	0.00783	0.0059
Mercury	mg/L	NG	0.001	0.000026	NG	NG	<0.00002	<0.0002	<0.0002	<0.0002	<0.0001	<0.00005	<0.00005	<0.00005	<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000005
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.00006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00005	0.00006	0.00006	0.000115	0.000099	0.000089	0.000091	0.000125	0.000142	0.000144	0.000124	0.000167	0.000154	0.000153	0.000215	0.000268	0.000294	0.000134	0.000218	0.000365	0.00044	0.00108
Nickel	mg/L	NG	NG	0.025[9]	0.05	0.1	0.0004	<0.0006	<0.0006	<0.0006	<0.0006	0.0011	0.0007	0.0004	0.0007	0.00066	0.00063	0.00109	0.00105	0.00086	0.00097	0.00098	0.00091	0.00143	0.00103	0.00101	0.00127	0.00187	0.00198	0.00201	0.00136	0.00173	0.00108	0.00119
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	0.016	<0.05	<0.05	<0.05	<0.05	0.02	0.03	<0.02	0.003	<0.02	0.0069	0.0046	0.0069	0.0028	0.0043	0.0027	0.0051	0.0033	0.0071	0.0046	0.0036	0.005	0.0072	0.0046	0.015	0.0023	0.0046	0.0037	<0.05
Potassium	mg/L	NG	NG	NG	NG	NG	0.25	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.4	<0.5	0.7	0.73	0.6	0.6	0.74	0.8	0.82	0.91	1.25	0.83	0.92	0.93	1.4	1.45	0.54	0.88	1.04	0.819	1.15
Rhenium	mg/L	NG	NG	NG	NG	NG																												<0.000005
Rubidium	mg/L	NG	NG	NG	NG	NG																												0.00154
Selenium	mg/L	NG	0.01	0.001	NG	NG	0.0001	<0.0008	<0.0008	<0.0008	<0.0008	<0.001	<0.001	0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.000048	0.000076
Silicon	mg/L	NG	NG	NG	NG	NG		0.61	0.46	0.62	0.9	0.48	0.47	0.73	0.89	1.28	1.4	0.77	0.698	0.648	0.704	0.632	0.714	0.876	0.497	0.451	2	2.52	2.6	0.691	1.21	1.47	0.551	1.57
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	0	<0.0001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.000005	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	0.67	0.8	0.5	<0.5	0.6	<0.5	1	1.7	1.1	2.75	2.94	2.07	2.28	3	3.48	3.43	3.9	5.46	3.47	3.99	3.51	4.89	5.03	0.6	3.21	3.17	2.37	3.08
Strontium	mg/L	NG	NG	NG	NG	NG	0.0074			0.006	0.01	0.008	0.0097	0.0103	0.012	0.0196	0.021	0.0161	0.0164	0.019	0.0211	0.0217	0.0248	0.0317	0.0204	0.0243	0.0313	0.0491	0.0442	0.00781	0.0249	0.03	0.0194	0.0337
Tellurium	mg/L	NG	NG	NG	NG	NG																												<0.00001
Thallium	mg/L	NG	NG	0.0008	NG	NG		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00001	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0000163	0.0000021
Thorium	mg/L	NG	NG	NG	NG	NG																												0.0000632
Tin	mg/L	NG	NG	NG	NG	NG																												<0.00001
Titanium	mg/L	NG	NG	NG	NG	NG																												0.000926
Tungsten	mg/L	NG	NG	NG	NG	NG																												0.000011
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00096	0.00066	0.00069	0.00063	0.00072	0.00058	0.00046	0.00049	0.00078	0.00265	0.00245	0.000928	0.00103	0.000951	0.00108	0.00103	0.00104	0.00112	0.000823	0.000764	0.00135	0.00159	0.00166	0.000522	0.0011	0.00213	0.00104	0.00676
Vanadium	mg/L	NG	NG	NG	NG	NG	0.00006	<0.0001	0.0001	0.0002	0.0003	<0.0005	<0.0005	0.0002	0.0016	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.00011	0.000142
Yttrium	mg/L	NG	NG	NG	NG	NG																												0.000535
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.0021	<0.002	<0.002	<0.002	<0.002	0.006	0.003	0.006	0.003	<0.001	<0.001	0.0013	0.0012	<0.001	0.0017	<0.005	<0.001	0.0034	<0.001	<0.001	<0.001	<0.001	0.0172	0.003	0.0036	<0.006	0.0074	0.00058	0.00043
Zirconium	mg/L	NG	NG	NG	NG	NG																												0.000236
Dissolved Metals																																		
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1	2	0.05	0.04	0.036	0.036	0.025	0.06	0.026	0.025	0.018	0.0041	<0.007	0.0106	0.0136	<0.009	0.0062	0.0059	0.0066	0.0097	0.0158	0.0135	0.0414	0.0752	0.0617		0.0305	0.0474	0.0187	
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0004	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	0.00003	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00064	<0.0001	<0.0001	<0.0001	<0.0001	0.0001		<0.0001	<0.0001	0.0003404	
Arsenic	mg/L	NG	0.01	0.005	NG	NG	<0.0004	0.0001	<0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	<0.0001	0.00022	0.00024	0.00016	0.00019	0.00039	0.00018	0.00031	0.0002	0.00045	0.00016	0.00019	0.00016	0.00021	0.00027		0.00019	0.0002	0.000235	
Barium	mg/L	NG	1	NG	NG	NG	0.0023	<0.003	0.005	<0.003	<0.003	0.00487	0.00372	0.00375	0.00199	0.00551	0.00634	0.00509	0.00505	0.00495	0.00471	0.00503	0.00571	0.00837	0.00548	0.00565	0.0094	0.0121	0.0133		0.00787	0.00983	0.0047	
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.0005	<0.0005	<0.0005	0.0000034	
Boron	mg/L	NG	5	1.5	NG	NG	0.003	<0.004	<0.004	<0.004	<0.004	<0.001	0.002	0.09	<0.001	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.01105	
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.0001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00005	<0.00005	<0.00005	<0.00005	<0.000005	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG		1.5	1.8	2	1.7	1.2	2.6	3	3.6	6.47	7.05	4.69	4.95	6	6.49	6.58	7.68	9.91	6.28	6.92	8.23	11.1	11.1	1.85	6.84	7.3	5.22	8.56
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0003	0.0031	0.0004	0.0034	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00052	<0.0005	<0.0005	<0.0005	0.000135	
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00002	0.00008	0.00004	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00013	0.00017	0.00018	<0.0001	<0.0001	<0.0001	<0.0001	0.0000455	
Copper	mg/L	1	NG	0.002[9]	NG	NG	0.0014	0.0064	0.0039	0.0016	<0.001	0.0003	0.0034	0.0022	0.0014	0.00203	0.0023	0.00192	0.00156	0.00168	0.00147	0.00189	0.00178	0.00249	0.00166	0.00178	0.00217	0.00138	0.00312	0.00088	0.00059	0.00322	0.00204	
Iron	mg/L	0.3	NG	0.3	NG	NG	0.023	0.02	0.04	<0.1	<0.1	<0.1	<0.1	0.03	<0.1	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.035	0.038	0.03	<0.03	<0.03	<0.03	0.051	
Lead	mg/L	NG	0.01	0.001[9]	NG	NG	<0.0001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00009	0.00006	0.00006	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00005	<0.00005	<0.00005	<0.00005	0.000254	0.0000668
Magnesium	mg/L	NG	NG	NG	NG	NG		0.7	<0.5	1	1.1	0.7	1.3	1.3	1.9	3.28	3.82	2.44	2.54	3.21	3.42	3.55	4.09	5.83	3.27	3.88	4.59	6.56	6.19	0.887	4.14	3.47	2.96	5.12
Manganese	mg/L	0.05	NG	NG	NG	NG	0.001	0.004	0.002	<0.01	<0.01	<0.01	<0.01	0.004	<0.01	<0.00005	0.000087	<0.00005	0.000435	0.000627	0.000847	0.000179	0.00089	0.00115	0.000376	0.000136	0.00357	0.00203	0.00201	0.00495	0.0013	0.000786	0.00582	
Mercury	mg/L	NG	0.001	0.000026	NG	NG		<0.0002	<0.0002	<0.0001	<0.0001	<0.00005	<0.00005	<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.0002	<0.0003	<0.0003	<0.0003	<0.0003	0.00007	0.00021	0.00006	<0.00005	0.000104	0.000108	0.000089	0.000104	0.000106	0.000131	0.000145	0.000129	0.000157	0.000151	0.000174	0.000214	0.000258	0.00024	0.000109	0.000236	0.000292	0.000435	
Nickel	mg/L	NG	NG	0.025[9]	NG	NG	0.0003	0.0004	0.0003	0.0002	<0.0001	0.0006	0.0043	0.00038	0.00064	0.00061	0.00066	0.00085	0.00099	0.001	0.00078	0.00101	0.00089	0.00137	0.00103	0.00092	0.00117	0.00185	0.00181	0.00177	0.00117	0.00131	0.00107	
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	0.002	<0.005	<0.005	<0.005			<0.005	0.002	<0.01	0.004	0.0023	0.0025	<0.002	<0.002	<0.002	<0.002	<0.002	0.0022	0.0026	0.0022	0.0029	0.0046	0.0031	0.0084	<0.002	0.0026	0.0013	0.0044
Potassium	mg/L	NG	NG	NG	NG	NG		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.4	<0.5	0.7	0.74	0.6	0.61	0.75	0.78	0.83	0.9	1.23	0.87	0.96	0.93	1.38	1.36	0.52	0.84	0.86	0.66	1.08
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0006	<0.0006	0.0001	<0.0006	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	0.000054	
Silicon	mg/L	NG	NG	NG	NG	NG		0.65	0.47	0.65	0.97	0.47	0.51	0.73	0.86	1.31	1.4	0.669	0.69	0.646	0.678	0.597	0.

Table D.4: Water Quality Station Analytical Results - JER-AEM-09 Depth

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-09
		AO	MAC		Max. Average	Max. Grab	15-Aug-11
							5.5 m
Physical Parameters							
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.7
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	63.9
Hardness	mg/L	NG	NG	NG	NG	NG	25.1
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	4.9
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	4.9
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	51
Turbidity	NTU	NG	NG	NG	NG	NG	0.36
Anions							
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	26.9
Ammonia as N	mg/L	NG	NG	3.98 [5]	6	12	0.0247
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	0.0042
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	0.719
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	<0.05
Chloride - Cl	mg/L	250	NG	120	500	1000	1.56
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<5
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	3.89
Total Metals							
Aluminum	mg/L	0.1 [7]	NG	0.100 [8]	1.5	3	0.0217
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0000409
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.000223
Barium	mg/L	NG	1	NG	NG	NG	0.00472
Beryllium	mg/L	NG	NG	NG	NG	NG	0.000004
Boron	mg/L	NG	5	1.5	NG	NG	0.0074
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	5.52
Chromium	mg/L	NG	0.05	NG	0.087	0.17	0.000129
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0000507
Copper	mg/L	1	NG	0.002 [9]	0.02	0.04	0.00213
Iron	mg/L	0.3	NG	0.3	NG	NG	0.065
Lead	mg/L	NG	0.01	0.001 [9]	0.01	0.02	0.0000105
Magnesium	mg/L	NG	NG	NG	NG	NG	3.08
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00717
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.000409
Nickel	mg/L	NG	NG	0.025 [9]	0.05	0.1	0.0011
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	0.0038
Potassium	mg/L	NG	NG	NG	NG	NG	0.801
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.00004
Silicon	mg/L	NG	NG	NG	NG	NG	0.552
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	2.28
Strontium	mg/L	NG	NG	NG	NG	NG	0.0186
Thallium	mg/L	NG	NG	0.0008	NG	NG	0.0000179
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00105
Vanadium	mg/L	NG	NG	NG	NG	NG	0.000099
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.00044
Dissolved Metals							
Aluminum	mg/L	0.1 [7]	NG	0.100 [8]	1	2	0.0178
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0000408
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00021
Barium	mg/L	NG	1	NG	NG	NG	0.00461
Beryllium	mg/L	NG	NG	NG	NG	NG	0.0000036
Boron	mg/L	NG	5	1.5	NG	NG	0.0105
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	5.23
Chromium	mg/L	NG	0.05	NG	NG	NG	0.000124
Cobalt	mg/L	NG	NG	NG	NG	NG	0.000035
Copper	mg/L	1	NG	0.002 [9]	NG	NG	0.00197
Iron	mg/L	0.3	NG	0.3	NG	NG	0.037
Lead	mg/L	NG	0.01	0.001 [9]	NG	NG	0.0000074
Magnesium	mg/L	NG	NG	NG	NG	NG	2.92
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00156
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.000419
Nickel	mg/L	NG	NG	0.025 [9]	NG	NG	0.00108
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	0.0012
Potassium	mg/L	NG	NG	NG	NG	NG	0.62
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.00004
Silicon	mg/L	NG	NG	NG	NG	NG	0.543
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	2.3
Strontium	mg/L	NG	NG	NG	NG	NG	0.0192
Thallium	mg/L	NG	NG	0.0008	NG	NG	0.0000152
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000953
Vanadium	mg/L	NG	NG	NG	NG	NG	0.000087
Zinc	mg/L	5	NG	0.03	NG	NG	0.00132

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term exposures (for clear flow)
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background levels when background is >250 mg/L (high flow)

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.5: Water Quality Station Analytical Results - JER-AEM-10

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-10				JER-AEM-10
		AO	MAC		Max. Average	Max. Grab	1-Jun-05	28-Jun-05	29-Jul-05	26-Aug-05	24-Sep-05
Physical Parameters											
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	6.8	**6.06**	**6.48**	7.15	6.94
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG		31	46	34	30
Hardness	mg/L	NG	NG	NG	NG	NG		11.4	18.7	14.1	10.8
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG		2	3	3	2
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG		1	2	3	3
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	7	<2	<2	<2	<2
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000		44	16	16	<10
Turbidity	NTU	NG	NG	NG	NG	NG	6	1	1	<1	<1
Anions											
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5	2	4	2	6
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG					
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG		<1	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG		12	17	14	11
Ammonia as N	mg/L	NG	NG	1.26-125 [5]	6	12		<0.1	<0.1	<0.1	<0.1
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]		<0.05	<0.05	<0.05	<0.05
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]		0.59	0.43	0.3	0.44
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG					
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG		0.03	0.05	0.03	0.03
Chloride - Cl	mg/L	250	NG	120	500	1000		1.4	3.5	2.2	1.8
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG		<1	<1	<1	<1
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG		<0.2	<0.2	<0.2	<0.2
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG		<0.5	1	0.6	<0.5
Ionic Balance	N/A	NG	NG	NG	NG	NG		0.99	0.96	0.98	0.9
Total Metals											
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1.5	3		0.064	0.048	0.034	0.033
Antimony	mg/L	NG	0.006	NG	NG	NG		<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1		<0.0004	<0.0004	<0.0004	<0.0004
Barium	mg/L	NG	1	NG	NG	NG		<0.005	0.011	0.006	0.006
Beryllium	mg/L	NG	NG	NG	NG	NG		<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG					
Boron	mg/L	NG	5	1.5	NG	NG		<0.01	<0.01	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024		*<0.0002*	*<0.0002*	*<0.0001*	*<0.0001*
Calcium	mg/L	NG	NG	NG	NG	NG		2.58	4.69	3.51	3.02
Cesium	mg/L	NG	NG	NG	NG	NG					
Chromium	mg/L	NG	0.05	NG	0.087	0.17		<0.0009	<0.0009	<0.0009	0.0019
Cobalt	mg/L	NG	NG	NG	NG	NG		<0.0001	<0.0001	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002 [9]	0.02	0.04		0.0014	0.0017	0.002	0.0022
Gallium	mg/L	NG	NG	NG	NG	NG					
Iron	mg/L	0.3	NG	0.3	NG	NG				<0.1	<0.1
Lead	mg/L	NG	0.01	0.001-0.0019 [9]	0.01	0.02		<0.0001	<0.0001	<0.0001	0.0004
Lithium	mg/L	NG	NG	NG	NG	NG					
Magnesium	mg/L	NG	NG	NG	NG	NG		1.02	1.4	1.36	1.21
Manganese	mg/L	0.05	NG	NG	NG	NG				<0.01	<0.01
Mercury	mg/L	NG	0.001	0.000026	NG	NG		*<0.0002*	*<0.0002*	*<0.0001*	*<0.0001*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5		<0.0005	<0.0005	<0.0005	<0.0005
Nickel	mg/L	NG	NG	0.025-0.070 [9]	0.05	0.1		<0.0006	<0.0006	<0.0006	<0.0006
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4		*<0.05*	*<0.05*	*<0.05*	*<0.05*
Potassium	mg/L	NG	NG	NG	NG	NG		<0.5	<0.5	<0.5	<0.5
Rhenium	mg/L	NG	NG	NG	NG	NG					
Rubidium	mg/L	NG	NG	NG	NG	NG					
Selenium	mg/L	NG	0.01	0.001	NG	NG		<0.0008	<0.0008	<0.0008	<0.0008
Silicon	mg/L	NG	NG	NG	NG	NG		0.62	1.21	0.66	1.35
Silver	mg/L	NG	NG	0.0001	NG	NG		*<0.0002*	*<0.0002*	*<0.0002*	*<0.0002*
Sodium	mg/L	200	NG	NG	NG	NG		0.8	0.8	<0.5	0.9
Strontium	mg/L	NG	NG	NG	NG	NG				0.0174	0.0127
Tellurium	mg/L	NG	NG	NG	NG	NG					
Thallium	mg/L	NG	NG	0.0008	NG	NG		<0.00005	<0.00005	<0.00005	<0.00005
Thorium	mg/L	NG	NG	NG	NG	NG					
Tin	mg/L	NG	NG	NG	NG	NG					
Titanium	mg/L	NG	NG	NG	NG	NG					
Tungsten	mg/L	NG	NG	NG	NG	NG					
Uranium	mg/L	NG	0.02	0.015	0.5	1		0.00037	0.00023	0.00016	0.00011
Vanadium	mg/L	NG	NG	NG	NG	NG		<0.0001	0.0001	0.0002	0.0004
Yttrium	mg/L	NG	NG	NG	NG	NG					
Zinc	mg/L	5	NG	0.03	0.25	0.5		<0.002	<0.002	0.005	0.006
Zirconium	mg/L	NG	NG	NG	NG	NG					
Dissolved Metals											
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1	2		0.049	0.039	0.023	0.022
Antimony	mg/L	NG	0.006	NG	NG	NG		<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	NG	NG		0.0002	<0.0001	0.0002	<0.0001
Barium	mg/L	NG	1	NG	NG	NG		0.008	0.008	0.006	0.006
Beryllium	mg/L	NG	NG	NG	NG	NG		<0.0001	<0.0001	<0.0001	<0.0001
Boron	mg/L	NG	5	1.5	NG	NG		<0.004	<0.004	<0.004	<0.004
Cadmium	mg/L	NG	0.005	0.00009	NG	NG		<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG		2.8	4.9	3.4	3
Chromium	mg/L	NG	0.05	NG	NG	NG		0.0004	<0.0004	<0.0004	0.0013
Cobalt	mg/L	NG	NG	NG	NG	NG		0.00007	<0.00005	<0.00005	<0.00005
Copper	mg/L	1	NG	0.002 [9]	NG	NG		0.0049	0.0064	0.0011	0.0061
Iron	mg/L	0.3	NG	0.3	NG	NG		0.02	<0.01	<0.1	<0.01
Lead	mg/L	NG	0.01	0.001-0.0019 [9]	NG	NG		0.00005	<0.00005	<0.00005	0.00056
Magnesium	mg/L	NG	NG	NG	NG	NG		1.1	1.6	1.4	0.8
Manganese	mg/L	0.05	NG	NG	NG	NG		0.008	0.003	<0.01	0.007
Mercury	mg/L	NG	0.001	0.000026	NG	NG		*<0.0002*	*<0.0002*	*<0.0001*	*<0.0001*
Molybdenum	mg/L	NG	NG	0.073	NG	NG		<0.0003	<0.0003	<0.0003	<0.0003
Nickel	mg/L	NG	NG	0.025-0.070 [9]	NG	NG		<0.0001	0.0006	0.0004	<0.0001
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG		*<0.005*	*<0.005*	*<0.005*	*<0.005*
Potassium	mg/L	NG	NG	NG	NG	NG		<0.5	<0.5	<0.5	<0.5
Selenium	mg/L	NG	0.01	0.001	NG	NG		<0.0004	<0.0004	<0.0004	<0.0004
Silicon	mg/L	NG	NG	NG	NG	NG		0.65	0.13	0.71	1.32
Silver	mg/L	NG	NG	0.0001	NG	NG		<0.00005	<0.00005	<0.00005	<0.00005
Sodium	mg/L	200	NG	NG	NG	NG		1	0.9	0.6	0.7
Strontium	mg/L	NG	NG	NG	NG	NG				0.0166	0.0132
Thallium	mg/L	NG	NG	0.0008	NG	NG		<0.00002	0.00016	<0.00002	<0.00002
Uranium	mg/L	NG	0.02	0.015	0.5	1		0.00035	0.00018	0.00016	0.00015
Vanadium	mg/L	NG	NG	NG	NG	NG		<0.0005	<0.0005	<0.0005	<0.0005
Zinc	mg/L	5	NG	0.03	NG	NG		0.003	0.002	<0.002	<0.002

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term exposures (for clear flow)
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background levels when background is >250 mg/L (high flow)

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.5: Water Quality Station Analytical Results - JER-AEM-10

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-10			
		AO	MAC		Max. Average	Max. Grab	27-Jun-06	6-Aug-06	12-Sep-06	26-Jun-07
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	6.75		7.4	7.26
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	15		80	65.1
Hardness	mg/L	NG	NG	NG	NG	NG	<6		30	25.4
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	2.8		4.2	4.53
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	0.2		4.3	3.59
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<2		<2	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	13		28	39
Turbidity	NTU	NG	NG	NG	NG	NG				
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	2		2	5.4
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG				
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1		<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	10		25	15.8
Ammonia as N	mg/L	NG	NG	1.26-125 [5]	6	12	0.02	0.01	0.02	0.0102
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	<0.05		<0.05	0.0033
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	<0.05		1.22	1.35
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	*<1*		*<1*	
Chloride - Cl	mg/L	250	NG	120	500	1000	0.2		4	3.71
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	0.04		0.04	
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.2		<0.2	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	1.1		3.6	3.65
Ionic Balance	N/A	NG	NG	NG	NG	NG	0.65		0.99	
Total Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1.5	3	0.0372	0.0428	0.0429	0.0615
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.00005	0.00008	<0.00005	<0.0001
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	<0.0002	0.0003	0.0003	0.00019
Barium	mg/L	NG	1	NG	NG	NG	0.0021	0.0126	0.0105	0.00962
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	0	<0.0001	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	<0.001	0.067	0.002	<0.01
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	0	<0.00002	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	1.12	7.63	7.07	5.6
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.00005	0.00008	0.00013	<0.0001
Copper	mg/L	1	NG	0.002 [9]	0.02	0.04	0.0012	0.0027	0.0031	0.00233
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.1	0.02	0.12	0.057
Lead	mg/L	NG	0.01	0.001-0.0019 [9]	0.01	0.02	0.00008	0.0001	0.00014	0.000097
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	<0.5	2.22	2.98	2.62
Manganese	mg/L	0.05	NG	NG	NG	NG	<0.01	0.007	0.02	0.00405
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	<0.00001	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.00005	0.00041	0.00017	0.000163
Nickel	mg/L	NG	NG	0.025-0.070 [9]	0.05	0.1	0.0004	0.0009	0.0014	0.00163
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	*<0.02*	0.003	*<0.02*	0.0047
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	1	0.6	0.83
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	0.0002	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.13	1.43	1.43	1.04
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.0001	0	<0.0001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	<0.5	2.2	1.8	2.26
Strontium	mg/L	NG	NG	NG	NG	NG	0.0047	0.0302	0.0239	0.0215
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	0.00002	<0.00005	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00016	0.00144	0.00165	0.00122
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.0005	0.0003	<0.0005	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.003	0.005	0.007	0.0041
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1	2	0.024	0.0372	0.008	0.0126
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.00005	0.00008	<0.00005	<0.0001
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.0001	0.0003	0.0003	0.00018
Barium	mg/L	NG	1	NG	NG	NG	0.00175	0.0125	0.00941	0.00929
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	0	<0.0001	<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	<0.001	0.051	0.002	<0.01
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	0	<0.00002	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	1.1	7.6	7.2	5.84
Chromium	mg/L	NG	0.05	NG	NG	NG	0.0005	0.0005	0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.00002	0.00008	0.00005	<0.0001
Copper	mg/L	1	NG	0.002 [9]	NG	NG	0.0002	0.0025	0.0031	0.00247
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.1	0.02	<0.1	<0.03
Lead	mg/L	NG	0.01	0.001-0.0019 [9]	NG	NG	0.0001	0.00007	<0.00005	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	0.5	2.2	2.9	2.62
Manganese	mg/L	0.05	NG	NG	NG	NG	<0.01	0.007	0.016	0.000579
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	<0.00001	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.00005	0.00041	<0.00005	0.000193
Nickel	mg/L	NG	NG	0.025-0.070 [9]	NG	NG	0.00006	0.00092	0.001	0.00156
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG		0.002	0.02	0.0027
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	1	0.5	0.86
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0006	<0.0001	<0.0006	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.15	1.4	1.38	0.887
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00005	0.00001	<0.00005	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	<0.5	2.2	1.6	2.29
Strontium	mg/L	NG	NG	NG	NG	NG	0.0046	0.03	0.0218	0.0217
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	0.00001	<0.00005	<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	<0.00005	0.00144	0.0013	0.00111
Vanadium	mg/L	NG	NG	NG	NG	NG	0.0001	0.0003	0.0004	<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	<0.001	0.003	0.003	0.0039

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (P

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for l
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% o

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.5: Water Quality Station Analytical Results - JER-AEM-10

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-10		
		AO	MAC		Max. Average	Max. Grab	22-Jul-07	11-Aug-07	25-Aug-07
Physical Parameters									
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.62	7.56	7.5
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	132	115	105
Hardness	mg/L	NG	NG	NG	NG	NG	48.4	43.9	40.2
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3.92	3.62	3.95
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	6.83	5.19	5.13
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	101	74	74
Turbidity	NTU	NG	NG	NG	NG	NG			
Anions									
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	1.9	1.1	3.2
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG			
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	31.6	28.1	26.3
Ammonia as N	mg/L	NG	NG	1.26-125 [5]	6	12	0.0078	<0.005	<0.005
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	0.0012	<0.001	<0.001
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	3.97	2.71	2.32
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG			
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG			
Chloride - Cl	mg/L	250	NG	120	500	1000	6.18	5.97	5.58
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG			
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	0.0015	<0.001	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	7.85	7.83	6.77
Ionic Balance	N/A	NG	NG	NG	NG	NG			
Total Metals									
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1.5	3	0.0193	0.0154	0.0199
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.0002	0.00014	0.00019
Barium	mg/L	NG	1	NG	NG	NG	0.018	0.0149	0.0135
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG			
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	11.4	10.3	9.83
Cesium	mg/L	NG	NG	NG	NG	NG			
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002 [9]	0.02	0.04	0.00197	0.0018	0.00188
Gallium	mg/L	NG	NG	NG	NG	NG			
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	<0.03
Lead	mg/L	NG	0.01	0.001-0.0019 [9]	0.01	0.02	<0.00005	<0.00005	<0.00005
Lithium	mg/L	NG	NG	NG	NG	NG			
Magnesium	mg/L	NG	NG	NG	NG	NG	4.8	4.39	3.87
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00393	0.00558	0.0022
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.000587	0.000358	0.000365
Nickel	mg/L	NG	NG	0.025-0.070 [9]	0.05	0.1	0.00116	0.00085	0.00089
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	0.0051	0.0032	0.0023
Potassium	mg/L	NG	NG	NG	NG	NG	1.26	1.01	1.06
Rhenium	mg/L	NG	NG	NG	NG	NG			
Rubidium	mg/L	NG	NG	NG	NG	NG			
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	1.66	1.36	1.38
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	3.84	3.39	3.27
Strontium	mg/L	NG	NG	NG	NG	NG	0.0474	0.0425	0.0363
Tellurium	mg/L	NG	NG	NG	NG	NG			
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG			
Tin	mg/L	NG	NG	NG	NG	NG			
Titanium	mg/L	NG	NG	NG	NG	NG			
Tungsten	mg/L	NG	NG	NG	NG	NG			
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000913	0.000547	0.000792
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG			
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.003	0.0026	0.0029
Zirconium	mg/L	NG	NG	NG	NG	NG			
Dissolved Metals									
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1	2	0.0148		*<0.01*
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001		<0.0001
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00019		0.00019
Barium	mg/L	NG	1	NG	NG	NG	0.0178		0.0133
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005		<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	<0.01		<0.01
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005		<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	11.4		9.83
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005		<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001		<0.0001
Copper	mg/L	1	NG	0.002 [9]	NG	NG	0.00186		0.00167
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03		<0.03
Lead	mg/L	NG	0.01	0.001-0.0019 [9]	NG	NG	<0.00005		<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	4.8		3.81
Manganese	mg/L	0.05	NG	NG	NG	NG	0.000619		0.000435
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*		*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.000586		0.000355
Nickel	mg/L	NG	NG	0.025-0.070 [9]	NG	NG	0.00102		0.00084
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	0.0021	<0.002	<0.002
Potassium	mg/L	NG	NG	NG	NG	NG	1.25		1.05
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001		<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	1.65		1.35
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001		<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	3.83		3.21
Strontium	mg/L	NG	NG	NG	NG	NG	0.0471		0.0362
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001		<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000855		0.000676
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001		<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	0.0026		0.0024

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (P

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for l
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% o

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.5: Water Quality Station Analytical Results - JER-AEM-10

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-10		
		AO	MAC		Max. Average	Max. Grab	16-Jul-08	6-Aug-08	18-Sep-08
Physical Parameters									
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.51	7.61	7.48
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	105	117	212
Hardness	mg/L	NG	NG	NG	NG	NG	37.2	44.4	65.8
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3.33	3.22	6.03
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	5.12	6.03	2.62
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	70	84	155
Turbidity	NTU	NG	NG	NG	NG	NG			
Anions									
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	3.6	3.5	4.8
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG			
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	24.5	27.4	14.1
Ammonia as N	mg/L	NG	NG	1.26-125 [5]	6	12	0.0065	0.0082	0.332
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	0.002	0.003	0.145
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	3.04	3.44	**14.3**
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG			
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG			
Chloride - Cl	mg/L	250	NG	120	500	1000	5.65	5.94	8.1
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG			
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	0.0011	<0.001	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	5.78	6.58	8.81
Ionic Balance	N/A	NG	NG	NG	NG	NG			
Total Metals									
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1.5	3	0.0316	0.0294	0.037
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00021	0.0002	0.00017
Barium	mg/L	NG	1	NG	NG	NG	0.0114	0.014	0.0179
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG			
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	8.71	10.1	13.8
Cesium	mg/L	NG	NG	NG	NG	NG			
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	0.00022
Copper	mg/L	1	NG	0.002 [9]	0.02	0.04	0.00245	0.00259	0.00281
Gallium	mg/L	NG	NG	NG	NG	NG			
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	0.033
Lead	mg/L	NG	0.01	0.001-0.0019 [9]	0.01	0.02	0.000132	0.00013	0.000117
Lithium	mg/L	NG	NG	NG	NG	NG			
Magnesium	mg/L	NG	NG	NG	NG	NG	3.7	4.15	7.26
Manganese	mg/L	0.05	NG	NG	NG	NG	0.000541	0.000428	0.00281
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.000373	0.00034	0.000179
Nickel	mg/L	NG	NG	0.025-0.070 [9]	0.05	0.1	0.00126	0.0011	0.00145
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	0.0037	0.0027	0.0039
Potassium	mg/L	NG	NG	NG	NG	NG	1.01	1.09	1.17
Rhenium	mg/L	NG	NG	NG	NG	NG			
Rubidium	mg/L	NG	NG	NG	NG	NG			
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.997	1.2	2.09
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	3.68	4	4.57
Strontium	mg/L	NG	NG	NG	NG	NG	0.0275	0.0335	0.0523
Tellurium	mg/L	NG	NG	NG	NG	NG			
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG			
Tin	mg/L	NG	NG	NG	NG	NG			
Titanium	mg/L	NG	NG	NG	NG	NG			
Tungsten	mg/L	NG	NG	NG	NG	NG			
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00316	0.00381	0.00151
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG			
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.001	<0.001	<0.001
Zirconium	mg/L	NG	NG	NG	NG	NG			
Dissolved Metals									
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1	2	0.0096	0.0085	0.031
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00018	0.0002	0.00016
Barium	mg/L	NG	1	NG	NG	NG	0.0113	0.0144	0.017
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	8.84	10.6	13.9
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	0.0002
Copper	mg/L	1	NG	0.002 [9]	NG	NG	0.00226	0.00253	0.0027
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	<0.03
Lead	mg/L	NG	0.01	0.001-0.0019 [9]	NG	NG	0.000072	0.000059	0.00008
Magnesium	mg/L	NG	NG	NG	NG	NG	3.67	4.36	7.53
Manganese	mg/L	0.05	NG	NG	NG	NG	0.000234	0.000164	0.00259
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.000408	0.000366	0.000178
Nickel	mg/L	NG	NG	0.025-0.070 [9]	NG	NG	0.00131	0.00117	0.00156
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	0.0023	0.002	0.0038
Potassium	mg/L	NG	NG	NG	NG	NG	1.02	1.14	1.17
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.919	1.14	2.05
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	3.69	4.2	4.66
Strontium	mg/L	NG	NG	NG	NG	NG	0.0276	0.0346	0.0512
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00315	0.00395	0.00141
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	<0.001	<0.001	<0.001

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
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2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (P

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for l
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% o

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.5: Water Quality Station Analytical Results - JER-AEM-10

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-10			
		AO	MAC		Max. Average	Max. Grab	14-Jun-09	12-Jul-09	1-Aug-11	26-Aug-14
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.07	6.52	7.78	7.52
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	24.4	98.5	90.4	84.2
Hardness	mg/L	NG	NG	NG	NG	NG	9.37	38.8	38.4	34.2
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	5.43	4.96	4.4	7.2
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	0.88	2.36	8	
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	29	61	66	42.5
Turbidity	NTU	NG	NG	NG	NG	NG	1.29	0.44	0.25	0.61
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	2.1	5.6	<5	
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG				30.4
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<5	<5
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	6.7	12.3	39.6	37
Ammonia as N	mg/L	NG	NG	1.26-125 [5]	6	12	0.0563	0.0355	<0.005	0.0102
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	<0.001	<0.001	<0.002	0.002
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	0.551	5.4	1.06	0.548
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG			<0.05	0.027
Chloride - Cl	mg/L	250	NG	120	500	1000	0.67	3.71	1.74	1.2
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<1	<1	<5	<5
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	0.0026	<0.001	<0.001	
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	1.06	5.53	5.94	5.95
Ionic Balance	N/A	NG	NG	NG	NG	NG				
Total Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1.5	3	**0.118**	0.0399	0.0298	0.0395
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.0001	0.0000438	0.0000435
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00017	0.00019	0.000193	0.000291
Barium	mg/L	NG	1	NG	NG	NG	0.00473	0.0102	0.0137	0.00775
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	0.0000051	0.0000116
Bismuth	mg/L	NG	NG	NG	NG	NG				<0.000001
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.01	0.0089	0.0115
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.00005	<0.000005	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	2.39	7.66	8.48	7.51
Cesium	mg/L	NG	NG	NG	NG	NG				0.0000141
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	<0.0005	0.000115	0.000201
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	0.0001	0.0000929	0.0000743
Copper	mg/L	1	NG	0.002 [9]	0.02	0.04	0.00194	0.00232	0.00289	0.00374
Gallium	mg/L	NG	NG	NG	NG	NG				<0.00005
Iron	mg/L	0.3	NG	0.3	NG	NG	0.089	<0.03	0.023	0.058
Lead	mg/L	NG	0.01	0.001-0.0019 [9]	0.01	0.02	0.00014	0.000097	0.0000201	0.0000639
Lithium	mg/L	NG	NG	NG	NG	NG				0.00063
Magnesium	mg/L	NG	NG	NG	NG	NG	1.15	4.31	4.27	4.02
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00863	0.000933	0.00582	0.0025
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	<0.000005
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.000118	0.000203	0.000363	0.000535
Nickel	mg/L	NG	NG	0.025-0.070 [9]	0.05	0.1	0.00213	0.00143	0.00135	0.00138
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	0.0146	<0.002	0.0038	*<0.05*
Potassium	mg/L	NG	NG	NG	NG	NG	0.61	0.87	1.08	0.915
Rhenium	mg/L	NG	NG	NG	NG	NG				<0.000005
Rubidium	mg/L	NG	NG	NG	NG	NG				0.00153
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	0.000041	0.000073
Silicon	mg/L	NG	NG	NG	NG	NG	0.803	1.24	1.37	1.41
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.000005	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	0.69	3	3	2.51
Strontium	mg/L	NG	NG	NG	NG	NG	0.00937	0.0302	0.032	0.0252
Tellurium	mg/L	NG	NG	NG	NG	NG				<0.00001
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	0.0000165	0.0000026
Thorium	mg/L	NG	NG	NG	NG	NG				0.0000519
Tin	mg/L	NG	NG	NG	NG	NG				<0.00001
Titanium	mg/L	NG	NG	NG	NG	NG				0.000777
Tungsten	mg/L	NG	NG	NG	NG	NG				0.000015
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000863	0.00149	0.000735	0.00304
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	0.000148	0.000136
Yttrium	mg/L	NG	NG	NG	NG	NG				0.000358
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.0033	<0.002	0.00593	0.00454
Zirconium	mg/L	NG	NG	NG	NG	NG				0.000158
Dissolved Metals										
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1	2		0.0317	0.0198	
Antimony	mg/L	NG	0.006	NG	NG	NG		<0.0001	0.0000487	
Arsenic	mg/L	NG	0.01	0.005	NG	NG		0.0002	0.000186	
Barium	mg/L	NG	1	NG	NG	NG		0.0104	0.0119	
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	0.0000047	
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.01	0.0129	
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.000005	
Calcium	mg/L	NG	NG	NG	NG	NG	2.14	8.02	8.4	7.14
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	<0.0005	0.000103	
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	0.0001	0.0000618	
Copper	mg/L	1	NG	0.002 [9]	NG	NG	0.00085	0.00196	0.00258	
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	<0.01	
Lead	mg/L	NG	0.01	0.001-0.0019 [9]	NG	NG	<0.00005	0.000053	0.0000052	
Magnesium	mg/L	NG	NG	NG	NG	NG	0.98	4.55	4.22	3.98
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00224	0.000524	0.00351	
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.000079	0.00022	0.000391	
Nickel	mg/L	NG	NG	0.025-0.070 [9]	NG	NG	0.00167	0.00137	0.0012	
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	0.0082	<0.002	0.001	0.0041
Potassium	mg/L	NG	NG	NG	NG	NG	0.52	0.91	1.03	0.88
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.00004	
Silicon	mg/L	NG	NG	NG	NG	NG	0.71	1.28	1.35	
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.000005	
Sodium	mg/L	200	NG	NG	NG	NG	0.61	3.13	3	2.6
Strontium	mg/L	NG	NG	NG	NG	NG	0.00829	0.032	0.0298	
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	0.0000156	
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000684	0.000232	0.000683	
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	0.000103	
Zinc	mg/L	5	NG	0.03	NG	NG	0.0027	0.0043	0.00563	

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (P

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for l
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% o

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.6: Water Quality Station Analytical Results - JER-AEM-11

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-11	
		AO	MAC		Max. Average	Max. Grab	30-Jul-05	11-Jul-06
Physical Parameters								
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	5.43	7.31
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	14	58
Hardness	mg/L	NG	NG	NG	NG	NG	<6	20
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3	3.5
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	<1	2.1
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<2	<2
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	16	40
Turbidity	NTU	NG	NG	NG	NG	NG	2	
Anions								
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	3	1
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG		
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	8	22
Ammonia as N	mg/L	NG	NG	12.5-125 [5]	6	12	<0.1	0.02
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	<0.05	<0.05
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	<0.05	0.86
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG		
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	0.05	*<1*
Chloride - Cl	mg/L	250	NG	120	500	1000	0.2	3.3
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<1	0.04
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.2	<0.2
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	0.8	3.7
Ionic Balance	N/A	NG	NG	NG	NG	NG	0.79	0.8
Total Metals								
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1.5	3	0.027	**0.167**
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.00005
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	<0.0004	0.0003
Barium	mg/L	NG	1	NG	NG	NG	<0.005	0.0107
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0001
Bismuth	mg/L	NG	NG	NG	NG	NG		
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	0.003
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	*<0.0002*	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	1.15	5.16
Cesium	mg/L	NG	NG	NG	NG	NG		
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0009	0.0013
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	0.0001
Copper	mg/L	1	NG	0.002 [9]	0.02	0.04	<0.001	0.0018
Gallium	mg/L	NG	NG	NG	NG	NG		
Iron	mg/L	0.3	NG	0.3	NG	NG		0.17
Lead	mg/L	NG	0.01	0.001 [9]	0.01	0.02	<0.0001	0.00014
Lithium	mg/L	NG	NG	NG	NG	NG		
Magnesium	mg/L	NG	NG	NG	NG	NG	0.57	1.64
Manganese	mg/L	0.05	NG	NG	NG	NG		<0.01
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.0002*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.0005	0.00011
Nickel	mg/L	NG	NG	0.025 [9]	0.05	0.1	<0.0006	0.0013
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	*<0.05*	*<0.02*
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	0.5
Rhenium	mg/L	NG	NG	NG	NG	NG		
Rubidium	mg/L	NG	NG	NG	NG	NG		
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0008	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.19	0.67
Silver	mg/L	NG	NG	0.0001	NG	NG	*<0.0002*	<0.0001
Sodium	mg/L	200	NG	NG	NG	NG	0.6	1.4
Strontium	mg/L	NG	NG	NG	NG	NG		0.0234
Tellurium	mg/L	NG	NG	NG	NG	NG		
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	<0.00005
Thorium	mg/L	NG	NG	NG	NG	NG		
Tin	mg/L	NG	NG	NG	NG	NG		
Titanium	mg/L	NG	NG	NG	NG	NG		
Tungsten	mg/L	NG	NG	NG	NG	NG		
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00016	0.00113
Vanadium	mg/L	NG	NG	NG	NG	NG	0.0002	0.0005
Yttrium	mg/L	NG	NG	NG	NG	NG		
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.002	0.005
Zirconium	mg/L	NG	NG	NG	NG	NG		
Dissolved Metals								
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1	2	0.013	0.022
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.00005
Arsenic	mg/L	NG	0.01	0.005	NG	NG	<0.0001	0.0003
Barium	mg/L	NG	1	NG	NG	NG	<0.003	0.00891
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001
Boron	mg/L	NG	5	1.5	NG	NG	<0.004	0.003
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	1.1	5
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0004	<0.0003
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.00005	0.00006
Copper	mg/L	1	NG	0.002 [9]	NG	NG	0.0035	0.0053
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.01	<0.1
Lead	mg/L	NG	0.01	0.001 [9]	NG	NG	<0.00005	0.00008
Magnesium	mg/L	NG	NG	NG	NG	NG	0.5	1.8
Manganese	mg/L	0.05	NG	NG	NG	NG	<0.001	<0.01
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.0002*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.0003	0.00029
Nickel	mg/L	NG	NG	0.025 [9]	NG	NG	0.0003	0.0011
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	*<0.005*	*<0.005*
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0004	<0.0006
Silicon	mg/L	NG	NG	NG	NG	NG	0.19	0.49
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00005	<0.00005
Sodium	mg/L	200	NG	NG	NG	NG	0.6	1.4
Strontium	mg/L	NG	NG	NG	NG	NG		0.0243
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00002	<0.00005
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00013	0.00105
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.0005	0.0003
Zinc	mg/L	5	NG	0.03	NG	NG	<0.002	0.005

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term exposures (for clear flow)
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background levels when background is

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.6: Water Quality Station Analytical Results - JER-AEM-11

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-11		
		AO	MAC		Max. Average	Max. Grab	7-Aug-06	15-Aug-11	29-Aug-14
Physical Parameters									
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8		7.01	6.71
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG		11.9	17.9
Hardness	mg/L	NG	NG	NG	NG	NG		5.2	6.7
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG		3.4	3.7
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG		2	
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25		<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000		14	7.3
Turbidity	NTU	NG	NG	NG	NG	NG		0.17	0.4
Anions									
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG		<5	
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG			5.9
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG		<5	<5
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG		<5	7.1
Ammonia as N	mg/L	NG	NG	12.5-125 [5]	6	12	<0.005	<0.005	0.0118
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]		<0.002	0.0024
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]		<0.006	0.0077
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG			
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG		<0.05	<0.02
Chloride - Cl	mg/L	250	NG	120	500	1000		<0.5	<0.5
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG		<5	<5
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG		<0.001	
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG		0.903	1.23
Ionic Balance	N/A	NG	NG	NG	NG	NG			
Total Metals									
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1.5	3	0.0213	0.0152	0.0132
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00001	0.0000074	<0.000005
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.0002	0.000186	0.000205
Barium	mg/L	NG	1	NG	NG	NG	0.00172	0.00166	0.0016
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.000003	<0.000002	0.000002
Bismuth	mg/L	NG	NG	NG	NG	NG			<0.000001
Boron	mg/L	NG	5	1.5	NG	NG	0.02	<0.005	<0.005
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	0	<0.000005	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	1.12	1.17	1.47
Cesium	mg/L	NG	NG	NG	NG	NG			<0.000005
Chromium	mg/L	NG	0.05	NG	0.087	0.17	0.0001	0.000068	0.000098
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00002	0.0000143	0.0000162
Copper	mg/L	1	NG	0.002 [9]	0.02	0.04	0.0018	0.00108	0.00107
Gallium	mg/L	NG	NG	NG	NG	NG			<0.00005
Iron	mg/L	0.3	NG	0.3	NG	NG	0.02	0.014	0.016
Lead	mg/L	NG	0.01	0.001 [9]	0.01	0.02	0.00002	0.0000052	<0.000005
Lithium	mg/L	NG	NG	NG	NG	NG			0.00045
Magnesium	mg/L	NG	NG	NG	NG	NG	0.46	0.628	0.783
Manganese	mg/L	0.05	NG	NG	NG	NG	0.002	0.00218	0.00187
Mercury	mg/L	NG	0.001	0.000026	NG	NG	<0.00001	*<0.00005*	<0.000005
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.00002	0.00003	0.000023
Nickel	mg/L	NG	NG	0.025 [9]	0.05	0.1	0.0003	0.000348	0.000343
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	0.003	0.0025	*<0.05*
Potassium	mg/L	NG	NG	NG	NG	NG	0.3	0.331	0.322
Rhenium	mg/L	NG	NG	NG	NG	NG			<0.000005
Rubidium	mg/L	NG	NG	NG	NG	NG			0.00078
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0001	<0.00004	<0.00004
Silicon	mg/L	NG	NG	NG	NG	NG	0.14	0.238	0.242
Silver	mg/L	NG	NG	0.0001	NG	NG	0	<0.000005	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	0.4	0.52	0.6
Strontium	mg/L	NG	NG	NG	NG	NG	0.0046	0.0049	0.00542
Tellurium	mg/L	NG	NG	NG	NG	NG			<0.00001
Thallium	mg/L	NG	NG	0.0008	NG	NG	<3.0E-7	0.0000116	<0.000001
Thorium	mg/L	NG	NG	NG	NG	NG			0.0000101
Tin	mg/L	NG	NG	NG	NG	NG			<0.00001
Titanium	mg/L	NG	NG	NG	NG	NG			0.000198
Tungsten	mg/L	NG	NG	NG	NG	NG			<0.00001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00014	0.000148	0.000185
Vanadium	mg/L	NG	NG	NG	NG	NG	0.0001	0.00004	0.00004
Yttrium	mg/L	NG	NG	NG	NG	NG			0.0000678
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.005	0.001	0.00066
Zirconium	mg/L	NG	NG	NG	NG	NG			0.00002
Dissolved Metals									
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1	2	0.0177	0.0109	
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00001	0.0000053	
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.0001	0.000178	
Barium	mg/L	NG	1	NG	NG	NG	0.00163	0.00164	
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.000003	<0.000002	
Boron	mg/L	NG	5	1.5	NG	NG	0.02	<0.005	
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	0	<0.000005	
Calcium	mg/L	NG	NG	NG	NG	NG	1.1	1.11	1.46
Chromium	mg/L	NG	0.05	NG	NG	NG	0.0001	0.000058	
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00002	0.0000086	
Copper	mg/L	1	NG	0.002 [9]	NG	NG	0.0017	0.000853	
Iron	mg/L	0.3	NG	0.3	NG	NG	0.01	<0.01	
Lead	mg/L	NG	0.01	0.001 [9]	NG	NG	0.00001	<0.000005	
Magnesium	mg/L	NG	NG	NG	NG	NG	0.4	0.58	0.73
Manganese	mg/L	0.05	NG	NG	NG	NG	0.002	0.000271	
Mercury	mg/L	NG	0.001	0.000026	NG	NG	<0.00001	*<0.00005*	
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.00002	0.000022	
Nickel	mg/L	NG	NG	0.025 [9]	NG	NG	0.00029	0.000313	
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	0.002	0.0015	0.0025
Potassium	mg/L	NG	NG	NG	NG	NG	0.3	0.21	0.33
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0001	<0.00004	
Silicon	mg/L	NG	NG	NG	NG	NG	0.12	0.226	
Silver	mg/L	NG	NG	0.0001	NG	NG	0	<0.000005	
Sodium	mg/L	200	NG	NG	NG	NG	0.4	<1	<1
Strontium	mg/L	NG	NG	NG	NG	NG	0.0046	0.00485	
Thallium	mg/L	NG	NG	0.0008	NG	NG	<6.0E-7	0.0000112	
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00014	0.000132	
Vanadium	mg/L	NG	NG	NG	NG	NG	0.0001	0.000037	
Zinc	mg/L	5	NG	0.03	NG	NG	0.003	0.00123	

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (P

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for l
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% and is >250 mg/L (high f

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.7: Water Quality Station Analytical Results - JER-AEM-12

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-12				JER-A
		AO	MAC		Max. Average	Max. Grab	30-Jun-05	20-Jul-05	31-Jul-05	31-Aug-05	28-Sep-05
Physical Parameters											
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8		7.03			
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG		19			
Hardness	mg/L	NG	NG	NG	NG	NG					
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG		3			
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG		<1			
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<2	<2	<2	<2	<2
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000					
Turbidity	NTU	NG	NG	NG	NG	NG		2		2	
Anions											
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	4	3			
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG					
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG		<1			
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG		8			
Ammonia as N	mg/L	NG	NG	1.26-39.7[5]	6	12		<0.1			
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]		<0.05			
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]		0.05			
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG					
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG		0.06			
Chloride - Cl	mg/L	250	NG	120	500	1000		0.6			
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG		<1			
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG		<0.2			
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG		1.7			
Ionic Balance	N/A	NG	NG	NG	NG	NG		0.36			
Total Metals											
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1.5	3	0.055	**1.44**	0.021	0.06	0.03
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	0.0033	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	<0.0004	0.0007	<0.0004	<0.0004	<0.0004
Barium	mg/L	NG	1	NG	NG	NG	<0.005	<0.005	<0.005	<0.005	<0.005
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG					
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	*<0.0002*	*<0.0002*	*<0.0002*	*<0.0001*	*<0.0001*
Calcium	mg/L	NG	NG	NG	NG	NG	1.14	1.13	1.19	1.38	1.19
Cesium	mg/L	NG	NG	NG	NG	NG					
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0009	0.001	<0.0009	<0.0009	<0.0009
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	0.0002	<0.0001	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002[9]	0.02	0.04	<0.001	**1.64**	0.0012	0.0029	0.0011
Gallium	mg/L	NG	NG	NG	NG	NG					
Iron	mg/L	0.3	NG	0.3	NG	NG	0.11		0.05	0.07	0.03
Lead	mg/L	NG	0.01	0.001[9]	0.01	0.02	<0.0001	**0.138**	0.0001	0.0004	<0.0001
Lithium	mg/L	NG	NG	NG	NG	NG					
Magnesium	mg/L	NG	NG	NG	NG	NG	0.59	0.62	0.58	0.61	0.52
Manganese	mg/L	0.05	NG	NG	NG	NG	0.009		0.008	0.004	0.002
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.0002*	*<0.0002*	*<0.0002*	*<0.0001*	*<0.0001*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	mg/L	NG	NG	0.025[9]	0.05	0.1	<0.0006	0.0112	<0.0006	<0.0006	<0.0006
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	*<0.05*	*<0.05*	0.062	0.089	*<0.05*
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5	<0.5	<0.5
Rhenium	mg/L	NG	NG	NG	NG	NG					
Rubidium	mg/L	NG	NG	NG	NG	NG					
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008
Silicon	mg/L	NG	NG	NG	NG	NG	0.26	0.5	0.19	0.26	0.18
Silver	mg/L	NG	NG	0.0001	NG	NG	*<0.0002*	*0.0005*	*<0.0002*	*<0.0002*	*<0.0002*
Sodium	mg/L	200	NG	NG	NG	NG	0.8	<0.5	0.6	0.8	<0.5
Strontium	mg/L	NG	NG	NG	NG	NG				0.0055	0.0057
Tellurium	mg/L	NG	NG	NG	NG	NG					
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Thorium	mg/L	NG	NG	NG	NG	NG					
Tin	mg/L	NG	NG	NG	NG	NG					
Titanium	mg/L	NG	NG	NG	NG	NG					
Tungsten	mg/L	NG	NG	NG	NG	NG					
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00016	0.00017	0.00013	0.00018	0.00013
Vanadium	mg/L	NG	NG	NG	NG	NG	0.0002	0.001	0.0002	0.0004	0.0005
Yttrium	mg/L	NG	NG	NG	NG	NG					
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.002	0.093	<0.002	0.019	0.003
Zirconium	mg/L	NG	NG	NG	NG	NG					
Dissolved Metals											
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1	2	0.014	0.024	0.011	0.009	0.005
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	0.0006	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.0002	0.0002	<0.0001	0.0002	0.0002
Barium	mg/L	NG	1	NG	NG	NG	0.004	<0.003	<0.003	<0.003	<0.003
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Boron	mg/L	NG	5	1.5	NG	NG	0.008	<0.004	<0.004	<0.004	<0.004
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	1.2	0.6	1.12	1.39	0.65
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0004	0.001	<0.0004	<0.0004	<0.0004
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Copper	mg/L	1	NG	0.002[9]	NG	NG	0.0037	0.213	0.0034	0.0026	0.0025
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	mg/L	NG	0.01	0.001[9]	NG	NG	<0.00005	**0.0278**	<0.00005	<0.00005	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	0.56	<0.5	0.52	<0.5	<0.5
Manganese	mg/L	0.05	NG	NG	NG	NG	0.003	0.002	0.002	<0.001	<0.001
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.0002*	*<0.0002*	*<0.0002*	*<0.0001*	*<0.0001*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.0003	0.0003	<0.0003	<0.0003	<0.0003
Nickel	mg/L	NG	NG	0.025[9]	NG	NG	0.0003	0.0022	0.0003	0.0006	<0.0001
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5	0.7	<0.5
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Silicon	mg/L	NG	NG	NG	NG	NG	0.22	0.18	0.16	0.21	0.2
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Sodium	mg/L	200	NG	NG	NG	NG	<0.5	<0.5	<0.5	0.7	<0.5
Strontium	mg/L	NG	NG	NG	NG	NG				0.0064	0.0054
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00014	<0.00005	0.00009	0.00012	0.00008
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	mg/L	5	NG	0.03	NG	NG	0.003	0.048	<0.002	0.021	0.004

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term exposures (for clear flow)
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background levels when background is >250 mg/L (high flow)

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.7: Water Quality Station Analytical Results - JER-AEM-12

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		EM-12				JER-AEM-12
		AO	MAC		Max. Average	Max. Grab	27-Jun-06	12-Jul-06	7-Aug-06	9-Aug-06	13-Aug-06
Physical Parameters											
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8					6.78
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG					17
Hardness	mg/L	NG	NG	NG	NG	NG					<6
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG					3
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG					1.1
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<2	<2		<2	
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000					15
Turbidity	NTU	NG	NG	NG	NG	NG					
Anions											
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG					2
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG					
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG					<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG					7
Ammonia as N	mg/L	NG	NG	1.26-39.7[5]	6	12			0.02		0.02
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]					<0.05
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]					0.08
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG					
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG					*<1*
Chloride - Cl	mg/L	250	NG	120	500	1000					0.4
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG					0.06
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG					<0.2
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG					1.6
Ionic Balance	N/A	NG	NG	NG	NG	NG					0.5
Total Metals											
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1.5	3	0.0342	0.0301	0.0203	0.0262	0.0208
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.00005	<0.00005	0.00001	<0.00005	<0.00005
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	<0.0002	<0.0002	0.0002	<0.0002	<0.0002
Barium	mg/L	NG	1	NG	NG	NG	0.00201	0.00167	0.00163	0.00152	0.00188
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	0	<0.0001	<0.0001
Bismuth	mg/L	NG	NG	NG	NG	NG					
Boron	mg/L	NG	5	1.5	NG	NG	<0.001	<0.001	0.081	<0.001	<0.001
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.00005	0	<0.00002	<0.00002
Calcium	mg/L	NG	NG	NG	NG	NG	1.11	0.86	1.03	1.42	1.14
Cesium	mg/L	NG	NG	NG	NG	NG					
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	0.0016	0.0001	0.0019	0.0015
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.00005	<0.00005	0.00002	<0.00005	<0.00005
Copper	mg/L	1	NG	0.002[9]	0.02	0.04	<0.001	<0.001	0.0015	0.0021	<0.001
Gallium	mg/L	NG	NG	NG	NG	NG					
Iron	mg/L	0.3	NG	0.3	NG	NG	0.13	<0.1	0.01	<0.1	<0.1
Lead	mg/L	NG	0.01	0.001[9]	0.01	0.02	<0.00005	<0.00005	0.00001	<0.00005	<0.00005
Lithium	mg/L	NG	NG	NG	NG	NG					
Magnesium	mg/L	NG	NG	NG	NG	NG	<0.5	0.21	0.46	0.61	0.56
Manganese	mg/L	0.05	NG	NG	NG	NG	<0.01	<0.01	0.002	<0.01	<0.01
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	<0.00001	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.00005	<0.00005	0.00002	<0.00005	<0.00005
Nickel	mg/L	NG	NG	0.025[9]	0.05	0.1	0.0002	0.0003	0.0003	0.0002	0.0007
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4		*<0.02*	0.003	*<0.02*	*<0.02*
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	0.3	<0.5	<0.5
Rhenium	mg/L	NG	NG	NG	NG	NG					
Rubidium	mg/L	NG	NG	NG	NG	NG					
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.0001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.15	0.12	0.22	0.26	0.2
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.0001	<0.0001	0	<0.0001	<0.0001
Sodium	mg/L	200	NG	NG	NG	NG	<0.5	<0.5	0.4	<0.5	<0.5
Strontium	mg/L	NG	NG	NG	NG	NG	0.0044	0.005	0.0046	0.0046	0.0044
Tellurium	mg/L	NG	NG	NG	NG	NG					
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	<0.00005	0	<0.00005	<0.00005
Thorium	mg/L	NG	NG	NG	NG	NG					
Tin	mg/L	NG	NG	NG	NG	NG					
Titanium	mg/L	NG	NG	NG	NG	NG					
Tungsten	mg/L	NG	NG	NG	NG	NG					
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00015	0.00012	0.00015	0.00019	0.00014
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	0.0001	0.0015	<0.0005
Yttrium	mg/L	NG	NG	NG	NG	NG					
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.002	0.004	0.005	0.002	0.002
Zirconium	mg/L	NG	NG	NG	NG	NG					
Dissolved Metals											
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1	2	0.016	0.019	0.0193	0.019	
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.00005	<0.00005	0.00001	<0.00005	
Arsenic	mg/L	NG	0.01	0.005	NG	NG	<0.0001	0.0002	0.0002	0.0002	
Barium	mg/L	NG	1	NG	NG	NG	<0.00005	0.00219	0.00163	0.00164	
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	0	<0.0001	
Boron	mg/L	NG	5	1.5	NG	NG	<0.001	0.001	0.068	0.001	
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	0	<0.00002	
Calcium	mg/L	NG	NG	NG	NG	NG	1.1	1	1	1.4	0.7
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0003	<0.0003	0.0001	0.0008	
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.00002	<0.00002	0.00002	0.00004	
Copper	mg/L	1	NG	0.002[9]	NG	NG	<0.0001	0.0053	0.0014	0.0022	
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.1	<0.1	0.01	<0.1	
Lead	mg/L	NG	0.01	0.001[9]	NG	NG	<0.00005	0.00009	0.00001	<0.00005	
Magnesium	mg/L	NG	NG	NG	NG	NG	0.6	0.4	0.4	0.5	0.3
Manganese	mg/L	0.05	NG	NG	NG	NG	<0.01	<0.01	0.002	<0.01	
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	<0.00001	*<0.00005*	
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.00005	0.00012	0.00002	<0.00005	
Mercury	mg/L	NG	NG	0.000026	NG	NG	*<0.00005*	*<0.00005*	<0.00001	*<0.00005*	
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.00005	0.00012	0.00002	<0.00005	
Nickel	mg/L	NG	NG	0.025[9]	NG	NG	<0.00005	0.00034	0.00028	0.00025	
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG		*<0.005*	0.002	*<0.01*	
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	0.3	<0.5	<0.5
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0006	<0.0006	<0.0001	<0.0006	
Silicon	mg/L	NG	NG	NG	NG	NG	0.14	0.12	0.21	0.26	
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00005	<0.00005	0	<0.00005	
Sodium	mg/L	200	NG	NG	NG	NG	<0.5	<0.5	0.4	<0.5	<0.5
Strontium	mg/L	NG	NG	NG	NG	NG	0.0043	0.006	0.0045	0.0048	
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	<0.00005	0	<0.00005	
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00013	0.00018	0.00015	0.00019	
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.0001	0.0002	0.0001	0.0005	
Zinc	mg/L	5	NG	0.03	NG	NG	<0.001	0.007	0.004	0.002	

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (P

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for l
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% o

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.7: Water Quality Station Analytical Results - JER-AEM-12

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-12				
		AO	MAC		Max. Average	Max. Grab	11-Sep-06	2-Jul-07	30-Jul-07	11-Aug-07	27-Aug-07
Physical Parameters											
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8				6.82	
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG				15.2	
Hardness	mg/L	NG	NG	NG	NG	NG		5.74	7.5	5.43	6.05
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG				2.8	
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG				0.63	
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<2	28.2	<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000				<10	
Turbidity	NTU	NG	NG	NG	NG	NG					
Anions											
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG				1.3	
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG				4.6	
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG				<1	
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG				4.6	
Ammonia as N	mg/L	NG	NG	1.26-39.7[5]	6	12				0.0076	
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]				<0.001	
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]				0.025	
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG					
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG					
Chloride - Cl	mg/L	250	NG	120	500	1000				<0.5	
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG					
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG				<0.001	
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG				1.1	
Ionic Balance	N/A	NG	NG	NG	NG	NG					
Total Metals											
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1.5	3	0.021	0.0305	0.0211	0.017	0.0191
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	<0.0002	0.00019	0.00017	0.00017	0.00016
Barium	mg/L	NG	1	NG	NG	NG	0.00187	0.00209	0.00198	0.0018	0.00172
Beryllium	mg/L	NG	NG	NG	NG	NG	0.0002	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG					
Boron	mg/L	NG	5	1.5	NG	NG	0.002	<0.01	<0.01	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	0.00004	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	1.04	1.34	1.93	1.18	1.38
Cesium	mg/L	NG	NG	NG	NG	NG					
Chromium	mg/L	NG	0.05	NG	0.087	0.17	0.0043	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002[9]	0.02	0.04	<0.001	0.00145	0.00325	0.00087	0.00158
Gallium	mg/L	NG	NG	NG	NG	NG					
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.1	0.041	<0.03	<0.03	<0.03
Lead	mg/L	NG	0.01	0.001[9]	0.01	0.02	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Lithium	mg/L	NG	NG	NG	NG	NG					
Magnesium	mg/L	NG	NG	NG	NG	NG	0.54	0.593	0.622	0.606	0.646
Manganese	mg/L	0.05	NG	NG	NG	NG	<0.01	0.0102	0.00223	0.00324	0.00185
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Nickel	mg/L	NG	NG	0.025[9]	0.05	0.1	0.0003	0.00054	<0.0005	<0.0005	<0.0005
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	*<0.02*			0.0034	
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5	<0.5	<0.5
Rhenium	mg/L	NG	NG	NG	NG	NG					
Rubidium	mg/L	NG	NG	NG	NG	NG					
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.16	0.242	0.248	0.169	0.182
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.0001	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	<0.5	0.54	0.55	0.53	0.54
Strontium	mg/L	NG	NG	NG	NG	NG	0.0052	0.00558	0.01	0.00536	0.00546
Tellurium	mg/L	NG	NG	NG	NG	NG					
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG					
Tin	mg/L	NG	NG	NG	NG	NG					
Titanium	mg/L	NG	NG	NG	NG	NG					
Tungsten	mg/L	NG	NG	NG	NG	NG					
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00014	0.000309	0.000255	0.000148	0.00018
Vanadium	mg/L	NG	NG	NG	NG	NG	0.0028	<0.001	<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG					
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.002	0.0023	0.0104	0.0011	<0.001
Zirconium	mg/L	NG	NG	NG	NG	NG					
Dissolved Metals											
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1	2	0.013	0.0108	*<0.01*		*<0.01*
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.00005	<0.0001	<0.0001		<0.0001
Arsenic	mg/L	NG	0.01	0.005	NG	NG	<0.0001	0.00016	0.00019		0.00016
Barium	mg/L	NG	1	NG	NG	NG	0.00215	0.00189	0.0018		0.00167
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0005	<0.0005		<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	0.002	<0.01	<0.01		<0.01
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	0.00002	<0.00005	<0.00005		<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	0.5	1.31	1.93		1.37
Chromium	mg/L	NG	0.05	NG	NG	NG	0.0011	<0.0005	<0.0005		<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.00002	<0.0001	<0.0001		<0.0001
Copper	mg/L	1	NG	0.002[9]	NG	NG	<0.0001	0.00115	0.00206		0.00135
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.1	<0.03	<0.03		<0.03
Lead	mg/L	NG	0.01	0.001[9]	NG	NG	0.00008	<0.00005	<0.00005		<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	0.4	0.599	0.653		0.636
Manganese	mg/L	0.05	NG	NG	NG	NG	<0.01	0.000269	<0.00005		0.000051
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*		*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.00008	<0.00005	<0.00005		<0.00005
Nickel	mg/L	NG	NG	0.025[9]	NG	NG	0.00026	<0.0005	<0.0005		<0.0005
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	*<0.01*			<0.002	
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5		<0.5
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0006	<0.001	<0.001		<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.14	0.195	0.248		0.158
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00005	<0.00001	<0.00001		<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	<0.5	0.53	0.55		0.54
Strontium	mg/L	NG	NG	NG	NG	NG	0.0051	0.00543	0.00827		0.00544
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	<0.0001	<0.0001		<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00011	0.000272	0.000202		0.000146
Vanadium	mg/L	NG	NG	NG	NG	NG	0.0005	<0.001	<0.001		<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	0.002	<0.001	0.0076		<0.001

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (P

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for l
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% o

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.7: Water Quality Station Analytical Results - JER-AEM-12

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-12			
		AO	MAC		Max. Average	Max. Grab	24-Sep-07	21-Apr-08	19-Jun-08	10-Jul-08
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8		6.65	7.31	7.83
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG		13.6		
Hardness	mg/L	NG	NG	NG	NG	NG	5.45	6.1	1.83	5.42
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG		3.32		
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG		0.62		
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000		19		
Turbidity	NTU	NG	NG	NG	NG	NG		0.27		
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG		2.5		
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG		4.4		
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG		<1		
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG		4.4		
Ammonia as N	mg/L	NG	NG	1.26-39.7[5]	6	12		0.0262		
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]		<0.001		
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]		0.0248		
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG				
Chloride - Cl	mg/L	250	NG	120	500	1000		<0.5		
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG				
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG		0.0015		
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG		1.06		
Ionic Balance	N/A	NG	NG	NG	NG	NG				
Total Metals										
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1.5	3	0.0135	0.0132	0.0303	0.0173
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00017	0.00029	<0.0001	0.00014
Barium	mg/L	NG	1	NG	NG	NG	0.00162	0.00198	0.00147	0.00186
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.01	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	1.22	1.25	0.46	1.2
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002[9]	0.02	0.04	0.00117	0.00091	0.00056	0.00094
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	0.036	<0.03
Lead	mg/L	NG	0.01	0.001[9]	0.01	0.02	0.000101	<0.00005	0.000073	<0.00005
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	0.595	0.695	0.27	0.58
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00152	0.000964	0.00426	0.00323
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.00005	<0.00005	<0.00005	<0.00005
Nickel	mg/L	NG	NG	0.025[9]	0.05	0.1	<0.0005	<0.0005	0.00075	<0.0005
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4		0.0047		
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5	<0.5
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.169	0.205	0.126	0.181
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	0.55	0.58	<0.5	0.51
Strontium	mg/L	NG	NG	NG	NG	NG	0.00526	0.006	0.00205	0.00542
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000143	0.000157	0.000113	0.000161
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.0025	0.0013	<0.001	<0.001
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1	2	0.0084	0.0134	0.0159	0.0196
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00016	0.00032	<0.0001	0.00014
Barium	mg/L	NG	1	NG	NG	NG	0.00156	0.00199	0.00126	0.00187
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.01	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	1.22	1.28	0.383	1.21
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002[9]	NG	NG	0.00103	0.00095	0.00048	0.00097
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	<0.03	<0.03
Lead	mg/L	NG	0.01	0.001[9]	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	0.586	0.708	0.213	0.583
Manganese	mg/L	0.05	NG	NG	NG	NG	0.000062	0.00093	0.00348	0.00321
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Nickel	mg/L	NG	NG	0.025[9]	NG	NG	<0.0005	<0.0005	0.00057	<0.0005
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG		<0.002		
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5	<0.5
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.143	0.217	0.105	0.182
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	0.55	0.58	<0.5	0.51
Strontium	mg/L	NG	NG	NG	NG	NG	0.00526	0.00594	0.00175	0.00541
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000116	0.000155	0.000083	0.000193
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	<0.001	0.0019	<0.001	<0.001

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (P

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for l
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% o

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.7: Water Quality Station Analytical Results - JER-AEM-12

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-12				
		AO	MAC		Max. Average	Max. Grab	6-Aug-08	18-Sep-08	1-Jan-09	15-Jun-09	14-Jul-09
Physical Parameters											
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8		6.95			**6.48**
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG		17.3	13.6		16.4
Hardness	mg/L	NG	NG	NG	NG	NG	5.97	6.58	6.1	5.78	5.44
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG		3.62	3.32		3.09
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG			0.62		0.66
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3		<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000		12	19		19
Turbidity	NTU	NG	NG	NG	NG	NG					0.4
Anions											
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG			2.5		2.8
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG		4.3	4.4		4.5
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG			<1		<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG			4.4		4.5
Ammonia as N	mg/L	NG	NG	1.26-39.7[5]	6	12			0.0262		<0.005
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]		0.0021	<0.001		<0.001
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]		0.209	0.0248		0.0653
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG					
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG					
Chloride - Cl	mg/L	250	NG	120	500	1000		<0.5	<0.5		<0.5
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG					<1
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG			0.0015		<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG		1.02	1.06		0.63
Ionic Balance	N/A	NG	NG	NG	NG	NG					
Total Metals											
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1.5	3	0.0154	0.022	0.0132	0.0971	0.028
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.0005	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00015	0.00017	0.00029	0.00021	0.00015
Barium	mg/L	NG	1	NG	NG	NG	0.0017	<0.02	0.00198	0.00273	0.00187
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005		<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG					
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.1	<0.01	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	*<0.0002*	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	1.26	1.33	1.25	1.47	1.21
Cesium	mg/L	NG	NG	NG	NG	NG					
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	*<0.002*	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001		<0.0001	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002[9]	0.02	0.04	0.00129	0.0013	0.00091	0.00269	0.00128
Gallium	mg/L	NG	NG	NG	NG	NG					
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	<0.03	0.083	0.032
Lead	mg/L	NG	0.01	0.001[9]	0.01	0.02	<0.00005	<0.0005	<0.00005	0.000161	<0.00005
Lithium	mg/L	NG	NG	NG	NG	NG					
Magnesium	mg/L	NG	NG	NG	NG	NG	0.623	0.67	0.695	0.672	0.606
Manganese	mg/L	0.05	NG	NG	NG	NG	0.000114	0.002	0.000964	0.0113	0.00518
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.0002*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.00005		<0.00005	<0.00005	<0.00005
Nickel	mg/L	NG	NG	0.025[9]	0.05	0.1	<0.0005		<0.0005	0.00064	<0.0005
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4			0.0047		0.0022
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	0.33	<0.5	<0.5	<0.5
Rhenium	mg/L	NG	NG	NG	NG	NG					
Rubidium	mg/L	NG	NG	NG	NG	NG					
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.134		0.205	0.582	0.392
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001		<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	0.53	<2	0.58	0.55	<0.5
Strontium	mg/L	NG	NG	NG	NG	NG	0.00573		0.006	0.00618	0.0056
Tellurium	mg/L	NG	NG	NG	NG	NG					
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001		<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG					
Tin	mg/L	NG	NG	NG	NG	NG					
Titanium	mg/L	NG	NG	NG	NG	NG					
Tungsten	mg/L	NG	NG	NG	NG	NG					
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00012	0.00017	0.000157	0.00139	0.000253
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001		<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG					
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.001	*<0.05*	0.0013	0.004	<0.004
Zirconium	mg/L	NG	NG	NG	NG	NG					
Dissolved Metals											
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1	2	0.0118	0.017	0.0134		0.0187
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.0005	<0.0001		<0.0001
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00015	0.00016	0.00032		0.00017
Barium	mg/L	NG	1	NG	NG	NG	0.002	<0.02	0.00199		0.00178
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005		<0.0005	<0.0005	<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.1	<0.01	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	*<0.0002*	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	1.34	1.42	1.28	1.32	1.2
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	*<0.002*	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001		<0.0001	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002[9]	NG	NG	0.00136	0.0012	0.00095	0.00194	0.00074
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	mg/L	NG	0.01	0.001[9]	NG	NG	<0.00005	<0.0005	<0.00005	<0.00005	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	0.637	0.74	0.708	0.601	0.593
Manganese	mg/L	0.05	NG	NG	NG	NG	0.000131	<0.002	0.00093	0.00138	0.00108
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.0002*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.00005		<0.00005	<0.00005	<0.00005
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.0002*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.00005		<0.00005	<0.00005	<0.00005
Nickel	mg/L	NG	NG	0.025[9]	NG	NG	<0.0005		<0.0005	0.00055	<0.0005
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG			<0.002		<0.002
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	0.36	<0.5	<0.5	<0.5
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.128		0.217	0.487	0.437
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001		<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	0.55	<2	0.58	<0.5	0.5
Strontium	mg/L	NG	NG	NG	NG	NG	0.006		0.00594	0.00569	0.00543
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001		<0.0001	<0.0001	<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00014	0.00018	0.000155	0.000963	0.000227
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001		<0.001	<0.001	<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	<0.001	*<0.05*	0.0019	0.0026	0.0019

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (P

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for l
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% o

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.7: Water Quality Station Analytical Results - JER-AEM-12

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-12		
		AO	MAC		Max. Average	Max. Grab	23-Aug-10	12-Apr-11	26-Aug-14
Physical Parameters									
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	6.53	7.07	6.75
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	13.7	16.3	17.7
Hardness	mg/L	NG	NG	NG	NG	NG	5.32		6.9
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3.48	4.3	3.3
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	0.89		
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	<10	11	7.5
Turbidity	NTU	NG	NG	NG	NG	NG	0.57	0.22	0.55
Anions									
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	2.8	<5	
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	6.5	7.1	6.5
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<5	<5
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	6.5	8.7	7.9
Ammonia as N	mg/L	NG	NG	1.26-39.7[5]	6	12	0.0063	0.0261	0.0133
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	<0.001	<0.002	<0.002
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	0.0362	0.0876	0.0136
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG			
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG		<0.05	<0.02
Chloride - Cl	mg/L	250	NG	120	500	1000	<0.5	<0.5	<0.5
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<1	<5	<5
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	0.95	1.3	0.962
Ionic Balance	N/A	NG	NG	NG	NG	NG			
Total Metals									
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1.5	3	0.0259		0.0122
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001		0.0000071
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00016		0.000212
Barium	mg/L	NG	1	NG	NG	NG	0.00187		0.00186
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005		0.0000028
Bismuth	mg/L	NG	NG	NG	NG	NG			<0.000001
Boron	mg/L	NG	5	1.5	NG	NG	<0.01		<0.005
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005		<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	1.34		1.47
Cesium	mg/L	NG	NG	NG	NG	NG			<0.000005
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005		0.000067
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001		0.0000159
Copper	mg/L	1	NG	0.002[9]	0.02	0.04	0.00176		0.00114
Gallium	mg/L	NG	NG	NG	NG	NG			<0.00005
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03		0.015
Lead	mg/L	NG	0.01	0.001[9]	0.01	0.02	0.000052		<0.000005
Lithium	mg/L	NG	NG	NG	NG	NG			0.00062
Magnesium	mg/L	NG	NG	NG	NG	NG	0.667		0.777
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00274		0.002
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*		<0.000005
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.00005		0.000051
Nickel	mg/L	NG	NG	0.025[9]	0.05	0.1	<0.0005		0.000297
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	0.0037	0.002	*<0.05*
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5		0.345
Rhenium	mg/L	NG	NG	NG	NG	NG			<0.000005
Rubidium	mg/L	NG	NG	NG	NG	NG			0.000822
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001		<0.00004
Silicon	mg/L	NG	NG	NG	NG	NG	0.328		0.239
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001		<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	0.56		0.6
Strontium	mg/L	NG	NG	NG	NG	NG	0.00636		0.00579
Tellurium	mg/L	NG	NG	NG	NG	NG			<0.00001
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001		<0.000001
Thorium	mg/L	NG	NG	NG	NG	NG			0.0000145
Tin	mg/L	NG	NG	NG	NG	NG			<0.00001
Titanium	mg/L	NG	NG	NG	NG	NG			0.000181
Tungsten	mg/L	NG	NG	NG	NG	NG			<0.00001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000201		0.000203
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001		0.000045
Yttrium	mg/L	NG	NG	NG	NG	NG			0.0000653
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.001		0.00039
Zirconium	mg/L	NG	NG	NG	NG	NG			0.000021
Dissolved Metals									
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1	2	0.0209		
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001		
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00016		
Barium	mg/L	NG	1	NG	NG	NG	0.00173		
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005		
Boron	mg/L	NG	5	1.5	NG	NG	<0.01		
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005		
Calcium	mg/L	NG	NG	NG	NG	NG	1.17		1.47
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005		
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001		
Copper	mg/L	1	NG	0.002[9]	NG	NG	0.00151		
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03		
Lead	mg/L	NG	0.01	0.001[9]	NG	NG	<0.00005		
Magnesium	mg/L	NG	NG	NG	NG	NG	0.586		0.78
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00239		
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*		
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.00005		
Nickel	mg/L	NG	NG	0.025[9]	NG	NG	<0.0005		
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	<0.002	<0.001	0.0029
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5		0.34
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001		
Silicon	mg/L	NG	NG	NG	NG	NG	0.333		
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001		
Sodium	mg/L	200	NG	NG	NG	NG	0.51		<1
Strontium	mg/L	NG	NG	NG	NG	NG	0.00543		
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001		
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000178		
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001		
Zinc	mg/L	5	NG	0.03	NG	NG	0.0015		

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (P

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for l
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% o

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.8: Water Quality Station Analytical Results - JER-AEM-13

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-13		
		AO	MAC		Max. Average	Max. Grab	28-Jun-05	29-Jul-05	26-Aug-05
Physical Parameters									
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	5.73	5.87	7.09
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	18	16	17
Hardness	mg/L	NG	NG	NG	NG	NG	6.4	7.2	7.4
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	5	5	5
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	<1	2	2
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<2	<2	<2
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	36	<10	20
Turbidity	NTU	NG	NG	NG	NG	NG	1	1	<1
Anions									
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	2	4	2
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	10	11	8
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	12	13	10
Ammonia as N	mg/L	NG	NG	3.98-125[5]	6	12	<0.1	<0.1	<0.1
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	<0.05	<0.05	<0.05
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	<0.05	<0.05	<0.05
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG			
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	0.03	0.05	0.02
Chloride - Cl	mg/L	250	NG	120	500	1000	0.1	0.3	0.4
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<1	<1	<1
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.2	<0.2	<0.2
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	<0.5	<0.5	<0.5
Ionic Balance	N/A	NG	NG	NG	NG	NG	0.83	0.77	0.95
Total Metals									
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1.5	3	0.05	0.029	0.027
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0001	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	<0.0004	<0.0004	<0.0004
Barium	mg/L	NG	1	NG	NG	NG	<0.005	<0.005	<0.005
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG			
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	*<0.0002*	*<0.0002*	*<0.0001*
Calcium	mg/L	NG	NG	NG	NG	NG	1.34	1.56	1.84
Cesium	mg/L	NG	NG	NG	NG	NG			
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0009	<0.0009	<0.0009
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002[9]	0.02	0.04	<0.001	<0.001	<0.001
Gallium	mg/L	NG	NG	NG	NG	NG			
Iron	mg/L	0.3	NG	0.3	NG	NG			<0.1
Lead	mg/L	NG	0.01	0.001[9]	0.01	0.02	<0.0001	<0.0001	<0.0001
Lithium	mg/L	NG	NG	NG	NG	NG			
Magnesium	mg/L	NG	NG	NG	NG	NG	0.52	0.63	0.7
Manganese	mg/L	0.05	NG	NG	NG	NG			<0.01
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.0002*	*<0.0002*	*<0.0001*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.0005	<0.0005	<0.0005
Nickel	mg/L	NG	NG	0.025[9]	0.05	0.1	<0.0006	<0.0006	<0.0006
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	*<0.05*	*<0.05*	*<0.05*
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5
Rhenium	mg/L	NG	NG	NG	NG	NG			
Rubidium	mg/L	NG	NG	NG	NG	NG			
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0008	<0.0008	<0.0008
Silicon	mg/L	NG	NG	NG	NG	NG	0.2	0.09	0.29
Silver	mg/L	NG	NG	0.0001	NG	NG	*<0.0002*	*<0.0002*	*<0.0002*
Sodium	mg/L	200	NG	NG	NG	NG	0.7	0.5	<0.5
Strontium	mg/L	NG	NG	NG	NG	NG			0.0047
Tellurium	mg/L	NG	NG	NG	NG	NG			
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	<0.00005	<0.00005
Thorium	mg/L	NG	NG	NG	NG	NG			
Tin	mg/L	NG	NG	NG	NG	NG			
Titanium	mg/L	NG	NG	NG	NG	NG			
Tungsten	mg/L	NG	NG	NG	NG	NG			
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.0002	0.00021	0.00024
Vanadium	mg/L	NG	NG	NG	NG	NG	0.0002	0.0002	0.0003
Yttrium	mg/L	NG	NG	NG	NG	NG			
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.002	<0.002	<0.002
Zirconium	mg/L	NG	NG	NG	NG	NG			
Dissolved Metals									
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1	2	0.041	0.02	0.022
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.0002	<0.0001	0.0002
Barium	mg/L	NG	1	NG	NG	NG	0.003	<0.003	<0.003
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001
Boron	mg/L	NG	5	1.5	NG	NG	<0.004	<0.004	<0.004
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	1.6	1.8	1.8
Chromium	mg/L	NG	0.05	NG	NG	NG	0.0007	<0.0004	<0.0004
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.00005	<0.00005	<0.00005
Copper	mg/L	1	NG	0.002[9]	NG	NG	0.0054	0.006	<0.001
Iron	mg/L	0.3	NG	0.3	NG	NG	0.03	0.09	<0.1
Lead	mg/L	NG	0.01	0.001[9]	NG	NG	<0.00005	<0.00005	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	0.6	0.7	0.7
Manganese	mg/L	0.05	NG	NG	NG	NG	0.005	<0.001	<0.01
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.0002*	*<0.0002*	*<0.0001*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.0003	<0.0003	<0.0003
Nickel	mg/L	NG	NG	0.025[9]	NG	NG	<0.0001	0.0003	0.0002
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	*<0.005*	*<0.005*	*<0.005*
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0004	<0.0004	<0.0004
Silicon	mg/L	NG	NG	NG	NG	NG	0.21	0.1	0.34
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00005	<0.00005	<0.00005
Sodium	mg/L	200	NG	NG	NG	NG	0.7	0.6	<0.5
Strontium	mg/L	NG	NG	NG	NG	NG			0.0044
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00002	<0.00002	<0.00002
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00019	0.00015	0.00021
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005
Zinc	mg/L	5	NG	0.03	NG	NG	0.004	<0.002	<0.002

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term exposures (for clear flow)
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background levels when background is >250 mg/L (high flow)

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.8: Water Quality Station Analytical Results - JER-AEM-13

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-13			
		AO	MAC		Max. Average	Max. Grab	24-Sep-05	21-Jun-06	11-Jul-06	6-Aug-06
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.2	6.85	7.18	
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	20	16	20	
Hardness	mg/L	NG	NG	NG	NG	NG	7.3	<6	7	
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	5	4	5	
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	2	0	1	
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<2	<2	<2	
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	12	13	12	
Turbidity	NTU	NG	NG	NG	NG	NG	2			
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	2	6	2	
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	10	9	10	
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	12	11	13	
Ammonia as N	mg/L	NG	NG	3.98-125[5]	6	12	<0.1	0.01	0.01	0.01
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	<0.05	<0.05	<0.05	
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	<0.05	<0.05	<0.05	
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG			0.4	
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	0.03	*<1*	*<1*	
Chloride - Cl	mg/L	250	NG	120	500	1000	0.3	0.5	0.3	
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<1	0.02	0.03	
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.2	<0.2	<0.2	
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	0.7	1.1	<0.5	
Ionic Balance	N/A	NG	NG	NG	NG	NG	0.81	0.38	0.73	
Total Metals										
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1.5	3	0.034	0.042	0.047	0.032
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.00005	<0.00005	0.00001
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	<0.0004	<0.0002	<0.0002	0.0002
Barium	mg/L	NG	1	NG	NG	NG	<0.005	0.00176	0.00206	0.00203
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0001	<0.0001	0
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.001	<0.001	0.112
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	*<0.0001*	<0.00005	<0.00005	0.00001
Calcium	mg/L	NG	NG	NG	NG	NG	2.14	1.22	1.49	1.84
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	0.0036	<0.0005	0.0012	0.0002
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.00005	<0.00005	0.00004
Copper	mg/L	1	NG	0.002[9]	0.02	0.04	0.0018	<0.001	0.0053	0.002
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	0.21	0.11	0.12	0.16
Lead	mg/L	NG	0.01	0.001[9]	0.01	0.02	0.0006	<0.00005	<0.00005	0.0001
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	0.78	<0.5	0.33	0.66
Manganese	mg/L	0.05	NG	NG	NG	NG	<0.01	0.01	<0.01	0.005
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.0001*	*<0.00005*	*<0.00005*	<0.00001
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.0005	<0.00005	<0.00005	0.00004
Nickel	mg/L	NG	NG	0.025[9]	0.05	0.1	<0.0006	0.0008	0.0005	0.0004
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	0.066	0.03	*<0.02*	0.005
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5	0.3
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0008	<0.001	<0.001	<0.0001
Silicon	mg/L	NG	NG	NG	NG	NG	0.36	0.18	0.25	0.47
Silver	mg/L	NG	NG	0.0001	NG	NG	*<0.0002*	<0.0001	<0.0001	0.0001
Sodium	mg/L	200	NG	NG	NG	NG	<0.5	<0.5	<0.5	0.5
Strontium	mg/L	NG	NG	NG	NG	NG	0.0047	0.0033	0.0048	0.0048
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	<0.00005	<0.00005	0
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00009	0.00014	0.00019	0.00021
Vanadium	mg/L	NG	NG	NG	NG	NG	0.0007	<0.0005	<0.0005	0.0002
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.004	0.002	0.008	0.004
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1	2	0.012	0.026	0.032	0.027
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.0001	<0.00005	0.00001
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.0002	0.0001	0.0002	0.0002
Barium	mg/L	NG	1	NG	NG	NG	<0.003	0.00192	0.00274	0.00192
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.000003
Boron	mg/L	NG	5	1.5	NG	NG	<0.004	<0.001	<0.001	0.111
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.00005	0.00001
Calcium	mg/L	NG	NG	NG	NG	NG	2.3	0.7	1.7	1.8
Chromium	mg/L	NG	0.05	NG	NG	NG	0.0009	<0.0003	<0.0003	0.0002
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.00005	<0.00002	0.00002	0.00004
Copper	mg/L	1	NG	0.002[9]	NG	NG	0.0041	0.0011	0.005	0.0019
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.01	<0.1	<0.1	0.15
Lead	mg/L	NG	0.01	0.001[9]	NG	NG	0.00026	<0.00005	0.00007	0.00007
Magnesium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	0.6	0.6
Manganese	mg/L	0.05	NG	NG	NG	NG	<0.001	<0.01	<0.01	0.005
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.0001*	*<0.00005*	*<0.00005*	<0.00001
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.0003	0.00005	0.00008	0.00004
Nickel	mg/L	NG	NG	0.025[9]	NG	NG	<0.0001	0.0002	0.00087	0.00035
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	*<0.005*		*<0.005*	0.002
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5	0.3
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0004	<0.0006	<0.0006	<0.0001
Silicon	mg/L	NG	NG	NG	NG	NG	0.36	0.24	0.27	0.42
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00005	<0.00005	<0.00005	0.00007
Sodium	mg/L	200	NG	NG	NG	NG	0.6	<0.5	<0.5	0.5
Strontium	mg/L	NG	NG	NG	NG	NG	0.0065	0.0041	0.0078	0.0047
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00002	<0.00005	<0.00005	0
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00014	0.00016	0.00022	0.00021
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.0005	0.0001	0.0004	0.0002
Zinc	mg/L	5	NG	0.03	NG	NG	<0.002	<0.001	0.006	0.003

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term expos
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background leve

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.8: Water Quality Station Analytical Results - JER-AEM-13

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-13			
		AO	MAC		Max. Average	Max. Grab	5-Sep-06	1-Jul-07	17-Jul-07	25-Aug-07
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.14	6.74	6.86	7.25
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	21	16.5	25.5	26.8
Hardness	mg/L	NG	NG	NG	NG	NG	10	7.58	9.43	11.7
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	5	5.85	6.57	6.99
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	2	1.01	1.69	2.06
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<2	<3	5.9	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	22	18	15	31
Turbidity	NTU	NG	NG	NG	NG	NG				
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	2	2.6	2.2	2.2
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	12	6.4	10	10.2
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	14	6.4	10	10.2
Ammonia as N	mg/L	NG	NG	3.98-125[5]	6	12	0.01	0.0118	0.0398	0.0126
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	<0.05	<0.001	<0.001	<0.001
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	<0.05	<0.005	<0.005	0.0051
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG	0.4			
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	*<1*			
Chloride - Cl	mg/L	250	NG	120	500	1000	0.4	<0.5	0.52	0.73
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	0.03			
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.2	<0.001	<0.001	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	1	<0.5	<0.5	0.52
Ionic Balance	N/A	NG	NG	NG	NG	NG	0.8			
Total Metals										
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1.5	3	0.025	0.037	0.0331	0.0219
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.00005	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.0004	0.00018	0.00023	0.00023
Barium	mg/L	NG	1	NG	NG	NG	0.00212	0.00253	0.00258	0.00196
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	0.001	<0.01	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00002	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	2.48	1.87	2.3	2.76
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	0.0024	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.00005	<0.0001	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002[9]	0.02	0.04	0.0015	0.0013	0.00158	0.00138
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	0.17	0.106	0.251	0.23
Lead	mg/L	NG	0.01	0.001[9]	0.01	0.02	<0.00005	<0.00005	<0.00005	<0.00005
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	1.01	0.708	0.92	1.13
Manganese	mg/L	0.05	NG	NG	NG	NG	<0.01	0.00812	0.0114	0.00304
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.00005	<0.00005	<0.00005	<0.00005
Nickel	mg/L	NG	NG	0.025[9]	0.05	0.1	0.0008	<0.0005	<0.0005	<0.0005
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	*<0.02*	0.0047	0.0129	0.0047
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5	<0.5
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.66	0.272	0.26	0.235
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.0001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	<0.5	<0.5	0.53	0.72
Strontium	mg/L	NG	NG	NG	NG	NG	0.0058	0.00504	0.0062	0.00648
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00023	0.000261	0.000273	0.000219
Vanadium	mg/L	NG	NG	NG	NG	NG	0.0017	<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.002	<0.001	<0.001	<0.001
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1	2	0.022	0.0194	0.0213	0.01
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.00005	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.0002	0.00017	0.00021	0.00021
Barium	mg/L	NG	1	NG	NG	NG	0.00146	0.00234	0.00251	0.00189
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0005	<0.0005	<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	<0.001	<0.01	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00002	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	2.3	1.84	2.28	2.78
Chromium	mg/L	NG	0.05	NG	NG	NG	0.0008	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.00002	<0.0001	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002[9]	NG	NG	0.0007	0.00128	0.00147	0.0013
Iron	mg/L	0.3	NG	0.3	NG	NG	0.14	0.031	0.137	0.093
Lead	mg/L	NG	0.01	0.001[9]	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	0.9	0.724	0.911	1.16
Manganese	mg/L	0.05	NG	NG	NG	NG	<0.01	0.000084	0.00641	0.000154
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Nickel	mg/L	NG	NG	0.025[9]	NG	NG	0.00029	<0.0005	<0.0005	<0.0005
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	*<0.01*	0.0027	0.0035	0.0021
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5	<0.5
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0006	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.63	0.232	0.246	0.231
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00005	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	0.5	<0.5	0.54	0.75
Strontium	mg/L	NG	NG	NG	NG	NG	0.0051	0.00491	0.00616	0.00668
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	<0.0001	<0.0001	<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00019	0.00022	0.000228	0.000179
Vanadium	mg/L	NG	NG	NG	NG	NG	0.0014	<0.001	<0.001	<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	0.002	<0.001	<0.001	<0.001

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term expos
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background leve

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.8: Water Quality Station Analytical Results - JER-AEM-13

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-13			
		AO	MAC		Max. Average	Max. Grab	23-Sep-07	9-Jul-08	6-Aug-08	18-Sep-08
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.73	6.81	7.61	6.95
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	27.4	17.6	20.6	20.7
Hardness	mg/L	NG	NG	NG	NG	NG	11.6	7.24	9.46	7.81
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	6.05	5.34	5.92	6.97
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	2.15	0.92	1.51	1.02
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	27	17	22	24
Turbidity	NTU	NG	NG	NG	NG	NG				
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	1.9	1.4	2.7	3.6
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	10.9	10.4	8	7.8
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	10.9	10.4	8	7.8
Ammonia as N	mg/L	NG	NG	3.98-125[5]	6	12	0.0117	0.0125	0.0305	0.0135
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	<0.001	<0.001	<0.001	<0.001
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	0.0198	<0.005	0.0239	0.0107
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG				
Chloride - Cl	mg/L	250	NG	120	500	1000	0.81	<0.5	<0.5	<0.5
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG				
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	0.0018
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	0.68	<0.5	<0.5	0.67
Ionic Balance	N/A	NG	NG	NG	NG	NG				
Total Metals										
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1.5	3	0.017	0.0334	0.0128	0.0728
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00022	0.00018	0.00022	0.00015
Barium	mg/L	NG	1	NG	NG	NG	0.00186	0.00201	0.00196	0.00184
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.01	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	2.77	1.83	2.28	2.03
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002[9]	0.02	0.04	0.00134	0.00142	0.00128	0.00194
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	0.174	0.148	0.111	0.09
Lead	mg/L	NG	0.01	0.001[9]	0.01	0.02	0.00009	<0.00005	<0.00005	<0.00005
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	1.14	0.702	0.901	0.862
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00163	0.00556	0.000635	0.00289
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.00005	<0.00005	<0.00005	<0.00005
Nickel	mg/L	NG	NG	0.025[9]	0.05	0.1	<0.0005	<0.0005	<0.0005	<0.0005
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	0.0031	<0.002	0.0058	0.0059
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5		<0.5
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001		<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.216	0.272	0.283	1.4
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	0.76	<0.5	0.64	0.56
Strontium	mg/L	NG	NG	NG	NG	NG	0.00667	0.00493	0.00584	0.00468
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000194	0.000226	0.000139	0.000551
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.0023	<0.001	<0.001	<0.001
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1	2	0.009	0.0341	0.0114	0.0508
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00021	0.00017	0.0003	0.00014
Barium	mg/L	NG	1	NG	NG	NG	0.0018	0.00195	0.00195	0.00159
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.01	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	2.76	1.77	2.26	1.82
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002[9]	NG	NG	0.00126	0.00134	0.00138	0.00154
Iron	mg/L	0.3	NG	0.3	NG	NG	0.082	0.146	0.139	0.053
Lead	mg/L	NG	0.01	0.001[9]	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	1.14	0.683	0.925	0.791
Manganese	mg/L	0.05	NG	NG	NG	NG	0.000541	0.00527	0.000261	0.00108
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Nickel	mg/L	NG	NG	0.025[9]	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	<0.002	<0.002	0.0021	0.0028
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5	<0.5
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.196	0.267	0.262	1.39
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	0.77	<0.5	0.68	<0.5
Strontium	mg/L	NG	NG	NG	NG	NG	0.0066	0.00474	0.00598	0.00447
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000149	0.000217	0.000158	0.000474
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	0.0019	<0.001	<0.001	<0.001

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
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[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term expos
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background leve

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.8: Water Quality Station Analytical Results - JER-AEM-13

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-13			
		AO	MAC		Max. Average	Max. Grab	15-Jun-09	11-Jul-09	15-Aug-11	26-Aug-14
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	6.51	6.58	7.31	6.94
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	10.9	14.4	19.7	27.9
Hardness	mg/L	NG	NG	NG	NG	NG	4.09	6.49	9.4	12
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	5.28	4.83	6.1	7.5
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	<0.5	0.69	2.9	
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	12	13	29	11.3
Turbidity	NTU	NG	NG	NG	NG	NG	1.1	0.43	0.4	0.74
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	2.5	1.7	<5	
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	3.3	5	8.7	10.6
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<5	<5
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	3.3	5	10.7	12.9
Ammonia as N	mg/L	NG	NG	3.98-125[5]	6	12	0.0142	<0.005	0.0082	0.0309
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	<0.001	<0.001	<0.002	<0.002
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	0.0096	<0.005	<0.006	0.0231
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG			0.05	<0.02
Chloride - Cl	mg/L	250	NG	120	500	1000	<0.5	<0.5	<0.5	<0.5
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<1	<1	<5	<5
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	0.53	<0.5	0.446	0.45
Ionic Balance	N/A	NG	NG	NG	NG	NG				
Total Metals										
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1.5	3	0.0683	0.0486	0.0323	0.0466
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.0001	0.0000093	0.0000082
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00013	0.00016	0.000274	0.000281
Barium	mg/L	NG	1	NG	NG	NG	0.00229	0.00216	0.00247	0.00245
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	0.0000034	0.0000094
Bismuth	mg/L	NG	NG	NG	NG	NG				<0.000001
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.01	<0.005	<0.005
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.00005	<0.000005	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	1.05	1.62	2.24	2.93
Cesium	mg/L	NG	NG	NG	NG	NG				0.0000094
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	<0.0005	0.000132	0.00014
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0001	<0.0001	0.0000528	0.0000575
Copper	mg/L	1	NG	0.002[9]	0.02	0.04	0.00081	0.00152	0.00188	0.00178
Gallium	mg/L	NG	NG	NG	NG	NG				<0.00005
Iron	mg/L	0.3	NG	0.3	NG	NG	0.118	0.141	**0.314**	0.221
Lead	mg/L	NG	0.01	0.001[9]	0.01	0.02	<0.00005	<0.00005	0.0000341	0.0000209
Lithium	mg/L	NG	NG	NG	NG	NG				0.00053
Magnesium	mg/L	NG	NG	NG	NG	NG	0.4	0.688	0.966	1.23
Manganese	mg/L	0.05	NG	NG	NG	NG	0.0303	0.00944	0.00846	0.0153
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	<0.000005
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.00005	<0.00005	0.00003	0.000027
Nickel	mg/L	NG	NG	0.025[9]	0.05	0.1	<0.0005	<0.0005	0.000463	0.000526
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	0.0152	0.003	0.0053	*<0.05*
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	0.418	0.356
Rhenium	mg/L	NG	NG	NG	NG	NG				<0.000005
Rubidium	mg/L	NG	NG	NG	NG	NG				0.000974
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.00004	0.000044
Silicon	mg/L	NG	NG	NG	NG	NG	0.43	0.329	0.355	0.679
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.000005	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	<0.5	<0.5	0.62	0.68
Strontium	mg/L	NG	NG	NG	NG	NG	0.0029	0.00418	0.00565	0.0069
Tellurium	mg/L	NG	NG	NG	NG	NG				<0.00001
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	0.0000102	0.0000014
Thorium	mg/L	NG	NG	NG	NG	NG				0.0000264
Tin	mg/L	NG	NG	NG	NG	NG				<0.00001
Titanium	mg/L	NG	NG	NG	NG	NG				0.000645
Tungsten	mg/L	NG	NG	NG	NG	NG				<0.00001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000169	0.000281	0.00022	0.000483
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	0.000242	0.000148
Yttrium	mg/L	NG	NG	NG	NG	NG				0.000232
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.0014	<0.006	0.00108	0.0005
Zirconium	mg/L	NG	NG	NG	NG	NG				0.000097
Dissolved Metals										
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1	2		0.0303	0.0221	
Antimony	mg/L	NG	0.006	NG	NG	NG		<0.0001	0.0000087	
Arsenic	mg/L	NG	0.01	0.005	NG	NG		0.00025	0.000254	
Barium	mg/L	NG	1	NG	NG	NG		0.00214	0.00272	
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	0.0000032	
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.01	0.0059	
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.000005	
Calcium	mg/L	NG	NG	NG	NG	NG	1.01	1.53	2.2	2.82
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	<0.0005	0.00011	
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	0.0000398	
Copper	mg/L	1	NG	0.002[9]	NG	NG	0.00074	0.00048	0.00158	
Iron	mg/L	0.3	NG	0.3	NG	NG	0.065	0.116	0.2	
Lead	mg/L	NG	0.01	0.001[9]	NG	NG	<0.00005	<0.00005	0.0000181	
Magnesium	mg/L	NG	NG	NG	NG	NG	0.383	0.65	0.95	1.22
Manganese	mg/L	0.05	NG	NG	NG	NG	0.0257	0.00833	0.00743	
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.00005	<0.00005	0.000021	
Nickel	mg/L	NG	NG	0.025[9]	NG	NG	<0.0005	0.0006	0.000438	
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	0.0048	<0.002	0.0017	0.0053
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	0.23	0.37
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.00004	
Silicon	mg/L	NG	NG	NG	NG	NG	0.412	0.357	0.351	
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.000005	
Sodium	mg/L	200	NG	NG	NG	NG	<0.5	<0.5	<1	<1
Strontium	mg/L	NG	NG	NG	NG	NG	0.00285	0.00419	0.00562	
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	0.000008	
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000149	0.000103	0.000193	
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	0.000175	
Zinc	mg/L	5	NG	0.03	NG	NG	0.0016	0.0031	0.00781	

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term expos
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background leve

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.9: Water Quality Station Analytical Results - JER-AEM-14

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-14		
		AO	MAC		Max. Average	Max. Grab	28-Jun-05	30-Jul-05	26-Aug-05
Physical Parameters									
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	5.57	5.99	6.97
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	17	17	18
Hardness	mg/L	NG	NG	NG	NG	NG	<6	8.1	7.9
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3	4	5
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	1	2	2
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<2	<2	<2
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	48	<10	<10
Turbidity	NTU	NG	NG	NG	NG	NG	1	1	1
Anions									
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	2	4	2
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	10	10	8
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	12	13	10
Ammonia as N	mg/L	NG	NG	3.98-125[5]	6	12	<0.1	<0.1	<0.1
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	<0.05	<0.05	<0.05
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	<0.05	0.08	0.08
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG			
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	0.03	0.05	0.02
Chloride - Cl	mg/L	250	NG	120	500	1000	0.1	0.3	0.4
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<1	<1	<1
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.2	<0.2	<0.2
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	<0.5	<0.5	<0.5
Ionic Balance	N/A	NG	NG	NG	NG	NG	0.75	0.85	0.95
Total Metals									
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1.5	3	0.059	0.034	0.03
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	<0.0004	<0.0004	<0.0004
Barium	mg/L	NG	1	NG	NG	NG	<0.005	<0.005	<0.005
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG			
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	*<0.0002*	*<0.0002*	*<0.0001*
Calcium	mg/L	NG	NG	NG	NG	NG	1.36	1.9	1.99
Cesium	mg/L	NG	NG	NG	NG	NG			
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0009	<0.0009	<0.0009
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002[9]	0.02	0.04	<0.001	<0.001	<0.001
Gallium	mg/L	NG	NG	NG	NG	NG			
Iron	mg/L	0.3	NG	0.3	NG	NG			<0.1
Lead	mg/L	NG	0.01	0.001[9]	0.01	0.02	<0.0001	<0.0001	<0.0001
Lithium	mg/L	NG	NG	NG	NG	NG			
Magnesium	mg/L	NG	NG	NG	NG	NG	0.52	0.72	0.73
Manganese	mg/L	0.05	NG	NG	NG	NG			<0.01
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.0002*	*<0.0002*	*<0.0001*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.0005	<0.0005	<0.0005
Nickel	mg/L	NG	NG	0.025[9]	0.05	0.1	<0.0006	<0.0006	<0.0006
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	*<0.05*	*<0.05*	*<0.05*
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5
Rhenium	mg/L	NG	NG	NG	NG	NG			
Rubidium	mg/L	NG	NG	NG	NG	NG			
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0008	<0.0008	<0.0008
Silicon	mg/L	NG	NG	NG	NG	NG	0.23	0.14	0.36
Silver	mg/L	NG	NG	0.0001	NG	NG	*<0.0002*	*<0.0002*	*<0.0002*
Sodium	mg/L	200	NG	NG	NG	NG	0.7	<0.5	<0.5
Strontium	mg/L	NG	NG	NG	NG	NG			0.0051
Tellurium	mg/L	NG	NG	NG	NG	NG			
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	<0.00005	<0.00005
Thorium	mg/L	NG	NG	NG	NG	NG			
Tin	mg/L	NG	NG	NG	NG	NG			
Titanium	mg/L	NG	NG	NG	NG	NG			
Tungsten	mg/L	NG	NG	NG	NG	NG			
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00023	0.00023	0.00026
Vanadium	mg/L	NG	NG	NG	NG	NG	0.0001	0.0002	0.0003
Yttrium	mg/L	NG	NG	NG	NG	NG			
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.002	<0.002	0.005
Zirconium	mg/L	NG	NG	NG	NG	NG			
Dissolved Metals									
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1	2	0.043	0.019	0.025
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.0001	<0.0001	0.0002
Barium	mg/L	NG	1	NG	NG	NG	0.004	0.004	<0.003
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001
Boron	mg/L	NG	5	1.5	NG	NG	<0.004	<0.004	<0.004
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	1.5	2.1	2
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0004	<0.0004	<0.0004
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00008	<0.00005	<0.00005
Copper	mg/L	1	NG	0.002[9]	NG	NG	0.0041	0.0056	<0.001
Iron	mg/L	0.3	NG	0.3	NG	NG	0.03	0.06	<0.1
Lead	mg/L	NG	0.01	0.001[9]	NG	NG	<0.00005	<0.00005	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	0.5	0.7	0.7
Manganese	mg/L	0.05	NG	NG	NG	NG	0.01	0.001	<0.01
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.0002*	*<0.0002*	*<0.0001*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.0003	<0.0003	<0.0003
Nickel	mg/L	NG	NG	0.025[9]	NG	NG	<0.0001	0.0003	0.0003
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	*<0.005*	*<0.005*	*<0.005*
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0004	<0.0004	<0.0004
Silicon	mg/L	NG	NG	NG	NG	NG	0.25	0.16	0.42
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00005	<0.00005	<0.00005
Sodium	mg/L	200	NG	NG	NG	NG	0.7	0.7	<0.5
Strontium	mg/L	NG	NG	NG	NG	NG			0.0046
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00002	<0.00002	<0.00002
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00022	0.00018	0.00021
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005
Zinc	mg/L	5	NG	0.03	NG	NG	0.004	<0.002	<0.002

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term exposures (for clear flow)
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background levels when background is >250 mg/L (high flow)

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.9: Water Quality Station Analytical Results - JER-AEM-14

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-14			
		AO	MAC		Max. Average	Max. Grab	21-Jun-06	11-Jul-06	24-Jun-07	22-Jul-07
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	6.85	7.05	6.59	7.18
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	16	19	13.2	25
Hardness	mg/L	NG	NG	NG	NG	NG	<6	7	5.82	11.1
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	4	4	4.74	5.04
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	0	1	0.71	1.88
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	2	2	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	12	16	16	21
Turbidity	NTU	NG	NG	NG	NG	NG				
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	5	3	2.6	1.6
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	10	12	4.5	9.8
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	12	14	4.5	9.8
Ammonia as N	mg/L	NG	NG	3.98-125[5]	6	12	0.03	0.01	0.0157	0.0215
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	<0.05	<0.05	<0.001	<0.001
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	<0.05	<0.05	0.0109	0.0653
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG		0.2		
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	*<1*	*<1*		
Chloride - Cl	mg/L	250	NG	120	500	1000	0.5	0.3	<0.5	0.6
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	0.02	0.03		
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.2	<0.2	<0.001	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	0.9	<0.5	<0.5	0.61
Ionic Balance	N/A	NG	NG	NG	NG	NG	0.33	0.72		
Total Metals										
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1.5	3	0.049	0.036	0.0389	0.0232
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.00005	<0.00005	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	<0.0002	<0.0002	0.00012	0.00018
Barium	mg/L	NG	1	NG	NG	NG	0.00209	0.00296	0.00197	0.00317
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	0.002	<0.001	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	1.28	1.67	1.38	2.65
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	0.0008	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.00005	<0.00005	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002[9]	0.02	0.04	0.0013	<0.001	0.00107	0.00156
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.1	<0.1	0.066	0.179
Lead	mg/L	NG	0.01	0.001[9]	0.01	0.02	<0.00005	<0.00005	<0.00005	<0.00005
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	<0.5	0.37	0.582	1.02
Manganese	mg/L	0.05	NG	NG	NG	NG	<0.01	<0.01	0.00365	0.00511
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.00005	<0.00005	<0.00005	<0.00005
Nickel	mg/L	NG	NG	0.025[9]	0.05	0.1	0.0003	0.0004	<0.0005	<0.0005
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	0.04	0.027	0.007	0.005
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5	<0.5
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.2	0.27	0.294	0.33
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.0001	<0.0001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	<0.5	<0.5	<0.5	0.6
Strontium	mg/L	NG	NG	NG	NG	NG	0.0037	0.0052	0.00373	0.00722
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	<0.00005	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00019	0.00016	0.000208	0.000228
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.002	0.005	<0.001	<0.001
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1	2	0.032	0.031	0.0275	0.0152
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.00005	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	NG	NG	<0.0001	0.0002	0.00012	0.00017
Barium	mg/L	NG	1	NG	NG	NG	0.00401	0.00351	0.00187	0.0031
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0005	<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	<0.001	<0.001	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	0.8	1.9	1.38	2.7
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0003	<0.0003	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.00002	<0.00002	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002[9]	NG	NG	0.0001	0.0048	0.00094	0.00155
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.1	<0.1	<0.03	0.08
Lead	mg/L	NG	0.01	0.001[9]	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	<0.5	0.6	0.579	1.05
Manganese	mg/L	0.05	NG	NG	NG	NG	<0.01	<0.01	0.00212	0.00151
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.00005	0.00006	<0.00005	<0.00005
Nickel	mg/L	NG	NG	0.025[9]	NG	NG	0.0001	0.0006	<0.0005	<0.0005
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG		*<0.005*	0.0024	0.0023
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5	<0.5
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0006	<0.0006	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.26	0.3	0.258	0.328
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00005	<0.00005	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	<0.5	<0.5	<0.5	0.61
Strontium	mg/L	NG	NG	NG	NG	NG	0.0041	0.0075	0.00369	0.00726
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	<0.00005	<0.0001	<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00022	0.0002	0.000197	0.000184
Vanadium	mg/L	NG	NG	NG	NG	NG	0.0001	0.0003	<0.001	<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	<0.001	0.007	<0.001	<0.001

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term expos
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background level

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.9: Water Quality Station Analytical Results - JER-AEM-14

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-14			
		AO	MAC		Max. Average	Max. Grab	26-Aug-07	9-Jul-08	6-Aug-08	15-Jun-09
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	6.96	6.77	7.57	**6.46**
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	36.5	18.2	33.4	10.8
Hardness	mg/L	NG	NG	NG	NG	NG	16.1	7.35	16.1	4.01
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	4.27	4.09	4.08	5.14
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	3.08	0.99	3.25	<0.5
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	28	<10	36	13
Turbidity	NTU	NG	NG	NG	NG	NG				0.79
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	4.3	1.5	3.9	2.2
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	15.2	12.3	15.5	2.9
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	15.2	12.3	15.5	2.9
Ammonia as N	mg/L	NG	NG	3.98-125[5]	6	12	<0.005	<0.005	0.0129	0.0253
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	<0.001	<0.001	<0.001	<0.001
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	0.118	0.0332	0.0388	0.0059
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG				
Chloride - Cl	mg/L	250	NG	120	500	1000	0.63	<0.5	<0.5	<0.5
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG				<1
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	0.0011
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	0.55	<0.5	<0.5	0.52
Ionic Balance	N/A	NG	NG	NG	NG	NG				
Total Metals										
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1.5	3	0.0344	0.0292	0.0393	0.0635
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00016	0.00013	0.00022	0.00014
Barium	mg/L	NG	1	NG	NG	NG	0.00502	0.00259	0.00538	0.00179
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.01	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	3.9	1.89	3.92	0.994
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0002	<0.0001	0.00017	<0.0001
Copper	mg/L	1	NG	0.002[9]	0.02	0.04	0.00092	0.00139	0.00117	0.0009
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	0.172	0.069	**0.327**	0.072
Lead	mg/L	NG	0.01	0.001[9]	0.01	0.02	<0.00005	<0.00005	<0.00005	<0.00005
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	1.47	0.698	1.41	0.397
Manganese	mg/L	0.05	NG	NG	NG	NG	0.0122	0.000865	0.0121	0.00526
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.00005	<0.00005	<0.00005	<0.00005
Nickel	mg/L	NG	NG	0.025[9]	0.05	0.1	0.00058	<0.0005	0.00061	<0.0005
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	0.003	<0.002	0.0036	0.0164
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5	<0.5
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	1.85	0.408	1.42	0.438
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	0.81	<0.5	0.71	<0.5
Strontium	mg/L	NG	NG	NG	NG	NG	0.00924	0.00517	0.0101	0.00282
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000149	0.000177	0.000183	0.000172
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.001	0.0024	0.0018	0.0021
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1	2	0.0234	0.0266	0.0307	
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.0001	<0.0001	
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00015	0.00012	0.00021	
Barium	mg/L	NG	1	NG	NG	NG	0.005	0.00257	0.00541	
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.01	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	3.99	1.81	4.09	0.963
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00013	<0.0001	0.00014	<0.0001
Copper	mg/L	1	NG	0.002[9]	NG	NG	<0.0009	0.00138	0.00114	0.00085
Iron	mg/L	0.3	NG	0.3	NG	NG	0.061	0.063	0.202	0.048
Lead	mg/L	NG	0.01	0.001[9]	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	1.49	0.689	1.44	0.39
Manganese	mg/L	0.05	NG	NG	NG	NG	0.0108	0.00089	0.0106	0.000865
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Nickel	mg/L	NG	NG	0.025[9]	NG	NG	0.00059	<0.0005	0.00063	<0.0005
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	<0.002	<0.002	<0.002	0.0058
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5	<0.5
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	1.85	0.399	1.41	0.425
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	0.82	<0.5	0.73	<0.5
Strontium	mg/L	NG	NG	NG	NG	NG	0.00955	0.00513	0.0106	0.00271
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000128	0.00018	0.00017	0.000161
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	<0.001	0.0023	0.0018	0.0021

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term expos
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background level

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.9: Water Quality Station Analytical Results - JER-AEM-14

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-14		
		AO	MAC		Max. Average	Max. Grab	11-Jul-09	2-Aug-11	26-Aug-14
Physical Parameters									
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	6.59	7.42	6.93
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	14.3	31.6	26.4
Hardness	mg/L	NG	NG	NG	NG	NG	6.31	15.3	11.3
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3.92	4.3	6.4
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	0.67	5	
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	8	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	13	26	10.9
Turbidity	NTU	NG	NG	NG	NG	NG	0.28	1.35	0.42
Anions									
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	2.5	<5	
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	5.1	13.1	9.8
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<5	<5
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	5.1	16	11.9
Ammonia as N	mg/L	NG	NG	3.98-125 [5]	6	12	<0.005	<0.005	0.015
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	<0.001	<0.002	<0.002
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	0.009	0.221	0.0318
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG			
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG		<0.05	<0.02
Chloride - Cl	mg/L	250	NG	120	500	1000	<0.5	<0.5	<0.5
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<1	<5	<5
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	<0.5	0.596	0.73
Ionic Balance	N/A	NG	NG	NG	NG	NG			
Total Metals									
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1.5	3	0.0493	0.0425	0.0384
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	0.0000068	0.0000081
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00012	0.000152	0.000218
Barium	mg/L	NG	1	NG	NG	NG	0.00232	0.00481	0.00299
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	0.000011	0.0000105
Bismuth	mg/L	NG	NG	NG	NG	NG			<0.000001
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.005	<0.005
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.000005	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	1.64	3.94	2.76
Cesium	mg/L	NG	NG	NG	NG	NG			0.0000085
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	0.000121	0.000123
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	0.0000777	0.0000312
Copper	mg/L	1	NG	0.002 [9]	0.02	0.04	0.00151	0.00154	0.00188
Gallium	mg/L	NG	NG	NG	NG	NG			<0.00005
Iron	mg/L	0.3	NG	0.3	NG	NG	0.068	0.146	0.106
Lead	mg/L	NG	0.01	0.001 [9]	0.01	0.02	<0.00005	0.0000325	0.0000173
Lithium	mg/L	NG	NG	NG	NG	NG			0.00045
Magnesium	mg/L	NG	NG	NG	NG	NG	0.722	1.37	1.15
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00109	0.00782	0.000662
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	<0.000005
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.00005	0.000016	0.000027
Nickel	mg/L	NG	NG	0.025 [9]	0.05	0.1	<0.0005	0.000488	0.000472
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	<0.002	0.0076	*<0.05*
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	0.366	0.339
Rhenium	mg/L	NG	NG	NG	NG	NG			<0.000005
Rubidium	mg/L	NG	NG	NG	NG	NG			0.00091
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.00004	<0.00004
Silicon	mg/L	NG	NG	NG	NG	NG	0.383	1.71	0.79
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.000005	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	<0.5	0.7	0.7
Strontium	mg/L	NG	NG	NG	NG	NG	0.00422	0.00876	0.00631
Tellurium	mg/L	NG	NG	NG	NG	NG			<0.00001
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	0.0000185	0.0000011
Thorium	mg/L	NG	NG	NG	NG	NG			0.0000259
Tin	mg/L	NG	NG	NG	NG	NG			<0.00001
Titanium	mg/L	NG	NG	NG	NG	NG			0.000447
Tungsten	mg/L	NG	NG	NG	NG	NG			<0.00001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000236	0.000305	0.000385
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	0.000167	0.000125
Yttrium	mg/L	NG	NG	NG	NG	NG			0.00027
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.005	0.00222	0.00207
Zirconium	mg/L	NG	NG	NG	NG	NG			0.000073
Dissolved Metals									
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1	2	0.0317	0.0248	
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	0.0000062	
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00012	0.000137	
Barium	mg/L	NG	1	NG	NG	NG	0.00221	0.00474	
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	0.0000091	
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.005	
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.000005	
Calcium	mg/L	NG	NG	NG	NG	NG	1.48	3.88	2.68
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	0.000123	
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	0.0000664	
Copper	mg/L	1	NG	0.002 [9]	NG	NG	0.00114	0.00141	
Iron	mg/L	0.3	NG	0.3	NG	NG	0.045	0.053	
Lead	mg/L	NG	0.01	0.001 [9]	NG	NG	<0.00005	0.000008	
Magnesium	mg/L	NG	NG	NG	NG	NG	0.635	1.36	1.12
Manganese	mg/L	0.05	NG	NG	NG	NG	0.000344	0.0062	
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.00005	0.000014	
Nickel	mg/L	NG	NG	0.025 [9]	NG	NG	<0.0005	0.000455	
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	<0.002	0.001	0.0047
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	0.363	0.35
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.00004	
Silicon	mg/L	NG	NG	NG	NG	NG	0.393	1.68	
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.000005	
Sodium	mg/L	200	NG	NG	NG	NG	<0.5	0.7	<1
Strontium	mg/L	NG	NG	NG	NG	NG	0.00421	0.00873	
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	0.0000184	
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000107	0.000256	
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	0.000089	
Zinc	mg/L	5	NG	0.03	NG	NG	0.0034	0.00318	

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term expos
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background level

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.10: Water Quality Station Analytical Results - JER-AEM-15 Surface

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-15							JER-AEM-15														JER-AEM-15				JER-AEM-15-S				JER-AEM-15	
		AO	MAC		Max. Average	Max. Grab	18-May-05	31-Jul-05	30-Aug-05	10-Dec-05	8-Apr-06	27-Jun-06	11-Jul-06	7-Aug-06	10-Sep-06	17-Dec-06	27-Apr-07	29-Jul-07	26-Aug-07	23-Sep-07	8-Dec-07	17-Dec-07	20-Apr-08	16-Jul-08	6-Aug-08	6-Aug-08	11-Sep-08	18-Sep-08	20-Jan-09	22-Apr-09	10-Jun-09	10-Jul-09	12-Apr-11	15-Aug-11	29-Aug-14
Physical Parameters																																					
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.1	6.75	**6.25**	6.76	6.82	6.75	6.81		6.73	6.78	6.73	6.7	6.89	7	6.71	**8.56**	6.91	6.68	6.92	6.92	6.92		7.35	7.02	7	6.63	7.11	7.01	6.6
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	17.3	13	13	23	17	15	14		14	22.3	15.3	15	15.4	16.1	13.8	18.9	15.4	18.2	12.5	13.7	16.8	17.5	25.8	24	18	14.9	15.5	11.9	17.6
Hardness	mg/L	NG	NG	NG	NG	NG	6	<6	<6		6	6	6		<6	8.53	5.63	5.5	5.13	6.07	5.75	6.89	6.71	5.52	5.3	5.47	5.68	6.18	10	8.81	6.56	5.3	8.13	5.1	6.6
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	2.7	3	2	4	3	4.4	2.7		2.5	4.29	3.02	3.54	3.04	3.24	3.01	3.48	3.37	3.84	3.88	3.09	3.07	3.45	6.43	4.98	3.93	3.24	4.7	3.7	4
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	1.2	1	2	2	<1	0.2	<0.1		1	1.25	0.79	0.65	0.74	0.84	0.7	0.98	0.66	<0.5	0.7	0.69	0.76	0.72	1.07	1.08	0.84	0.58		2	
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<2	<2	<2	<2		<2	2	<2	<2.3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	30	<10	12	28	13	13	4		8	17	<10	13	14	<10	17	16	<10	<10	26	16	17	21	28	27	14	14	12	10	7.3
Turbidity	NTU	NG	NG	NG	NG	NG	0.15	2	2	1													0.21	0.38					0.54	0.31	0.18	0.33	0.13	0.19	0.44
Anions																																					
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5	2	2	3	<1	2	4		1	2.2	1.2	1.1	1.9	1.8	1.6	<1	1.1	2.5	2.5	2.5	<1	2.5	1.5	1.1	1.9	2.8	<5	<5	
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	5	6	7	16	9	7	7		9	10.2	4.7	4.8	4.4	4.6	4.4	5.6	4.9	6	4.1	4.1	5	5.7	7.2	6.9	5.1	4.4	6.7	<5	6
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5	<1	<1	<1	<1	<1	<1		<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	<1	<1	<5	<5	<5
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	6	7	8	19	11	9	9		11	10.2	4.7	4.8	4.4	4.6	4.4	5.6	4.9	6	4.1	4.1	5	5.7	7.2	6.9	5.1	4.4	8.2	5.5	7.3
Ammonia as N	mg/L	NG	NG	0.413-125[5]	6	12	0.037	<0.1	<0.1	<0.1	<0.1	0.03	0.01	<0.005	0.01	0.0199	0.0337	0.008	0.0093	0.0131	0.0122	0.0244	0.017	0.0084	0.0258	0.0103	0.006	0.0103	0.134	0.0386	0.0267	<0.005	0.0251	0.0108	0.0137
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	<0.002	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0022	0.0023	0.0019	0.001	<0.001	<0.001	<0.001	<0.002	<0.002	0.0021
Nitrate - N	mg/L	NG	10	13	20[9]	40[6]	<0.006	<0.05	0.09	<0.05	<0.05	<0.05	<0.05		<0.05	0.0917	0.0071	0.0223	0.0524	0.0398	0.0386	0.0395	0.0541	0.0332	0.0306	0.0177	0.121	0.209	0.26	0.234	0.18	0.101	0.0684	<0.006	0.0125
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG							<0.2																						
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG			0.05	<0.02	0.04	<1	<1		<1																		<0.05	<0.05	<0.02	
Chloride - Cl	mg/L	250	NG	120	500	1000	<1	0.2	0.3	0.4	0.4	0.2	0.2		0.2	0.64	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.55	0.64	<0.5	<0.5	<0.5	<0.5	<0.5
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<5	<1	<1	<1	<1	0.04	0.04	0.03		0.03													<1	1	<1	<1	<5	<5	<5	
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2	<0.001	0.0011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	0.0013	0.001	<0.001	<0.001	<0.001	<0.001	
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	1.27	<0.5	0.8	2	0.6	1.2	<0.5		<0.5	1.66	1.14	1.09	1.11	1.77	1.11	1.76	1.05	0.98	<0.5	0.88	1.17	1.02	1.75	1.77	1.49	1.02	1.27	0.869	1.16
Ionic Balance	N/A	NG	NG	NG	NG	NG		1.06	0.74		0.39	0.68	0.73			0.3																				
Total Metals																																					
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1.5	3	0.0137	0.021	0.019	0.027	0.013	0.0332	0.0276	0.0217	0.0185	0.0162	0.0148	0.0183	0.0141	0.0128	0.0104	0.013	0.0092	0.0218	0.0208	0.0158	0.028	0.0214	0.048	0.0295	0.0208	0.0332	0.0203	0.0152	0.0125
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00009	<0.0001	0.0002	0.0003	<0.0001	<0.00005	<0.00005	0.00001	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	0.0000283	0.0000128	<0.000005	
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.0002	<0.0004	<0.0004	<0.0004	<0.0004	<0.0002	<0.0002	0.0002	<0.0002	0.00021	0.00016	0.00016	0.00018	0.00015	0.00015	0.00017	0.00033	0.00015	0.00013	0.00015	0.00017	0.00016	0.00025	0.00025	0.00016	0.00017	0.000233	0.00019	0.000187	
Barium	mg/L	NG	1	NG	NG	NG	0.00178	<0.005	<0.005	<0.005	<0.005	0.00212	0.00167	0.00161	0.00182	0.0025	0.00174	0.00188	0.00179	0.0021	0.00171	0.00237	0.00189	0.00181	0.00218	0.0017	0.00181	0.00192	0.00296	0.00274	0.00202	0.00203	0.00283	0.00175	0.00154	
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0001	<0.0001	0	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.0005	<0.0005	0.000003	0.0000022	<0.000002	
Bismuth	mg/L	NG	NG	NG	NG	NG									NG																				<0.000001	
Boron	mg/L	NG	5	1.5	NG	NG	0.001	<0.01	<0.01	<0.01	<0.01	<0.01	0.001	<0.001	0.02	0.002	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.005	<0.005	<0.005	
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.0002	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005		0.00003	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00005	<0.00005	<0.00005	0.0000089	<0.000005	<0.000005	
Calcium	mg/L	NG	NG	NG	NG	NG	1.34	1.13	1.08	1.98	1.28	1.07	0.88	1	1.04	1.83	1.22	1.24	1.1	1.37	1.25	1.53	1.4	1.14	1.1	1.14	1.24	1.26	2.13	1.86	1.35	1.33	1.73	1.17	1.45	
Cesium	mg/L	NG	NG	NG	NG	NG																													<0.000005	
Chromium	mg/L	NG	0.05	NG	0.087	0.17	0.0001	<0.0009	<0.0009	<0.0009	<0.0009	<0.0005	0.0011	0.0004	0.0033	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.0005	<0.0005	<0.0005	0.000118	0.000068	0.000057	
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	0.00001	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	0.000018	0.0000162	0.0000172	
Copper	mg/L	1	NG	0.002[9]	0.02	0.04	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0011	<0.001	0.0015	<0.001	0.0014	0.00097	0.00093	0.0008	0.00083	0.00081	0.00115	0.00094	0.00081	0.00153	0.00084	0.00107	0.0011	0.00173	0.0014	0.00123	0.00107	0.00171	0.0011	0.00104	
Gallium	mg/L	NG	NG	NG	NG	NG																													<0.00005	
Iron	mg/L	0.3	NG	0.3	NG	NG			0.02	<0.1	<0.1	<0.1	<0.1	0.01	<0.1	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.121	<0.03	<0.03	<0.03	<0.03	<0.03	0.03	<0.03	<0.03	0.01	<0.01	0.014	
Lead	mg/L	NG	0.01	0.001[9]	0.01	0.02	<0.00005	<0.0001	<0.0001	<0.0001	0.0001	<0.0004	0.00049	<0.00005	0.00003	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00005	<0.00005	<0.00005	<0.00005	0.0000059	<0.000005	
Lithium	mg/L	NG	NG	NG	NG	NG																														0.00043	
Magnesium	mg/L	NG	NG	NG	NG	NG	0.698	0.56	0.53	0.89	0.64	<0.5	0.2	0.47	0.54	0.906	0.642	0.582	0.614	0.659	0.638	0.823	0.781	0.575	0.6	0.609	0.596	0.646	1.34	1.03	0.689	0.751	0.885	0.632	0.771	
Manganese	mg/L	0.05	NG	NG	NG	NG	0.0011			<0.01	<0.01	<0.01	<0.01	0.002	<0.01	0.00216	0.00113	0.00435	0.00218	0.00187	0.000639	0.000716	0.000472	0.00342	0.00387	0.002	0.002	0.00186	0.00169	0.000962	0.00105	0.00668	0.000957	0.00214	0.00181	
Mercury	mg/L	NG	0.001	0.000026	NG	NG	<0.00002	<0.0002	<0.0001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00005	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.00006	<0.0005	<0.0005	<0.0005	<0.0005	0.00006	<0.00005	0.00002	<0.00005	<0.00005	<0.00005	<0.00005	0.000104	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.000062	0.00005	<0.00005	<0.00005	<0.00005	0.000042	0.000023	0.000021	
Nickel	mg/L	NG	NG	0.025[9]	0.05	0.1	0.00029	<0.0006	<0.0006	<0.0006	0.0008	0.0003	0.0003	0.0003	<0.0001	0.00071	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	0.00059	<0.0005	<0.0005	<0.0005	0.00034	0.00033	
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	0.004	<0.05	<0.05	<0.05	<0.05	<0.02	0.03	0.03	<0.02	0.002	0.0086	0.0042	0.0033	0.0023	0.0026	0.0025	0.0034	0.0026	0.0047	0.0056	0.0026	0.0039	0.0037	0.005	0.0022	0.0028	<0.002	0.0033	0.0023	<0.05	
Potassium	mg/L	NG	NG	NG	NG	NG	0.36	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.3	<0.5	0.55	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	0.53	<0.5	<0.5	<0.5	0.46	0.317	0.341	
Rhenium	mg/L	NG	NG	NG	NG	NG																														<0.000005	
Rubidium	mg/L	NG	NG	NG	NG	NG																														0.000794	
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0001	<0.0008	<0.0008	<0.0008	<0.0008	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.00004	<0.00004	0.000041	
Silicon	mg/L	NG	NG	NG	NG	NG		0.19	0.18	0.25	0.21	0.12	0.13	0.24	0.16	0.304	0.162	0.188	0.182	0.176	0.139	0.165	0.148	0.17	0.281	0.111	0.257	0.296	0.57	0.51	0.418	0.388	0.457	0.24	0.235	
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	0	<0.0001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.00001	<0.00001	<0.00001	<0.000005	<0.000005	<0.000005	
Sodium	mg/L	200	NG	NG	NG	NG	0.584	0.6	0.8	0.7	<0.5	0.7	<0.5	0.5	<0.5	0.87	0.55	0.55	0.55	0.59	0.59	0.71	0.65	0.51	<0.5	0.52	0.58	0.53	1.03	0.92	0.61	0.58	0.86	0.51	0.59	
Strontium	mg/L	NG	NG	NG	0.059		0.0059		0.0052	0.0085	0.0056	0.0045	0.0048	0.0044	0.005	0.00806	0.00538	0.00547	0.0052	0.00579	0.0061	0.00671	0.00627	0.00517	0.00412	0.00551	0.00556	0.00605	0.0104	0.00861	0.00637	0.00586	0.00749	0.00498	0.00537	
Tellurium	mg/L	NG	NG	NG	NG	NG																													<0.00001	
Thallium	mg/L	NG	NG	0.0008	NG	NG		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00001	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	0.000025	0.000012	<0.000001	
Thorium	mg/L	NG	NG		NG	NG																													0.0000106	
Tin	mg/L	NG	NG		NG	NG																													<0.00001	
Titanium	mg/L	NG	NG		NG	NG																													0.000193	
Tungsten	mg/L	NG	NG		NG	NG																													<0.00001	
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00014	0.00012	0.00009	0.00012	0.00014	0.00014	0.00009	0.00014	0.00015	0.000215	0.000152	0.000156	0.000165	0.000137	0.000129	0.000168	0.00014	0.000136	0.000096	0.000129	0.000174	0.000166	0.000321	0.00027	0.000206	0.000206	0.000216	0.000149	0.000185	
Vanadium	mg/L	NG	NG	NG	<0.00005	0.0001	0.0003	<0.0005	0.0003	<0.0005	<0.0005	<0.0005	0.0001	0.0029	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.000043	0.000041	0.000042	
Yttrium	mg/L	NG	NG	NG	NG	NG																													0.0000666	
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.001	<0.002	<0.002	0.008	<0.002	0.006	0.002	0.003	0.002	0.0011	<0.001	<0.001	0.0033	<0.001	<0.001	0.0047	<0.001	<0.001	<0.001	<0.001	0.0013	<0.001	<0.006	0.0011	<0.001	<0.004	0.00378	0.00096	0.00033	
Zirconium	mg/L	NG	NG	NG	NG	NG																													0.000019	
Dissolved Metals																																					
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1	2	0.01	0.012	0.015	0.015	0.013	0.02	0.016	0.0198	0.014	0.0099	0.0109	<0.009	<0.009	0.0083	0.0087	0.0097	0.0092	0.0134	0.0095	0.0111	0.0161	0.0158	0.0372	0.027		0.0181	0.0196	0.011	
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0004	<0.0001	<0.0001	0.0002	<0.0001	<0.00005	<0.00005	0.00001	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001		<0.0001	0.0000174	0.0000066	
Arsenic	mg/L	NG	0.01	0.005	NG	NG	<0.0001	<0.0004	<0.0001	<0.0001	0.0002	0.0002	<0.0001	0.0002	0.0002	<0.0001	0.00022	0.00016	0.00013	0.00016	0.00017	0.00015	0.00017	0.00033	0.00015	0.00012	0.00014	0.00016	0.00015	0.00025	0.00039		0.00016	0.000243	0.000178	
Barium	mg/L	NG	1	NG	NG	NG	0.0018	<0.003	<0.003	<0.003	<0.003	<0.00005	0.0115	0.0016	0.00208	0.00253	0.00175	0.00172	0.00164	0.00204	0.00166	0.00209	0.00192	0.00182	0.00248	0.00169	0.00175	0.00189	0.0028	0.00266		0.00193	0.00344	0.00165	
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.000003	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.0005	<0.0005	0.0000035	<0.000002		
Boron	mg/L	NG	5	1.5	NG	NG	0.002	<0.004	<0.004	<0.004	<0.004	<0.001	<0.001	0.017	0.001	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.005	<0.005		
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.0001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00005	<0.00005	<0.00005	<0.00005	<0.000005	<0.000005	
Calcium	mg/L	NG	NG	NG	NG	NG	1.3	1.1	1	1.6	0.6	1.1	1	1	0.5	1.87	1.24	1.21	1.07	1.35	1.25	1.44	1.39	1.22	1.11	1.16	1.27	1.34	1.99	1.87	1.43	1.09	1.75	1.1	1.45	
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0003	<0.0003	0.0004	0.0008	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.0005	<0.0005	0.000132	0.000074		
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00002	<0.00002	0.00001	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	0.0000184	0.0000099		
Copper	mg/L	1	NG	0.002[9]	NG	NG	0.0008	0.0036	<0.001	0.003	<0.001	<0.0001	0.0036	0.0015	<0.0001	0.00117	0.00086	<0.0009	<0.0008	0.00075	<0.0009	0.00091	0.00094	0.00089	0.00135	0.00085	0.00091	0.00114	0.00116	0.00152	0.00089	0.00076	0.00161	0.000915		
Iron	mg/L	0.3	NG	0.3	NG	NG	0.005	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	0.01	<0.1	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.03	<0.03	<0.03	<0.01	<0.01		
Lead	mg/L	NG	0.01	0.001[9]	NG	NG	<0.0001	<0.00005	0.0001	0.00011	<0.00005	<0.00005	<0.00005	0.00003	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00005	<0.00005	<0.00005	0.0000383	<0.000005		
Magnesium	mg/L	NG	NG	NG	NG	NG	0.68	0.5	<0.5	0.8	<0.5	<0.5	0.4	0.5	0.4	0.938	0.618	0.603	0.598	0.657	0.637	0.8	0.789	0.602	0.611	0.627	0.609	0.692	1.23	1.01	0.724	0.626	0.915	0.58	0.73	
Manganese	mg/L	0.05	NG	NG	NG	NG	0.001	<0.001	<0.01	<0.01	<0.01	<0.01	<0.01	0.002	<0.01	0.000081	0.000161	<0.00007	<0.00005	0.000084	0.000081	0.000208	0.000454	0.000894	0.00216	0.000128	0.000184	0.000088	0.000593	0.000513	0.000121	0.00128	0.000605	0.000243		
Mercury	mg/L	NG	0.001	0.000026	NG	NG		<0.0002	<0.0001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00005	<0.00005	<0.00005	<0.00005	<0.00005		
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.0002	<0.0003	<0.0003	<0.0003	<0.0003	<0.00005	<0.00005	0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.000051	<0.00005	<0.00005	<0.00005	<0.00005	0.000055	0.00005	<0.00005	<0.00005	<0.00005	0.000033	0.000023		
Nickel	mg/L	NG	NG	0.025[9]	NG	NG	0.0002	0.0003	0.0003	0.0006	<0.0001	<0.00005	0.00035	0.00029	0.00025	0.00127	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0

Table D.11: Water Quality Station Analytical Results - JER-AEM-15 Depth

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-15-NB		
		AO	MAC		Max. Average	Max. Grab	12-Apr-11	15-Aug-11	29-Aug-14*
							15 m		
Physical Parameters									
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	6.94	6.94	**6.47**
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	11.6	12.1	17.9
Hardness	mg/L	NG	NG	NG	NG	NG	6.87	5.2	6.6
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3.4	3.2	3.5
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG		2	
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	<5	17	7.7
Turbidity	NTU	NG	NG	NG	NG	NG	<0.1	0.16	0.38
Anions									
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5	<5	
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5	<5	5.4
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5	<5	<5
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	5.5	<5	6.6
Ammonia as N	mg/L	NG	NG	12.5-39.7 [5]	6	12	0.021	0.0135	0.033
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	<0.002	<0.002	0.0026
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	0.112	0.0358	0.159
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	<0.05	<0.05	<0.02
Chloride - Cl	mg/L	250	NG	120	500	1000	<0.5	<0.5	<0.5
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<5	<5	<5
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	1	0.912	1.19
Total Metals									
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1.5	3	0.022	0.0189	0.0134
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0000147	0.0000053	0.0000063
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.000249	0.000172	0.000197
Barium	mg/L	NG	1	NG	NG	NG	0.0024	0.00178	0.00283
Beryllium	mg/L	NG	NG	NG	NG	NG	0.0000029	0.0000024	<0.000002
Bismuth	mg/L	NG	NG	NG	NG	NG			<0.000001
Boron	mg/L	NG	5	1.5	NG	NG	<0.005	<0.005	<0.005
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.000005	<0.000005	0.0000192
Calcium	mg/L	NG	NG	NG	NG	NG	1.74	1.16	1.43
Cesium	mg/L	NG	NG	NG	NG	NG			<0.000005
Chromium	mg/L	NG	0.05	NG	0.087	0.17	0.000116	0.000069	0.000072
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0000182	0.0000162	0.0000149
Copper	mg/L	1	NG	0.002-0.004 [9]	0.02	0.04	0.00145	0.00103	0.0626
Gallium	mg/L	NG	NG	NG	NG	NG			<0.00005
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.01	<0.01	0.013
Lead	mg/L	NG	0.01	0.001-0.007 [9]	0.01	0.02	0.0000218	<0.000005	0.000155
Lithium	mg/L	NG	NG	NG	NG	NG			0.00044
Magnesium	mg/L	NG	NG	NG	NG	NG	0.899	0.623	0.758
Manganese	mg/L	0.05	NG	NG	NG	NG	0.000858	0.00322	0.00266
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	0.000041
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.00003	0.000019	0.000019
Nickel	mg/L	NG	NG	0.025-0.150 [9]	0.05	0.1	0.000469	0.000377	0.000345
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	0.0032	0.0031	*<0.05*
Potassium	mg/L	NG	NG	NG	NG	NG	0.44	0.313	0.322
Rhenium	mg/L	NG	NG	NG	NG	NG			<0.000005
Rubidium	mg/L	NG	NG	NG	NG	NG			0.000787
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.00004	<0.00004	<0.00004
Silicon	mg/L	NG	NG	NG	NG	NG	0.471	0.329	0.361
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005	<0.000005	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	0.73	0.5	0.58
Strontium	mg/L	NG	NG	NG	NG	NG	0.00734	0.00484	0.00556
Tellurium	mg/L	NG	NG	NG	NG	NG			<0.00001
Thallium	mg/L	NG	NG	0.0008	NG	NG	0.0000269	0.0000148	<0.000001
Thorium	mg/L	NG	NG	NG	NG	NG			0.0000127
Tin	mg/L	NG	NG	NG	NG	NG			0.00285
Titanium	mg/L	NG	NG	NG	NG	NG			0.000121
Tungsten	mg/L	NG	NG	NG	NG	NG			<0.00001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000224	0.000158	0.000187
Vanadium	mg/L	NG	NG	NG	NG	NG	0.00005	0.000034	0.000032
Yttrium	mg/L	NG	NG	NG	NG	NG			0.0000695
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.0021	0.0009	0.129
Zirconium	mg/L	NG	NG	NG	NG	NG			0.000021
Dissolved Metals									
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1	2	0.0168	0.0144	
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0000074	<0.000005	
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.000196	0.000164	
Barium	mg/L	NG	1	NG	NG	NG	0.00656	0.0018	
Beryllium	mg/L	NG	NG	NG	NG	NG	0.0000026	0.0000024	
Boron	mg/L	NG	5	1.5	NG	NG	<0.005	<0.005	
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.000005	<0.000005	
Calcium	mg/L	NG	NG	NG	NG	NG	1.49	1.12	1.47
Chromium	mg/L	NG	0.05	NG	NG	NG	0.000089	0.000072	
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0000141	0.0000098	
Copper	mg/L	1	NG	0.002-0.004 [9]	NG	NG	0.00118	0.000859	
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.01	<0.01	
Lead	mg/L	NG	0.01	0.001-0.007 [9]	NG	NG	0.0000089	<0.000005	
Magnesium	mg/L	NG	NG	NG	NG	NG	0.768	0.58	0.71
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00117	0.000452	
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.000025	0.000019	
Nickel	mg/L	NG	NG	0.025-0.150 [9]	NG	NG	0.000376	0.000348	
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	<0.001	0.0013	0.0032
Potassium	mg/L	NG	NG	NG	NG	NG	0.3	0.16	0.33
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.00004	<0.00004	
Silicon	mg/L	NG	NG	NG	NG	NG	0.431	0.325	
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005	<0.000005	
Sodium	mg/L	200	NG	NG	NG	NG	0.59	<1	<1
Strontium	mg/L	NG	NG	NG	NG	NG	0.00649	0.00487	
Thallium	mg/L	NG	NG	0.0008	NG	NG	0.0000193	0.0000127	
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000181	0.000134	
Vanadium	mg/L	NG	NG	NG	NG	NG	0.000044	0.00003	
Zinc	mg/L	5	NG	0.03	NG	NG	0.0286	0.00174	

Notes:

***** The equipment blank results indicate TDS, nitrate, aluminum, copper, mercury, tin, and zinc levels are unreliable, and represent contamination from the Kemmerer sampler and/or the nitric acid cleaning solution.

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term exposures (for clear flow)
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background levels when background is >250 mg/L (high flow)

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.12: Water Quality Station Analytical Results - JER-AEM-16

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-16			
		AO	MAC		Max. Average	Max. Grab	30-Jun-05	29-Jul-05	26-Aug-05	24-Sep-05
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	5.72	5.66	6.91	6.94
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	20	13	14	12
Hardness	mg/L	NG	NG	NG	NG	NG		<6	<6	<6
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	2	2	3	2
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	1	1	2	2
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<2	2	<2	<2
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	<10	12	12	68
Turbidity	NTU	NG	NG	NG	NG	NG	1	2	1	2
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	2	3	2	1
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	9	6	6	6
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	11	7	7	7
Ammonia as N	mg/L	NG	NG	12.5-39.7[5]	6	12	<0.1	<0.1	<0.1	<0.1
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	<0.05	<0.05	<0.05	<0.05
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	0.05	<0.05	<0.05	<0.05
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	0.04	0.06	0.03	0.04
Chloride - Cl	mg/L	250	NG	120	500	1000	0.4	0.2	0.4	0.3
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.2	<0.2	<0.2	<0.2
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	3.4	0.9	0.7	1.7
Ionic Balance	N/A	NG	NG	NG	NG	NG		1.02	0.89	0.51
Total Metals										
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1.5	3	*<0.02*	0.05	0.034	0.018
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	<0.0004	<0.0004	<0.0004	<0.0004
Barium	mg/L	NG	1	NG	NG	NG	<0.005	<0.005	<0.005	<0.005
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.01	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	*<0.0002*	*<0.0002*	*<0.0001*	*<0.0001*
Calcium	mg/L	NG	NG	NG	NG	NG	1.12	1.16	1.17	1.13
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0009	<0.0009	<0.0009	0.0025
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002[9]	0.02	0.04	<0.001	<0.001	0.0012	<0.001
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG			<0.1	<0.1
Lead	mg/L	NG	0.01	0.001[9]	0.01	0.02	<0.0001	<0.0001	<0.0001	<0.0001
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	0.56	0.57	0.56	<0.5
Manganese	mg/L	0.05	NG	NG	NG	NG			<0.01	<0.01
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.0002*	*<0.0002*	*<0.0001*	*<0.0001*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	mg/L	NG	NG	0.025[9]	0.05	0.1	<0.0006	<0.0006	<0.0006	<0.0006
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	*<0.05*	*<0.05*	*<0.05*	*<0.05*
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5	<0.5
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0008	<0.0008	<0.0008	<0.0008
Silicon	mg/L	NG	NG	NG	NG	NG	0.2	0.26	0.21	0.19
Silver	mg/L	NG	NG	0.0001	NG	NG	*<0.0002*	*<0.0002*	*<0.0002*	*<0.0002*
Sodium	mg/L	200	NG	NG	NG	NG	0.8	0.6	<0.5	<0.5
Strontium	mg/L	NG	NG	NG	NG	NG			0.0048	0.004
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00012	0.00017	0.00016	<0.00005
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.0001	0.0002	0.0002	0.0006
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.002	<0.002	0.004	<0.002
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1	2	0.013	0.018	0.022	0.007
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.0002	<0.0001	0.0003	0.0002
Barium	mg/L	NG	1	NG	NG	NG	<0.003	<0.003	<0.003	<0.003
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Boron	mg/L	NG	5	1.5	NG	NG	<0.004	<0.004	<0.004	<0.004
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	1.2	1.4	1.2	1.2
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0004	<0.0004	<0.0004	0.0004
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Copper	mg/L	1	NG	0.002[9]	NG	NG	0.0039	0.0047	<0.001	0.0049
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.01	<0.01	<0.1	<0.01
Lead	mg/L	NG	0.01	0.001[9]	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	0.6	0.6	0.5	<0.5
Manganese	mg/L	0.05	NG	NG	NG	NG	0.003	<0.001	<0.01	<0.001
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.0002*	*<0.0002*	*<0.0001*	*<0.0001*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.0003	<0.0003	<0.0003	<0.0003
Nickel	mg/L	NG	NG	0.025[9]	NG	NG	0.0003	0.0003	0.0002	<0.0001
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5	<0.5
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0004	<0.0004	<0.0004	<0.0004
Silicon	mg/L	NG	NG	NG	NG	NG	0.21	0.25	0.25	0.16
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Sodium	mg/L	200	NG	NG	NG	NG	<0.5	<0.5	<0.5	<0.5
Strontium	mg/L	NG	NG	NG	NG	NG			0.0047	0.0054
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00002	<0.00002	<0.00002	<0.00002
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00011	0.00012	0.00026	0.00008
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	mg/L	5	NG	0.03	NG	NG	0.003	0.002	<0.002	<0.002

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term exposures (for clear flow)
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background levels when background is >250 mg/L (high flow)

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.12: Water Quality Station Analytical Results - JER-AEM-16

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-16			
		AO	MAC		Max. Average	Max. Grab	18-Jun-06	11-Jul-06	7-Aug-06	10-Sep-06
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	6.76	6.81		6.75
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	14	14		14
Hardness	mg/L	NG	NG	NG	NG	NG	<6	<6		<6
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	2.7	2.7		2.6
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	0.1	<0.1		1
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25		<2	<2	<2
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	32	12		8
Turbidity	NTU	NG	NG	NG	NG	NG				
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	3	2		1
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	6	8		9
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1		<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	8	10		11
Ammonia as N	mg/L	NG	NG	12.5-39.7[5]	6	12	0.02	0.01	<0.005	0.01
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	<0.05	<0.05		<0.05
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	<0.05	<0.05		<0.05
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG		<0.2		
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	*<1*	*<1*		*<1*
Chloride - Cl	mg/L	250	NG	120	500	1000	0.4	0.2		0.3
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	0.03	0.03		0.03
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.2	<0.2		<0.2
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	0.8	<0.5		0.6
Ionic Balance	N/A	NG	NG	NG	NG	NG	0.6	0.67		0.28
Total Metals										
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1.5	3	0.0211	0.0283	0.0219	0.0239
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.00005	<0.00005	0.00001	<0.00005
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	<0.0002	<0.0002	0.0002	<0.0002
Barium	mg/L	NG	1	NG	NG	NG	0.00177	0.00163	0.00164	0.00202
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.000003	0.0002
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	<0.001	<0.001	0.029	0.001
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.00005	<0.000002	0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	1.08	0.88	1.02	1.08
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	0.0014	0.0013	0.0003	0.0034
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00006	<0.00005	0.00002	<0.00005
Copper	mg/L	1	NG	0.002[9]	0.02	0.04	0.0076	<0.001	0.0016	<0.001
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.1	<0.1	0.01	<0.1
Lead	mg/L	NG	0.01	0.001[9]	0.01	0.02	<0.00005	<0.00005	0.00002	<0.00005
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	<0.5	0.19	0.47	0.55
Manganese	mg/L	0.05	NG	NG	NG	NG	<0.01	<0.01	0.002	<0.01
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	<0.00001	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.00005	<0.00005	0.00002	<0.00005
Nickel	mg/L	NG	NG	0.025[9]	0.05	0.1	0.0005	0.0004	0.0003	0.0002
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	0.02	*<0.02*	0.003	*<0.02*
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	0.3	<0.5
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.0001	0.0012
Silicon	mg/L	NG	NG	NG	NG	NG	0.15	0.12	0.27	0.18
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.0001	<0.0001	0	<0.0001
Sodium	mg/L	200	NG	NG	NG	NG	<0.5	<0.5	0.5	<0.5
Strontium	mg/L	NG	NG	NG	NG	NG	0.0044	0.0046	0.0045	0.0052
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	<0.00005	0.00001	<0.00005
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00012	0.0001	0.00014	0.00014
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	0.0001	0.0029
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.007	0.003	0.004	0.003
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1	2	0.015	0.019	0.0186	0.013
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.00005	0.00001	<0.00005
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.0002	0.0001	0.0002	<0.0001
Barium	mg/L	NG	1	NG	NG	NG	0.00156	0.00284	0.00159	0.00206
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.000003	<0.0001
Boron	mg/L	NG	5	1.5	NG	NG	<0.001	<0.001	0.025	<0.001
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.000002	<0.00002
Calcium	mg/L	NG	NG	NG	NG	NG	0.7	1.1	1	0.5
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0003	<0.0003	0.0003	0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00002	<0.00002	0.00002	<0.00002
Copper	mg/L	1	NG	0.002[9]	NG	NG	<0.0001	0.0029	0.0015	<0.0001
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.1	<0.1	0.01	<0.1
Lead	mg/L	NG	0.01	0.001[9]	NG	NG	<0.00005	0.00006	0.00001	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	<0.5	0.4	0.5	0.4
Manganese	mg/L	0.05	NG	NG	NG	NG	<0.01	<0.01	0.002	<0.01
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	<0.00001	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.00005	0.00006	0.00002	<0.00005
Nickel	mg/L	NG	NG	0.025[9]	NG	NG	0.00025	0.00042	0.00027	0.00025
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG		*<0.005*	0.002	*<0.01*
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	0.3	<0.5
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0006	<0.0006	<0.0001	<0.0006
Silicon	mg/L	NG	NG	NG	NG	NG	0.26	0.14	0.26	0.15
Silver	mg/L	NG	NG	0.0001	NG	NG	0.00006	<0.00005	0	<0.00005
Sodium	mg/L	200	NG	NG	NG	NG	<0.5	<0.5	0.4	<0.5
Strontium	mg/L	NG	NG	NG	NG	NG	0.0044	0.0061	0.0045	0.0052
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	<0.00005	0.00001	<0.00005
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00011	0.00014	0.00014	0.00011
Vanadium	mg/L	NG	NG	NG	NG	NG	0.0002	0.0003	0.0001	0.0005
Zinc	mg/L	5	NG	0.03	NG	NG	<0.001	0.004	0.001	0.002

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10%

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.12: Water Quality Station Analytical Results - JER-AEM-16

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-16			
		AO	MAC		Max. Average	Max. Grab	26-Jun-07	17-Jul-07	25-Aug-07	23-Sep-07
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	**6.45**	6.89	6.86	7.09
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	14.4	17.3	14.7	13.1
Hardness	mg/L	NG	NG	NG	NG	NG	5.35	5.31	5.37	5.37
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3.22	3.18	3.22	3.07
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	0.62	0.64	0.7	0.71
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	10	<10	17	16
Turbidity	NTU	NG	NG	NG	NG	NG				
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	1.7	1.6	2
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	3.9	5.4	4.3	4.4
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	3.9	5.4	4.3	4.4
Ammonia as N	mg/L	NG	NG	12.5-39.7[5]	6	12	0.0108	0.0073	0.009	0.0079
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	<0.001	<0.001	<0.001	0.0012
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	0.0408	0.0243	0.0237	0.0354
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG				
Chloride - Cl	mg/L	250	NG	120	500	1000	<0.5	<0.5	<0.5	<0.5
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG				
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	0.91	0.95	1.07	1.28
Ionic Balance	N/A	NG	NG	NG	NG	NG				
Total Metals										
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1.5	3	0.0391	0.0203	0.0246	0.0146
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00015	0.00015	0.00017	0.00017
Barium	mg/L	NG	1	NG	NG	NG	0.00231	0.00178	0.00189	0.00169
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.01	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	1.15	1.13	1.3	1.16
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002[9]	0.02	0.04	0.00091	0.00088	0.00161	0.00086
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	0.041	<0.03	0.05	<0.03
Lead	mg/L	NG	0.01	0.001[9]	0.01	0.02	<0.00005	<0.00005	<0.00005	<0.00005
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	0.632	0.58	0.62	0.578
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00562	0.00521	0.004	0.00246
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.00005	<0.00005	<0.00005	<0.00005
Nickel	mg/L	NG	NG	0.025[9]	0.05	0.1	0.00058	<0.0005	<0.0005	<0.0005
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	0.0051	0.0022	0.0062	0.0026
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5	<0.5
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.3	0.18	0.167	0.175
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	<0.5	0.52	0.57	0.53
Strontium	mg/L	NG	NG	NG	NG	NG	0.00538	0.00511	0.00546	0.00516
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000207	0.000151	0.000165	0.000135
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.001	<0.001	<0.003	<0.001
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1	2	0.0204	0.0125	<0.009	0.008
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00015	0.00017	0.00015	0.00016
Barium	mg/L	NG	1	NG	NG	NG	0.00205	0.00177	0.00169	0.00157
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.01	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	1.15	1.15	1.2	1.19
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002[9]	NG	NG	0.00083	0.00083	<0.0007	0.00069
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	<0.03	<0.03
Lead	mg/L	NG	0.01	0.001[9]	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	0.6	0.59	0.576	0.584
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00206	0.00242	0.000062	0.000069
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Nickel	mg/L	NG	NG	0.025[9]	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	<0.002	<0.002	0.0021	<0.002
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5	<0.5
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.216	0.164	0.143	0.138
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	<0.5	0.54	0.55	0.55
Strontium	mg/L	NG	NG	NG	NG	NG	0.00522	0.00524	0.00501	0.00516
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000161	0.000132	0.000118	0.000108
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	<0.001	<0.001	0.001	0.0011

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10%

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.12: Water Quality Station Analytical Results - JER-AEM-16

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-16			
		AO	MAC		Max. Average	Max. Grab	9-Jul-08	6-Aug-08	18-Sep-08	15-Jun-09
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	6.81	7	6.86	6.89
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	17.8	14.5	16	18
Hardness	mg/L	NG	NG	NG	NG	NG	4.64	5.66	5.98	6.64
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	2.59	5.12	3.42	3.32
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	<0.5	0.74	0.68	0.79
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	12	21	23	23
Turbidity	NTU	NG	NG	NG	NG	NG				0.33
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	3.2	2.4	2.8	1.9
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	6.1	4.4	5.8	5.2
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	6.1	4.4	5.8	5.2
Ammonia as N	mg/L	NG	NG	12.5-39.7[5]	6	12	0.0074	0.132	<0.005	0.0215
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	<0.001	<0.001	0.001	<0.001
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	0.0455	0.0193	0.128	0.185
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG				
Chloride - Cl	mg/L	250	NG	120	500	1000	<0.5	<0.5	<0.5	<0.5
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG				<1
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	0.0027	<0.001	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	0.84	0.87	0.96	1.44
Ionic Balance	N/A	NG	NG	NG	NG	NG				
Total Metals										
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1.5	3	0.0164	0.0175	0.0239	0.0246
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00013	0.00016	0.00017	0.00017
Barium	mg/L	NG	1	NG	NG	NG	0.00163	0.00172	0.00194	0.00217
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.01	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	1.02	1.17	1.19	1.44
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002[9]	0.02	0.04	0.00076	0.00085	0.00097	0.00067
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	<0.03	<0.03
Lead	mg/L	NG	0.01	0.001[9]	0.01	0.02	<0.00005	<0.00005	<0.00005	<0.00005
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	0.51	0.617	0.642	0.722
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00333	0.00239	0.00192	0.00201
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.00005	<0.00005	<0.00005	<0.00005
Nickel	mg/L	NG	NG	0.025[9]	0.05	0.1	<0.0005	<0.0005	<0.0005	<0.0005
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	0.0048	0.0218	0.0034	0.0031
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5	<0.5
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.166	0.129	0.295	0.398
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	<0.5	0.53	0.55	0.65
Strontium	mg/L	NG	NG	NG	NG	NG	0.00473	0.00554	0.0059	0.00675
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000129	0.000133	0.00017	0.000203
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.001	<0.001	<0.001	0.0019
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1	2	0.0154	0.0137	0.017	
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.0001	<0.0001	
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00012	0.00015	0.00015	
Barium	mg/L	NG	1	NG	NG	NG	0.0016	0.00173	0.00183	
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.01	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	1.01	1.22	1.27	1.46
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002[9]	NG	NG	0.00081	0.00086	0.00091	0.0006
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	<0.03	<0.03
Lead	mg/L	NG	0.01	0.001[9]	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	0.512	0.637	0.678	0.728
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00321	0.000754	0.000099	0.000277
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Nickel	mg/L	NG	NG	0.025[9]	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	<0.002	0.0056	<0.002	<0.002
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5	<0.5
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.161	0.111	0.269	0.393
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	<0.5	0.56	0.58	0.65
Strontium	mg/L	NG	NG	NG	NG	NG	0.00461	0.0057	0.0061	0.00674
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000124	0.000126	0.000151	0.000181
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	<0.001	<0.001	<0.001	0.0022

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10%

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.12: Water Quality Station Analytical Results - JER-AEM-16

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-16			
		AO	MAC		Max. Average	Max. Grab	14-Jul-09	12-Apr-11	15-Aug-11	29-Aug-14
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	6.57	7.14	7.02	6.58
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	14.7	19.4	11.9	17.4
Hardness	mg/L	NG	NG	NG	NG	NG	5.52	8.84	5.2	6.6
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3.31	5.2	3.4	3.6
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	0.56		2	
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	10	10	14	7
Turbidity	NTU	NG	NG	NG	NG	NG	0.31	0.36	0.2	0.4
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	2.6	<5	<5	
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	4.3	7.6	<5	5.5
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<5	<5	<5
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	4.3	9.3	5.9	6.7
Ammonia as N	mg/L	NG	NG	12.5-39.7[5]	6	12	<0.005	0.0402	<0.005	0.0119
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	<0.001	<0.002	<0.002	0.0025
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	0.0966	0.0993	<0.006	0.0159
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG		<0.05	<0.05	<0.02
Chloride - Cl	mg/L	250	NG	120	500	1000	<0.5	<0.5	<0.5	<0.5
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<1	<5	<5	<5
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	1.01	1.49	0.921	1.14
Ionic Balance	N/A	NG	NG	NG	NG	NG				
Total Metals										
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1.5	3	0.0305	0.03	0.0148	0.0124
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	0.000089	0.0000065	<0.000005
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00016	0.00029	0.000173	0.000207
Barium	mg/L	NG	1	NG	NG	NG	0.00195	0.00522	0.0017	0.00163
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	0.0000048	<0.000002	<0.000002
Bismuth	mg/L	NG	NG	NG	NG	NG				<0.000001
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.005	<0.005	0.0073
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	0.0000181	<0.000005	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	1.26	2.01	1.18	1.46
Cesium	mg/L	NG	NG	NG	NG	NG				<0.000005
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	0.000227	0.000068	0.000076
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	0.000043	0.0000143	0.0000164
Copper	mg/L	1	NG	0.002[9]	0.02	0.04	0.00102	0.00281	0.00105	0.00101
Gallium	mg/L	NG	NG	NG	NG	NG				<0.00005
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	0.022	0.011	0.015
Lead	mg/L	NG	0.01	0.001[9]	0.01	0.02	<0.00005	0.000157	<0.000005	0.000005
Lithium	mg/L	NG	NG	NG	NG	NG				0.00084
Magnesium	mg/L	NG	NG	NG	NG	NG	0.723	1.04	0.633	0.781
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00643	0.00425	0.0022	0.00185
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	<0.000005
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.00005	0.000037	0.000022	0.000044
Nickel	mg/L	NG	NG	0.025[9]	0.05	0.1	<0.0005	0.000663	0.000342	0.000292
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	<0.002	0.0049	0.0027	*<0.05*
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	0.66	0.302	0.332
Rhenium	mg/L	NG	NG	NG	NG	NG				<0.000005
Rubidium	mg/L	NG	NG	NG	NG	NG				0.000784
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	0.00004	<0.00004	0.000057
Silicon	mg/L	NG	NG	NG	NG	NG	0.383	0.532	0.244	0.239
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.000005	<0.000005	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	0.55	0.95	0.5	0.59
Strontium	mg/L	NG	NG	NG	NG	NG	0.00567	0.0089	0.00488	0.00534
Tellurium	mg/L	NG	NG	NG	NG	NG				<0.00001
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	0.0000262	0.0000123	<0.000001
Thorium	mg/L	NG	NG	NG	NG	NG				0.0000108
Tin	mg/L	NG	NG	NG	NG	NG				<0.00001
Titanium	mg/L	NG	NG	NG	NG	NG				0.000174
Tungsten	mg/L	NG	NG	NG	NG	NG				<0.00001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000198	0.000269	0.000146	0.000183
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	0.000066	0.00004	0.000041
Yttrium	mg/L	NG	NG	NG	NG	NG				0.0000655
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.003	0.014	0.00073	0.00037
Zirconium	mg/L	NG	NG	NG	NG	NG				0.00002
Dissolved Metals										
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1	2	0.0199	0.0214	0.0111	
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	0.0000357	0.000005	
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00016	0.000266	0.000175	
Barium	mg/L	NG	1	NG	NG	NG	0.0019	0.00359	0.00169	
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	0.0000041	<0.000002	
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.005	<0.005	
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	0.0000139	<0.000005	
Calcium	mg/L	NG	NG	NG	NG	NG	1.15	1.92	1.11	1.46
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	0.000164	0.000058	
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	0.0000181	0.0000096	
Copper	mg/L	1	NG	0.002[9]	NG	NG	0.00077	0.00236	0.000849	
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.01	<0.01	
Lead	mg/L	NG	0.01	0.001[9]	NG	NG	<0.00005	0.00141	<0.000005	
Magnesium	mg/L	NG	NG	NG	NG	NG	0.642	0.984	0.58	0.72
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00122	0.000785	0.000276	
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.00005	0.000039	0.000021	
Nickel	mg/L	NG	NG	0.025[9]	NG	NG	<0.0005	0.000547	0.000327	
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	<0.002	<0.001	<0.001	0.0024
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	0.63	0.21	0.33
Selenium	mg/L	NG	0.01	0.001	NG	NG	*<0.5*	<0.00004	<0.00004	
Silicon	mg/L	NG	NG	NG	NG	NG	0.393	0.517	0.238	
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.000005	<0.000005	
Sodium	mg/L	200	NG	NG	NG	NG	<0.5	0.85	<1	<1
Strontium	mg/L	NG	NG	NG	NG	NG	0.00571	0.00841	0.00481	
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	0.0000246	0.0000112	
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000155	0.000225	0.000129	
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	0.000047	0.00004	
Zinc	mg/L	5	NG	0.03	NG	NG	<0.001	0.00925	0.00142	

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (I

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10%

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.13: Water Quality Station Analytical Results - JER-AEM-22 Surface

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-22					JER-A
		AO	MAC		Max. Average	Max. Grab	31-Jul-05	11-Jul-06	17-Jul-07	11-Aug-07	24-Jul-08	11-Jul-09
Physical Parameters												
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	6.92	7.03	6.87	7.3	6.58	7.94
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	17	18	24	23.3	15.6	26.5
Hardness	mg/L	NG	NG	NG	NG	NG	7.2	7	8.84	9.49	7.32	11.9
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3	3	3.87	3.2	3.06	3.96
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	2	1	1.56	1.56	0.97	1.55
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<2	<2	<3	<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	24	8	15	11	23	21
Turbidity	NTU	NG	NG	NG	NG	NG	3					0.55
Anions												
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	2	3	2	<1	<1	3
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	8	11	9.3	8.9	5.8	8.6
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	9	14	9.3	8.9	5.8	8.6
Ammonia as N	mg/L	NG	NG	1.26-39.8[5]	6	12	<0.1	0.02	0.0067	0.009	0.008	0.0095
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	<0.05	<0.05	<0.001	0.0015	<0.001	<0.001
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	<0.05	<0.05	<0.005	<0.005	0.0058	<0.005
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG		0.2				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	0.05	*<1*				
Chloride - Cl	mg/L	250	NG	120	500	1000	0.5	0.4	0.6	0.76	<0.5	<0.5
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<1	0.02				<1
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.2	<0.2	<0.001	<0.001	0.0012	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	<0.5	<0.5	0.51	0.67	0.56	2.08
Ionic Balance	N/A	NG	NG	NG	NG	NG	1.06	0.69				
Total Metals												
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1.5	3	<0.02	0.0373	0.0262	0.0336	0.0212	0.0371
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	<0.0004	<0.0002	0.0002	0.0002	0.00024	0.00018
Barium	mg/L	NG	1	NG	NG	NG	<0.005	0.00199	0.00167	0.0015	0.00164	0.0021
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG						
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.001	<0.01	<0.01	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	*<0.0002*	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	1.68	1.41	2.05	2.2	1.6	2.66
Cesium	mg/L	NG	NG	NG	NG	NG						
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0009	0.0011	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002[9]	0.02	0.04	<0.001	<0.001	0.00103	0.00101	0.00123	0.00139
Gallium	mg/L	NG	NG	NG	NG	NG						
Iron	mg/L	0.3	NG	0.3	NG	NG		<0.1	0.117	0.158	0.032	0.067
Lead	mg/L	NG	0.01	0.001[9]	0.01	0.02	<0.0001	<0.00005	<0.00005	0.00005	0.00007	<0.00005
Lithium	mg/L	NG	NG	NG	NG	NG						
Magnesium	mg/L	NG	NG	NG	NG	NG	0.73	0.34	0.856	0.971	0.807	1.4
Manganese	mg/L	0.05	NG	NG	NG	NG		<0.01	0.00464	0.00494	0.00203	0.00481
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.0002*	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.0005	<0.00005	<0.00005	<0.00005	0.000121	<0.00005
Nickel	mg/L	NG	NG	0.025[9]	0.05	0.1	<0.0006	0.0003	<0.0005	0.00062	<0.0005	0.00084
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	*<0.05*	*<0.02*	0.006	0.0066	0.0044	0.0047
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Rhenium	mg/L	NG	NG	NG	NG	NG						
Rubidium	mg/L	NG	NG	NG	NG	NG						
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0008	<0.001	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.17	0.2	0.187	0.239	0.258	0.41
Silver	mg/L	NG	NG	0.0001	NG	NG	*<0.0002*	<0.0001	<0.00001	<0.00001	0.000017	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	0.6	<0.5	0.57	0.71	<0.5	0.93
Strontium	mg/L	NG	NG	NG	NG	NG		0.0036	0.0049	0.00521	0.00449	0.00619
Tellurium	mg/L	NG	NG	NG	NG	NG						
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG						
Tin	mg/L	NG	NG	NG	NG	NG						
Titanium	mg/L	NG	NG	NG	NG	NG						
Tungsten	mg/L	NG	NG	NG	NG	NG						
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00008	0.00005	0.000104	0.000092	0.000059	0.000164
Vanadium	mg/L	NG	NG	NG	NG	NG	0.0002	<0.0005	<0.001	<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG						
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.002	0.005	0.0027	0.0013	0.0015	<0.005
Zirconium	mg/L	NG	NG	NG	NG	NG						
Dissolved Metals												
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1	2	0.016	0.023	0.0125			0.0258
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.00005	<0.0001			<0.0001
Arsenic	mg/L	NG	0.01	0.005	NG	NG	<0.0001	0.0002	0.00018			0.00017
Barium	mg/L	NG	1	NG	NG	NG	<0.003	0.0104	0.00155			0.00212
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0005			<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	<0.004	<0.001	<0.01			<0.01
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.00005			<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	1.7	1.6	2.09			2.54
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0004	<0.0003	<0.0005			<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.00005	<0.00002	<0.0001			<0.0001
Copper	mg/L	1	NG	0.002[9]	NG	NG	0.0038	0.0033	0.00092			0.00065
Iron	mg/L	0.3	NG	0.3	NG	NG	0.04	<0.1	0.056			0.041
Lead	mg/L	NG	0.01	0.001[9]	NG	NG	<0.00005	<0.00005	<0.00005			<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	0.7	0.6	0.882			1.35
Manganese	mg/L	0.05	NG	NG	NG	NG	<0.001	<0.01	0.000326			0.00214
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.0002*	*<0.00005*	*<0.00005*			*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.0003	0.00005	<0.00005			<0.00005
Nickel	mg/L	NG	NG	0.025[9]	NG	NG	0.0002	0.0005	<0.0005			0.00064
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	*<0.005*	*<0.005*	<0.002	0.0026	0.0021	<0.002
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5			<0.5
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0004	<0.0006	<0.001			<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.18	0.22	0.189			0.419
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00005	<0.00005	<0.00001			<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	0.6	<0.5	0.58			0.87
Strontium	mg/L	NG	NG	NG	NG	NG		0.0054	0.00494			0.00642
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00002	<0.00005	<0.0001			<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	<0.00005	0.0001	0.000081			0.000225
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.0005	0.0003	<0.001			<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	<0.002	0.002	0.0015			0.0023

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term exposures (for clear flow)
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background levels when background is >250 mg/L (high flow)

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{0}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.13: Water Quality Station Analytical Results - JER-AEM-22 Surface

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		EM-22	
		AO	MAC		Max. Average	Max. Grab	7-Aug-11	25-Aug-14
Physical Parameters								
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.37	7.26
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	32.8	42.5
Hardness	mg/L	NG	NG	NG	NG	NG	14.4	17.6
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	4.5	6.1
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	3.6	
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	24	19.3
Turbidity	NTU	NG	NG	NG	NG	NG	0.42	0.86
Anions								
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5	
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	13.3	15.2
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5	<5
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	16.2	18.6
Ammonia as N	mg/L	NG	NG	1.26-39.8[5]	6	12	0.0059	0.0163
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	<0.002	<0.002
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	<0.006	0.0155
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG		
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	<0.05	<0.02
Chloride - Cl	mg/L	250	NG	120	500	1000	<0.5	0.52
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<5	<5
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	1.39	2.07
Ionic Balance	N/A	NG	NG	NG	NG	NG		
Total Metals								
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1.5	3	0.0151	0.039
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0000141	0.0000099
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.000253	0.000322
Barium	mg/L	NG	1	NG	NG	NG	0.00225	0.00201
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.000002	0.0000052
Bismuth	mg/L	NG	NG	NG	NG	NG		<0.000001
Boron	mg/L	NG	5	1.5	NG	NG	<0.005	<0.005
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.000005	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	3.36	3.78
Cesium	mg/L	NG	NG	NG	NG	NG		0.0000052
Chromium	mg/L	NG	0.05	NG	0.087	0.17	0.0001	0.000187
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0000204	0.0000498
Copper	mg/L	1	NG	0.002[9]	0.02	0.04	0.00121	0.00161
Gallium	mg/L	NG	NG	NG	NG	NG		<0.00005
Iron	mg/L	0.3	NG	0.3	NG	NG	0.117	0.076
Lead	mg/L	NG	0.01	0.001[9]	0.01	0.02	0.0000142	0.0000167
Lithium	mg/L	NG	NG	NG	NG	NG		0.00042
Magnesium	mg/L	NG	NG	NG	NG	NG	1.67	2.14
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00549	0.00662
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	0.0000052
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.000048	0.000041
Nickel	mg/L	NG	NG	0.025[9]	0.05	0.1	0.000719	0.000889
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	0.0049	*<0.05*
Potassium	mg/L	NG	NG	NG	NG	NG	0.463	0.476
Rhenium	mg/L	NG	NG	NG	NG	NG		<0.000005
Rubidium	mg/L	NG	NG	NG	NG	NG		0.000874
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.00004	0.000043
Silicon	mg/L	NG	NG	NG	NG	NG	0.237	0.661
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	1.02	1.21
Strontium	mg/L	NG	NG	NG	NG	NG	0.00764	0.00851
Tellurium	mg/L	NG	NG	NG	NG	NG		<0.00001
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.000005	<0.000001
Thorium	mg/L	NG	NG	NG	NG	NG		0.0000199
Tin	mg/L	NG	NG	NG	NG	NG		<0.00001
Titanium	mg/L	NG	NG	NG	NG	NG		0.000859
Tungsten	mg/L	NG	NG	NG	NG	NG		<0.00001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.0000979	0.000281
Vanadium	mg/L	NG	NG	NG	NG	NG	0.000106	0.000116
Yttrium	mg/L	NG	NG	NG	NG	NG		0.000114
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.00153	0.00029
Zirconium	mg/L	NG	NG	NG	NG	NG		0.000048
Dissolved Metals								
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1	2	0.01	
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0000129	
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.000242	
Barium	mg/L	NG	1	NG	NG	NG	0.00235	
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.000002	
Boron	mg/L	NG	5	1.5	NG	NG	<0.005	
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.000005	
Calcium	mg/L	NG	NG	NG	NG	NG	3.15	3.57
Chromium	mg/L	NG	0.05	NG	NG	NG	0.000091	
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0000103	
Copper	mg/L	1	NG	0.002[9]	NG	NG	0.00105	
Iron	mg/L	0.3	NG	0.3	NG	NG	0.073	
Lead	mg/L	NG	0.01	0.001[9]	NG	NG	0.0000078	
Magnesium	mg/L	NG	NG	NG	NG	NG	1.58	2.1
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00141	
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.000047	
Nickel	mg/L	NG	NG	0.025[9]	NG	NG	0.000689	
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	0.0015	0.0089
Potassium	mg/L	NG	NG	NG	NG	NG	0.32	0.43
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.00004	
Silicon	mg/L	NG	NG	NG	NG	NG	0.223	
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005	
Sodium	mg/L	200	NG	NG	NG	NG	1	1.4
Strontium	mg/L	NG	NG	NG	NG	NG	0.00773	
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.000005	
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.0000808	
Vanadium	mg/L	NG	NG	NG	NG	NG	0.000086	
Zinc	mg/L	5	NG	0.03	NG	NG	0.00248	

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFA

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for long
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of ba

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{0}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.14: Water Quality Station Analytical Results - JER-AEM-22 Depth

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-22
		AO	MAC		Max. Average	Max. Grab	7-Aug-11
							3.5 m
Physical Parameters							
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.39
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	32.7
Hardness	mg/L	NG	NG	NG	NG	NG	14.4
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	4.4
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	3.6
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	21
Turbidity	NTU	NG	NG	NG	NG	NG	0.44
Anions							
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	12.8
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	15.6
Ammonia as N	mg/L	NG	NG	3.98 [5]	6	12	<0.005
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	<0.002
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	<0.006
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	<0.05
Chloride - Cl	mg/L	250	NG	120	500	1000	<0.5
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<5
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	1.4
Total Metals							
Aluminum	mg/L	0.1 [7]	NG	0.100 [8]	1.5	3	0.0151
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0000107
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.000256
Barium	mg/L	NG	1	NG	NG	NG	0.00208
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.000002
Boron	mg/L	NG	5	1.5	NG	NG	<0.005
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	3.33
Chromium	mg/L	NG	0.05	NG	0.087	0.17	0.000086
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0000188
Copper	mg/L	1	NG	0.002 [9]	0.02	0.04	0.00117
Iron	mg/L	0.3	NG	0.3	NG	NG	0.12
Lead	mg/L	NG	0.01	0.001 [9]	0.01	0.02	0.0000116
Magnesium	mg/L	NG	NG	NG	NG	NG	1.65
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00598
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.000046
Nickel	mg/L	NG	NG	0.025 [9]	0.05	0.1	0.00072
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	0.0051
Potassium	mg/L	NG	NG	NG	NG	NG	0.459
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.00004
Silicon	mg/L	NG	NG	NG	NG	NG	0.234
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	1.02
Strontium	mg/L	NG	NG	NG	NG	NG	0.00779
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.000005
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.0000995
Vanadium	mg/L	NG	NG	NG	NG	NG	0.000108
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.00056
Dissolved Metals							
Aluminum	mg/L	0.1 [7]	NG	0.100 [8]	1	2	0.00931
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0000108
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.000246
Barium	mg/L	NG	1	NG	NG	NG	0.00219
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.000002
Boron	mg/L	NG	5	1.5	NG	NG	<0.005
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	3.16
Chromium	mg/L	NG	0.05	NG	NG	NG	0.000069
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0000102
Copper	mg/L	1	NG	0.002 [9]	NG	NG	0.00102
Iron	mg/L	0.3	NG	0.3	NG	NG	0.066
Lead	mg/L	NG	0.01	0.001 [9]	NG	NG	0.0000079
Magnesium	mg/L	NG	NG	NG	NG	NG	1.58
Manganese	mg/L	0.05	NG	NG	NG	NG	0.000714
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.000048
Nickel	mg/L	NG	NG	0.025 [9]	NG	NG	0.000679
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	0.0014
Potassium	mg/L	NG	NG	NG	NG	NG	0.36
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.00004
Silicon	mg/L	NG	NG	NG	NG	NG	0.222
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	1
Strontium	mg/L	NG	NG	NG	NG	NG	0.00769
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.000005
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.0000843
Vanadium	mg/L	NG	NG	NG	NG	NG	0.000083
Zinc	mg/L	5	NG	0.03	NG	NG	0.00167

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
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2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term exposures (for clear flow)
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background levels when background is >250 mg/L (high flow)

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Table D.15: Water Quality Station Analytical Results - JER-AEM-23 Surface

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-23			
		AO	MAC		Max. Average	Max. Grab	31-Jul-05	11-Jul-06	17-Jul-07	24-Jul-08
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.2	7.03	6.81	6.69
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	16	17	20.8	22.2
Hardness	mg/L	NG	NG	NG	NG	NG	6.7	7	7.64	9.89
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3	3	3.66	8.26
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	2	0	1.17	1.63
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<2	<2	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	<10	15	13	16
Turbidity	NTU	NG	NG	NG	NG	NG	1			
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	3	1	2.1	<1
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	7	9	8	8.5
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	9	12	8	8.5
Ammonia as N	mg/L	NG	NG	12.5-39.8[5]	6	12	<0.1	0.02	0.0183	0.0097
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	<0.05	<0.05	<0.001	<0.001
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	0.06	0.08	0.0088	<0.005
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG		<0.2		
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	0.05	*<1*		
Chloride - Cl	mg/L	250	NG	120	500	1000	0.3	0.3	<0.5	0.76
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<1	0.02		
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.2	<0.2	<0.001	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	<0.5	<0.5	0.59	0.76
Ionic Balance	N/A	NG	NG	NG	NG	NG	1.01	0.75		
Total Metals										
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1.5	3	0.029	0.043	0.0278	0.0187
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.00005	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	<0.0004	<0.0002	0.00019	0.00019
Barium	mg/L	NG	1	NG	NG	NG	<0.005	0.00149	0.00189	0.00157
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0001	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	0.001	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	0.0012	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	1.59	1.42	1.73	2.22
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0009	0.001	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.00005	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002[9]	0.02	0.04	0.0015	0.0016	0.00138	0.00099
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG		<0.1	0.079	0.077
Lead	mg/L	NG	0.01	0.001[9]	0.01	0.02	0.0002	<0.00005	<0.00005	<0.00005
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	0.75	0.39	0.793	1.05
Manganese	mg/L	0.05	NG	NG	NG	NG		<0.01	0.00606	0.00269
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.0002*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.0005	<0.00005	<0.00005	<0.00005
Nickel	mg/L	NG	NG	0.025[9]	0.05	0.1	<0.0006	0.0004	<0.0005	<0.0005
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	0.063	*<0.02*	0.0092	0.0065
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5	<0.5
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0008	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.25	0.19	0.281	0.221
Silver	mg/L	NG	NG	0.0001	NG	NG	*<0.0002*	<0.0001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	0.6	<0.5	<0.5	0.69
Strontium	mg/L	NG	NG	NG	NG	NG		0.0046	0.0049	0.00515
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	<0.00005	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00005	<0.00005	0.000062	0.00009
Vanadium	mg/L	NG	NG	NG	NG	NG	0.0002	<0.0005	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.002	0.003	0.0022	<0.001
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1	2	0.021	0.028	0.0128	
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.00005	<0.0001	
Arsenic	mg/L	NG	0.01	0.005	NG	NG	<0.0001	0.0002	0.00019	
Barium	mg/L	NG	1	NG	NG	NG	<0.003	0.00227	0.00176	
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0005	
Boron	mg/L	NG	5	1.5	NG	NG	<0.004	<0.001	<0.01	
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.00005	
Calcium	mg/L	NG	NG	NG	NG	NG	1.6	1.5	1.73	
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0004	<0.0003	<0.0005	
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.00005	<0.00002	<0.0001	
Copper	mg/L	1	NG	0.002[9]	NG	NG	0.0044	0.0032	0.00111	
Iron	mg/L	0.3	NG	0.3	NG	NG	0.01	<0.1	<0.03	
Lead	mg/L	NG	0.01	0.001[9]	NG	NG	<0.00005	<0.00005	<0.00005	
Magnesium	mg/L	NG	NG	NG	NG	NG	0.7	0.7	0.806	
Manganese	mg/L	0.05	NG	NG	NG	NG	<0.001	<0.01	0.000551	
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.0002*	*<0.00005*	*<0.00005*	
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.0003	<0.00005	<0.00005	
Nickel	mg/L	NG	NG	0.025[9]	NG	NG	0.0002	0.0005	<0.0005	
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	*<0.005*	*<0.005*	<0.002	0.0027
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5	
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0004	<0.0006	<0.001	
Silicon	mg/L	NG	NG	NG	NG	NG	0.25	0.21	0.271	
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00005	<0.00005	<0.00001	
Sodium	mg/L	200	NG	NG	NG	NG	0.5	<0.5	<0.5	
Strontium	mg/L	NG	NG	NG	NG	NG		0.006	0.00492	
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00002	<0.00005	<0.0001	
Uranium	mg/L	NG	0.02	0.015	0.5	1	<0.00005	0.00006	0.000051	
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.0005	0.0003	<0.001	
Zinc	mg/L	5	NG	0.03	NG	NG	<0.002	0.003	<0.001	

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term exposures (for clear flow)
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background levels when background is >250 mg/L (high flow)

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.15: Water Quality Station Analytical Results - JER-AEM-23 Surface

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-23			
		AO	MAC		Max. Average	Max. Grab	11-Jul-09	16-Apr-11	7-Aug-11	25-Aug-14
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	6.59	7.17	7.23	7.05
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	19.9	51	25.2	40.6
Hardness	mg/L	NG	NG	NG	NG	NG	8.88	21.7	10.5	15.1
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	4.34	6	4.2	6.5
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	0.98		2.9	
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	17	34	16	18.7
Turbidity	NTU	NG	NG	NG	NG	NG	0.59	<0.1	0.32	0.96
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	3.1	<5	<5	
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	6.4	16.8	9.3	12.2
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<5	<5	<5
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	6.4	20.5	11.3	14.9
Ammonia as N	mg/L	NG	NG	12.5-39.8[5]	6	12	0.0095	0.0281	0.0079	0.0229
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	<0.001	<0.002	<0.002	0.0023
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	0.0509	0.277	<0.006	0.0762
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG		<0.05	<0.05	<0.02
Chloride - Cl	mg/L	250	NG	120	500	1000	<0.5	1.7	0.69	0.61
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<1	<5	<5	<5
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	1.13	4.02	1.4	3.25
Ionic Balance	N/A	NG	NG	NG	NG	NG				
Total Metals										
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1.5	3	0.0588	0.0282	0.0239	0.0617
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	0.0000176	0.0000121	0.0000118
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00016	0.000273	0.000252	0.000277
Barium	mg/L	NG	1	NG	NG	NG	0.00247	0.00563	0.00228	0.00321
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	0.0000045	0.0000021	0.0000075
Bismuth	mg/L	NG	NG	NG	NG	NG				<0.000001
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.005	<0.005	<0.005
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.000005	<0.000005	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	1.98	4.72	2.31	3.24
Cesium	mg/L	NG	NG	NG	NG	NG				0.000007
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	0.000148	0.000097	0.000175
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	0.0000296	0.000029	0.0000494
Copper	mg/L	1	NG	0.002[9]	0.02	0.04	0.00203	0.0026	0.00174	0.00246
Gallium	mg/L	NG	NG	NG	NG	NG				<0.00005
Iron	mg/L	0.3	NG	0.3	NG	NG	0.06	0.029	0.046	0.081
Lead	mg/L	NG	0.01	0.001[9]	0.01	0.02	<0.00005	0.0000824	0.0000137	0.0000193
Lithium	mg/L	NG	NG	NG	NG	NG				0.00044
Magnesium	mg/L	NG	NG	NG	NG	NG	1.07	2.52	1.23	1.85
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00473	0.00165	0.00389	0.00324
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	<0.000005
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.00005	0.000054	0.000043	0.000087
Nickel	mg/L	NG	NG	0.025[9]	0.05	0.1	0.00077	0.000782	0.000483	0.000561
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	0.0042	0.0029	0.0047	*<0.05*
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	0.78	0.413	0.618
Rhenium	mg/L	NG	NG	NG	NG	NG				<0.000005
Rubidium	mg/L	NG	NG	NG	NG	NG				0.00116
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.00004	<0.00004	0.000054
Silicon	mg/L	NG	NG	NG	NG	NG	0.696	1.24	0.217	0.724
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.000005	<0.000005	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	0.65	2.32	1.05	1.58
Strontium	mg/L	NG	NG	NG	NG	NG	0.00547	0.0144	0.00729	0.0141
Tellurium	mg/L	NG	NG	NG	NG	NG				<0.00001
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	0.0000231	0.0000095	<0.000001
Thorium	mg/L	NG	NG	NG	NG	NG				0.0000288
Tin	mg/L	NG	NG	NG	NG	NG				<0.00001
Titanium	mg/L	NG	NG	NG	NG	NG				0.000942
Tungsten	mg/L	NG	NG	NG	NG	NG				<0.00001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000139	0.000162	0.0000759	0.000192
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	0.000072	0.000101	0.000152
Yttrium	mg/L	NG	NG	NG	NG	NG				0.000171
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.005	0.0057	0.00099	0.00044
Zirconium	mg/L	NG	NG	NG	NG	NG				0.000073
Dissolved Metals										
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1	2	0.0403	0.0262	0.0179	
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	0.0000183	0.000011	
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00018	0.000265	0.000228	
Barium	mg/L	NG	1	NG	NG	NG	0.00243	0.00533	0.00219	
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	0.0000048	<0.000002	
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.005	<0.005	
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.000005	<0.000005	
Calcium	mg/L	NG	NG	NG	NG	NG	1.92	4.62	2.15	3.12
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	0.000126	0.000082	
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	0.0000288	0.0000133	
Copper	mg/L	1	NG	0.002[9]	NG	NG	0.00051	0.00249	0.00148	
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	0.016	0.023	
Lead	mg/L	NG	0.01	0.001[9]	NG	NG	<0.00005	0.00003	<0.000005	
Magnesium	mg/L	NG	NG	NG	NG	NG	0.994	2.47	1.26	1.77
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00184	0.000987	0.00103	
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.00005	0.000055	0.000043	
Nickel	mg/L	NG	NG	0.025[9]	NG	NG	0.00074	0.000759	0.000461	
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	<0.002	0.0012	0.0012	0.0056
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	0.91	0.34	0.59
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.00004	<0.00004	
Silicon	mg/L	NG	NG	NG	NG	NG	0.758	1.22	0.209	
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.000005	<0.000005	
Sodium	mg/L	200	NG	NG	NG	NG	0.58	2.24	1.1	1.7
Strontium	mg/L	NG	NG	NG	NG	NG	0.00562	0.0148	0.00742	
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	0.0000214	0.0000079	
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000108	0.000155	0.0000654	
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	0.000065	0.000086	
Zinc	mg/L	5	NG	0.03	NG	NG	<0.001	0.00678	0.00133	

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10%

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.16: Water Quality Station Analytical Results - JER-AEM-23 Depth

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-23
		AO	MAC		Max. Average	Max. Grab	7-Aug-11
							5 m
Physical Parameters							
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.22
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	25.3
Hardness	mg/L	NG	NG	NG	NG	NG	10.5
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	4.3
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	2.9
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	13
Turbidity	NTU	NG	NG	NG	NG	NG	0.34
Anions							
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	12.1
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	14.8
Ammonia as N	mg/L	NG	NG	12.5 [5]	6	12	<0.005
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	<0.002
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	<0.006
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	<0.05
Chloride - Cl	mg/L	250	NG	120	500	1000	0.69
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<5
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	1.39
Total Metals							
Aluminum	mg/L	0.1 [7]	NG	0.100 [8]	1.5	3	0.0235
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0000107
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.000251
Barium	mg/L	NG	1	NG	NG	NG	0.00226
Beryllium	mg/L	NG	NG	NG	NG	NG	0.0000026
Boron	mg/L	NG	5	1.5	NG	NG	<0.005
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	2.32
Chromium	mg/L	NG	0.05	NG	0.087	0.17	0.000091
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0000237
Copper	mg/L	1	NG	0.002 [9]	0.02	0.04	0.00172
Iron	mg/L	0.3	NG	0.3	NG	NG	0.05
Lead	mg/L	NG	0.01	0.001 [9]	0.01	0.02	0.0000088
Magnesium	mg/L	NG	NG	NG	NG	NG	1.24
Manganese	mg/L	0.05	NG	NG	NG	NG	0.0037
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.000044
Nickel	mg/L	NG	NG	0.025 [9]	0.05	0.1	0.000479
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	0.0038
Potassium	mg/L	NG	NG	NG	NG	NG	0.425
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.00004
Silicon	mg/L	NG	NG	NG	NG	NG	0.224
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	1.06
Strontium	mg/L	NG	NG	NG	NG	NG	0.00753
Thallium	mg/L	NG	NG	0.0008	NG	NG	0.0000102
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.0000782
Vanadium	mg/L	NG	NG	NG	NG	NG	0.000099
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.0006
Dissolved Metals							
Aluminum	mg/L	0.1 [7]	NG	0.100 [8]	1	2	0.0169
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00001
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.000233
Barium	mg/L	NG	1	NG	NG	NG	0.00222
Beryllium	mg/L	NG	NG	NG	NG	NG	0.0000021
Boron	mg/L	NG	5	1.5	NG	NG	<0.005
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	2.18
Chromium	mg/L	NG	0.05	NG	NG	NG	0.000065
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0000122
Copper	mg/L	1	NG	0.002 [9]	NG	NG	0.00147
Iron	mg/L	0.3	NG	0.3	NG	NG	0.02
Lead	mg/L	NG	0.01	0.001 [9]	NG	NG	<0.000005
Magnesium	mg/L	NG	NG	NG	NG	NG	1.22
Manganese	mg/L	0.05	NG	NG	NG	NG	0.000731
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.000043
Nickel	mg/L	NG	NG	0.025 [9]	NG	NG	0.00046
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	0.0013
Potassium	mg/L	NG	NG	NG	NG	NG	0.37
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.00004
Silicon	mg/L	NG	NG	NG	NG	NG	0.211
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	1.1
Strontium	mg/L	NG	NG	NG	NG	NG	0.00727
Thallium	mg/L	NG	NG	0.0008	NG	NG	0.0000079
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.0000667
Vanadium	mg/L	NG	NG	NG	NG	NG	0.000084
Zinc	mg/L	5	NG	0.03	NG	NG	0.00125

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term exposures (for clear flow)
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background levels when background is >250 mg/L (high flow)

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Table D.17: Water Quality Station Analytical Results - JER-AEM-24 Surface

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-24				JER-AEM-24				
		AO	MAC		Max. Average	Max. Grab	31-Jul-05	11-Jul-06	13-Aug-06	17-Jul-07	11-Aug-07	17-Dec-07	6-Mar-08	24-Jul-08	11-Jul-09
Physical Parameters															
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	**6.47**	6.95	6.89	6.77	7.14	7.7	7.55	7.36	6.56
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	15	17	19	20.1	18.4	24.4	29.4	16.5	16.9
Hardness	mg/L	NG	NG	NG	NG	NG	6.4	6	<6	7.12	7.38	10.7	12.5	7.93	7.63
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3	3	3	3.57	3.43	4.3	4.58	3.26	3.97
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	2	0	1	1.07	1.07	1.74	2.1	1.13	0.76
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<2	2		<3	<3	<3	<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	20	12	16	<10	15	22	27	11	14
Turbidity	NTU	NG	NG	NG	NG	NG	2								0.51
Anions															
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	3	2	2	2.2	<1	1.4	2	1.1	2.8
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	8	9	8	7.5	6.3	9.3	12.7	6.3	5.5
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	9	12	9	7.5	6.3	9.3	12.7	6.3	5.5
Ammonia as N	mg/L	NG	NG	3.98-39.8[5]	6	12	<0.1	0.03	0.01	0.0099	0.0084	0.0263	0.0381	<0.005	<0.005
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	<0.05	<0.05	<0.05	0.0015	<0.001	<0.001	<0.001	<0.001	<0.001
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	<0.05	0.1	0.1	0.0673	0.0708	0.0774	0.0905	0.0193	0.106
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG		0.2							
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	0.05	<u>*<1*</u>	<u>*<1*</u>						
Chloride - Cl	mg/L	250	NG	120	500	1000	0.2	0.4	0.5	<0.5	<0.5	0.58	0.74	<0.5	<0.5
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<1	0.02	0.05						<1
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.2	<0.2	<0.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	<0.5	<0.5	1.1	0.59	0.71	1.15	1.15	0.58	0.8
Ionic Balance	N/A	NG	NG	NG	NG	NG	0.98	0.73	0.51						
Total Metals															
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1.5	3	0.025	0.036	0.03	0.0217	0.0206	0.0138	0.0143	0.079	0.0561
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	<0.0004	<0.0002	<0.0002	0.00016	0.00016	0.00018	0.00025	0.00019	0.00014
Barium	mg/L	NG	1	NG	NG	NG	<0.005	0.00168	0.00152	0.00187	0.0018	0.00272	0.00266	0.00243	0.00213
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG									
Boron	mg/L	NG	5	1.5	NG	NG	<0.01	<0.001	<0.001	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	*<0.0002*	<0.00005	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	1.47	1.35	1.51	1.69	1.73	2.5	3.06	1.73	1.74
Cesium	mg/L	NG	NG	NG	NG	NG									
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0009	0.001	0.0013	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002[9]	0.02	0.04	0.0011	<0.001	0.0012	0.00115	0.00135	0.00157	0.00194	0.00144	0.00161
Gallium	mg/L	NG	NG	NG	NG	NG									
Iron	mg/L	0.3	NG	0.3	NG	NG		<0.1	<0.1	0.049	0.063	<0.03	<0.03	0.111	0.046
Lead	mg/L	NG	0.01	0.001[9]	0.01	0.02	0.0001	<0.00005	<0.00005	<0.00005	0.000056	<0.00005	<0.00005	0.000056	<0.00005
Lithium	mg/L	NG	NG	NG	NG	NG									
Magnesium	mg/L	NG	NG	NG	NG	NG	0.67	0.35	0.69	0.752	0.744	1.14	1.22	0.874	0.891
Manganese	mg/L	0.05	NG	NG	NG	NG		<0.01	<0.01	0.0071	0.00501	0.00162	0.00119	0.00572	0.0053
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.0002*	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	<0.0005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Nickel	mg/L	NG	NG	0.025[9]	0.05	0.1	<0.0006	0.0004	0.0003	<0.0005	0.00055	0.00055	0.00054	<0.0005	0.00059
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	0.073	*<0.02*	*<0.02*	0.0027	0.0052	0.0053	0.0031	0.005	0.0034
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Rhenium	mg/L	NG	NG	NG	NG	NG									
Rubidium	mg/L	NG	NG	NG	NG	NG									
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0008	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.27	0.2	0.23	0.276	0.23	0.247	0.291	0.33	0.617
Silver	mg/L	NG	NG	0.0001	NG	NG	*<0.0002*	<0.0001	<0.0001	<0.00001	<0.00001	<0.00001	<0.00001	0.000029	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	<0.5	<0.5	<0.5	<0.5	<0.5	0.63	0.75	<0.5	<0.5
Strontium	mg/L	NG	NG	NG	NG	NG		0.0043	0.0038	0.00479	0.00505	0.00679	0.00819	0.00494	0.00466
Tellurium	mg/L	NG	NG	NG	NG	NG									
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG									
Tin	mg/L	NG	NG	NG	NG	NG									
Titanium	mg/L	NG	NG	NG	NG	NG									
Tungsten	mg/L	NG	NG	NG	NG	NG									
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00006	<0.00005	0.00007	0.00008	0.000088	0.000087	0.000091	0.000075	0.000127
Vanadium	mg/L	NG	NG	NG	NG	NG	0.0001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG									
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.002	0.01	0.002	0.001	0.0018	0.0057	0.001	<0.003	<0.004
Zirconium	mg/L	NG	NG	NG	NG	NG									
Dissolved Metals															
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1	2	0.022	0.026		0.0124		0.0102	0.0126		0.0386
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	<0.00005		<0.0001		<0.0001	<0.0001		<0.0001
Arsenic	mg/L	NG	0.01	0.005	NG	NG	<0.0001	0.0002		0.00016		0.00017	0.00023		0.00016
Barium	mg/L	NG	1	NG	NG	NG	<0.003	0.00217		0.00177		0.00251	0.00278		0.00208
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001		<0.0005		<0.0005	<0.0005		<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	<0.004	<0.001		<0.01		<0.01	<0.01		<0.01
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005		<0.00005		<0.00005	<0.00005		<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	1.5	1.5	0.9	1.63		2.44	3.01		1.7
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0004	<0.0003		<0.0005		<0.0005	<0.0005		<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.00005	<0.00002		<0.0001		<0.0001	<0.0001		<0.0001
Copper	mg/L	1	NG	0.002[9]	NG	NG	0.0034	0.0031		0.00099		0.00126	0.00248		0.00058
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.01	<0.1		<0.03		<0.03	<0.03		<0.03
Lead	mg/L	NG	0.01	0.001[9]	NG	NG	<0.00005	0.00006		<0.00005		<0.00005	<0.00005		<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	0.6	0.6	0.4	0.743		1.13	1.21		0.82
Manganese	mg/L	0.05	NG	NG	NG	NG	<0.001	<0.01		0.00232		0.000398	0.000484		0.00131
Mercury	mg/L	NG	0.001	0.000026	NG	NG	<u>*<0.0002*</u>	<u>*<0.00005*</u>		<u>*<0.00005*</u>		<u>*<0.00005*</u>	<u>*<0.00005*</u>		<u>*<0.00005*</u>
Molybdenum	mg/L	NG	NG	0.073	NG	NG	<0.0003	0.00005		<0.00005		<0.00005	0.000051		<0.00005
Nickel	mg/L	NG	NG	0.025[9]	NG	NG	0.0003	0.0008		<0.0005		<0.0005	0.0005		<0.0005
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	<u>*<0.005*</u>	<u>*<0.005*</u>		<0.002	<0.002	<0.002	0.0023	0.0021	<0.002
Potassium	mg/L	NG	NG	NG	NG	NG	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5		<0.5
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.0004	<0.0006		<0.001		<0.001	<0.001		<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.27	0.22		0.265		0.225	0.284		0.646
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00005	<0.00005		<0.00001		<0.00001	<0.00001		<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	0.5	<0.5	<0.5	<0.5		0.63	0.73		<0.5
Strontium	mg/L	NG	NG	NG	NG	NG		0.0063		0.00463		0.0066	0.00821		0.00479
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.00002	<0.00005		<0.0001		<0.0001	<0.0001		<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00006	0.00008		0.000069		0.000085	0.000091		0.000121
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.0005	0.0003		<0.001		<0.001	<0.001		<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	<0.002	0.008		<0.001		0.0039	<0.001		0.0017

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term exposures (for clear flow)
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background levels when background is >250 mg/L (high flow)

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline
BOLD - Exceeds GCDWQ Guideline
Shaded - Exceeds CCME Guideline
Red and Underlined - Exceeds Water Licence Guideline
Italic - Detection limit greater than guideline
Blank - Not analyzed

Table D.17: Water Quality Station Analytical Results - JER-AEM-24 Surface

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-24		JER-AEM-24	
		AO	MAC		Max. Average	Max. Grab	12-Apr-11	15-Apr-11	9-Aug-11	25-Aug-14
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.24	7.01	7.12	6.87
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	21.8	16	18.6	26.3
Hardness	mg/L	NG	NG	NG	NG	NG	11.2	8.3	7.7	10.5
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	4.6	4.4	4.1	4.6
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG			2.5	
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	15	31	10	12.7
Turbidity	NTU	NG	NG	NG	NG	NG	0.16	0.18	0.34	0.46
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5	<5	<5	
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	8.8	7.4	6.8	10
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5	<5	<5	<5
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	10.7	9	8.3	12.2
Ammonia as N	mg/L	NG	NG	3.98-39.8[5]	6	12	0.0416	0.0137	<0.005	0.0221
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	<0.002	<0.002	<0.002	0.0021
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	0.0923	<0.006	<0.006	0.0234
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	<0.05	<0.05	<0.05	<0.02
Chloride - Cl	mg/L	250	NG	120	500	1000	0.51	<0.5	<0.5	0.69
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<5	<5	<5	<5
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	1.33	1.01	0.811	2.07
Ionic Balance	N/A	NG	NG	NG	NG	NG				
Total Metals										
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1.5	3	0.025	0.0149	0.0207	0.0276
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0000162	0.0000322	0.0000107	0.000008
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.000211	0.000218	0.000196	0.000228
Barium	mg/L	NG	1	NG	NG	NG	0.00267	0.00223	0.00198	0.00201
Beryllium	mg/L	NG	NG	NG	NG	NG	0.0000031	0.0000021	0.0000025	0.000005
Bismuth	mg/L	NG	NG	NG	NG	NG				<0.000001
Boron	mg/L	NG	5	1.5	NG	NG	<0.005	<0.005	<0.005	<0.005
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.000005	0.0000056	<0.000005	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	2.54	1.93	1.89	2.34
Cesium	mg/L	NG	NG	NG	NG	NG				<0.000005
Chromium	mg/L	NG	0.05	NG	0.087	0.17	0.000123	0.000148	0.000081	0.000104
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0000223	0.0000159	0.0000322	0.0000317
Copper	mg/L	1	NG	0.002[9]	0.02	0.04	0.00204	0.00194	0.00146	0.00155
Gallium	mg/L	NG	NG	NG	NG	NG				<0.00005
Iron	mg/L	0.3	NG	0.3	NG	NG	0.018	0.013	0.039	0.04
Lead	mg/L	NG	0.01	0.001[9]	0.01	0.02	0.0000194	0.000611	0.0000118	0.000007
Lithium	mg/L	NG	NG	NG	NG	NG				0.00035
Magnesium	mg/L	NG	NG	NG	NG	NG	1.2	0.893	0.93	1.21
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00173	0.00124	0.00588	0.00334
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	<0.000005
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.000031	0.000028	0.000034	0.000029
Nickel	mg/L	NG	NG	0.025[9]	0.05	0.1	0.000581	0.000313	0.000466	0.000436
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	0.0039	0.0023	0.0037	*<0.05*
Potassium	mg/L	NG	NG	NG	NG	NG	0.5	0.5	0.329	0.35
Rhenium	mg/L	NG	NG	NG	NG	NG				<0.000005
Rubidium	mg/L	NG	NG	NG	NG	NG				0.000755
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.00004	<0.00004	<0.00004	<0.00004
Silicon	mg/L	NG	NG	NG	NG	NG	0.729	0.657	0.245	0.471
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005	<0.000005	<0.000005	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	0.88	0.78	0.65	0.82
Strontium	mg/L	NG	NG	NG	NG	NG	0.00692	0.00712	0.00523	0.00686
Tellurium	mg/L	NG	NG	NG	NG	NG				<0.00001
Thallium	mg/L	NG	NG	0.0008	NG	NG	0.0000208	0.000021	0.0000107	<0.000001
Thorium	mg/L	NG	NG	NG	NG	NG				0.0000177
Tin	mg/L	NG	NG	NG	NG	NG				<0.00001
Titanium	mg/L	NG	NG	NG	NG	NG				0.000333
Tungsten	mg/L	NG	NG	NG	NG	NG				<0.00001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000121	0.000199	0.0000801	0.000132
Vanadium	mg/L	NG	NG	NG	NG	NG	0.000053	0.000034	0.000078	0.000076
Yttrium	mg/L	NG	NG	NG	NG	NG				0.000098
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.00291	0.00236	0.00066	0.00035
Zirconium	mg/L	NG	NG	NG	NG	NG				0.000038
Dissolved Metals										
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1	2	0.0227	0.0127	0.0149	
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0000119	0.000021	0.0000092	
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.000206	0.000195	0.000192	
Barium	mg/L	NG	1	NG	NG	NG	0.00291	0.00207	0.00192	
Beryllium	mg/L	NG	NG	NG	NG	NG	0.0000038	0.000002	0.0000022	
Boron	mg/L	NG	5	1.5	NG	NG	<0.005	<0.005	<0.005	
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.000005	0.0000065	<0.000005	
Calcium	mg/L	NG	NG	NG	NG	NG	2.53	1.92	1.71	2.27
Chromium	mg/L	NG	0.05	NG	NG	NG	0.00013	0.000104	0.000062	
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0000165	0.0000139	0.0000106	
Copper	mg/L	1	NG	0.002[9]	NG	NG	0.00184	0.00156	0.00136	
Iron	mg/L	0.3	NG	0.3	NG	NG	0.015	<0.01	0.016	
Lead	mg/L	NG	0.01	0.001[9]	NG	NG	0.00002	0.000263	<0.000005	
Magnesium	mg/L	NG	NG	NG	NG	NG	1.2	0.875	0.84	1.18
Manganese	mg/L	0.05	NG	NG	NG	NG	0.000484	0.000492	0.000631	
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.000029	0.000029	0.000032	
Nickel	mg/L	NG	NG	0.025[9]	NG	NG	0.000548	0.000309	0.000462	
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	<0.001	<0.001	0.001	0.0041
Potassium	mg/L	NG	NG	NG	NG	NG	0.33	0.53	0.15	0.35
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.00004	0.000042	<0.00004	
Silicon	mg/L	NG	NG	NG	NG	NG	0.714	0.65	0.237	
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005	<0.000005	<0.000005	
Sodium	mg/L	200	NG	NG	NG	NG	0.8	0.78	<1	<1
Strontium	mg/L	NG	NG	NG	NG	NG	0.00684	0.00693	0.00542	
Thallium	mg/L	NG	NG	0.0008	NG	NG	0.0000195	0.0000205	0.0000097	
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000118	0.000188	0.000071	
Vanadium	mg/L	NG	NG	NG	NG	NG	0.000051	0.000034	0.000063	
Zinc	mg/L	5	NG	0.03	NG	NG	0.00517	0.00347	0.00126	

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level fo
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10%

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline
BOLD - Exceeds GCDWQ Guideline
Shaded - Exceeds CCME Guideline
Red and Underlined - Exceeds Water Licence Guideline
Italic - Detection limit greater than guideline
Blank - Not analyzed

Table D.18: Water Quality Station Analytical Results - JER-AEM-24 Depth

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-24	
		AO	MAC		Max. Average	Max. Grab	12-Apr-11	9-Aug-11
							5.5	8.5 m
Physical Parameters								
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.16	7.06
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	20.4	16.8
Hardness	mg/L	NG	NG	NG	NG	NG	11.2	7.9
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	4.5	3.8
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG		2.4
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	19	15
Turbidity	NTU	NG	NG	NG	NG	NG	0.22	0.33
Anions								
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5	<5
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	8.4	6.9
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5	<5
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	10.3	8.4
Ammonia as N	mg/L	NG	NG	12.5 [5]	6	12	0.0273	0.0188
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	<0.002	<0.002
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	0.0885	0.023
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	<0.05	<0.05
Chloride - Cl	mg/L	250	NG	120	500	1000	<0.5	<0.5
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<5	<5
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	1.2	0.757
Total Metals								
Aluminum	mg/L	0.1 [7]	NG	0.100 [8]	1.5	3	0.0257	0.0267
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0000221	0.0000084
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.000204	0.000169
Barium	mg/L	NG	1	NG	NG	NG	0.00265	0.00204
Beryllium	mg/L	NG	NG	NG	NG	NG	0.0000033	0.0000027
Boron	mg/L	NG	5	1.5	NG	NG	<0.005	<0.005
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.000005	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	2.44	1.76
Chromium	mg/L	NG	0.05	NG	0.087	0.17	0.000195	0.000119
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0000242	0.0000207
Copper	mg/L	1	NG	0.002 [9]	0.02	0.04	0.00192	0.0014
Iron	mg/L	0.3	NG	0.3	NG	NG	0.018	0.016
Lead	mg/L	NG	0.01	0.001 [9]	0.01	0.02	0.0000278	0.0000072
Magnesium	mg/L	NG	NG	NG	NG	NG	1.15	0.859
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00188	0.00217
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.000029	0.000023
Nickel	mg/L	NG	NG	0.025 [9]	0.05	0.1	0.000527	0.000531
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	0.0027	0.0062
Potassium	mg/L	NG	NG	NG	NG	NG	0.38	0.307
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.00004	<0.00004
Silicon	mg/L	NG	NG	NG	NG	NG	0.7	0.304
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	0.74	0.58
Strontium	mg/L	NG	NG	NG	NG	NG	0.00645	0.00505
Thallium	mg/L	NG	NG	0.0008	NG	NG	0.00002	0.0000133
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000118	0.0000845
Vanadium	mg/L	NG	NG	NG	NG	NG	0.000056	0.000053
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.00138	0.00142
Dissolved Metals								
Aluminum	mg/L	0.1 [7]	NG	0.100 [8]	1	2	0.0234	0.0218
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0000137	0.0000942
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.0002	0.00159
Barium	mg/L	NG	1	NG	NG	NG	0.00443	0.00201
Beryllium	mg/L	NG	NG	NG	NG	NG	0.0000033	0.0000027
Boron	mg/L	NG	5	1.5	NG	NG	<0.005	<0.005
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.000005	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	2.53	1.74
Chromium	mg/L	NG	0.05	NG	NG	NG	0.000136	0.000081
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0000173	0.0000142
Copper	mg/L	1	NG	0.002 [9]	NG	NG	0.00201	0.00122
Iron	mg/L	0.3	NG	0.3	NG	NG	0.01	<0.01
Lead	mg/L	NG	0.01	0.001 [9]	NG	NG	0.0000367	<0.000005
Magnesium	mg/L	NG	NG	NG	NG	NG	1.18	0.86
Manganese	mg/L	0.05	NG	NG	NG	NG	0.000462	0.000121
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.000057	0.000026
Nickel	mg/L	NG	NG	0.025 [9]	NG	NG	0.000556	0.000506
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	<0.001	0.0013
Potassium	mg/L	NG	NG	NG	NG	NG	0.32	0.18
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.00004	<0.00004
Silicon	mg/L	NG	NG	NG	NG	NG	0.716	0.295
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	0.76	<1
Strontium	mg/L	NG	NG	NG	NG	NG	0.00678	0.00546
Thallium	mg/L	NG	NG	0.0008	NG	NG	0.0000185	0.000012
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000122	0.0000792
Vanadium	mg/L	NG	NG	NG	NG	NG	0.000049	0.000045
Zinc	mg/L	5	NG	0.03	NG	NG	0.00401	0.00158

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term exposures (for clear flow)
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background levels when background is
>250 mg/L (high flow)

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.19: Water Quality Station Analytical Results - JER-AEM-26 Surface

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-26	
		AO	MAC		Max. Average	Max. Grab	6-Aug-11	26-Aug-14
Physical Parameters								
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.24	7.66
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	22.8	95.9
Hardness	mg/L	NG	NG	NG	NG	NG	10.8	42.8
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3.9	3.8
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	3.2	
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	19	46.4
Turbidity	NTU	NG	NG	NG	NG	NG	0.52	0.68
Anions								
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5	
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	9.8	44.1
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5	<5
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	12	53.8
Ammonia as N	mg/L	NG	NG	3.98-12.5 [5]	6	12	0.039	0.0112
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	<0.002	<0.002
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	<0.006	0.0298
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	<0.05	0.027
Chloride - Cl	mg/L	250	NG	120	500	1000	<0.5	1.65
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<5	<5
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	0.504	1.02
Total Metals								
Aluminum	mg/L	0.1 [7]	NG	0.100 [8]	1.5	3	0.0178	0.00615
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0000114	0.0000112
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.000252	0.000267
Barium	mg/L	NG	1	NG	NG	NG	0.00237	0.00666
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.000002	<0.000002
Bismuth	mg/L	NG	NG	NG	NG	NG		<0.000001
Boron	mg/L	NG	5	1.5	NG	NG	<0.005	<0.005
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.000005	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	2.5	9.98
Cesium	mg/L	NG	NG	NG	NG	NG		0.0000096
Chromium	mg/L	NG	0.05	NG	0.087	0.17	0.000078	0.000104
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0000262	0.0000297
Copper	mg/L	1	NG	0.002 [9]	0.02	0.04	0.0015	0.000714
Gallium	mg/L	NG	NG	NG	NG	NG		<0.00005
Iron	mg/L	0.3	NG	0.3	NG	NG	0.067	0.057
Lead	mg/L	NG	0.01	0.001 [9]	0.01	0.02	0.0000106	0.0000121
Lithium	mg/L	NG	NG	NG	NG	NG		0.0005
Magnesium	mg/L	NG	NG	NG	NG	NG	1.22	4.59
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00791	0.00897
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	<0.000005
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.000023	0.000062
Nickel	mg/L	NG	NG	0.025 [9]	0.05	0.1	0.000561	0.00129
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	0.0049	*<0.05*
Potassium	mg/L	NG	NG	NG	NG	NG	0.31	0.917
Rhenium	mg/L	NG	NG	NG	NG	NG		<0.000005
Rubidium	mg/L	NG	NG	NG	NG	NG		0.00221
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.00004	<0.00004
Silicon	mg/L	NG	NG	NG	NG	NG	0.383	0.169
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	0.57	1.86
Strontium	mg/L	NG	NG	NG	NG	NG	0.00616	0.0402
Tellurium	mg/L	NG	NG	NG	NG	NG		<0.00001
Thallium	mg/L	NG	NG	0.0008	NG	NG	0.0000087	<0.000001
Thorium	mg/L	NG	NG	NG	NG	NG		<0.000005
Tin	mg/L	NG	NG	NG	NG	NG		<0.00001
Titanium	mg/L	NG	NG	NG	NG	NG		0.000215
Tungsten	mg/L	NG	NG	NG	NG	NG		<0.00001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000115	0.000372
Vanadium	mg/L	NG	NG	NG	NG	NG	0.0001	0.000039
Yttrium	mg/L	NG	NG	NG	NG	NG		0.0000185
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.00124	0.00019
Zirconium	mg/L	NG	NG	NG	NG	NG		0.00001
Dissolved Metals								
Aluminum	mg/L	0.1 [7]	NG	0.100 [8]	1	2	0.00797	
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00001	
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.000237	
Barium	mg/L	NG	1	NG	NG	NG	0.00236	
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.000002	
Boron	mg/L	NG	5	1.5	NG	NG	<0.005	
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.000005	
Calcium	mg/L	NG	NG	NG	NG	NG	2.38	9.49
Chromium	mg/L	NG	0.05	NG	NG	NG	0.000083	
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0000112	
Copper	mg/L	1	NG	0.002 [9]	NG	NG	0.00126	
Iron	mg/L	0.3	NG	0.3	NG	NG	0.03	
Lead	mg/L	NG	0.01	0.001 [9]	NG	NG	0.0000053	
Magnesium	mg/L	NG	NG	NG	NG	NG	1.18	4.65
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00232	
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.000024	
Nickel	mg/L	NG	NG	0.025 [9]	NG	NG	0.000514	
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	0.0015	0.0044
Potassium	mg/L	NG	NG	NG	NG	NG	0.19	0.91
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.00004	
Silicon	mg/L	NG	NG	NG	NG	NG	0.364	
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005	
Sodium	mg/L	200	NG	NG	NG	NG	<1	2.1
Strontium	mg/L	NG	NG	NG	NG	NG	0.00624	
Thallium	mg/L	NG	NG	0.0008	NG	NG	0.0000067	
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000103	
Vanadium	mg/L	NG	NG	NG	NG	NG	0.000069	
Zinc	mg/L	5	NG	0.03	NG	NG	0.00193	

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term exposures (for clear flow) Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background levels when background is
>250 mg/L (high flow)

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Table D.20: Water Quality Station Analytical Results - JER-AEM-26 Depth

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-26
		AO	MAC		Max. Average	Max. Grab	6-Aug-11
Physical Parameters							
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.27
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	23
Hardness	mg/L	NG	NG	NG	NG	NG	10.8
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3.9
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	3.2
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	20
Turbidity	NTU	NG	NG	NG	NG	NG	0.53
Anions							
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	10.2
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	12.5
Ammonia as N	mg/L	NG	NG	12.5 [5]	6	12	0.0079
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	<0.002
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	<0.006
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	<0.05
Chloride - Cl	mg/L	250	NG	120	500	1000	<0.5
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<5
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	0.506
Total Metals							
Aluminum	mg/L	0.1 [7]	NG	0.100 [8]	1.5	3	0.0185
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0000094
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.000252
Barium	mg/L	NG	1	NG	NG	NG	0.00213
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.000002
Bismuth	mg/L	NG	NG	NG	NG	NG	
Boron	mg/L	NG	5	1.5	NG	NG	<0.005
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	2.54
Cesium	mg/L	NG	NG	NG	NG	NG	
Chromium	mg/L	NG	0.05	NG	0.087	0.17	0.000091
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0000286
Copper	mg/L	1	NG	0.002 [9]	0.02	0.04	0.00153
Gallium	mg/L	NG	NG	NG	NG	NG	
Iron	mg/L	0.3	NG	0.3	NG	NG	0.065
Lead	mg/L	NG	0.01	0.001 [9]	0.01	0.02	0.0000089
Lithium	mg/L	NG	NG	NG	NG	NG	
Magnesium	mg/L	NG	NG	NG	NG	NG	1.22
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00756
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.000023
Nickel	mg/L	NG	NG	0.025 [9]	0.05	0.1	0.000558
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	0.0069
Potassium	mg/L	NG	NG	NG	NG	NG	0.327
Rhenium	mg/L	NG	NG	NG	NG	NG	
Rubidium	mg/L	NG	NG	NG	NG	NG	
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.00004
Silicon	mg/L	NG	NG	NG	NG	NG	0.382
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	0.56
Strontium	mg/L	NG	NG	NG	NG	NG	0.00613
Tellurium	mg/L	NG	NG	NG	NG	NG	
Thallium	mg/L	NG	NG	0.0008	NG	NG	0.0000089
Thorium	mg/L	NG	NG	NG	NG	NG	
Tin	mg/L	NG	NG	NG	NG	NG	
Titanium	mg/L	NG	NG	NG	NG	NG	
Tungsten	mg/L	NG	NG	NG	NG	NG	
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000118
Vanadium	mg/L	NG	NG	NG	NG	NG	0.000099
Yttrium	mg/L	NG	NG	NG	NG	NG	
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.00064
Zirconium	mg/L	NG	NG	NG	NG	NG	
Dissolved Metals							
Aluminum	mg/L	0.1 [7]	NG	0.100 [8]	1	2	0.00795
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0000088
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.000206
Barium	mg/L	NG	1	NG	NG	NG	0.00189
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.000002
Boron	mg/L	NG	5	1.5	NG	NG	<0.005
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	2.37
Chromium	mg/L	NG	0.05	NG	NG	NG	0.000067
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0000097
Copper	mg/L	1	NG	0.002 [9]	NG	NG	0.00134
Iron	mg/L	0.3	NG	0.3	NG	NG	0.026
Lead	mg/L	NG	0.01	0.0019	NG	NG	<0.000005
Magnesium	mg/L	NG	NG	NG	NG	NG	1.18
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00145
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.000021
Nickel	mg/L	NG	NG	0.025 [9]	NG	NG	0.000516
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	0.0019
Potassium	mg/L	NG	NG	NG	NG	NG	0.21
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.00004
Silicon	mg/L	NG	NG	NG	NG	NG	0.362
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	<1
Strontium	mg/L	NG	NG	NG	NG	NG	0.00626
Thallium	mg/L	NG	NG	0.0008	NG	NG	0.0000058
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.0001
Vanadium	mg/L	NG	NG	NG	NG	NG	0.000067
Zinc	mg/L	5	NG	0.03	NG	NG	0.00106

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table

MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.

AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term exposures (for clear flow)

Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background levels when background is >250 mg/L (high flow)

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Table D.21: Water Quality Station Analytical Results - JER-AEM-27 Surface

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-27	
		AO	MAC		Max. Average	Max. Grab	6-Aug-11	26-Aug-14
Physical Parameters								
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.8	7.16
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	69.1	37.7
Hardness	mg/L	NG	NG	NG	NG	NG	28.9	16.5
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3.2	6.8
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	6.9	
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	39	16.1
Turbidity	NTU	NG	NG	NG	NG	NG	0.14	1.07
Anions								
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5	
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	31	15.4
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5	<5
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	37.9	18.8
Ammonia as N	mg/L	NG	NG	3.98-12.5 [5]	6	12	<0.005	0.035
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	<0.002	<0.002
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	<0.006	0.0081
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	<0.05	<0.02
Chloride - Cl	mg/L	250	NG	120	500	1000	1.92	<0.5
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<5	<5
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	1.04	1.02
Total Metals								
Aluminum	mg/L	0.1 [7]	NG	0.100 [8]	1.5	3	0.0038	0.0363
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0000158	<0.00002
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.000188	0.000267
Barium	mg/L	NG	1	NG	NG	NG	0.00769	0.00221
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.000002	<0.000005
Bismuth	mg/L	NG	NG	NG	NG	NG		<0.00005
Boron	mg/L	NG	5	1.5	NG	NG	<0.005	<0.005
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.000005	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	7.3	3.59
Cesium	mg/L	NG	NG	NG	NG	NG		0.0000064
Chromium	mg/L	NG	0.05	NG	0.087	0.17	0.000087	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0000235	<0.00005
Copper	mg/L	1	NG	0.002 [9]	0.02	0.04	0.000684	0.00163
Gallium	mg/L	NG	NG	NG	NG	NG		<0.00005
Iron	mg/L	0.3	NG	0.3	NG	NG	0.058	0.075
Lead	mg/L	NG	0.01	0.001 [9]	0.01	0.02	0.0000075	<0.00005
Lithium	mg/L	NG	NG	NG	NG	NG		0.00057
Magnesium	mg/L	NG	NG	NG	NG	NG	2.99	1.95
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00843	0.00537
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	<0.000005
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.000068	<0.00005
Nickel	mg/L	NG	NG	0.025 [9]	0.05	0.1	0.00111	0.00056
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	0.003	*<0.3*
Potassium	mg/L	NG	NG	NG	NG	NG	0.747	<2
Rhenium	mg/L	NG	NG	NG	NG	NG		<0.000005
Rubidium	mg/L	NG	NG	NG	NG	NG		0.000784
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.00004	<0.0002
Silicon	mg/L	NG	NG	NG	NG	NG	0.311	0.483
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	1.77	<2
Strontium	mg/L	NG	NG	NG	NG	NG	0.0267	0.00861
Tellurium	mg/L	NG	NG	NG	NG	NG		<0.00001
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.000005	0.0000025
Thorium	mg/L	NG	NG	NG	NG	NG		0.0000172
Tin	mg/L	NG	NG	NG	NG	NG		<0.0002
Titanium	mg/L	NG	NG	NG	NG	NG		0.00089
Tungsten	mg/L	NG	NG	NG	NG	NG		<0.00001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000148	0.000281
Vanadium	mg/L	NG	NG	NG	NG	NG	0.000041	0.000119
Yttrium	mg/L	NG	NG	NG	NG	NG		0.0000848
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.00069	<0.003
Zirconium	mg/L	NG	NG	NG	NG	NG		0.000088
Dissolved Metals								
Aluminum	mg/L	0.1 [7]	NG	0.100 [8]	1	2	0.00238	
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0000139	
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.000183	
Barium	mg/L	NG	1	NG	NG	NG	0.0077	
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.000002	
Boron	mg/L	NG	5	1.5	NG	NG	<0.005	
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.000005	
Calcium	mg/L	NG	NG	NG	NG	NG	6.93	3.5
Chromium	mg/L	NG	0.05	NG	NG	NG	0.000068	
Cobalt	mg/L	NG	NG	NG	NG	NG	0.000009	
Copper	mg/L	1	NG	0.0029	NG	NG	0.00055	
Iron	mg/L	0.3	NG	0.3	NG	NG	0.023	
Lead	mg/L	NG	0.01	0.001 [9]	NG	NG	<0.000005	
Magnesium	mg/L	NG	NG	NG	NG	NG	2.82	1.89
Manganese	mg/L	0.05	NG	NG	NG	NG	0.000627	
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.000067	
Nickel	mg/L	NG	NG	0.025 [9]	NG	NG	0.00103	
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	0.001	0.0054
Potassium	mg/L	NG	NG	NG	NG	NG	0.6	0.37
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.00004	
Silicon	mg/L	NG	NG	NG	NG	NG	0.303	
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005	
Sodium	mg/L	200	NG	NG	NG	NG	1.7	<1
Strontium	mg/L	NG	NG	NG	NG	NG	0.0276	
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.000005	
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000148	
Vanadium	mg/L	NG	NG	NG	NG	NG	0.000032	
Zinc	mg/L	5	NG	0.03	NG	NG	0.00094	

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term exposures (for clear flow)
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background levels when background is
>250 mg/L (high flow)

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Table D.22: Water Quality Station Analytical Results - JER-AEM-27 Depth

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-AEM-27
		AO	MAC		Max. Average	Max. Grab	6-Aug-11
Physical Parameters							
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.85
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	69.9
Hardness	mg/L	NG	NG	NG	NG	NG	29.1
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3.4
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	6.9
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	35
Turbidity	NTU	NG	NG	NG	NG	NG	0.18
Anions							
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	31.7
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	38.7
Ammonia as N	mg/L	NG	NG	1.26 [5]	6	12	0.0062
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	<0.002
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	<0.006
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	<0.05
Chloride - Cl	mg/L	250	NG	120	500	1000	1.88
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<5
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	1.04
Total Metals							
Aluminum	mg/L	0.1 [7]	NG	0.100 [8]	1.5	3	0.00352
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0000147
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.000212
Barium	mg/L	NG	1	NG	NG	NG	0.00849
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.000002
Boron	mg/L	NG	5	1.5	NG	NG	<0.005
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	7.44
Chromium	mg/L	NG	0.05	NG	0.087	0.17	0.00008
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0000149
Copper	mg/L	1	NG	0.002 [9]	0.02	0.04	0.000616
Iron	mg/L	0.3	NG	0.3	NG	NG	0.027
Lead	mg/L	NG	0.01	0.001 [9]	0.01	0.02	<0.000005
Magnesium	mg/L	NG	NG	NG	NG	NG	3.03
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00478
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.000069
Nickel	mg/L	NG	NG	0.025 [9]	0.05	0.1	0.00117
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	0.003
Potassium	mg/L	NG	NG	NG	NG	NG	0.761
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.00004
Silicon	mg/L	NG	NG	NG	NG	NG	0.319
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	1.79
Strontium	mg/L	NG	NG	NG	NG	NG	0.0284
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.000005
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000151
Vanadium	mg/L	NG	NG	NG	NG	NG	0.000034
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.00038
Dissolved Metals							
Aluminum	mg/L	0.1 [7]	NG	0.100 [8]	1	2	0.00207
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0000131
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.000176
Barium	mg/L	NG	1	NG	NG	NG	0.00731
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.000002
Boron	mg/L	NG	5	1.5	NG	NG	<0.005
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	6.97
Chromium	mg/L	NG	0.05	NG	NG	NG	0.00006
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0000106
Copper	mg/L	1	NG	0.002 [9]	NG	NG	0.000538
Iron	mg/L	0.3	NG	0.3	NG	NG	0.017
Lead	mg/L	NG	0.01	0.001 [9]	NG	NG	<0.000005
Magnesium	mg/L	NG	NG	NG	NG	NG	2.84
Manganese	mg/L	0.05	NG	NG	NG	NG	0.000185
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.000067
Nickel	mg/L	NG	NG	0.025 [9]	NG	NG	0.000947
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	0.0012
Potassium	mg/L	NG	NG	NG	NG	NG	0.6
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.00004
Silicon	mg/L	NG	NG	NG	NG	NG	0.302
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	1.7
Strontium	mg/L	NG	NG	NG	NG	NG	0.0267
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.000005
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000146
Vanadium	mg/L	NG	NG	NG	NG	NG	0.000028
Zinc	mg/L	5	NG	0.03	NG	NG	0.00091

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term exposures (for clear flow)

Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background levels when background is >250 mg/L (high flow)

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.23: Water Quality Station Analytical Results - SWQ-02

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		SWQ-02		SWQ-02		
		AO	MAC		Max. Average	Max. Grab	27-Jun-07	22-Jul-07	25-Aug-07	9-Oct-08	29-Aug-14
Physical Parameters											
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8					7.76
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	715	1250	1570	550	209
Hardness	mg/L	NG	NG	NG	NG	NG	257	381	466	170	75.6
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3.56	3.66	8.34	3.41	2
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	13.1	8.11	12.3	12.6	
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	3.5	26.2	16.7	3.6	3.1
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	452	**1010**	**1200**	389	117
Turbidity	NTU	NG	NG	NG	NG	NG					2.02
Anions											
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	9.4	4.9	8.2	2.2	
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	75.6	35.9	63.8	59.5	42.2
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1	<5
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	75.6	35.9	63.8	59.5	51.5
Ammonia as N	mg/L	NG	NG	1.26[5]	6	12	8.61	14	20.8	4.71	0.0383
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	**1.58**	**2.98**	**4.56**	0.885	0.0384
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	**56.4**	**92.8**	**121**	**34.4**	8.86
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG					0.059
Chloride - Cl	mg/L	250	NG	120	500	1000	25.8	88	97.4	29.3	6.06
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG					<5
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	0.0045	<0.001	<0.001	<0.001	
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	32.3	53.1	52.3	26.2	10
Ionic Balance	N/A	NG	NG	NG	NG	NG					103
Total Metals											
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1.5	3	0.058	**0.372**	**0.216**	0.0678	0.0898
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00094	0.00098	0.00114	0.00095	0.000287
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00042	0.00038	0.00085	0.0006	0.000484
Barium	mg/L	NG	1	NG	NG	NG	0.168	0.325	0.283	0.0833	0.0414
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.001	<0.0005	<0.0005	0.000008
Bismuth	mg/L	NG	NG	NG	NG	NG					<0.00005
Boron	mg/L	NG	5	1.5	NG	NG	0.096	0.092	0.19	0.102	0.0463
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	*<0.0001*	0.000073	<0.00005	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	40.1	110	117	39	17.6
Cesium	mg/L	NG	NG	NG	NG	NG					0.0000655
Chromium	mg/L	NG	0.05	NG	0.087	0.17	0.00072	0.0043	0.0027	0.00102	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00235	0.00293	0.00327	0.00088	0.00008
Copper	mg/L	1	NG	0.002-0.004[9]	0.02	0.04	0.00596	0.00655	0.0216	0.00293	0.00146
Gallium	mg/L	NG	NG	NG	NG	NG					<0.00005
Iron	mg/L	0.3	NG	0.3	NG	NG	0.123	**0.692**	**0.577**	0.091	0.089
Lead	mg/L	NG	0.01	0.00223-0.007[9]	0.01	0.02	0.000387	0.0011	0.000658	0.000565	0.000224
Lithium	mg/L	NG	NG	NG	NG	NG					0.00341
Magnesium	mg/L	NG	NG	NG	NG	NG	37.5	33.4	47.7	21	7.66
Manganese	mg/L	0.05	NG	NG	NG	NG	0.0256	0.0496	**0.255**	0.0441	0.00176
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*	<0.000005
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.0189	0.0333	0.0672	0.0165	0.00708
Nickel	mg/L	NG	NG	0.077-0.150[9]	0.05	0.1	0.0308	0.0487	0.0768	0.0122	0.00169
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	0.0204	0.0184	0.0026	0.0108	*<0.3*
Potassium	mg/L	NG	NG	NG	NG	NG	7.87	24.4	22.5	8.05	3.5
Rhenium	mg/L	NG	NG	NG	NG	NG					0.0000083
Rubidium	mg/L	NG	NG	NG	NG	NG					0.0093
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	*<0.002*	*<0.005*	0.0014	0.00026
Silicon	mg/L	NG	NG	NG	NG	NG	4.52	4.94	5.6	4.24	2.32
Silver	mg/L	NG	NG	0.0001	NG	NG	0.00004	<0.00005	0.000082	<0.00001	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	17	49.1	57.1	19.1	7.1
Strontium	mg/L	NG	NG	NG	NG	NG	0.499	3.67	2.61	0.559	0.244
Tellurium	mg/L	NG	NG	NG	NG	NG					<0.00001
Thallium	mg/L	NG	NG	0.0008	NG	NG	0.00012	<0.0002	<0.0001	<0.0001	0.000007
Thorium	mg/L	NG	NG	NG	NG	NG					0.0000357
Tin	mg/L	NG	NG	NG	NG	NG					<0.0002
Titanium	mg/L	NG	NG	NG	NG	NG					0.00281
Tungsten	mg/L	NG	NG	NG	NG	NG					0.000496
Uranium	mg/L	NG	0.02	0.015	0.5	1	**0.0508**	0.0184	**0.12**	**0.234**	**0.117**
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.002	<0.001	<0.001	0.000785
Yttrium	mg/L	NG	NG	NG	NG	NG					0.000171
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.0024	<0.004	<0.005	0.001	<0.003
Zirconium	mg/L	NG	NG	NG	NG	NG					0.000145
Dissolved Metals											
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1	2	0.0023	<0.002	<0.003	0.0035	
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00095	0.00096	0.00113	0.00093	
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.0004	0.00032	0.00073	0.00047	
Barium	mg/L	NG	1	NG	NG	NG	0.168	0.3	0.28	0.0789	
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.001	<0.0005	<0.0005	
Boron	mg/L	NG	5	1.5	NG	NG	0.097	0.085	0.179	0.097	
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	*<0.0001*	<0.00005	<0.00005	
Calcium	mg/L	NG	NG	NG	NG	NG	40.7	103	111	35.8	17.7
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	<0.001	<0.0005	<0.0005	
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00219	0.00201	0.00264	0.00071	
Copper	mg/L	1	NG	0.002-0.004[9]	NG	NG	0.00557	0.00431	0.0141	0.00219	
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	0.097	<0.03	
Lead	mg/L	NG	0.01	0.00223-0.007[9]	NG	NG	0.000091	0.00013	0.000159	<0.00005	
Magnesium	mg/L	NG	NG	NG	NG	NG	37.7	29.9	45.8	19.5	7.63
Manganese	mg/L	0.05	NG	NG	NG	NG	0.0161	0.0295	**0.145**	0.0306	
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*	
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.0195	0.0316	0.0645	0.0167	
Nickel	mg/L	NG	NG	0.077-0.150[9]	NG	NG	0.029	0.0334	0.0664	0.00941	
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	0.0127	0.0059	<0.002	0.0043	0.0033
Potassium	mg/L	NG	NG	NG	NG	NG	8.01	23.1	21.6	7.35	3.39
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	*<0.002*	*<0.005*	<0.001	
Silicon	mg/L	NG	NG	NG	NG	NG	4.23	3.19	4.42	4.01	
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00008	0.000027	0.000061	0.00001	
Sodium	mg/L	200	NG	NG	NG	NG	17.2	45.4	56.1	18.1	7.2
Strontium	mg/L	NG	NG	NG	NG	NG	0.495	3.46	2.53	0.538	
Thallium	mg/L	NG	NG	0.0008	NG	NG	0.00012	<0.0002	<0.0001	<0.0001	
Uranium	mg/L	NG	0.02	0.015	0.5	1	**50.8**	**16.3**	**115**	**246**	
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.002	<0.001	<0.001	
Zinc	mg/L	5	NG	0.03	NG	NG	0.0022	<0.002	<0.001	0.0016	
Hydrocarbons											
Benzene	mg/L	NG	0.005	0.37	NG	NG					<0.0005
Toluene	mg/L	0.024	NG	0.002	NG	NG					<0.0005
Ethylbenzene	mg/L	0.0024	NG	0.09	NG	NG					<0.0005
Xylenes (m & p)	mg/L	NG	NG	NG	NG	NG					<0.0005
Xylene (o)	mg/L	NG	NG	NG	NG	NG					<0.0005
Xylenes Total	mg/L	0.3	NG	NG	NG	NG					<0.00071
F1 (C_6 to C_{10})	mg/L	NG	NG	NG	NG	NG					<0.1
F1 (C_6-C_{10}) - BTEX	mg/L	NG	NG	NG	NG	NG					<0.1
F2 (C_{10}-C_{16})	mg/L	NG	NG	NG	NG	NG					<0.25
F3 (C_{16} - C_{34})	mg/L	NG	NG	NG	NG	NG					<0.25
F4 (C_{34} - C_{50})	mg/L	NG	NG	NG	NG	NG					<0.25

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

2 Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term exposures (for clear flow)
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background levels when background is >250 mg/L (high flow)

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Table D.24: Water Quality Station Analytical Results - SWQ-04

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		SWQ-04		
		AO	MAC		Max. Average	Max. Grab	27-Nov-06	17-Dec-06	22-Jan-07
Physical Parameters									
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8			
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	268	261	311
Hardness	mg/L	NG	NG	NG	NG	NG	89.8	95.9	102
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	4.27	3.71	3.64
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	11.5	13.7	7.63
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<2.3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	156	166	184
Turbidity	NTU	NG	NG	NG	NG	NG			
Anions									
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	2	2.4	2.4
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	58.1	56.6	65.3
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG			<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	58.1	56.6	65.3
Ammonia as N	mg/L	NG	NG	1.26-12.5[5]	6	12	0.109	0.201	0.157
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	0.0311	0.0527	0.122
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	**10.8**	**11.5**	**12.7**
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG			
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG			
Chloride - Cl	mg/L	250	NG	120	500	1000	11.9	12.7	14
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG			
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	15.9	16.5	18.6
Ionic Balance	N/A	NG	NG	NG	NG	NG			
Total Metals									
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1.5	3	0.0192	0.0035	0.0128
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00052	0.00044	0.00052
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00055	0.00049	0.0006
Barium	mg/L	NG	1	NG	NG	NG	0.0644	0.0659	0.0726
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG			
Boron	mg/L	NG	5	1.5	NG	NG	0.033	0.036	0.042
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	0.000056	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	17.9	18.5	21.3
Cesium	mg/L	NG	NG	NG	NG	NG			
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00014	<0.0001	0.00012
Copper	mg/L	1	NG	0.002-0.00334[9]	0.02	0.04	0.00715	0.00236	0.00398
Gallium	mg/L	NG	NG	NG	NG	NG			
Iron	mg/L	0.3	NG	0.3	NG	NG	0.034	<0.03	0.038
Lead	mg/L	NG	0.01	0.001-0.00533[9]	0.01	0.02	0.000247	<0.00005	0.000183
Lithium	mg/L	NG	NG	NG	NG	NG			
Magnesium	mg/L	NG	NG	NG	NG	NG	11	10.8	12.4
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00368	0.00312	0.00563
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.0035	0.00361	0.00383
Nickel	mg/L	NG	NG	0.025-0.130[9]	0.05	0.1	0.00249	0.0024	0.00272
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	0.0141	0.0101	0.0106
Potassium	mg/L	NG	NG	NG	NG	NG	8.39	9.21	10.4
Rhenium	mg/L	NG	NG	NG	NG	NG			
Rubidium	mg/L	NG	NG	NG	NG	NG			
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	1.39	1.6	1.72
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	11.4	11.8	13.8
Strontium	mg/L	NG	NG	NG	NG	NG	0.239	0.253	0.27
Tellurium	mg/L	NG	NG	NG	NG	NG			
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG			
Tin	mg/L	NG	NG	NG	NG	NG			
Titanium	mg/L	NG	NG	NG	NG	NG			
Tungsten	mg/L	NG	NG	NG	NG	NG			
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00127	0.00133	0.0014
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG			
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.0177	0.0018	0.0083
Zirconium	mg/L	NG	NG	NG	NG	NG			
Dissolved Metals									
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1	2	0.0052	0.0012	<0.003
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00051	0.00048	0.0005
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00053	0.00054	0.00059
Barium	mg/L	NG	1	NG	NG	NG	0.0639	0.0692	0.0723
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	0.034	0.037	0.041
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	18	19.5	20.9
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002-0.00334[9]	NG	NG	0.00826	0.00192	0.00316
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	<0.03
Lead	mg/L	NG	0.01	0.001-0.00533[9]	NG	NG	0.000069	<0.00005	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	10.9	11.5	12.2
Manganese	mg/L	0.05	NG	NG	NG	NG	0.000245	0.000148	0.000608
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.00359	0.00371	0.00373
Nickel	mg/L	NG	NG	0.025-0.130[9]	NG	NG	0.00239	0.0023	0.00236
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	0.0031	0.0035	0.0041
Potassium	mg/L	NG	NG	NG	NG	NG	8.42	9.59	10.1
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	1.32	1.67	1.66
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	11.5	12.3	13.4
Strontium	mg/L	NG	NG	NG	NG	NG	0.237	0.265	0.277
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	1.24	0.999	1.36
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	0.0205	0.0019	0.0056

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

[2] Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term exposures (for clear flow)
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background levels when background is >250 mg/L (high flow)

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.24: Water Quality Station Analytical Results - SWQ-04

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		SWQ-04			
		AO	MAC		Max. Average	Max. Grab	12-Feb-07	29-Mar-07	28-Apr-07	13-Jun-07
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8				
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	334	332	308	158
Hardness	mg/L	NG	NG	NG	NG	NG	109	109	106	47
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	4.32	4.64	3.63	2.96
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	11	10	10.9	6.44
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3	3	3.7
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	200	193	182	101
Turbidity	NTU	NG	NG	NG	NG	NG				
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	3.7	2.7	2	2.4
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	70.5	67.6	65.2	29.1
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	70.5	67.6	65.2	29.1
Ammonia as N	mg/L	NG	NG	1.26-12.5[5]	6	12	0.127		0.137	0.337
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	0.116		0.0608	0.0656
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	**14**		**12.9**	6.13
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG				
Chloride - Cl	mg/L	250	NG	120	500	1000	15.2	15.3	14.9	6.02
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG				
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	0.0028		<0.001	0.0017
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	20.1	19.9	20	12.7
Ionic Balance	N/A	NG	NG	NG	NG	NG				
Total Metals										
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1.5	3	0.0114	0.0085	0.0075	0.0692
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00054	0.0005	0.00039	0.00037
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00059	0.00049	0.00047	0.00037
Barium	mg/L	NG	1	NG	NG	NG	0.0783	0.0692	0.0658	0.0372
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	0.044	0.039	0.04	0.034
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	0.00009	0.000055	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	22.3	21.4	20.4	10.5
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00012	0.00012	0.0001	0.00029
Copper	mg/L	1	NG	0.002-0.00334[9]	0.02	0.04	0.00668	0.00373	0.00208	0.00198
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	<0.03	0.102
Lead	mg/L	NG	0.01	0.001-0.00533[9]	0.01	0.02	0.000441	0.000129	<0.00005	0.000116
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	12.6	13.2	12.5	5.68
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00757	0.0302	0.0296	**0.0733**
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.00389	0.0027	0.00267	0.00382
Nickel	mg/L	NG	NG	0.025-0.130[9]	0.05	0.1	0.00276	0.00212	0.00178	0.00386
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	0.0108		0.0348	0.0207
Potassium	mg/L	NG	NG	NG	NG	NG	10.9	10.4	9.67	6.23
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	1.88	1.91	1.98	1.71
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	14.5	14	13.3	8.03
Strontium	mg/L	NG	NG	NG	NG	NG	0.288	0.268	0.248	0.154
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.0015	0.000966	0.000969	0.00167
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.0152	0.0093	<0.001	0.003
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1	2	0.0041	0.0034	<0.004	0.0091
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0005	0.00046	0.00039	0.00037
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00058	0.00047	0.00046	0.00036
Barium	mg/L	NG	1	NG	NG	NG	0.0783	0.0681	0.0673	0.036
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	0.044	0.04	0.041	0.033
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	0.000072	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	22.5	21.7	21.1	9.91
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0001	<0.0001	<0.0001	<0.0001
Copper	mg/L	1	NG	0.002-0.00334[9]	NG	NG	0.00563	0.00324	0.00194	0.0014
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	<0.03	<0.03
Lead	mg/L	NG	0.01	0.001-0.00533[9]	NG	NG	0.00006	0.000056	<0.00005	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	12.8	13.2	12.9	5.4
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00244	0.0165	0.00209	0.025
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.00391	0.00274	0.00269	0.00379
Nickel	mg/L	NG	NG	0.025-0.130[9]	NG	NG	0.00259	0.00208	0.00185	0.00284
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	0.0053	0.0043	0.0037	0.0053
Potassium	mg/L	NG	NG	NG	NG	NG	11	10.5	9.92	5.91
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	1.86	1.87	1.95	1.49
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	14.6	14.2	13.6	7.79
Strontium	mg/L	NG	NG	NG	NG	NG	0.286	0.269	0.262	0.151
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	**1.47**	**0.925**	**0.944**	**1.25**
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	0.0141	0.0077	<0.001	<0.001

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

[2] Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term expo
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background lev

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.24: Water Quality Station Analytical Results - SWQ-04

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		SWQ-04			
		AO	MAC		Max. Average	Max. Grab	15-Jul-07	20-Aug-07	9-Sep-07	23-Sep-07
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8				
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	192	305	337	294
Hardness	mg/L	NG	NG	NG	NG	NG	62.4	85.7	92.9	78
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3.49	2.43	2.53	3.03
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	8.4	4.6	5.81	9.11
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	7.3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	118	223	230	190
Turbidity	NTU	NG	NG	NG	NG	NG				
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	1.6	3.2	1.7	5
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	36.5	30.2	36.2	48.5
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	36.5	30.2	36.2	48.5
Ammonia as N	mg/L	NG	NG	1.26-12.5[5]	6	12	0.143	0.366	0.704	1.24
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	0.0784	0.206	0.268	0.0483
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	8.25	**17.3**	**18.9**	**11.8**
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG				
Chloride - Cl	mg/L	250	NG	120	500	1000	7.43	14.6	15.6	14
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG				
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	13	24.7	27.4	26.6
Ionic Balance	N/A	NG	NG	NG	NG	NG				
Total Metals										
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1.5	3	0.0142	**0.121**	0.0379	0.0349
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00035	0.00047	0.00046	0.00032
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00043	0.00053	0.00041	0.00039
Barium	mg/L	NG	1	NG	NG	NG	0.0335	0.0868	0.0918	0.0636
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	0.028	0.038	0.035	0.03
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	12.4	21.8	21.9	17.6
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	0.00133	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00013	0.00055	0.00025	0.0003
Copper	mg/L	1	NG	0.002-0.00334[9]	0.02	0.04	0.00202	0.00209	0.00109	0.00169
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	0.038	0.219	0.059	0.037
Lead	mg/L	NG	0.01	0.001-0.00533[9]	0.01	0.02	<0.00005	0.000109	0.000052	0.000386
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	7.32	8.58	9.1	8.38
Manganese	mg/L	0.05	NG	NG	NG	NG	0.0148	0.0148	0.0141	**0.188**
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.00323	0.00864	0.00739	0.0045
Nickel	mg/L	NG	NG	0.025-0.130[9]	0.05	0.1	0.0017	0.00926	0.00547	0.00294
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	0.0054	0.0071	0.0057	0.006
Potassium	mg/L	NG	NG	NG	NG	NG	5.73	12	11.3	7.26
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.99	2.78	2.49	3.45
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	8.3	18	16.9	14.9
Strontium	mg/L	NG	NG	NG	NG	NG	0.159	0.555	0.567	0.279
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00133	0.000967	0.000845	0.0083
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.001	0.0027	<0.001	<0.001
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1	2	0.0091	0.0022	0.0401	0.0083
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00034	0.00051	0.00045	0.0003
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00042	0.00049	0.00041	0.00035
Barium	mg/L	NG	1	NG	NG	NG	0.0339	0.0832	0.0921	0.0627
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	0.028	0.038	0.035	0.03
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	12.8	21.3	22.2	17.5
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00011	0.00011	0.00027	0.00024
Copper	mg/L	1	NG	0.002-0.00334[9]	NG	NG	0.00195	0.00112	0.00104	0.00154
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	0.058	<0.03
Lead	mg/L	NG	0.01	0.001-0.00533[9]	NG	NG	<0.00005	<0.00005	<0.00005	0.000123
Magnesium	mg/L	NG	NG	NG	NG	NG	7.39	7.87	9.12	8.34
Manganese	mg/L	0.05	NG	NG	NG	NG	0.0113	0.000394	0.0142	**0.185**
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.00335	0.00865	0.00748	0.00452
Nickel	mg/L	NG	NG	0.025-0.130[9]	NG	NG	0.00169	0.00397	0.00551	0.00275
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	0.0036	0.0026	0.0032	0.0029
Potassium	mg/L	NG	NG	NG	NG	NG	5.86	11.7	11.2	7.17
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.945	2.36	2.52	3.31
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	8.28	18.3	16.8	14.8
Strontium	mg/L	NG	NG	NG	NG	NG	0.163	0.541	0.569	0.269
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	**1.37**	**0.799**	**0.833**	**8.07**
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	<0.001	<0.001	<0.001	0.0012

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

[2] Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term expc
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background lev

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.24: Water Quality Station Analytical Results - SWQ-04

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		SWQ-04		JER-SWQ-04	
		AO	MAC		Max. Average	Max. Grab	13-Nov-07	7-Dec-07	27-Jan-08	24-Feb-08
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8				
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	387	417	511	599
Hardness	mg/L	NG	NG	NG	NG	NG	102	115	137	147
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	2.49	2.94	2.92	4.93
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	8.76	9.02	11.3	13.2
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	6.3	<3	16.7
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	244	21	318	386
Turbidity	NTU	NG	NG	NG	NG	NG				
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	3.8	3.3	1.9	3.7
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	42.9	47.8	58	69.8
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	42.9	47.8	58	69.8
Ammonia as N	mg/L	NG	NG	1.26-12.5[5]	6	12	3.65	0.849	1.11	1.2
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	0.213	0.235	0.177	0.179
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	21	22.9	27.7	32.4
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG				
Chloride - Cl	mg/L	250	NG	120	500	1000	17.7	19.5	23.7	27.6
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG				
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	30.6	33.1	39.4	45.7
Ionic Balance	N/A	NG	NG	NG	NG	NG				
Total Metals										
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1.5	3	<0.002	0.002	0.0353	<0.001
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00048	0.00058	0.00054	0.00057
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00039	0.00046	0.00066	0.00049
Barium	mg/L	NG	1	NG	NG	NG	0.0946	0.107	0.135	0.132
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	0.039	0.047	0.054	0.055
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	23.9	26.7	33.6	36.5
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	<0.0005	0.00129	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00012	0.00017	0.00043	0.0003
Copper	mg/L	1	NG	0.002-0.00334[9]	0.02	0.04	0.00094	0.00119	0.00134	0.00098
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	0.109	<0.03
Lead	mg/L	NG	0.01	0.001-0.00533[9]	0.01	0.02	<0.00005	<0.00005	0.000077	<0.00005
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	9.73	11.2	14.5	12.9
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00352	0.00604	0.0158	0.0171
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.001*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.00737	0.00665	0.00792	0.00785
Nickel	mg/L	NG	NG	0.025-0.130[9]	0.05	0.1	0.00412	0.00488	0.0104	0.0128
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	0.0026	0.0041	0.0058	0.0239
Potassium	mg/L	NG	NG	NG	NG	NG	12.8	14.4	16.2	16.7
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	2.98	3.33	4.29	4.53
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	0.000012	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	19.9	21.7	24.8	23.9
Strontium	mg/L	NG	NG	NG	NG	NG	0.593	0.691	0.799	0.828
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00121	0.00123	0.00159	0.000945
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.003	<0.001	0.0012	<0.001
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1	2	0.0013	0.0015	<0.001	<0.001
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0005	0.00058	0.00056	0.00057
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00039	0.00045	0.00049	0.00054
Barium	mg/L	NG	1	NG	NG	NG	0.0956	0.107	0.126	0.133
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	0.04	0.048	0.054	0.055
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	24.8	27.1	32.4	37
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.001
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00013	0.00015	0.00021	0.00026
Copper	mg/L	1	NG	0.002-0.00334[9]	NG	NG	0.00121	0.00094	0.00106	0.00085
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	<0.03	<0.03
Lead	mg/L	NG	0.01	0.001-0.00533[9]	NG	NG	<0.00005	<0.00005	<0.00005	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	9.83	11.5	13.7	13.2
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00155	0.000695	0.00849	0.0155
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.001*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.00767	0.00706	0.00751	0.00809
Nickel	mg/L	NG	NG	0.025-0.130[9]	NG	NG	0.00431	0.00469	0.00644	0.00967
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	<0.002	0.0025	0.0033	0.0036
Potassium	mg/L	NG	NG	NG	NG	NG	13.3	14.4	15.5	17.4
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	2.89	3.3	4.16	4.66
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	19.9	22.2	23.7	26.3
Strontium	mg/L	NG	NG	NG	NG	NG	0.605	0.691	0.762	0.831
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	1.24	1.28	1.49	0.845
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	<0.001	<0.001	<0.001	<0.001

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

[2] Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term expc
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background lev

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.24: Water Quality Station Analytical Results - SWQ-04

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-SWQ-04			
		AO	MAC		Max. Average	Max. Grab	27-Feb-08	12-Mar-08	19-Jun-08	24-Jul-08
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8				
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG		598	255	257
Hardness	mg/L	NG	NG	NG	NG	NG	143	150	78.1	72.9
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG		3.6	2.55	3.33
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG			7.76	7.93
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25		<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000		359	169	161
Turbidity	NTU	NG	NG	NG	NG	NG				
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG		5.1	1.9	1.1
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG		69.9	59.2	37
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG		<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG		69.9	59.2	37
Ammonia as N	mg/L	NG	NG	1.26-12.5[5]	6	12		1.27	0.119	0.174
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]		0.164	0.0822	0.0908
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]		**32.7**	**12.3**	**11.3**
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG				
Chloride - Cl	mg/L	250	NG	120	500	1000		27.7	13.1	12.7
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG				
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG		<0.001	<0.001	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG		45.7	20.1	19.4
Ionic Balance	N/A	NG	NG	NG	NG	NG				
Total Metals										
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1.5	3	0.0019	0.0029	0.0291	0.012
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00059	0.00065	0.00038	0.00035
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00053	0.0006	0.0003	0.00037
Barium	mg/L	NG	1	NG	NG	NG	0.124	0.135	0.054	0.0427
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	0.055	0.056	0.033	0.031
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	0.000057	0.000051	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	34.6	36.9	18	16
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00024	0.00026	0.00016	0.00011
Copper	mg/L	1	NG	0.002-0.00334[9]	0.02	0.04	0.00153	0.00162	0.00209	0.00147
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	<0.03	<0.03
Lead	mg/L	NG	0.01	0.001-0.00533[9]	0.01	0.02	<0.00005	0.000078	0.000088	<0.00005
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	13	13.1	9.08	7.99
Manganese	mg/L	0.05	NG	NG	NG	NG	0.0213	0.0259	0.0182	0.00519
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.00787	0.00837	0.00387	0.00431
Nickel	mg/L	NG	NG	0.025-0.130[9]	0.05	0.1	0.00726	0.00831	0.00396	0.00228
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4		0.0081	0.0127	0.0058
Potassium	mg/L	NG	NG	NG	NG	NG	17.8	19.1	9.17	8.54
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	4.45	4.87	1.36	0.633
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	27	28.4	14.1	12
Strontium	mg/L	NG	NG	NG	NG	NG	0.741	0.792	0.352	0.365
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00157	0.00168	0.00349	0.00291
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.001	0.0115	<0.005	<0.001
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1	2	<0.001	0.0014	0.0221	
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00058	0.00065	0.00033	
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00052	0.00056	0.00032	
Barium	mg/L	NG	1	NG	NG	NG	0.126	0.136	0.0551	
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	
Boron	mg/L	NG	5	1.5	NG	NG	0.057	0.057	0.03	
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	0.000052	0.000052	<0.00005	
Calcium	mg/L	NG	NG	NG	NG	NG	34.8	37.6	17.2	
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	<0.0005	<0.0005	
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00023	0.00024	0.00014	
Copper	mg/L	1	NG	0.002-0.00334[9]	NG	NG	0.0016	0.00176	0.00151	
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	<0.03	
Lead	mg/L	NG	0.01	0.001-0.00533[9]	NG	NG	<0.00005	<0.00005	<0.00005	
Magnesium	mg/L	NG	NG	NG	NG	NG	13.5	13.6	8.53	
Manganese	mg/L	0.05	NG	NG	NG	NG	0.0168	0.0173	0.017	
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.00814	0.00853	0.00382	
Nickel	mg/L	NG	NG	0.025-0.130[9]	NG	NG	0.00757	0.00827	0.00372	
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG		0.003	0.0048	0.0033
Potassium	mg/L	NG	NG	NG	NG	NG	18.4	19.2	8.85	
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	
Silicon	mg/L	NG	NG	NG	NG	NG	4.48	4.89	1.39	
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	
Sodium	mg/L	200	NG	NG	NG	NG	27.9	28.9	13.1	
Strontium	mg/L	NG	NG	NG	NG	NG	0.762	0.812	0.368	
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	
Uranium	mg/L	NG	0.02	0.015	0.5	1	**1.71**	**1.78**	**3.15**	
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	
Zinc	mg/L	5	NG	0.03	NG	NG	0.0011	0.005	<0.001	

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

[2] Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term expo
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background lev

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.24: Water Quality Station Analytical Results - SWQ-04

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-SWQ-04			
		AO	MAC		Max. Average	Max. Grab	14-Aug-08	21-Aug-08	28-Aug-08	18-Sep-08
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8				
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	258	254	248	244
Hardness	mg/L	NG	NG	NG	NG	NG	75.1	69.4	70.9	75.9
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3.7	3.84	4.2	4.09
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	8.49	9.39	8.3	9.33
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	161	153	137	148
Turbidity	NTU	NG	NG	NG	NG	NG				
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	6.1	1.7	3.2	5.9
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	38.6	39.5	40.6	42.5
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	0	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	38.6	39.5	40.6	42.5
Ammonia as N	mg/L	NG	NG	1.26-12.5[5]	6	12	0.123	0.0992	0.143	0.133
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	0.0877	0.0707	0.0661	0.0351
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	**10.6**	10.2	9.97	9.38
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG				
Chloride - Cl	mg/L	250	NG	120	500	1000	12.7	12.1	12.4	11.8
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG				
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	19.8	18.8	19.6	19.6
Ionic Balance	N/A	NG	NG	NG	NG	NG				
Total Metals										
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1.5	3	0.0152	0.0281	0.0275	0.0207
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00036	0.00034	0.00033	0.0003
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	<0.0004	0.00043	0.00041	0.00041
Barium	mg/L	NG	1	NG	NG	NG	0.0444	0.0411	0.0437	0.0437
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	0.033	0.029	0.03	0.034
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	16.6	15.7	15.6	18.1
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00014	0.00014	0.00016	0.00015
Copper	mg/L	1	NG	0.002-0.00334[9]	0.02	0.04	0.00168	0.00191	0.00168	0.00187
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	0.035	0.047	0.059	0.044
Lead	mg/L	NG	0.01	0.001-0.00533[9]	0.01	0.02	0.000051	<0.00005	0.000053	0.000068
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	8.14	7.1	7.09	9.51
Manganese	mg/L	0.05	NG	NG	NG	NG	0.0126	0.0146	0.0167	0.0142
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.00446	0.00398	0.00441	0.00431
Nickel	mg/L	NG	NG	0.025-0.130[9]	0.05	0.1	0.00232	0.00222	0.00262	0.0028
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	0.0074	0.0078	0.0059	0.0079
Potassium	mg/L	NG	NG	NG	NG	NG	9.2	8.51	8.38	9.33
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	0.65	0.771	0.953	1.04
Silver	mg/L	NG	NG	0.0001	NG	NG	0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	13	11.7	11.4	13.8
Strontium	mg/L	NG	NG	NG	NG	NG	0.34	0.292	0.288	0.316
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00259	0.00247	0.00295	0.00314
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.001	<0.001	<0.001	0.0027
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1	2		0.0131	0.0114	0.0111
Antimony	mg/L	NG	0.006	NG	NG	NG		0.00033	0.00033	0.00031
Arsenic	mg/L	NG	0.01	0.005	NG	NG		0.00037	0.00039	0.00041
Barium	mg/L	NG	1	NG	NG	NG		0.0412	0.0429	0.0425
Beryllium	mg/L	NG	NG	NG	NG	NG		<0.0005	<0.0005	<0.0005
Boron	mg/L	NG	5	1.5	NG	NG		0.029	0.031	0.031
Cadmium	mg/L	NG	0.005	0.00009	NG	NG		<0.00005	<0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG		15.8	16.2	16
Chromium	mg/L	NG	0.05	NG	NG	NG		<0.0005	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG		<0.0001	<0.0001	0.00011
Copper	mg/L	1	NG	0.002-0.00334[9]	NG	NG		0.00146	0.00142	0.00168
Iron	mg/L	0.3	NG	0.3	NG	NG		<0.03	<0.03	<0.03
Lead	mg/L	NG	0.01	0.001-0.00533[9]	NG	NG		<0.00005	<0.00005	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG		7.28	7.35	8.73
Manganese	mg/L	0.05	NG	NG	NG	NG		0.00052	0.000911	0.00926
Mercury	mg/L	NG	0.001	0.000026	NG	NG		*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG		0.00427	0.0046	0.00436
Nickel	mg/L	NG	NG	0.025-0.130[9]	NG	NG		0.00202	0.00247	0.00284
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	0.0035	0.0028	0.0023	0.0029
Potassium	mg/L	NG	NG	NG	NG	NG		8.56	8.68	8.4
Selenium	mg/L	NG	0.01	0.001	NG	NG		<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG		0.692	0.862	1.02
Silver	mg/L	NG	NG	0.0001	NG	NG		<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG		12.1	11.8	12.2
Strontium	mg/L	NG	NG	NG	NG	NG		0.291	0.292	0.315
Thallium	mg/L	NG	NG	0.0008	NG	NG		<0.0001	<0.0001	<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1		**2.5**	**2.97**	**3.09**
Vanadium	mg/L	NG	NG	NG	NG	NG		<0.001	<0.001	<0.001
Zinc	mg/L	5	NG	0.03	NG	NG		<0.001	<0.001	0.0017

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
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Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background lev

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.24: Water Quality Station Analytical Results - SWQ-04

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		JER-SWQ-04			SWQ-04
		AO	MAC		Max. Average	Max. Grab	9-Oct-08	6-Nov-08	20-Jan-09	29-Jan-09
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8			7.53	7.61
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	232	273	324	348
Hardness	mg/L	NG	NG	NG	NG	NG	66.6	84.3	113	122
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	4.24	7.68	3.81	4.09
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	8.41	11	13.1	13.2
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	24.2	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	159	161	212	211
Turbidity	NTU	NG	NG	NG	NG	NG			0.45	0.45
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	1.2	2.4	3.7	9.5
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	41.2	46.9	58.8	63.6
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	41.2	46.9	58.8	63.6
Ammonia as N	mg/L	NG	NG	1.26-12.5[5]	6	12	0.105	0.142	0.203	0.14
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	0.0249	0.0238	0.0199	0.0271
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	8.9	10	**12.4**	**12.3**
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG				
Chloride - Cl	mg/L	250	NG	120	500	1000	11.6	13.9	16.8	17.9
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG			<1	<1
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	19.6	22.3	28.8	28.2
Ionic Balance	N/A	NG	NG	NG	NG	NG				
Total Metals										
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1.5	3	0.0292	**0.147**	0.0141	0.0178
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00025	0.0004	0.00035	0.00051
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.0003	0.00047	0.00039	0.00047
Barium	mg/L	NG	1	NG	NG	NG	0.0407	0.0582	0.0815	0.0871
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	0.025	0.034	0.039	0.042
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.00007	<0.00005	0.000054
Calcium	mg/L	NG	NG	NG	NG	NG	14.6	19.8	22.8	25.1
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	0.00819	<0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00014	0.0013	0.00015	0.00015
Copper	mg/L	1	NG	0.002-0.00334[9]	0.02	0.04	0.00167	0.00638	0.00236	0.00273
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	0.055	**0.62**	<0.03	0.032
Lead	mg/L	NG	0.01	0.001-0.00533[9]	0.01	0.02	0.000076	0.00043	<0.00005	0.000115
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	7.3	12.5	13.6	14.4
Manganese	mg/L	0.05	NG	NG	NG	NG	0.0134	0.0221	0.00691	0.00663
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.00404	0.00494	0.00495	0.00534
Nickel	mg/L	NG	NG	0.025-0.130[9]	0.05	0.1	0.00256	0.0259	0.0046	0.00453
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	0.0061	0.0382	0.0079	0.0074
Potassium	mg/L	NG	NG	NG	NG	NG	7.17	10.2	10.7	11.7
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	1.18	2.78	1.7	1.72
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	10	14.9	15.8	17.1
Strontium	mg/L	NG	NG	NG	NG	NG	0.279	0.368	0.55	0.573
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00315	0.00447	0.00405	0.0041
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.0014	0.0278	<0.004	0.0049
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1	2	0.0122	0.005	0.0091	0.0065
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00027	0.00035	0.00035	0.0004
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00033	0.00038	0.00042	0.00047
Barium	mg/L	NG	1	NG	NG	NG	0.0407	0.0479	0.0832	0.0879
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	<0.0005	<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	0.026	0.031	0.039	0.044
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	<0.00005	0.000051
Calcium	mg/L	NG	NG	NG	NG	NG	14.7	18.2	22.8	25
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	0.00063	<0.0005	0.00072
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	0.00018	0.00011	0.00012
Copper	mg/L	1	NG	0.002-0.00334[9]	NG	NG	0.00172	0.00386	0.00215	0.002
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	0.037	<0.03	<0.03
Lead	mg/L	NG	0.01	0.001-0.00533[9]	NG	NG	<0.00005	0.000113	<0.00005	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	7.27	9.45	13.7	14.4
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00854	0.00793	0.00498	0.00128
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*<0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.00412	0.00484	0.0052	0.00556
Nickel	mg/L	NG	NG	0.025-0.130[9]	NG	NG	0.00251	0.00543	0.00425	0.00419
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	0.0032	0.0035	0.0042	0.004
Potassium	mg/L	NG	NG	NG	NG	NG	7.27	9.23	10.8	11.6
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	<0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	1.16	1.21	1.79	1.75
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	9.84	13.5	16.1	17.3
Strontium	mg/L	NG	NG	NG	NG	NG	0.282	0.352	0.549	0.558
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	<0.0001	<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	3.04	3.52	0.00393	0.004
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	<0.001	<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	<0.001	0.0126	0.0021	0.0034

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
AO refers to the Aesthetic Objective according to the GCDWQ criteria.

[2] Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term expc
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background lev

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.24: Water Quality Station Analytical Results - SWQ-04

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		SWQ-04			
		AO	MAC		Max. Average	Max. Grab	25-Feb-09	13-Mar-09	22-Apr-09	20-May-09
Physical Parameters										
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.59	7.68	7.66	7.68
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	367	385	371	361
Hardness	mg/L	NG	NG	NG	NG	NG	111	114	123	112
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	4.04	5	4.77	4.14
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	14.2	14.4	11.6	14.1
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3	3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	222	238	227	213
Turbidity	NTU	NG	NG	NG	NG	NG	0.45	1.09	0.96	0.25
Anions										
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	2.5	7.2	2.2	3.5
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	59	72.1	69	66.8
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	1	<1
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	59	72.1	69	66.8
Ammonia as N	mg/L	NG	NG	1.26-12.5[5]	6	12	0.132	0.132	0.0859	0.0524
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	0.0308	0.0347	0.0347	0.0296
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	**13.7**	**14.8**	**13.4**	**12.8**
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG				
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG				
Chloride - Cl	mg/L	250	NG	120	500	1000	19	19.6	19.3	18.1
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<1	<1	1	<1
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	<0.001	0.0013	0.0019	<0.001
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	32	33.8	33.2	32.1
Ionic Balance	N/A	NG	NG	NG	NG	NG				
Total Metals										
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1.5	3	0.0166	0.0135	0.0128	<0.007
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00044	0.00047	0.00039	0.00031
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00044	0.00071	0.00048	0.0004
Barium	mg/L	NG	1	NG	NG	NG	0.0747	0.0727	0.0893	0.085
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	0.0005	<0.0005
Bismuth	mg/L	NG	NG	NG	NG	NG				
Boron	mg/L	NG	5	1.5	NG	NG	0.047	0.047	0.047	0.04
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	0.000052	0.000058	0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	25.4	28.6	28.6	25.1
Cesium	mg/L	NG	NG	NG	NG	NG				
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	<0.0005	0.0005	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00014	0.00015	0.00026	0.00012
Copper	mg/L	1	NG	0.002-0.00334[9]	0.02	0.04	0.00245	0.00277	0.00267	0.00259
Gallium	mg/L	NG	NG	NG	NG	NG				
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	0.039	0.03	<0.03
Lead	mg/L	NG	0.01	0.001-0.00533[9]	0.01	0.02	0.000074	0.000184	0.000074	<0.00005
Lithium	mg/L	NG	NG	NG	NG	NG				
Magnesium	mg/L	NG	NG	NG	NG	NG	12.3	12.6	14.7	11.9
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00736	0.0088	**0.098**	0.0176
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	*0.00005*	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.00528	0.00553	0.00585	0.00403
Nickel	mg/L	NG	NG	0.025-0.130[9]	0.05	0.1	0.00494	0.00527	0.00487	0.00397
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	0.0083	0.0071	0.005	0.0064
Potassium	mg/L	NG	NG	NG	NG	NG	12.5	13.8	13.4	11.7
Rhenium	mg/L	NG	NG	NG	NG	NG				
Rubidium	mg/L	NG	NG	NG	NG	NG				
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	1.91	2.15	1.99	1.97
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	17.8	20	19.3	15.6
Strontium	mg/L	NG	NG	NG	NG	NG	0.483	0.454	0.554	0.526
Tellurium	mg/L	NG	NG	NG	NG	NG				
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	0.0001	<0.0001
Thorium	mg/L	NG	NG	NG	NG	NG				
Tin	mg/L	NG	NG	NG	NG	NG				
Titanium	mg/L	NG	NG	NG	NG	NG				
Tungsten	mg/L	NG	NG	NG	NG	NG				
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00395	0.00408	0.00324	0.00299
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	0.001	<0.001
Yttrium	mg/L	NG	NG	NG	NG	NG				
Zinc	mg/L	5	NG	0.03	0.25	0.5	<0.006	0.0056	0.006	0.0023
Zirconium	mg/L	NG	NG	NG	NG	NG				
Dissolved Metals										
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1	2	0.01	*<0.008*	0.007	0.0094
Antimony	mg/L	NG	0.006	NG	NG	NG	0.00038	0.0004	0.00036	0.00033
Arsenic	mg/L	NG	0.01	0.005	NG	NG	0.00042	0.0006	0.00051	0.00045
Barium	mg/L	NG	1	NG	NG	NG	0.0746	0.0685	0.086	0.0859
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	0.0005	<0.0005
Boron	mg/L	NG	5	1.5	NG	NG	0.045	0.045	0.046	0.042
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	0.00005	<0.00005
Calcium	mg/L	NG	NG	NG	NG	NG	24.3	26.4	26.3	24.1
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	<0.0005	0.00096	<0.0005
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00011	0.00012	0.00011	0.00011
Copper	mg/L	1	NG	0.002-0.00334[9]	NG	NG	0.00184	0.00209	0.00205	0.00213
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	0.03	<0.03
Lead	mg/L	NG	0.01	0.001-0.00533[9]	NG	NG	<0.00005	<0.00005	0.00005	<0.00005
Magnesium	mg/L	NG	NG	NG	NG	NG	12.2	11.6	13.9	12.6
Manganese	mg/L	0.05	NG	NG	NG	NG	0.000777	0.0011	0.00758	0.0152
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<0.00005*	*<0.00005*	0.00005	*<0.00005*
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.00502	0.00505	0.00499	0.00387
Nickel	mg/L	NG	NG	0.025-0.130[9]	NG	NG	0.00433	0.00472	0.00431	0.00379
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	0.0054	0.0023	0.0056	0.0047
Potassium	mg/L	NG	NG	NG	NG	NG	12.2	13	12.5	11.1
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	0.001	<0.001
Silicon	mg/L	NG	NG	NG	NG	NG	1.97	2.15	2	2.05
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	0.00001	<0.00001
Sodium	mg/L	200	NG	NG	NG	NG	17.4	18.6	18.6	16.7
Strontium	mg/L	NG	NG	NG	NG	NG	0.461	0.425	0.53	0.515
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	0.0001	<0.0001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00377	0.00383	0.00301	0.00277
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	0.001	<0.001
Zinc	mg/L	5	NG	0.03	NG	NG	0.0031	0.0025	0.0041	0.0156

Notes:

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MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
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[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term expo
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background lev

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.24: Water Quality Station Analytical Results - SWQ-04

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		SWQ-04		
		AO	MAC		Max. Average	Max. Grab	15-Jun-09	10-Jul-09	26-Aug-14
Physical Parameters									
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.70	6.71	7.95
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	99.7	203	186
Hardness	mg/L	NG	NG	NG	NG	NG	30.7	57.4	69.9
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	3.18	3.05	4.8
Total Inorganic Carbon (TIC)	mg/L	NG	NG	NG	NG	NG	4.54	8.67	
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3	<3	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	57	112	96
Turbidity	NTU	NG	NG	NG	NG	NG	1.32	0.46	0.86
Anions									
Acidity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	2.4	7	
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	22.9	41.5	66.4
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<1	<1	<5
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	22.9	41.5	81
Ammonia as N	mg/L	NG	NG	1.26-12.5[5]	6	12	0.0388	0.0179	0.0096
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	0.006	<0.001	0.0028
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	2.66	3.59	0.0195
Total Kjeldahl Nitrogen (TKN)	mg/L	NG	NG	NG	NG	NG			
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG			0.074
Chloride - Cl	mg/L	250	NG	120	500	1000	4.1	5.49	4.54
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<1	<1	<5
Phosphate-Ortho	mg/L	NG	NG	NG	NG	NG	0.0024	<0.001	
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	8.53	11	14.9
Ionic Balance	N/A	NG	NG	NG	NG	NG			108
Total Metals									
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1.5	3	0.0754	0.022	0.0144
Antimony	mg/L	NG	0.006	NG	NG	NG	<0.0001	0.00021	0.0000654
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.00023	0.00032	0.0005
Barium	mg/L	NG	1	NG	NG	NG	0.0225	0.0427	0.0243
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	0.0000022
Bismuth	mg/L	NG	NG	NG	NG	NG			<0.000001
Boron	mg/L	NG	5	1.5	NG	NG	0.014	0.024	0.0255
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.00005	<0.00005	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	7.18	14.5	12.5
Cesium	mg/L	NG	NG	NG	NG	NG			0.0000442
Chromium	mg/L	NG	0.05	NG	0.087	0.17	<0.0005	<0.0005	0.000092
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00017	<0.0001	0.000074
Copper	mg/L	1	NG	0.002-0.00334[9]	0.02	0.04	0.00152	0.00179	0.00178
Gallium	mg/L	NG	NG	NG	NG	NG			<0.00005
Iron	mg/L	0.3	NG	0.3	NG	NG	0.069	<0.03	0.071
Lead	mg/L	NG	0.01	0.001-0.00533[9]	0.01	0.02	0.000092	<0.00005	0.0000216
Lithium	mg/L	NG	NG	NG	NG	NG			0.001
Magnesium	mg/L	NG	NG	NG	NG	NG	3.77	7.98	9.03
Manganese	mg/L	0.05	NG	NG	NG	NG	0.0301	0.00911	0.0446
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<u>0.00005</u>*	*<u>0.00005</u>*	<0.000005
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.00164	0.00325	0.00262
Nickel	mg/L	NG	NG	0.025-0.130[9]	0.05	0.1	0.00257	0.00232	0.00119
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	0.0136	0.0068	*<u>0.05</u>*
Potassium	mg/L	NG	NG	NG	NG	NG	3.36	6.58	5.94
Rhenium	mg/L	NG	NG	NG	NG	NG			0.0000109
Rubidium	mg/L	NG	NG	NG	NG	NG			0.0123
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	0.000099
Silicon	mg/L	NG	NG	NG	NG	NG	0.916	0.88	0.15
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	4.66	9.21	7.6
Strontium	mg/L	NG	NG	NG	NG	NG	0.131	0.308	0.232
Tellurium	mg/L	NG	NG	NG	NG	NG			<0.00001
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	0.0000035
Thorium	mg/L	NG	NG	NG	NG	NG			0.0000084
Tin	mg/L	NG	NG	NG	NG	NG			<0.00001
Titanium	mg/L	NG	NG	NG	NG	NG			0.000432
Tungsten	mg/L	NG	NG	NG	NG	NG			0.000068
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00259	0.00306	0.00458
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	0.000092
Yttrium	mg/L	NG	NG	NG	NG	NG			0.0000383
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.0027	<0.006	0.00034
Zirconium	mg/L	NG	NG	NG	NG	NG			0.000017
Dissolved Metals									
Aluminum	mg/L	0.1[7]	NG	0.100[8]	1	2		0.0088	
Antimony	mg/L	NG	0.006	NG	NG	NG		0.00019	
Arsenic	mg/L	NG	0.01	0.005	NG	NG		0.00033	
Barium	mg/L	NG	1	NG	NG	NG		0.0397	
Beryllium	mg/L	NG	NG	NG	NG	NG	<0.0005	<0.0005	
Boron	mg/L	NG	5	1.5	NG	NG	0.012	0.019	
Cadmium	mg/L	NG	0.005	0.00009	NG	NG	<0.00005	<0.00005	
Calcium	mg/L	NG	NG	NG	NG	NG	6.56	12.1	12.7
Chromium	mg/L	NG	0.05	NG	NG	NG	<0.0005	<0.0005	
Cobalt	mg/L	NG	NG	NG	NG	NG	<0.0001	<0.0001	
Copper	mg/L	1	NG	0.002-0.00334[9]	NG	NG	0.00088	0.00077	
Iron	mg/L	0.3	NG	0.3	NG	NG	<0.03	<0.03	
Lead	mg/L	NG	0.01	0.001-0.00533[9]	NG	NG	<0.00005	<0.00005	
Magnesium	mg/L	NG	NG	NG	NG	NG	3.47	6.57	9.27
Manganese	mg/L	0.05	NG	NG	NG	NG	0.022	0.000416	
Mercury	mg/L	NG	0.001	0.000026	NG	NG	*<u>0.00005</u>*	*<u>0.00005</u>*	
Molybdenum	mg/L	NG	NG	0.073	NG	NG	0.0015	0.00296	
Nickel	mg/L	NG	NG	0.025-0.130[9]	NG	NG	0.00195	0.00164	
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	0.0051	<0.002	0.008
Potassium	mg/L	NG	NG	NG	NG	NG	3.1	5.4	6.3
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.001	<0.001	
Silicon	mg/L	NG	NG	NG	NG	NG	0.811	0.932	
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.00001	<0.00001	
Sodium	mg/L	200	NG	NG	NG	NG	4.35	7.34	8.3
Strontium	mg/L	NG	NG	NG	NG	NG	0.122	0.292	
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.0001	<0.0001	
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.00217	0.00284	
Vanadium	mg/L	NG	NG	NG	NG	NG	<0.001	<0.001	
Zinc	mg/L	5	NG	0.03	NG	NG	0.0016	0.0013	

Notes:

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MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
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[2] Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term expc
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background lev

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[8] Guideline varies with pH

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.25: Water Quality Station Analytical Results - SWQ-07

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		SWQ-07
		AO	MAC		Max. Average	Max. Grab	29-Jan-09
Physical Parameters							
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	7.95
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	309
Hardness	mg/L	NG	NG	NG	NG	NG	91.1
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	5.1
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	<3
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	174
Turbidity	NTU	NG	NG	NG	NG	NG	0.95
Anions							
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	66.3
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	80.9
Ammonia as N	mg/L	NG	NG	1.26 [5]	6	12	0.167
Nitrite - N	mg/L	NG	1	0.06	1 [6]	2 [6]	0.0456
Nitrate - N	mg/L	NG	10	13	20 [6]	40 [6]	3.74
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	0.108
Chloride - Cl	mg/L	250	NG	120	500	1000	6.71
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<5
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	50.8
Ionic Balance	N/A	NG	NG	NG	NG	NG	103
Total Metals							
Aluminum	mg/L	0.1 [7]	NG	0.005, 0.100 [8]	1.5	3	0.028
Antimony	mg/L	NG	0.006	NG	NG	NG	0.000342
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.000438
Barium	mg/L	NG	1	NG	NG	NG	0.0395
Beryllium	mg/L	NG	NG	NG	NG	NG	0.0000033
Bismuth	mg/L	NG	NG	NG	NG	NG	<0.000001
Boron	mg/L	NG	5	1.5	NG	NG	0.0442
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	0.0000051
Calcium	mg/L	NG	NG	NG	NG	NG	20.3
Cesium	mg/L	NG	NG	NG	NG	NG	0.0000894
Chromium	mg/L	NG	0.05	NG	0.087	0.17	0.00037
Cobalt	mg/L	NG	NG	NG	NG	NG	0.00011
Copper	mg/L	1	NG	0.002-0.004 [9]	0.02	0.04	0.00201
Gallium	mg/L	NG	NG	NG	NG	NG	<0.00005
Iron	mg/L	0.3	NG	0.3	NG	NG	0.105
Lead	mg/L	NG	0.01	0.001-0.007 [9]	0.01	0.02	0.0000701
Lithium	mg/L	NG	NG	NG	NG	NG	0.00173
Magnesium	mg/L	NG	NG	NG	NG	NG	10.4
Manganese	mg/L	0.05	NG	NG	NG	NG	0.0106
Mercury	mg/L	NG	0.001	0.000026	NG	NG	<0.000005
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.0103
Nickel	mg/L	NG	NG	0.025-0.150 [9]	0.05	0.1	0.00325
Phosphorus	mg/L	NG	NG	0.004 [10]	0.2	0.4	*<0.05*
Potassium	mg/L	NG	NG	NG	NG	NG	9.81
Rhenium	mg/L	NG	NG	NG	NG	NG	0.0000357
Rubidium	mg/L	NG	NG	NG	NG	NG	0.0233
Selenium	mg/L	NG	0.01	0.001	NG	NG	0.000561
Silicon	mg/L	NG	NG	NG	NG	NG	1.46
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	18.8
Strontium	mg/L	NG	NG	NG	NG	NG	0.512
Tellurium	mg/L	NG	NG	NG	NG	NG	<0.00001
Thallium	mg/L	NG	NG	0.0008	NG	NG	0.0000112
Thorium	mg/L	NG	NG	NG	NG	NG	0.0000195
Tin	mg/L	NG	NG	NG	NG	NG	<0.00001
Titanium	mg/L	NG	NG	NG	NG	NG	0.00112
Tungsten	mg/L	NG	NG	NG	NG	NG	0.000116
Uranium	mg/L	NG	0.02	0.015	0.5	1	**0.0219**
Vanadium	mg/L	NG	NG	NG	NG	NG	0.000262
Yttrium	mg/L	NG	NG	NG	NG	NG	0.0000678
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.00034
Zirconium	mg/L	NG	NG	NG	NG	NG	0.000046
Dissolved Metals							
Calcium	mg/L	NG	NG	NG	NG	NG	20
Magnesium	mg/L	NG	NG	NG	NG	NG	10
Phosphorus	mg/L	NG	NG	0.004 [10]	NG	NG	0.0083
Potassium	mg/L	NG	NG	NG	NG	NG	10.2
Sodium	mg/L	200	NG	NG	NG	NG	19.2

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (August 2012). Guidelines for Canadian Drinking Water Quality Summary Table
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
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[2] Canadian Council of Ministers of the Environment (CCME) (Updated 2014). Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PFAL)

[3] Licence No. 2AM-JER1119

[4] Narrative. Maximum increase of 25 mg/L from background levels for any short-term exposure. Maximum average increase of 5 mg/L from background level for longer term exposures (for clear flow)
Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Shouldnot increase more than 10% of background levels when background is >250 mg/L (high flow)

[5] Guideline varies with pH and temperature

[6] More conservative value applied, effluent limits upon commercial operation may otherwise be applied

[7] Drinking Water operational guideline for conventional treatment (<0.2 mg/L for other treatment types)

[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

NG - No guideline

BOLD - Exceeds GCDWQ Guideline

Shaded - Exceeds CCME Guideline

Red and Underlined - Exceeds Water Licence Guideline

Italic - Detection limit greater than guideline

Blank - Not analyzed

Table D.26: Water Quality Station Analytical Results - 2014-CL-S1 and 2014-CL-S2

Parameter	Unit	GCDWQ[1]		CCME - PFAL[2]	Water License[3]		2014-CL-S1	2014-CL-S2
		AO	MAC		Max. Average	Max. Grab	27-Aug-14	27-Aug-14
Physical Parameters								
pH	pH Units	6.5-8.5	NG	6.5-9.0	6.0-8.8	6.0-8.8	6.83	6.73
Electrical Conductivity (EC)	uS/cm	NG	NG	NG	NG	NG	25.2	19.6
Hardness	mg/L	NG	NG	NG	NG	NG	9.9	7.4
Total Organic Carbon (TOC)	mg/L	NG	NG	NG	NG	NG	4.0	3.9
Total Suspended Solids (TSS)	mg/L	NG	NG	See note[4]	15	25	**<3**	**<3**
Total Dissolved Solids (TDS)	mg/L	500	NG	NG	2000	4000	10.4	8.1
Turbidity	NTU	NG	NG	NG	NG	NG	0.5	0.43
Anions								
Alkalinity - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	7.8	7.0
Carbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	<5	<5
Bicarbonate - $CaCO_3$	mg/L	NG	NG	NG	NG	NG	9.6	8.5
Ammonia as N	mg/L	NG	NG	12.5[5]	6	12	0.0063	0.0104
Nitrite - N	mg/L	NG	1	0.06	1[6]	2[6]	<0.002	<0.002
Nitrate - N	mg/L	NG	10	13	20[6]	40[6]	0.125	0.0167
Fluoride - F	mg/L	NG	1.5	0.12	NG	NG	<0.02	<0.02
Chloride - Cl	mg/L	250	NG	120	500	1000	<0.5	<0.5
Hydroxide - OH	mg/L	NG	NG	NG	NG	NG	<5	<5
Sulphate - SO_4	mg/L	500	NG	NG	NG	NG	1.51	1.11
Metals								
Aluminum	mg/L	0.1[7]	NG	0.005, 0.100[8]	1.5	3	0.0186	0.0188
Antimony	mg/L	NG	0.006	NG	NG	NG	0.0000078	<0.000005
Arsenic	mg/L	NG	0.01	0.005	0.05	0.1	0.000212	0.000229
Barium	mg/L	NG	1	NG	NG	NG	0.00253	0.00203
Beryllium	mg/L	NG	NG	NG	NG	NG	0.0000039	0.0000042
Bismuth	mg/L	NG	NG	NG	NG	NG	<0.000001	<0.000001
Boron	mg/L	NG	5	1.5	NG	NG	0.0055	<0.005
Cadmium	mg/L	NG	0.005	0.00009	0.0012	0.0024	<0.000005	<0.000005
Calcium	mg/L	NG	NG	NG	NG	NG	2.13	1.69
Cesium	mg/L	NG	NG	NG	NG	NG	<0.000005	<0.000005
Chromium	mg/L	NG	0.05	NG	0.087	0.17	0.000087	0.00008
Cobalt	mg/L	NG	NG	NG	NG	NG	0.0000276	0.0000211
Copper	mg/L	1	NG	0.002-0.004[9]	0.02	0.04	0.00131	0.00117
Gallium	mg/L	NG	NG	NG	NG	NG	<0.00005	<0.00005
Iron	mg/L	0.3	NG	0.3	NG	NG	0.023	0.02
Lead	mg/L	NG	0.01	0.001-0.007[9]	0.01	0.02	0.0000067	0.0000071
Lithium	mg/L	NG	NG	NG	NG	NG	0.00054	0.00056
Magnesium	mg/L	NG	NG	NG	NG	NG	1.13	0.859
Manganese	mg/L	0.05	NG	NG	NG	NG	0.00166	0.00157
Mercury	mg/L	NG	0.001	0.000026	NG	NG	<0.000005	<0.000005
Molybdenum	mg/L	NG	NG	0.073	0.73	1.5	0.000145	0.000039
Nickel	mg/L	NG	NG	0.025-0.150[9]	0.05	0.1	0.000347	0.000333
Phosphorus	mg/L	NG	NG	0.004[10]	0.2	0.4	<0.05	<0.05
Potassium	mg/L	NG	NG	NG	NG	NG	0.402	0.342
Rhenium	mg/L	NG	NG	NG	NG	NG	<0.000005	<0.000005
Rubidium	mg/L	NG	NG	NG	NG	NG	0.000864	0.000787
Selenium	mg/L	NG	0.01	0.001	NG	NG	<0.00004	<0.00004
Silicon	mg/L	NG	NG	NG	NG	NG	0.535	0.393
Silver	mg/L	NG	NG	0.0001	NG	NG	<0.000005	<0.000005
Sodium	mg/L	200	NG	NG	NG	NG	0.85	0.65
Strontium	mg/L	NG	NG	NG	NG	NG	0.00832	0.0063
Tellurium	mg/L	NG	NG	NG	NG	NG	<0.00001	<0.00001
Thallium	mg/L	NG	NG	0.0008	NG	NG	<0.000001	<0.000001
Thorium	mg/L	NG	NG	NG	NG	NG	0.0000215	0.0000191
Tin	mg/L	NG	NG	NG	NG	NG	<0.00001	<0.00001
Titanium	mg/L	NG	NG	NG	NG	NG	0.000227	0.000221
Tungsten	mg/L	NG	NG	NG	NG	NG	<0.00001	<0.00001
Uranium	mg/L	NG	0.02	0.015	0.5	1	0.000395	0.000213
Vanadium	mg/L	NG	NG	NG	NG	NG	0.000052	0.000052
Yttrium	mg/L	NG	NG	NG	NG	NG	0.000121	0.0000978
Zinc	mg/L	5	NG	0.03	0.25	0.5	0.00052	0.00059
Zirconium	mg/L	NG	NG	NG	NG	NG	0.000035	0.00003
Dissolved Metals								
Calcium	mg/L	NG	NG	NG	NG	NG	2.14	1.58
Magnesium	mg/L	NG	NG	NG	NG	NG	1.11	0.84
Phosphorus	mg/L	NG	NG	0.004[10]	NG	NG	0.0025	0.0025
Potassium	mg/L	NG	NG	NG	NG	NG	0.37	0.33
Sodium	mg/L	200	NG	NG	NG	NG	<1	<1

Notes:

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[5] Guideline varies with pH and temperature. Water temperature assumed to be 5 ^{o}C, pH range of 6.0-8.0 shown

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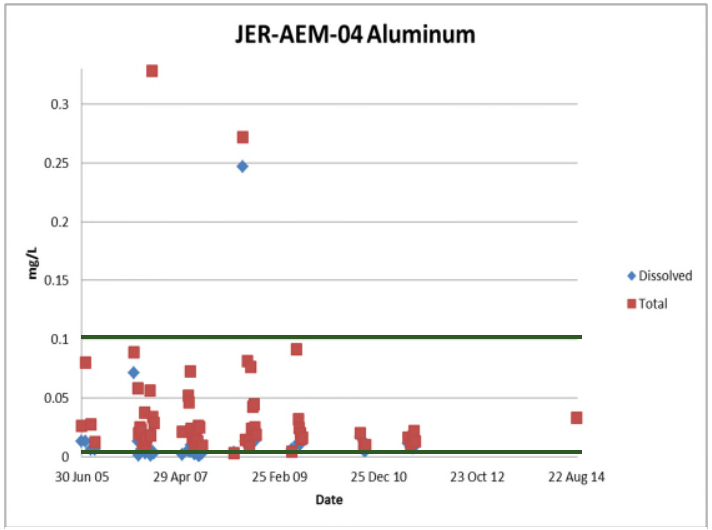
[8] Guideline varies with pH

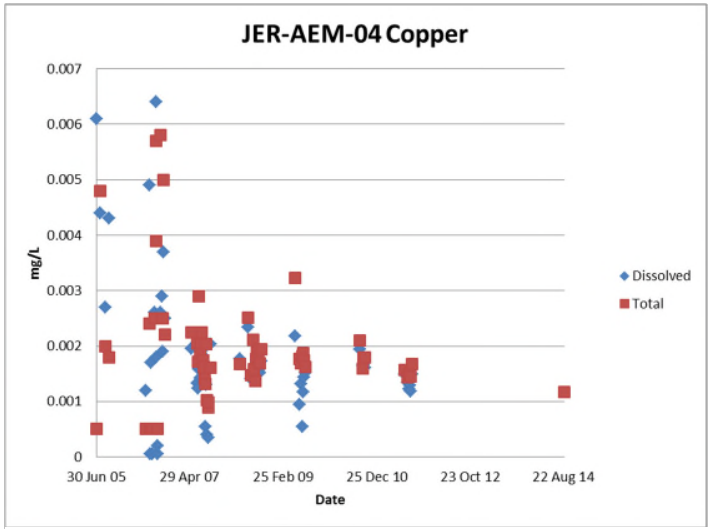
[9] Guideline varies with hardness

[10] No guideline level. Provided is a guidance framework for Total Phosphorus trigger levels in an ultra-oligotrophic system

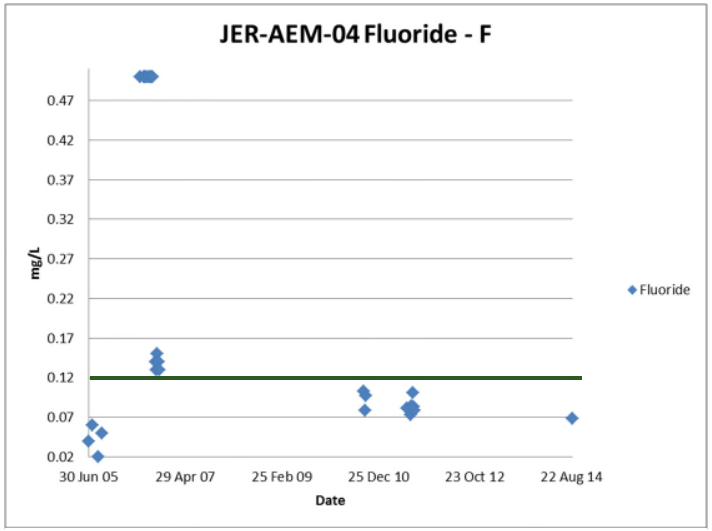
NG - No guideline
BOLD - Exceeds GCDWQ Guideline
Shaded - Exceeds CCME Guideline
Red and Underlined - Exceeds Water Licence Guideline
Italic - Detection limit greater than guideline
Blank - Not analyzed



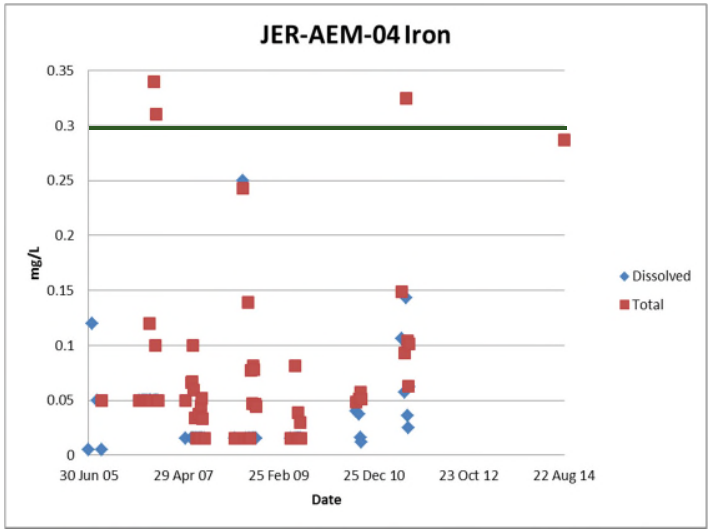
GRAPH D.1: Aluminum CCME FAL guideline 0.005 mg/L or 0.1 mg/L depending on pH



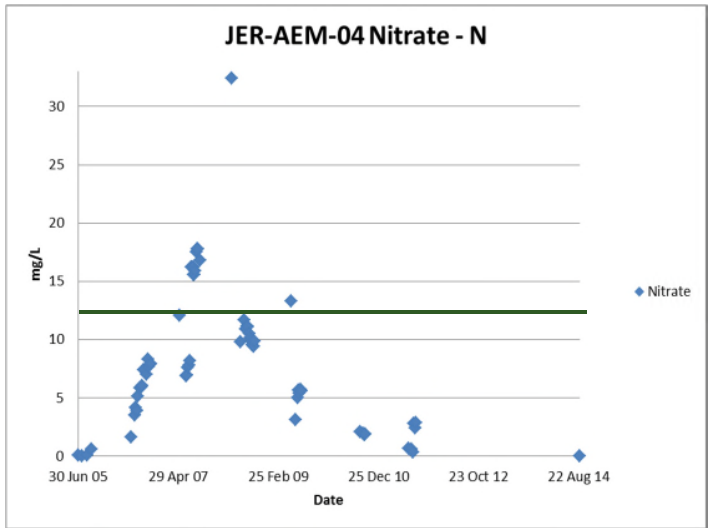
GRAPH D.2: Copper CCME FAL guideline ranges from 0.002-0.0038 mg/L depending on hardness



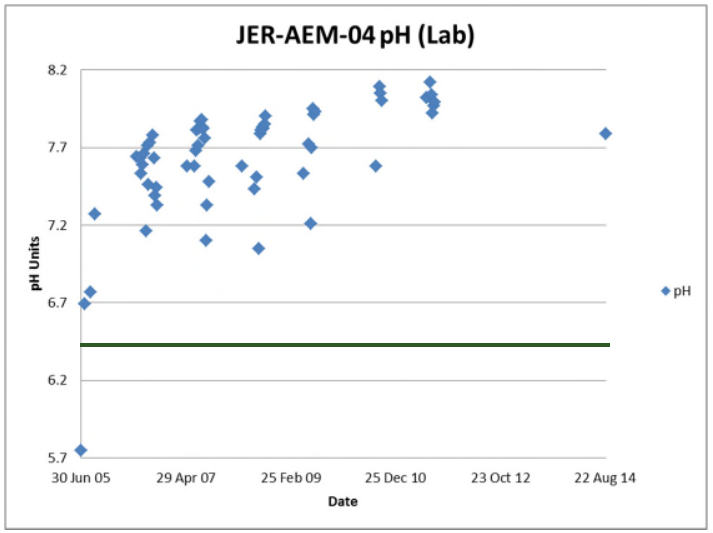
GRAPH D.3: Fluoride CCME FAL guideline 0.12 mg/L



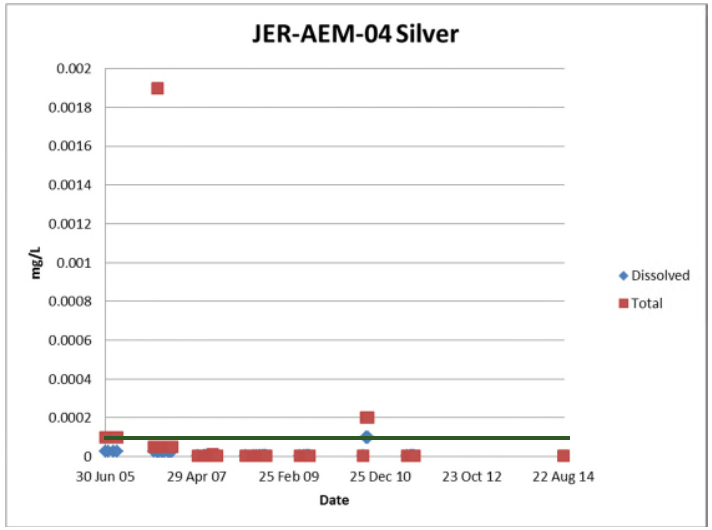
GRAPH D.4: Iron CCME FAL guideline 0.3 mg/L



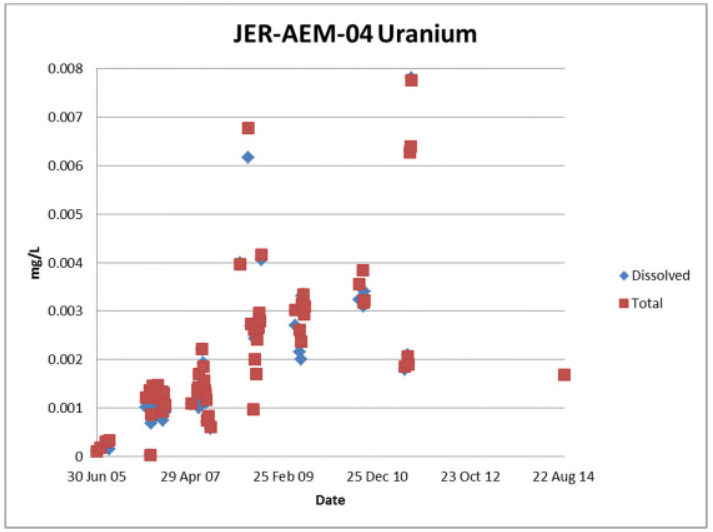
GRAPH D.5: Nitrate-N CCME FAL guideline 13 mg/L



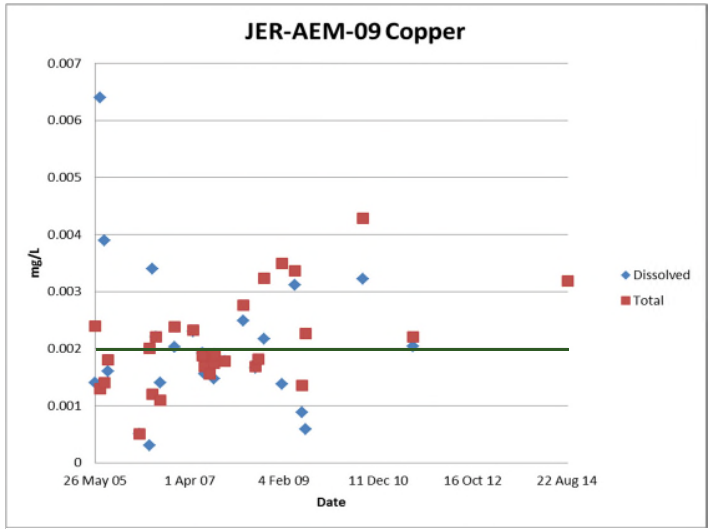
GRAPH D.6: pH CCME FAL guideline 6.5-9.0



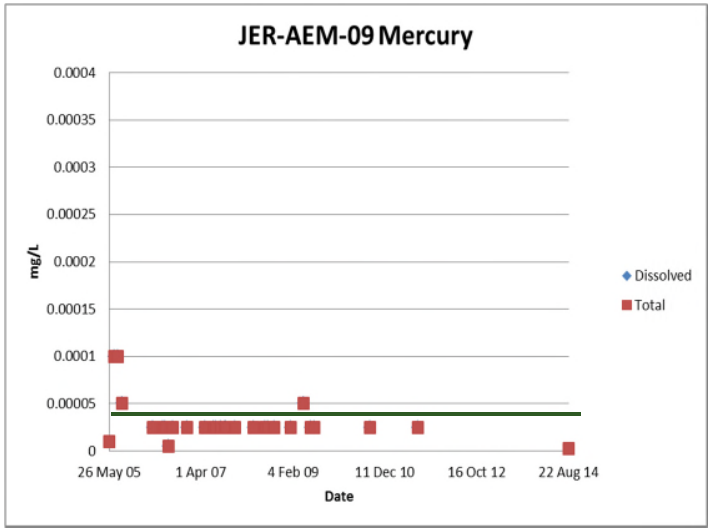
GRAPH D.7: Silver CCME FAL guideline 0.0001 mg/L



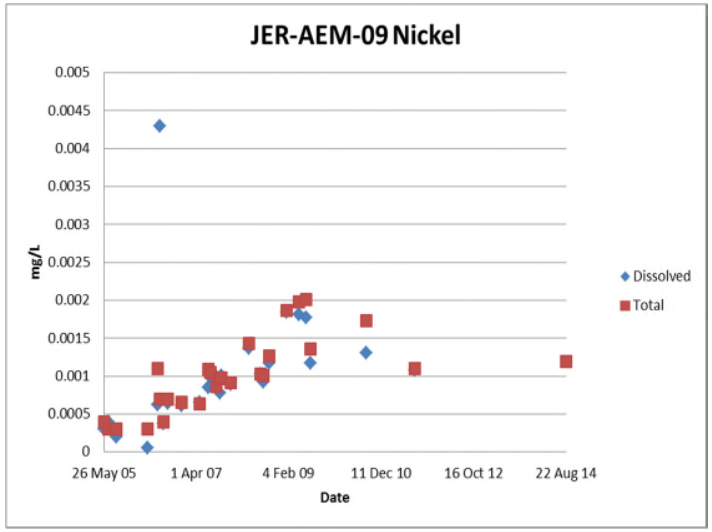
GRAPH D.8: Uranium CCME FAL guideline 0.015 mg/L



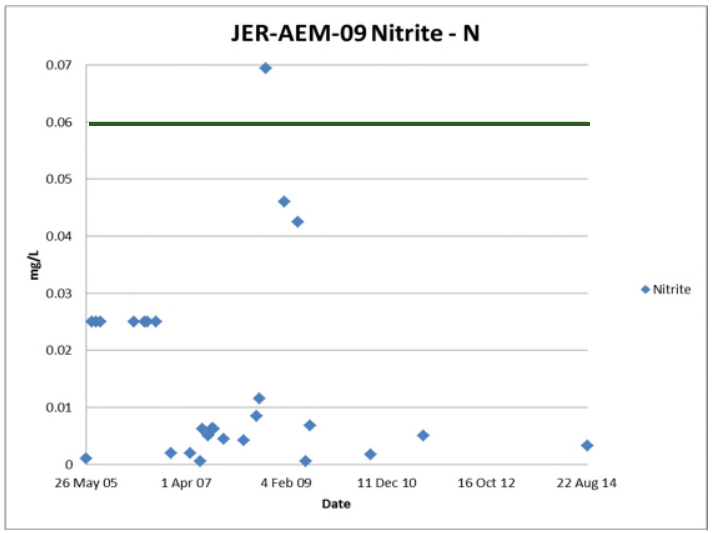
GRAPH D.9: Copper CCME FAL guideline 0.002 mg/L



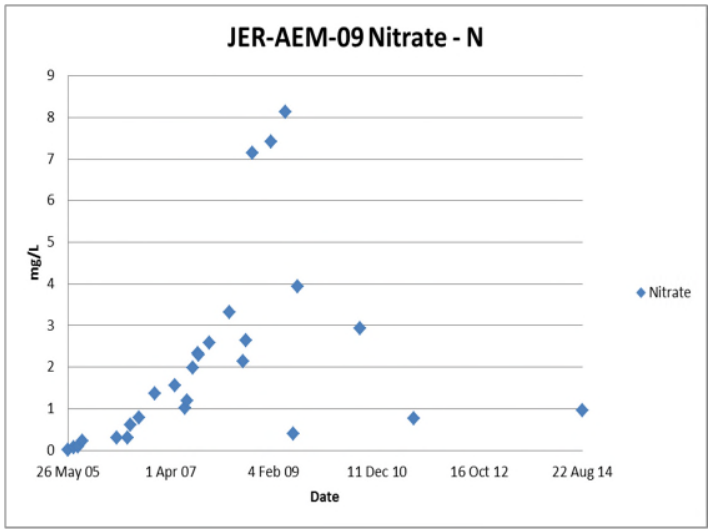
GRAPH D.10: Mercury CCME FAL guideline 0.000026 mg/L



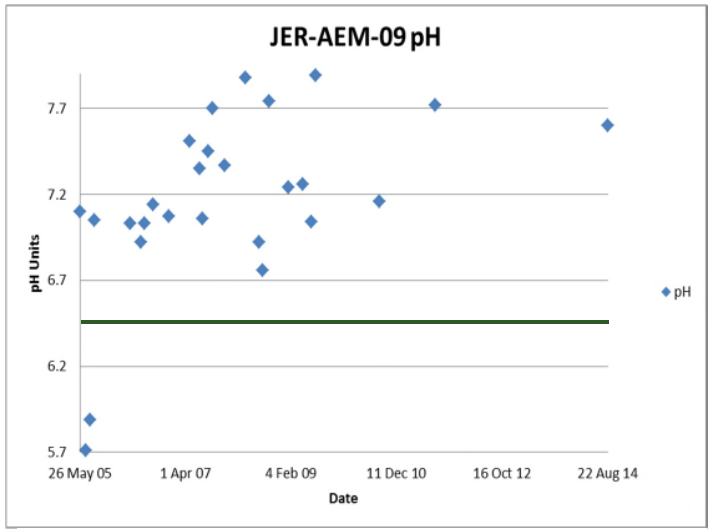
GRAPH D.11: Nickel CCME FAL guideline 0.025 mg/L



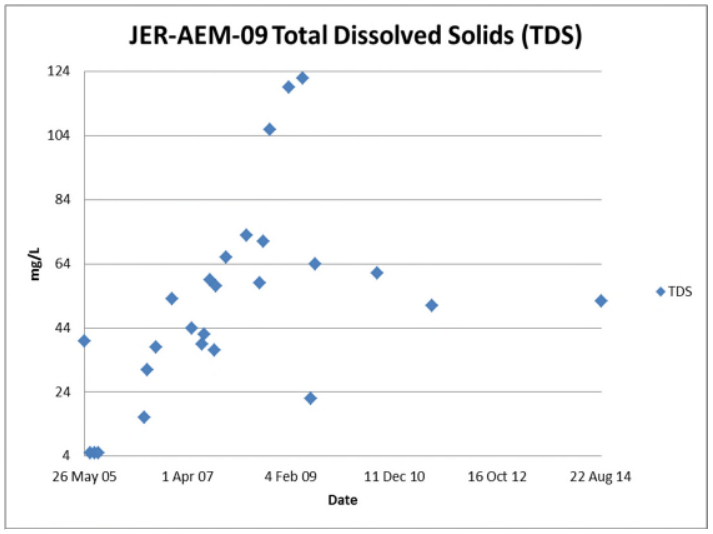
GRAPH D.12: Nitrite CCME FAL guideline 0.06 mg/L



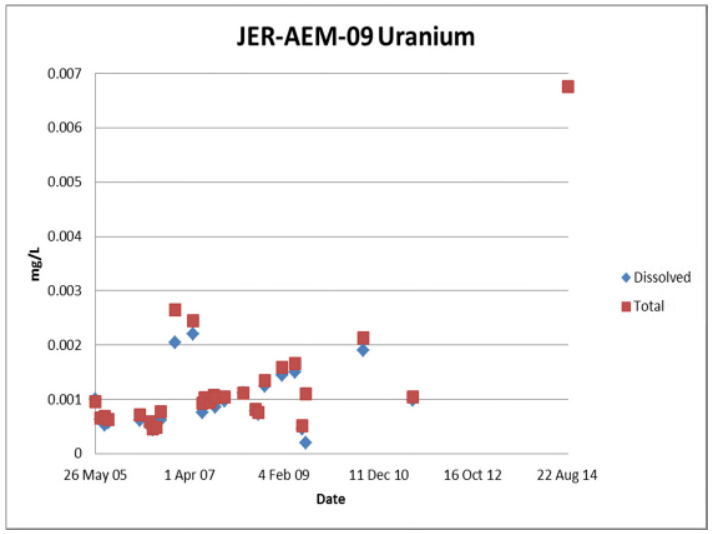
GRAPH D.13: Nitrate CCME FAL guideline13 mg/L



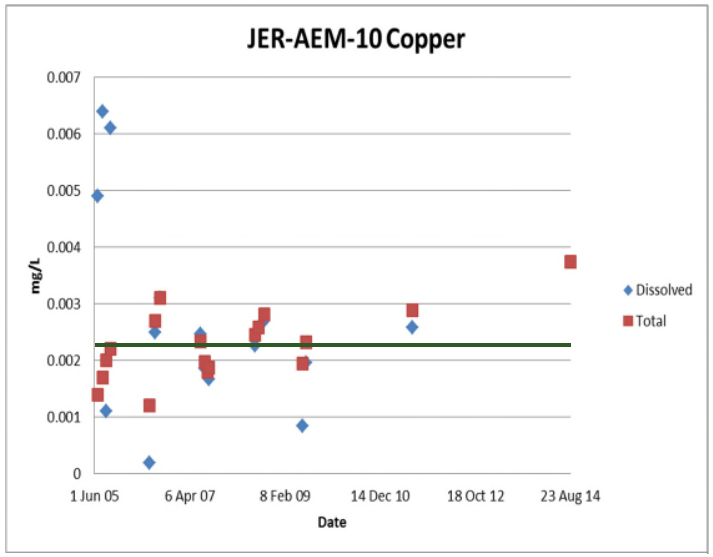
GRAPH D.14: pH CCME FAL guideline ranges from 6.5-9.0



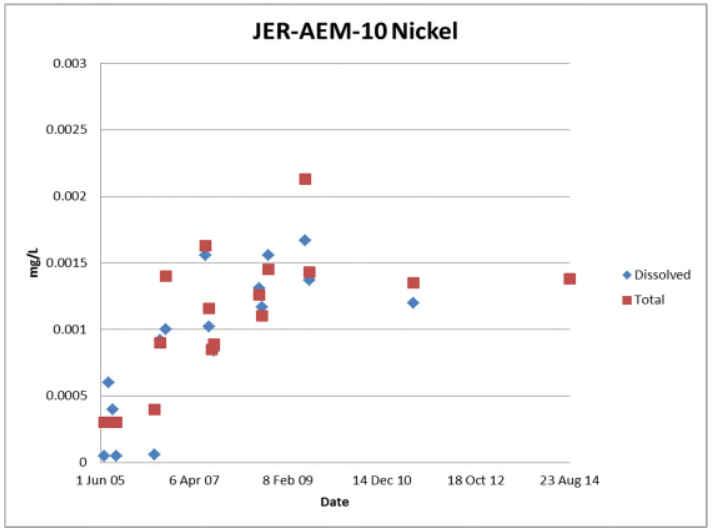
GRAPH D.15: No TDS CCME FAL guideline



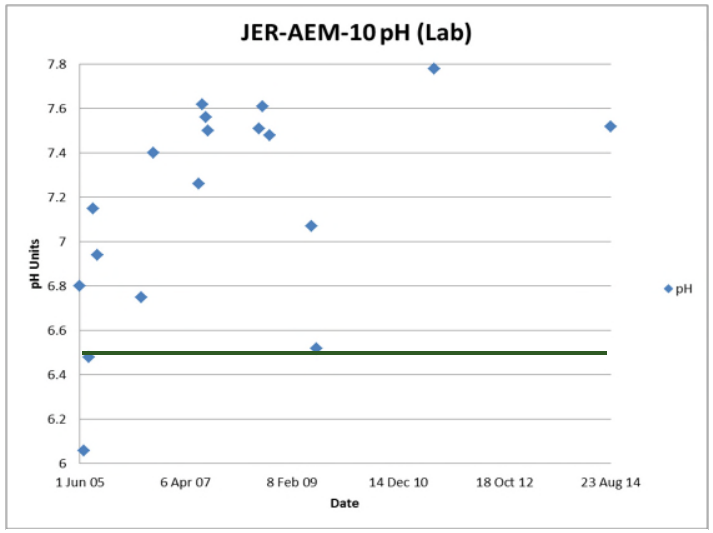
GRAPH D.16: Uranium CCME FAL guideline 0.015 mg/L



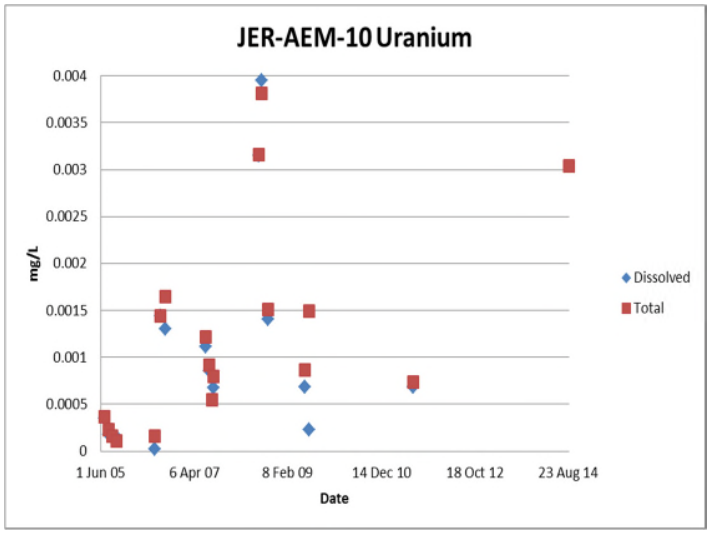
GRAPH D.17: Copper CCME FAL guideline 0.002 mg/L



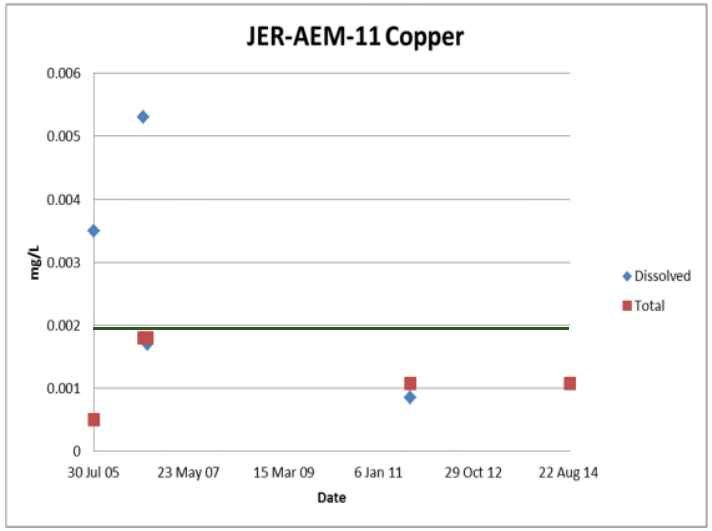
GRAPH D.18: Nickel CCME FAL ranges from 0.025-0.070 mg/L depending on hardness



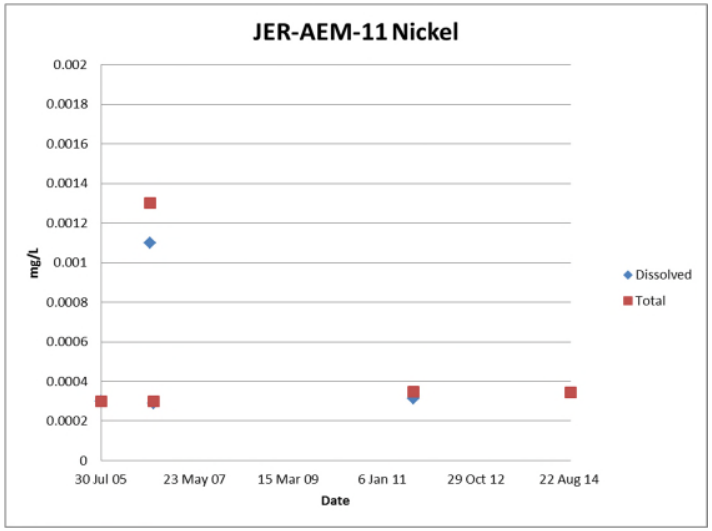
GRAPH D.19: pH CCME FAL guideline 6.5-9.0



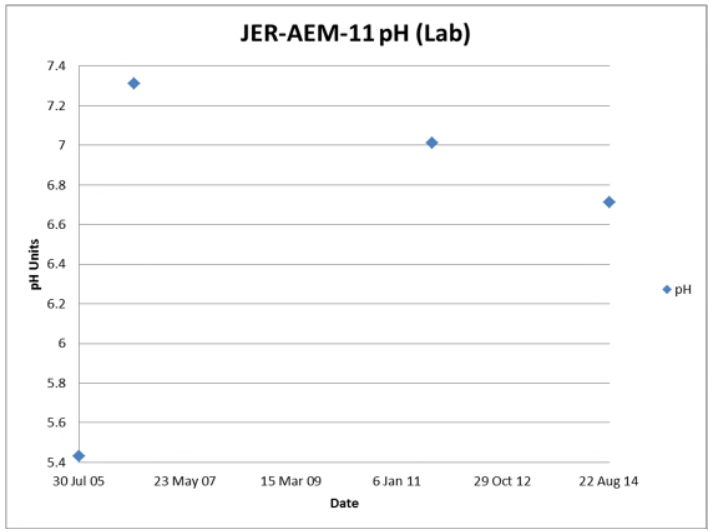
GRAPH D.20: Uranium CCME FAL guideline 0.015 mg/L



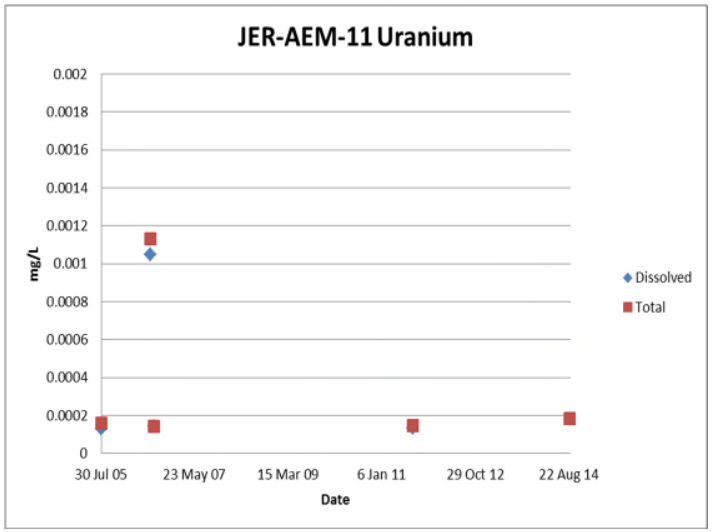
GRAPH D.21: Copper CCME FAL guideline 0.002 mg/L



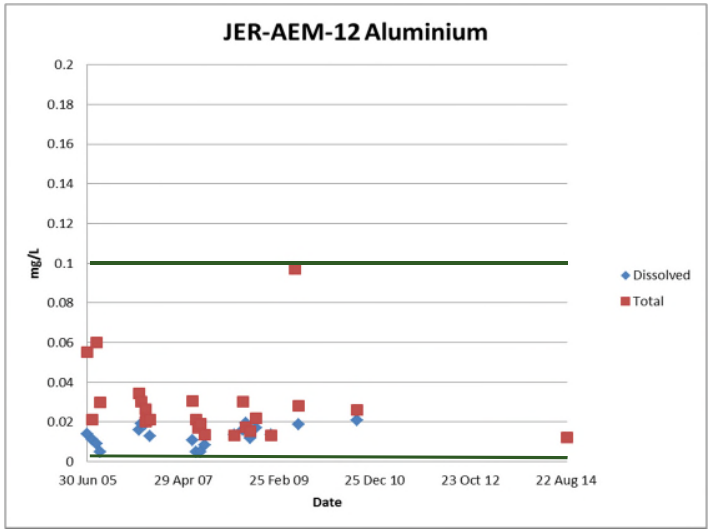
GRAPH D.22: Nickel CCME FAL guideline 0.025 mg/L



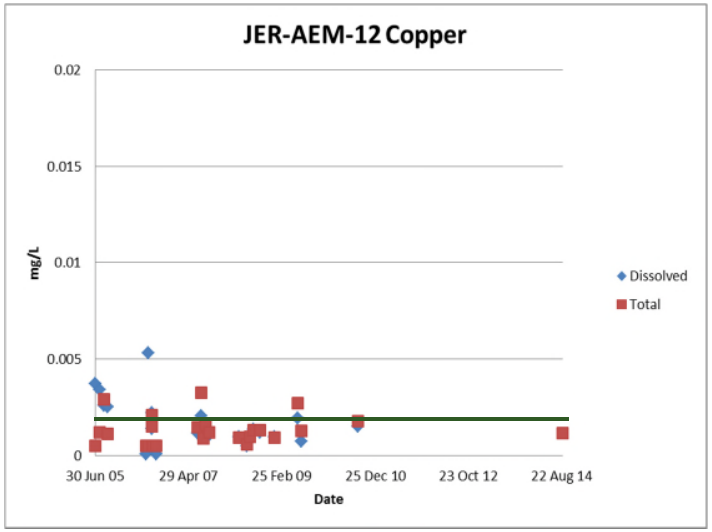
GRAPH D.23: pH CCME FAL guideline ranges from 6.5 to 9.0



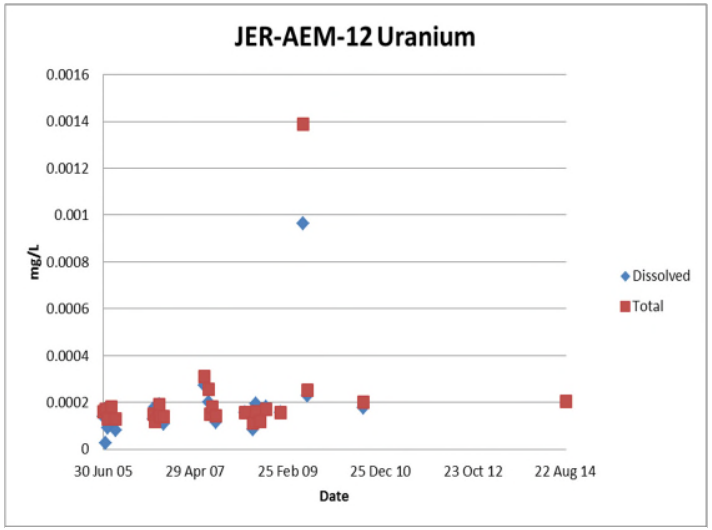
GRAPH D.24: Uranium CCME FAL guideline 0.015 mg/L



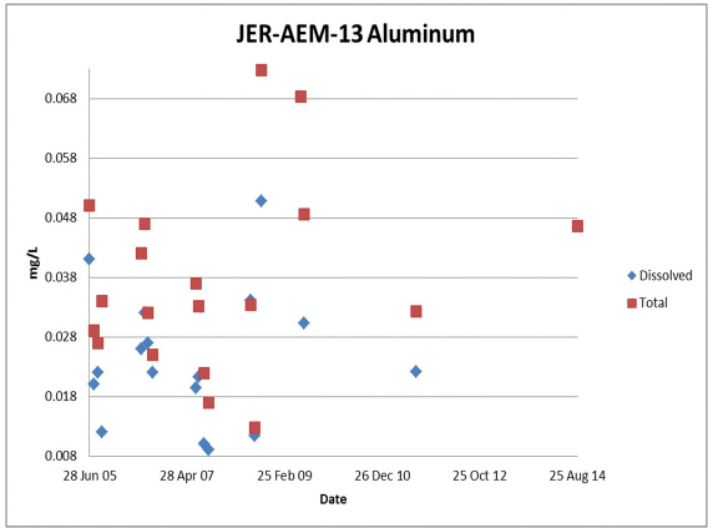
GRAPH D.25: Aluminum CCME FAL guideline 0.005 mg/L or 0.1 mg/L depending on pH



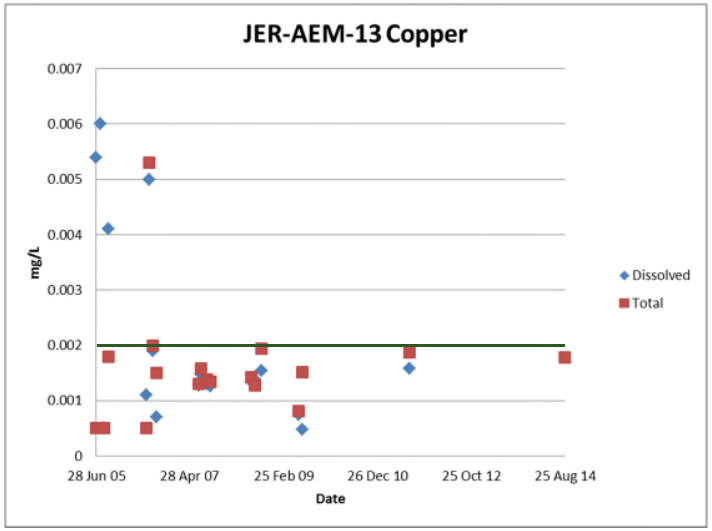
GRAPH D.26: Copper CCME FAL guideline 0.002 mg/L



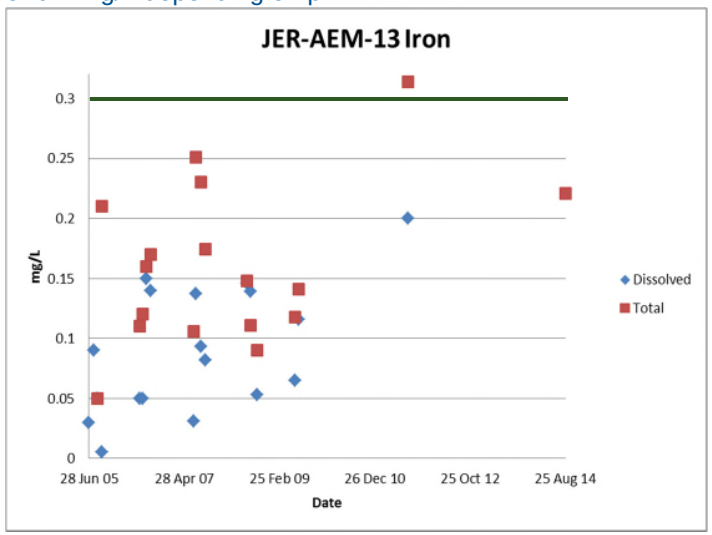
GRAPH D.27 Uranium CCME FAL guideline 0.015 mg/L



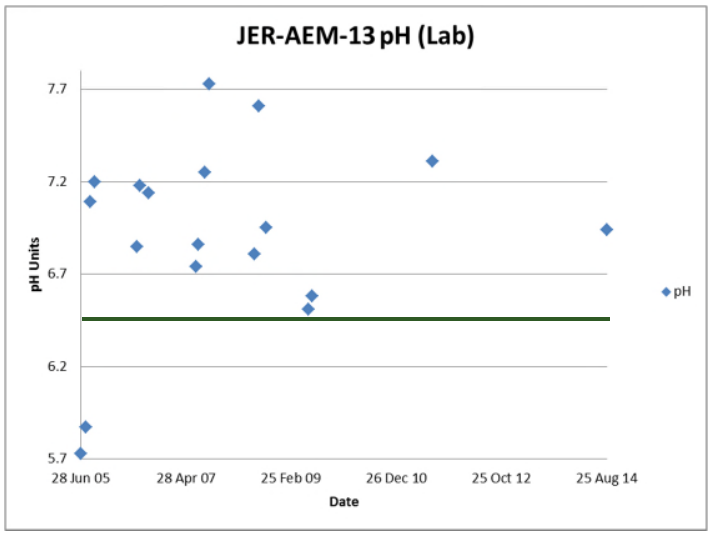
GRAPH D.28: Aluminum CCME FAL guideline 0.005 mg/L or 0.1 mg/L depending on pH



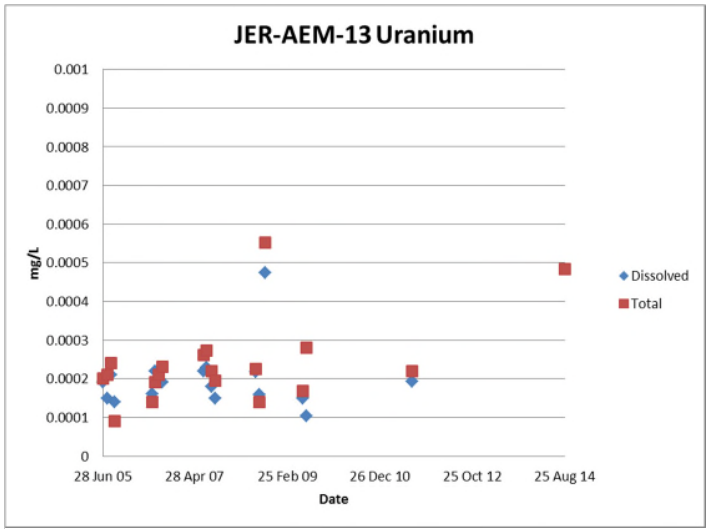
GRAPH D.29: Copper CCME FAL guideline 0.002 mg/L



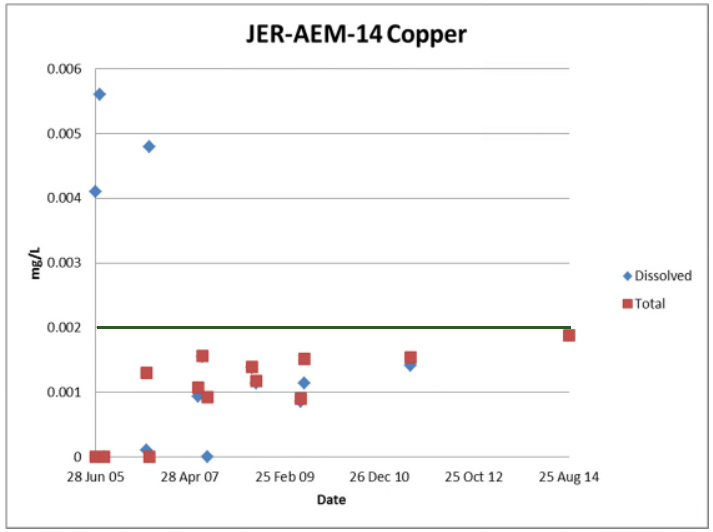
GRAPH D.30: Iron CCME FAL guideline 0.3 mg/L



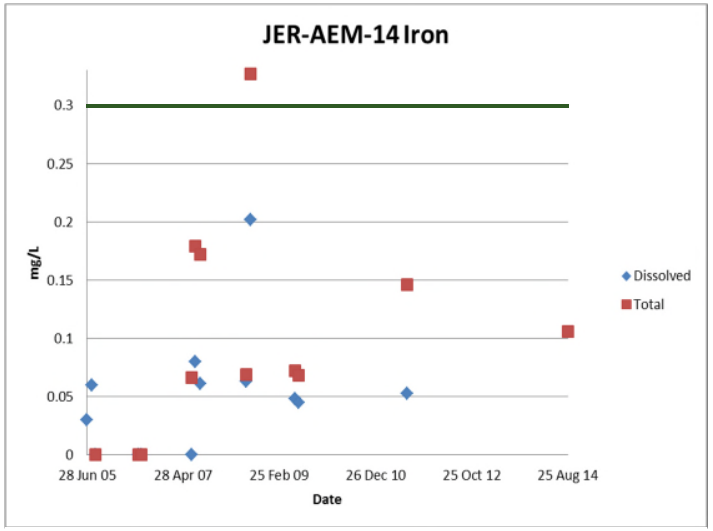
GRAPH D.31: pH CCME FAL guideline ranges from 6.5-9.0



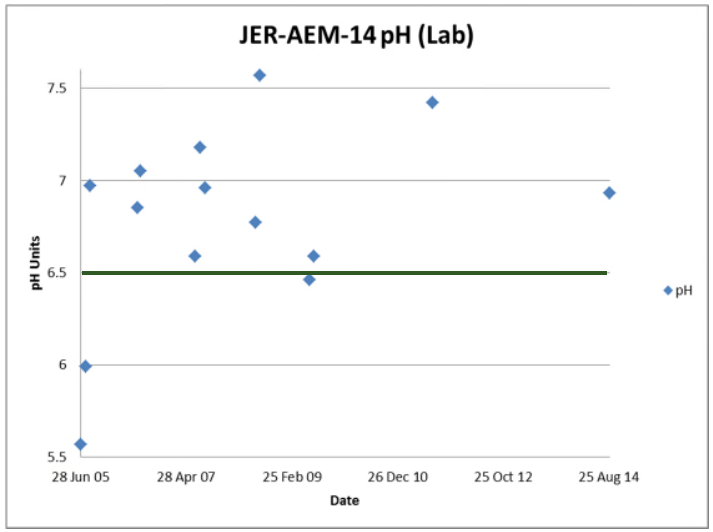
GRAPH D.32: Uranium CCME FAL guideline 0.015 mg/L



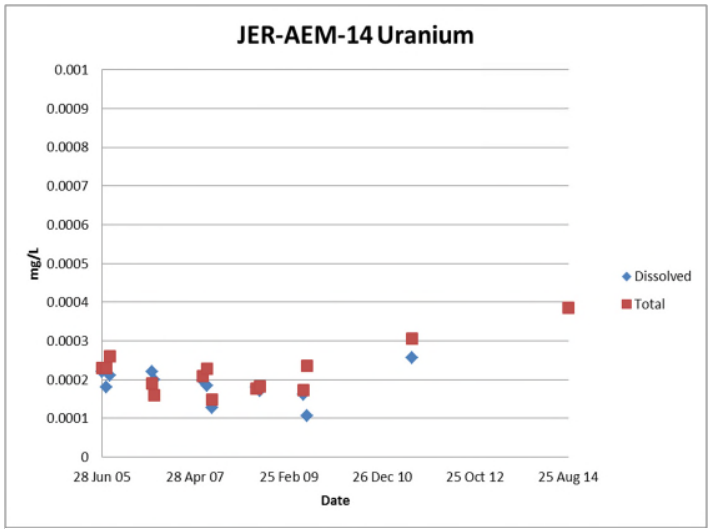
GRAPH D.33: Copper CCME FAL guideline 0.002 mg/L



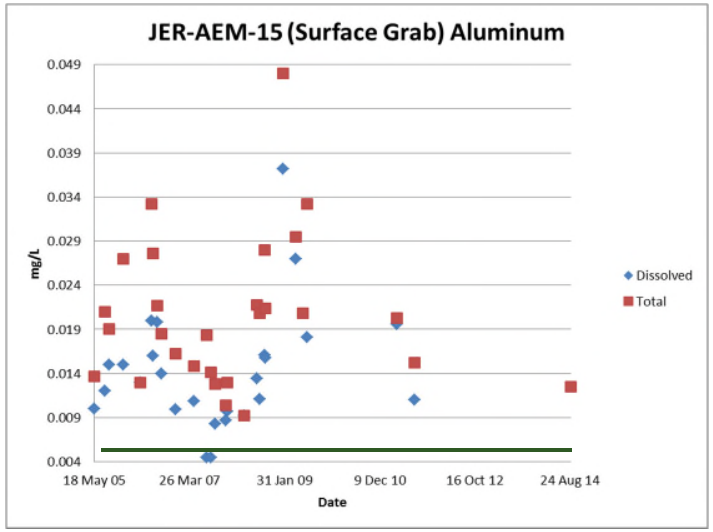
GRAPH D.34: Iron CCME FAL guideline 0.3 mg/L



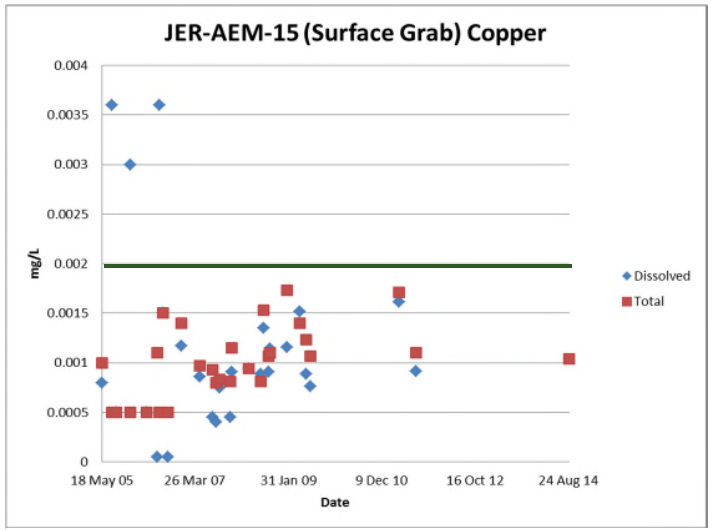
GRAPH D.35: pH CCME FAL guideline ranges from 6.5-9.0



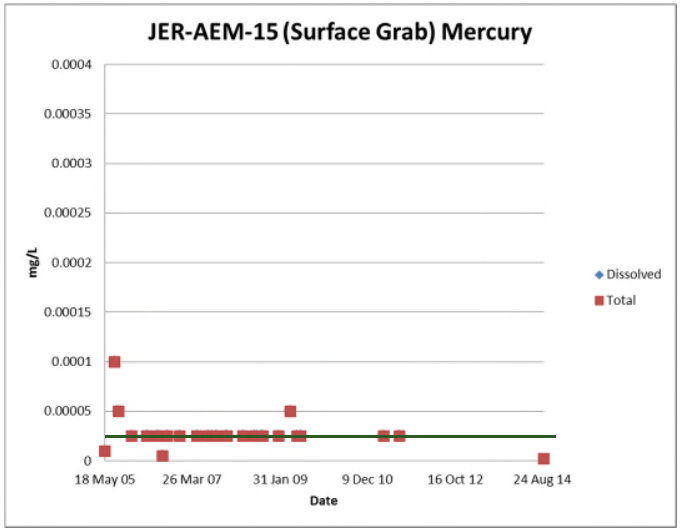
GRAPH D.36: Uranium CCME FAL guideline 0.015 mg/L



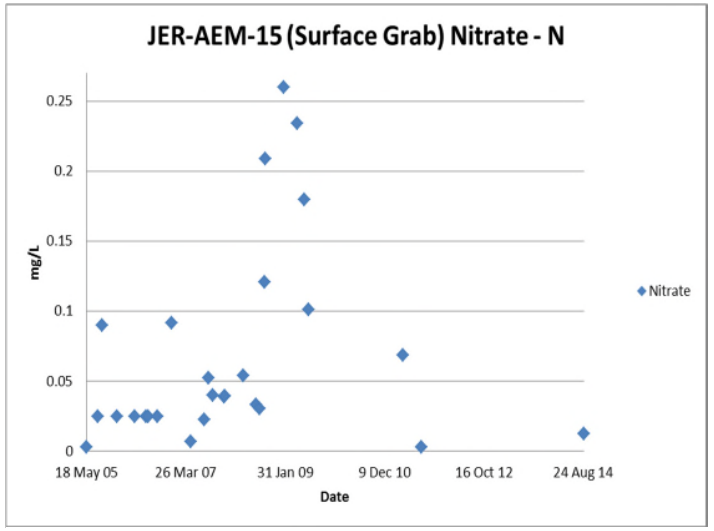
GRAPH D.37: Aluminum CCME FAL guideline 0.005 mg/L or 0.1 mg/L depending on pH



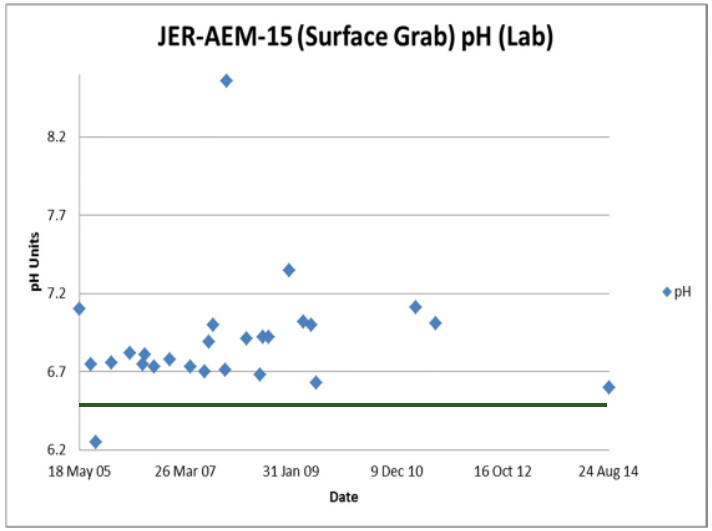
GRAPH D.38: Copper CCME FAL guideline 0.002 mg/L



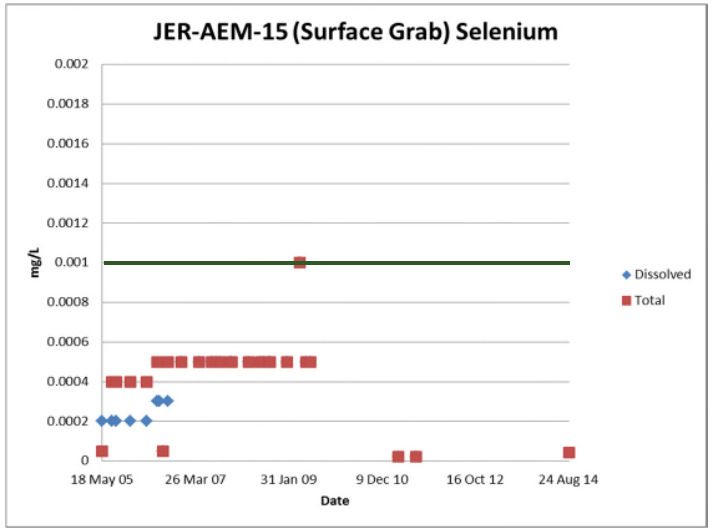
GRAPH D.39: Mercury CCME FAL guideline 0.000026 mg/L



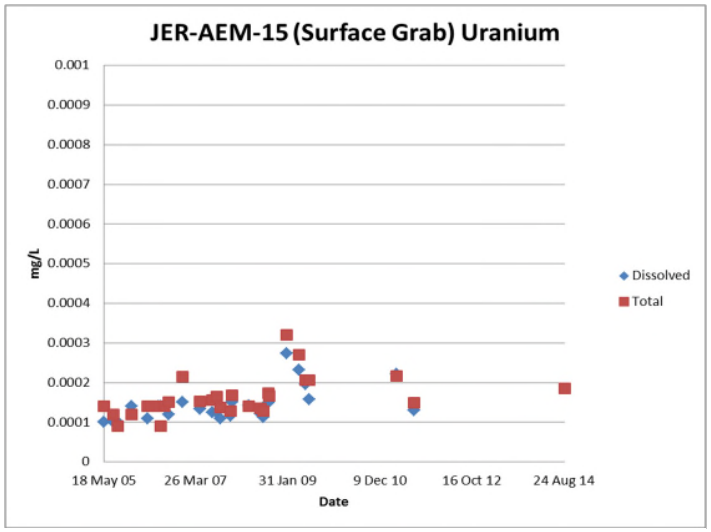
GRAPH D.40: Nitrate CCME FAL guideline 13 mg/L



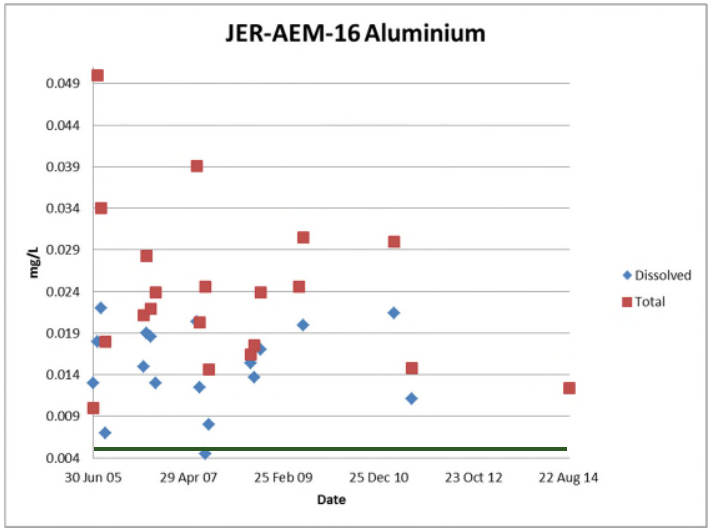
GRAPH D.41: pH CCME FAL guideline 6.5-9.0



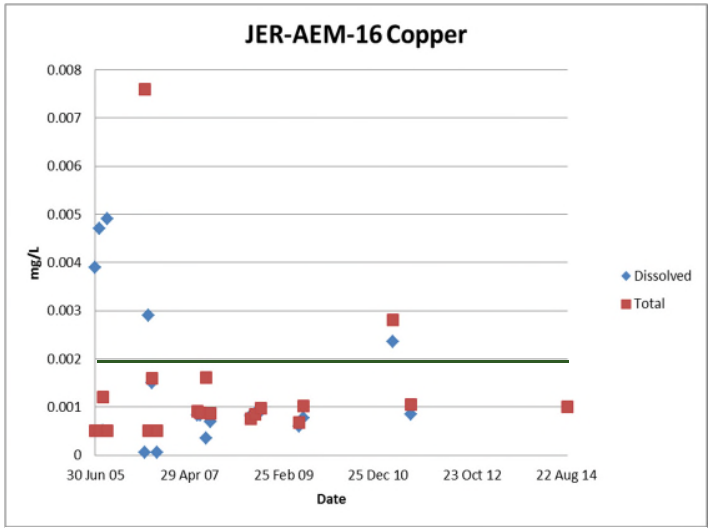
GRAPH D.42: Selenium CCME FAL guideline 0.001 mg/L



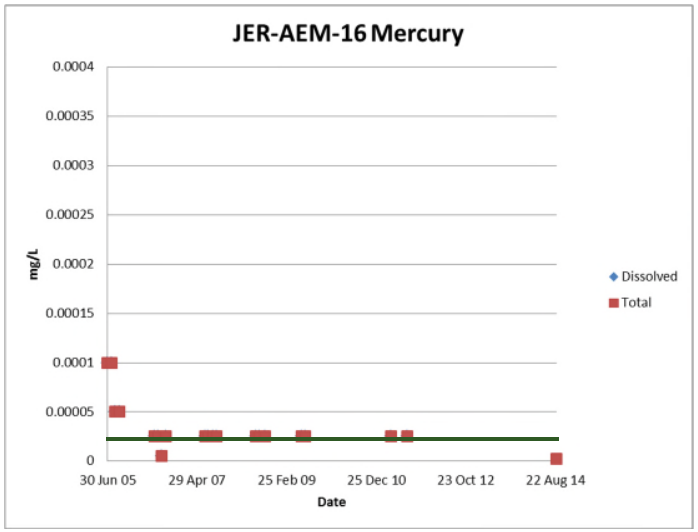
GRAPH D.43: Uranium CCME FAL guideline 0.015 mg/L



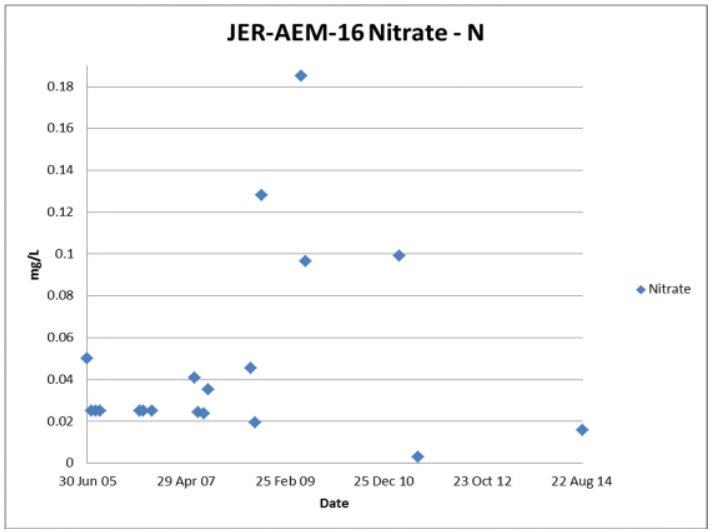
GRAPH D.44: Aluminum CCME FAL guideline 0.005 mg/L or 0.1 mg/L depending on pH



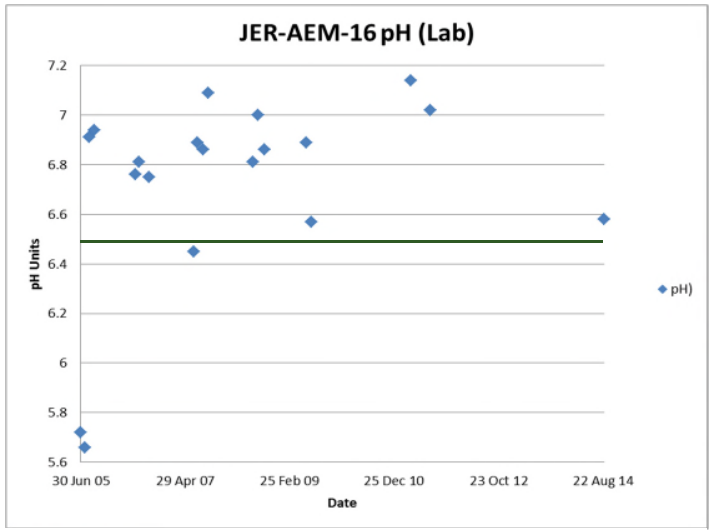
GRAPH D.45: Copper CCME FAL guideline 0.002 mg/L



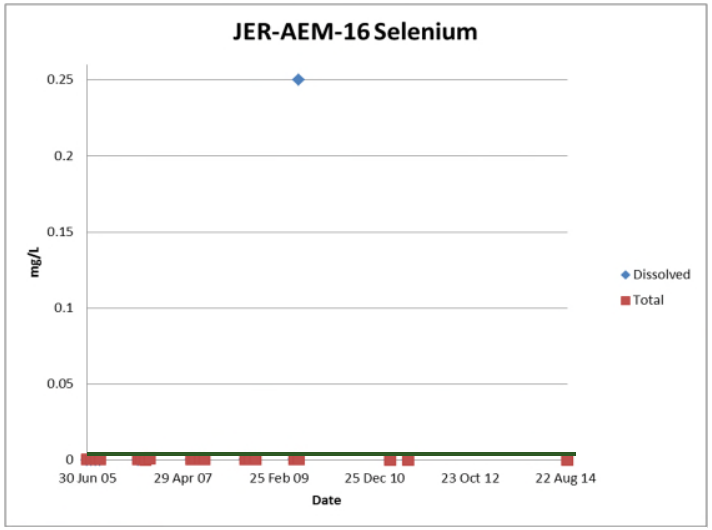
GRAPH D.46: Mercury CCME FAL guideline 0.000026 mg/L



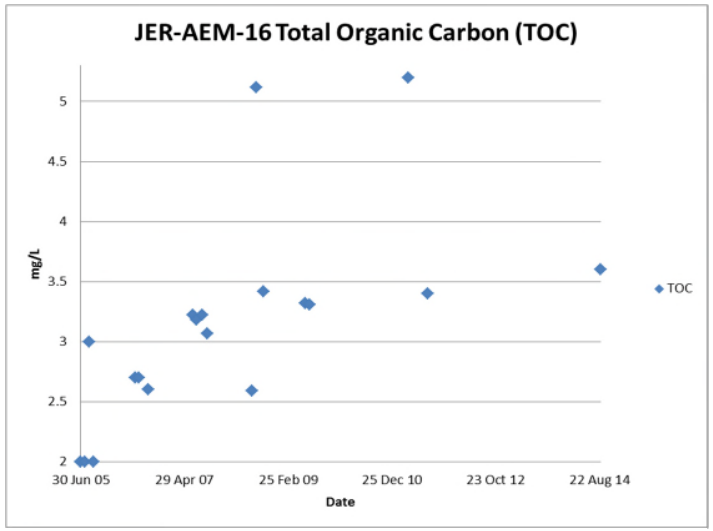
GRAPH D.47: Nitrate CCME FAL guideline 13 mg/L



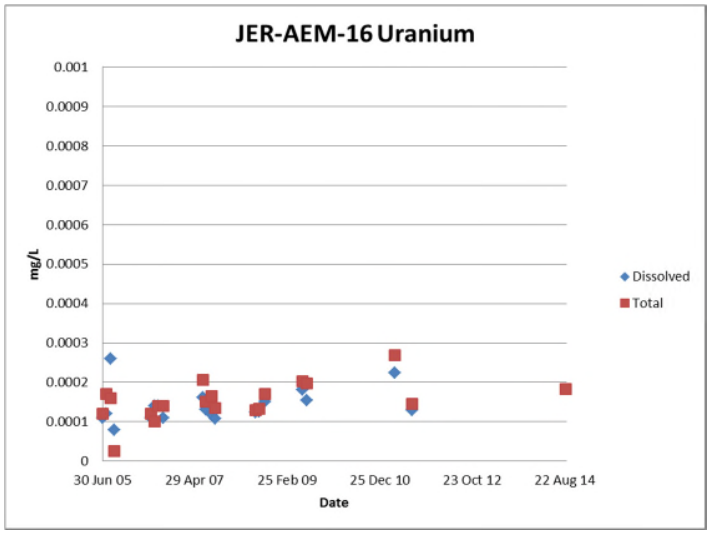
GRAPH D.48: pH CCME FAL guideline 6.5-9.0



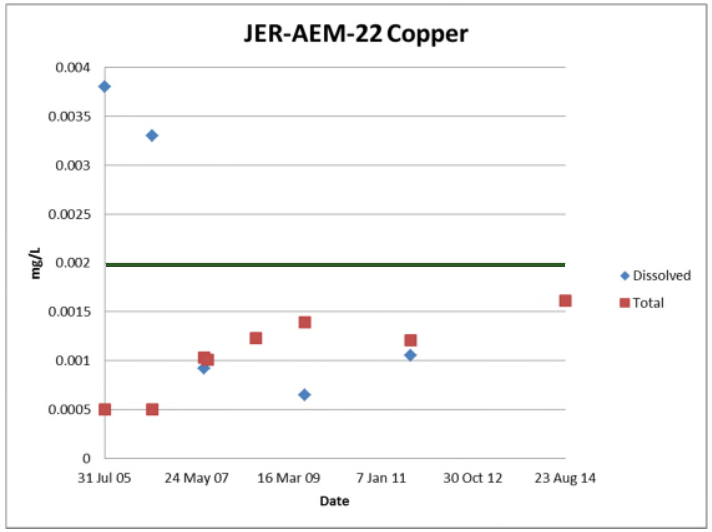
GRAPH D.49: Selenium CCME FAL guideline 0.001 mg/L



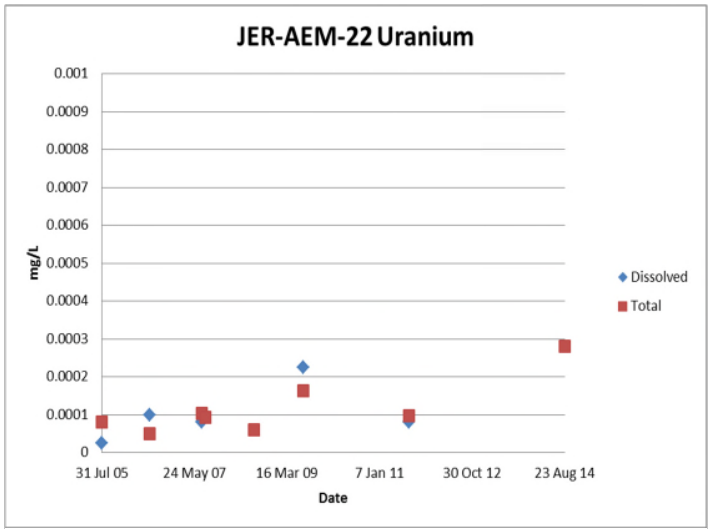
GRAPH D.50: No CCME FAL guideline for TOC



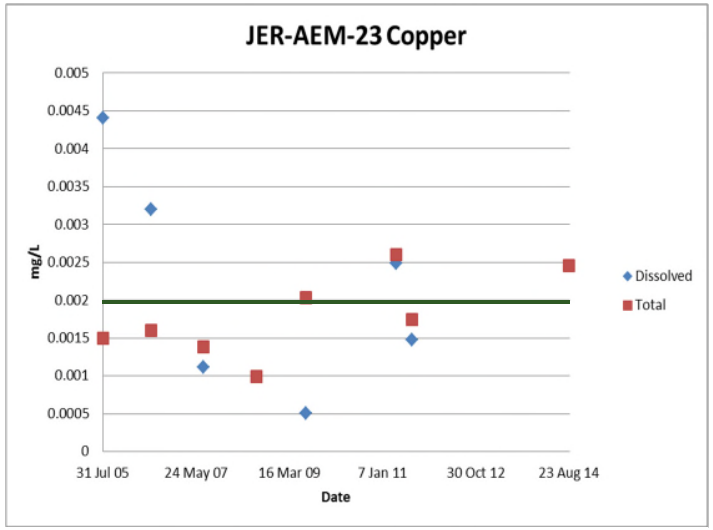
GRAPH D.51: Uranium CCME FAL guideline 0.015 mg/L



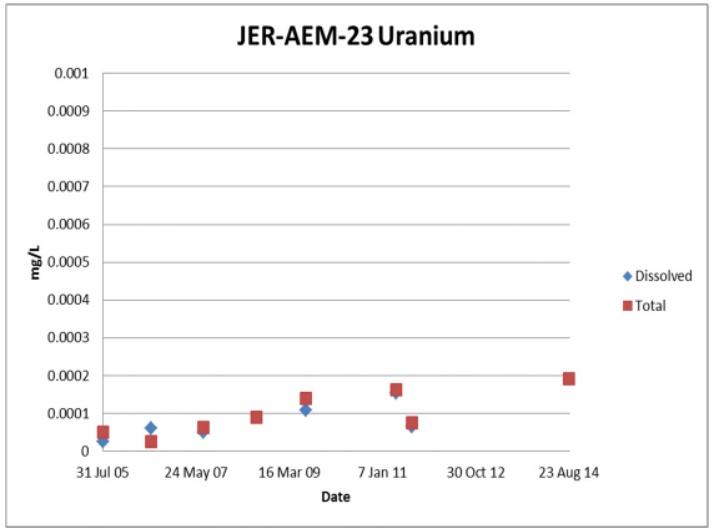
GRAPH D.52: Copper CCME FAL guideline 0.002 mg/L



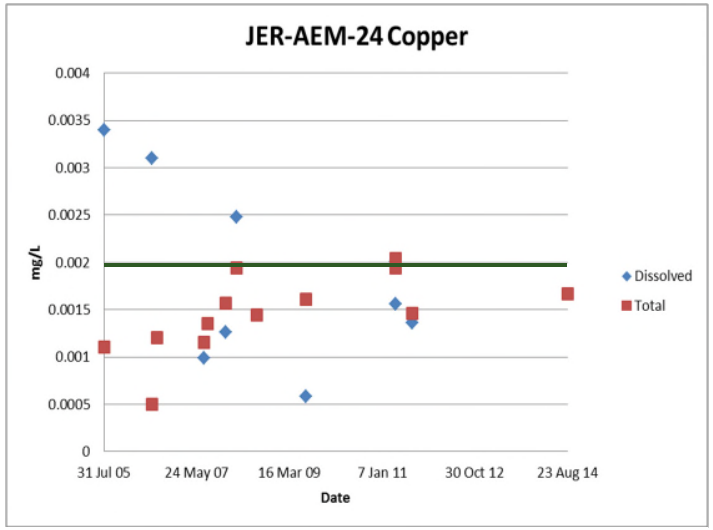
GRAPH D.53: Uranium CCME FAL guideline 0.015 mg/L



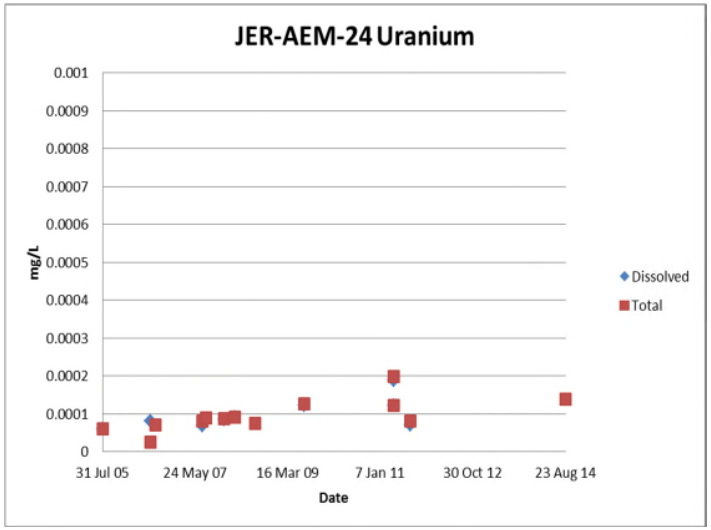
GRAPH D.54: Copper CCME FAL guideline 0.002 mg/L



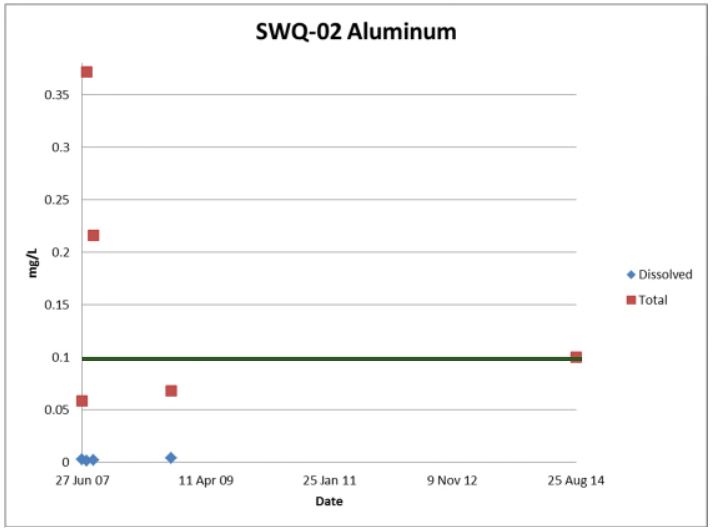
GRAPH D.55: Uranium CCME FAL guideline 0.015 mg/L



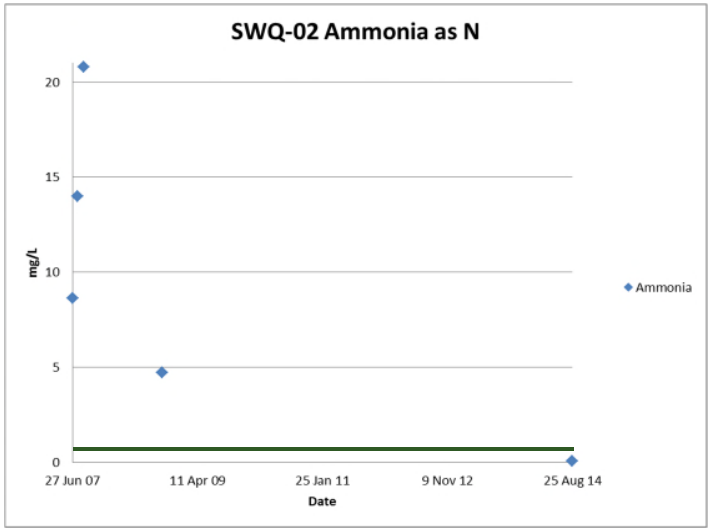
GRAPH D.56: Copper CCME FAL guideline 0.002 mg/L



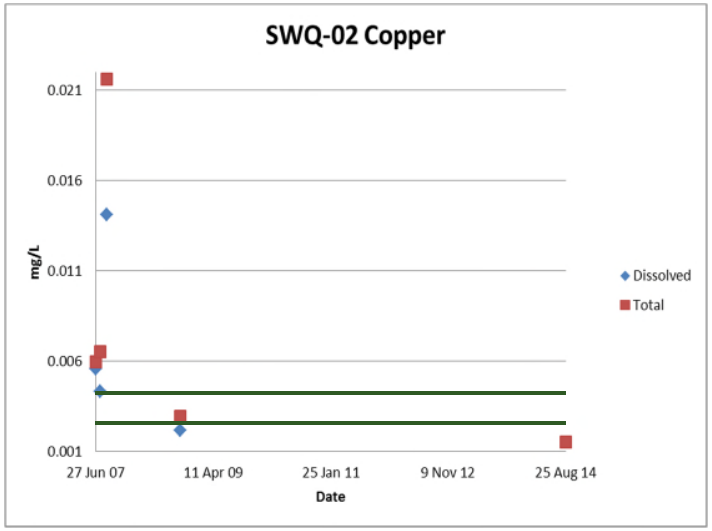
GRAPH D.57: Uranium CCME FAL guideline 0.015 mg/L



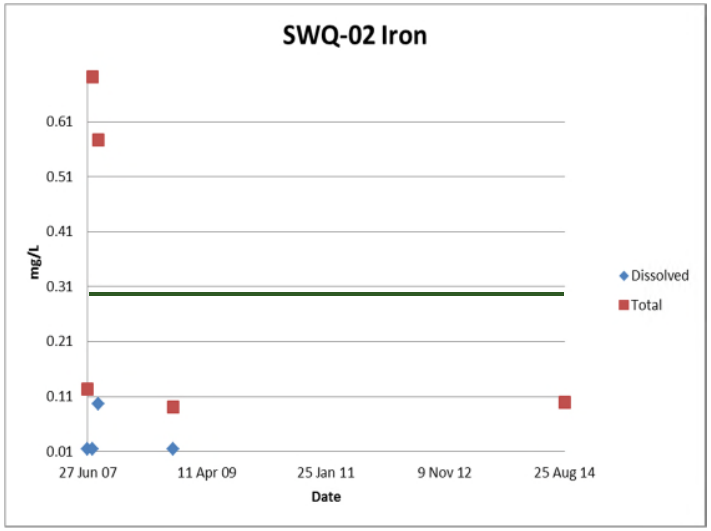
GRAPH D.58: Aluminum CCME FAL guideline 0.1 mg/L



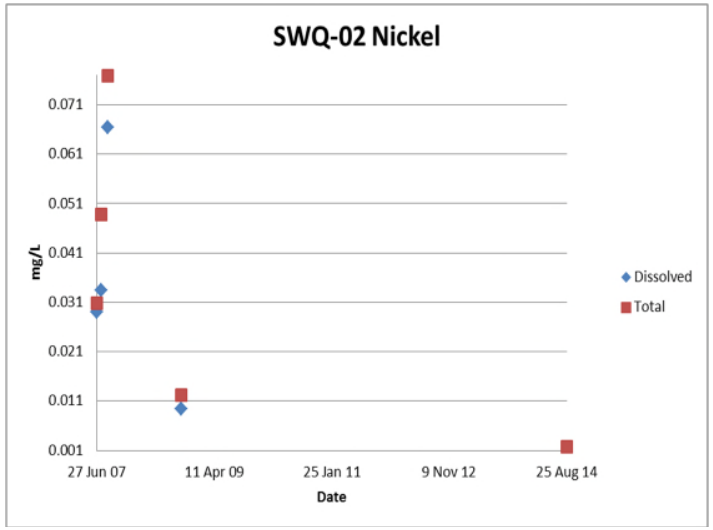
GRAPH D.59: Ammonia CCME FAL guideline 1.26 mg/L



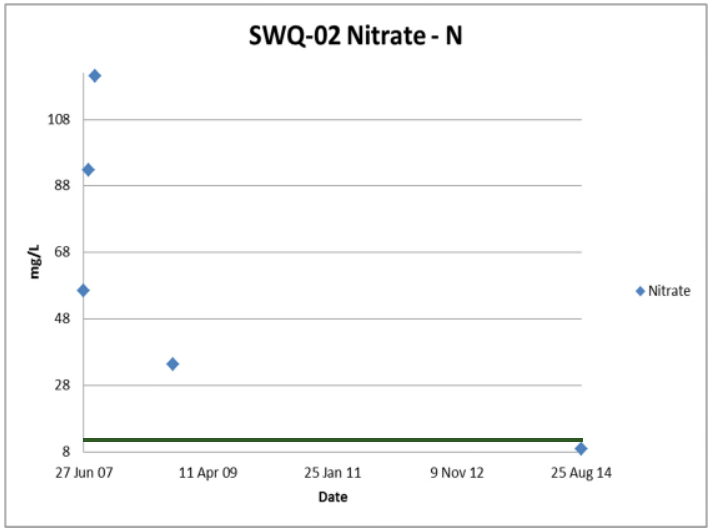
GRAPH D.60: Copper CCME FAL guideline ranges from 0.002-0.004 mg/L depending on hardness



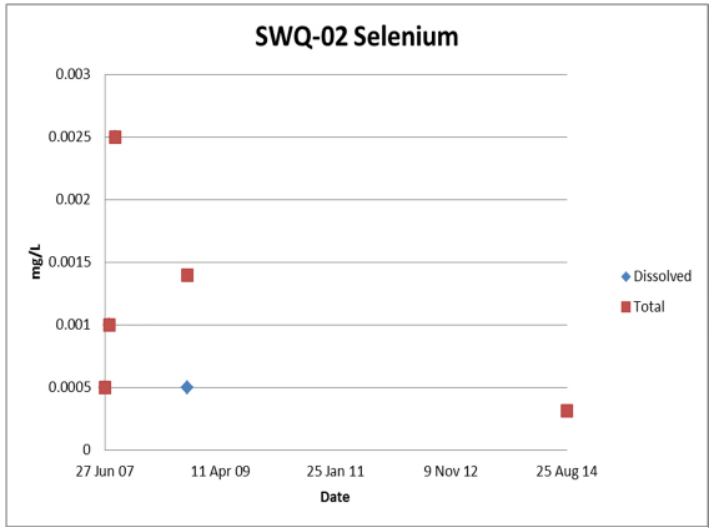
GRAPH D.61: Iron CCME FAL guideline 0.3 mg/L



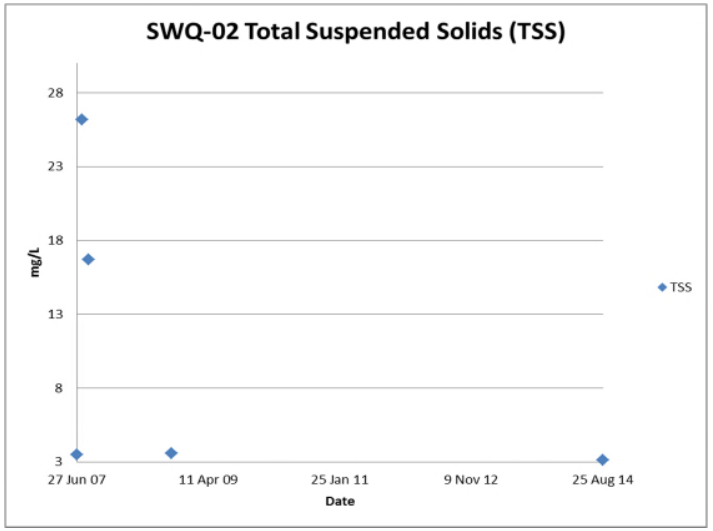
GRAPH D.62: Nickel CCME FAL guideline ranging from 0.077-0.150 mg/L depending on hardness



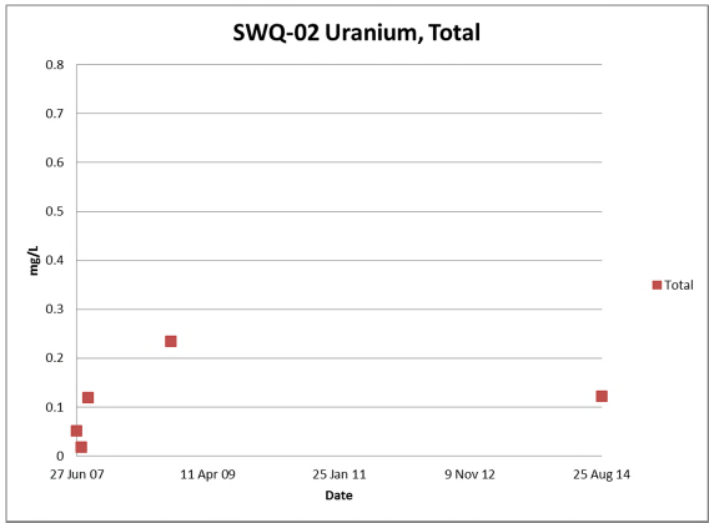
GRAPH D.63: Nitrate CCME FAL guideline 13 mg/L



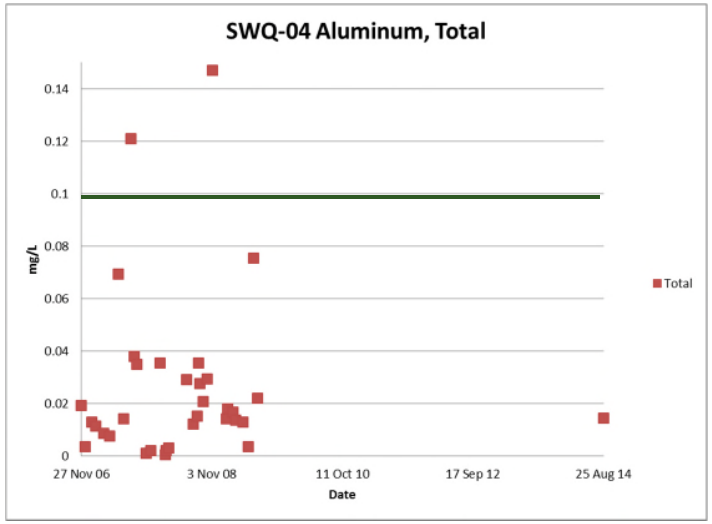
GRAPH D.64: Selenium CCME FAL guideline 0.001 mg/L



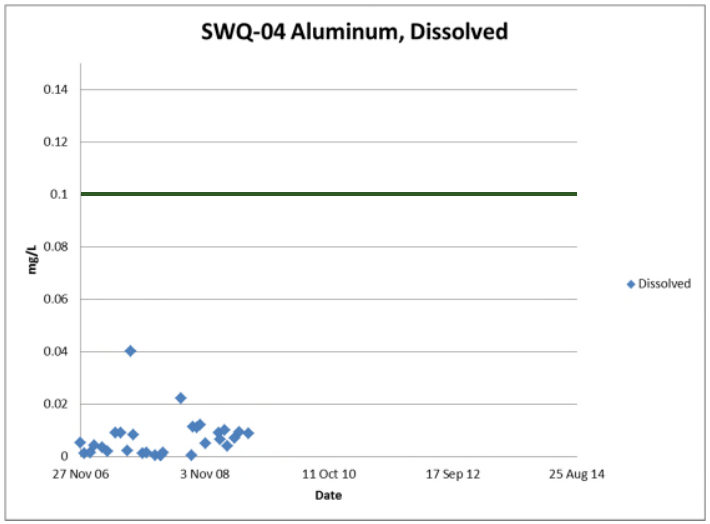
GRAPH D.65: No TSS CCME FAL guideline



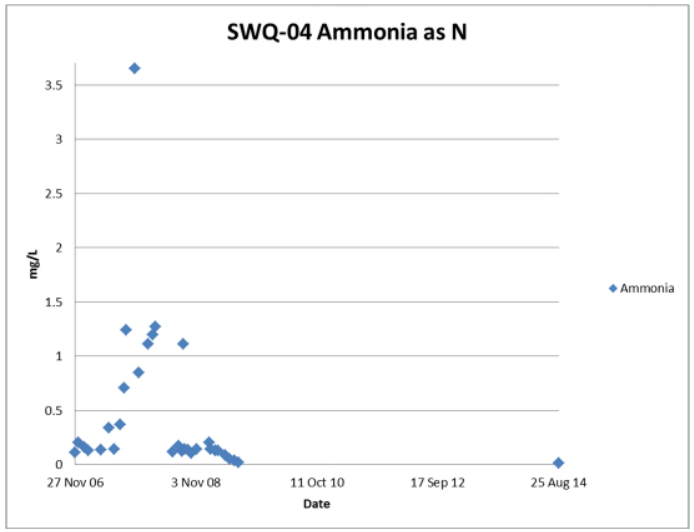
GRAPH D.66: Uranium CCME FAL guideline 0.015 mg/L



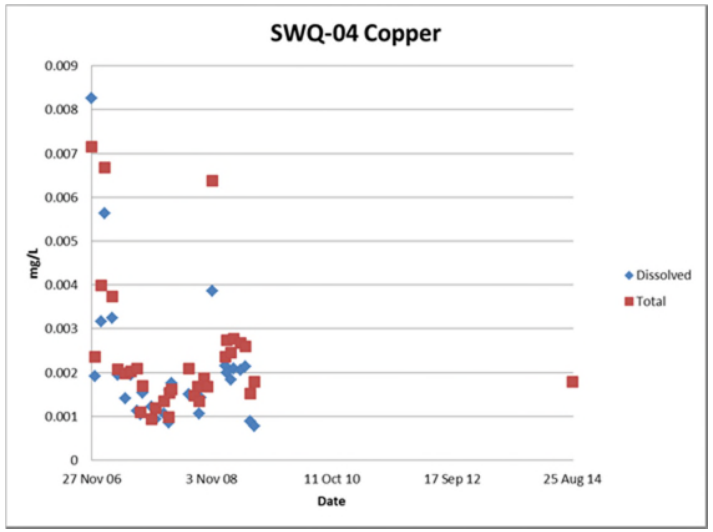
GRAPH D.66a: Aluminum CCME FAL guideline 0.1 mg/L



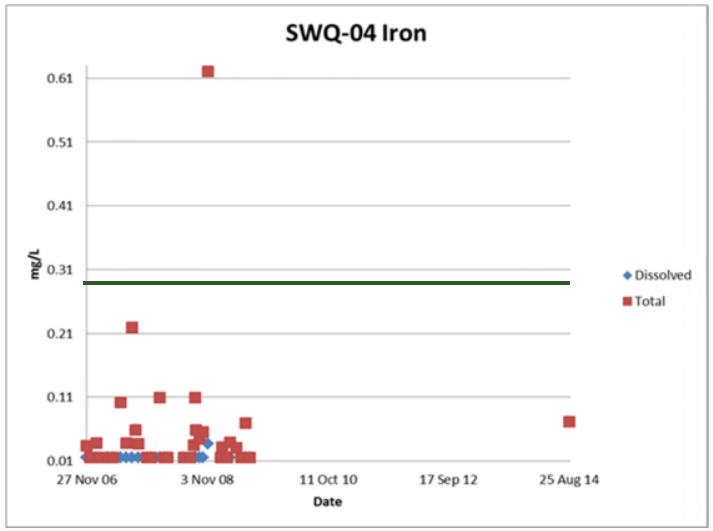
GRAPH D.66b: Aluminum CCME FAL guideline 0.1 mg/L



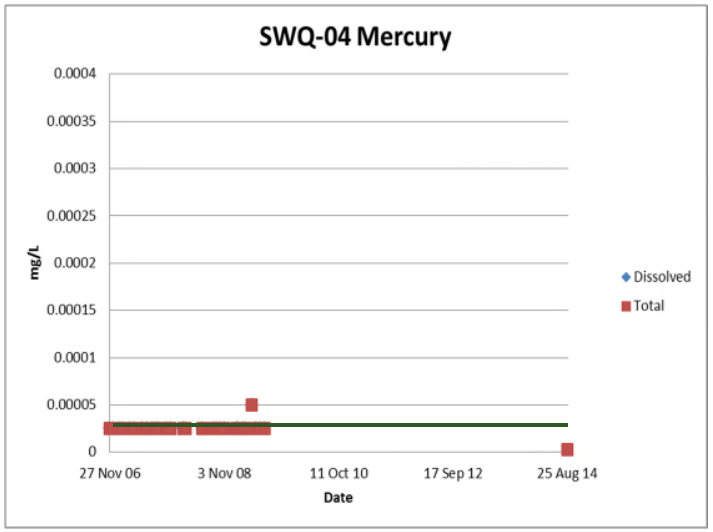
GRAPH D.67: Ammonia-N CCME FAL guideline ranges from 1.26-12.5 mg/L depending on pH and temperature



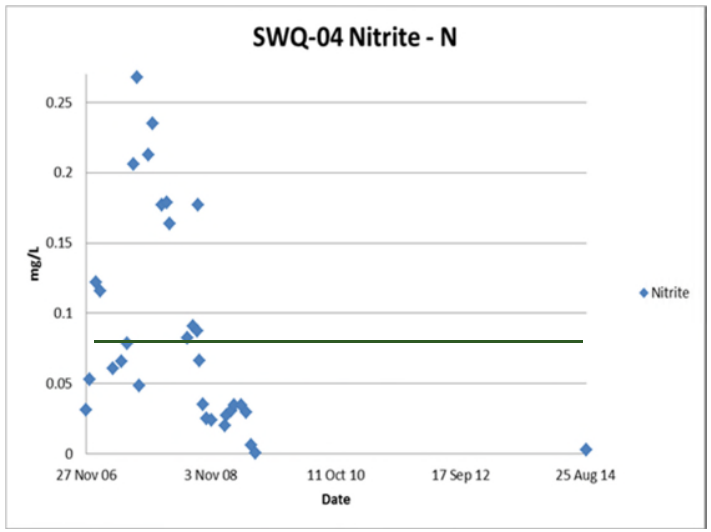
GRAPH D.68: Copper CCME FAL guideline ranges from 0.002-0.00334 mg/L depending on hardness



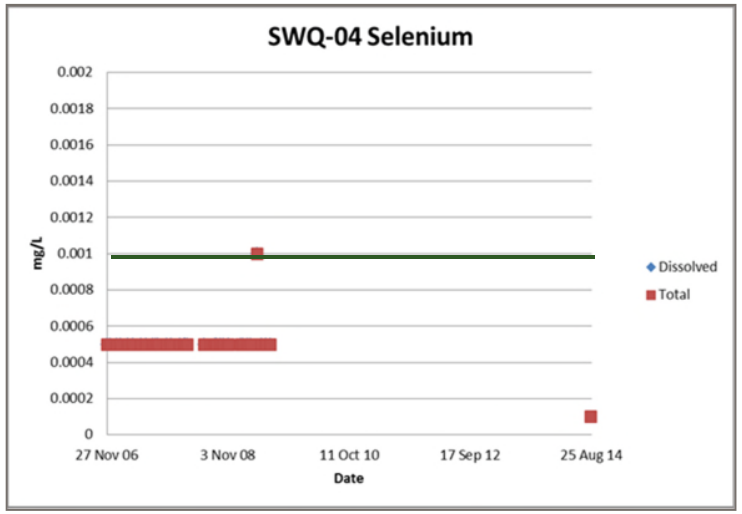
GRAPH D.69: Iron CCME FAL guideline 0.3 mg/L



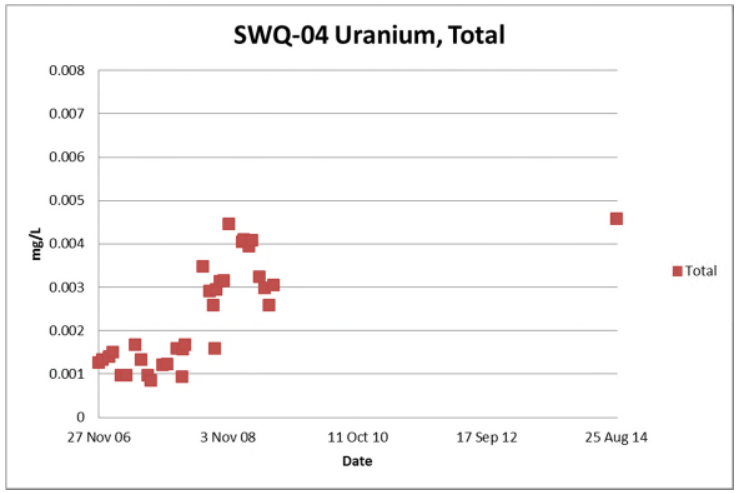
GRAPH D.70: Mercury CCME FAL guideline 0.000026 mg/L



GRAPH D.71: Nitrite CCME FAL guideline 0.06 mg/L



GRAPH D.72: Selenium CCME FAL guideline 0.001 mg/L



GRAPH D.73: Uranium CCME FAL guideline 0.015 mg/L

APPENDIX E

HAZARDOUS AND NON-HAZARDOUS MATERIALS INVENTORY

Photo E.1: Total lead in paint sample on AST #20 at the airstrip.

Photo E.2: Total lead in paint on similar ASTs at the hazardous waste transfer area.

Photo E.3: ASTs containing mostly waste oil at the hazardous waste transfer area.

Photo E.4: Suspect contaminated soil bags and soil in drums at the hazardous waste transfer area.

Photo E.5: Overview of the west berm at the hazardous waste transfer area.

Photo E.6: View north of the double stacked drums with various contents at the hazardous waste transfer area.

Photo E.7: View of the east berm with the truck tank full of diesel at the hazardous waste transfer area.

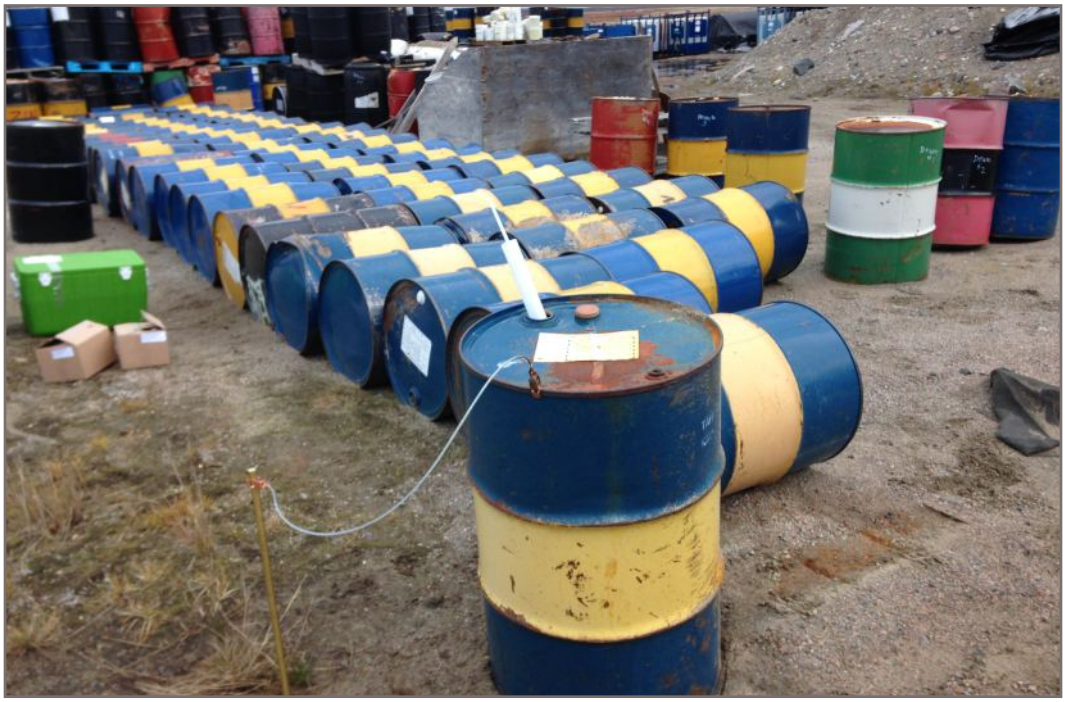


Photo E.8: Drum content sample DR2-1 (Jet B fuel) at the hazardous waste transfer area.

Photo E.9: Tank content sample TANK2-1 (diesel) at the hazardous waste transfer area.

Photo E.10: Phase 1 tank farm.

Photo E.11: Tank #9 fuel level at the phase 2 tank farm.

Photo E.12: Tank #10 fuel level at the phase 2 tank farm.

Photo E.13: Tank #11 fuel level at the phase 1 tank farm.

Photo E.14: Tank #12 fuel level at the phase 2 tank farm.

Photo E.15: Suspected contaminated soil at the phase 2 tank farm.

Photo E.16: Fluorescent lights and fox feces at the camp facility corridor.

Photo E.17: Batteries in the truck shop.

Photo E.18: Vehicle batteries in the truck shop (most common type on site).

Photo E.19: Fire extinguishers in the wood shed.

Photo E.20: Wheeled fire extinguisher at the airstrip.

Photo E.21: Walk-in cooler with refrigerant.

Photo E.22: Propane cylinders at Borrow Area A.

Photo E.23: Misc. hazardous solids, bentonite bags in the main camp storage shed.

Photo E.24: Misc. hazardous liquids in a flammable cabinet in the process plant.

Photo E.25: Misc. hazardous liquids, acids in the process plant.

Photo E.26: Misc. hazardous liquids, paraffin wax in the process plant.

Photo E.27: Mould on shelf boxes in the process plant.

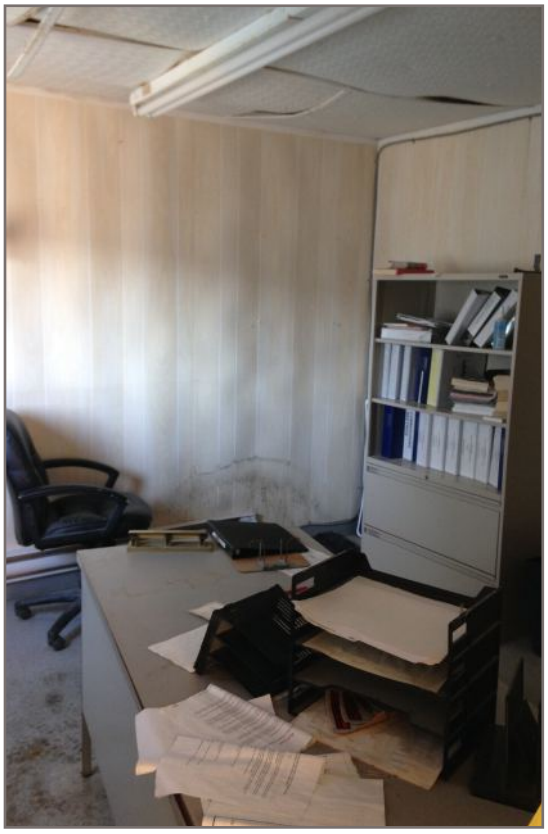


Photo E.28: Mould and water damage in the contractor offices.

Photo E.29: Mould and water damage in the contractor offices.

Photo E.30: View north of wood and metal airstrip buildings.

Photo E.31: View south of the wood and metal airstrip buildings.

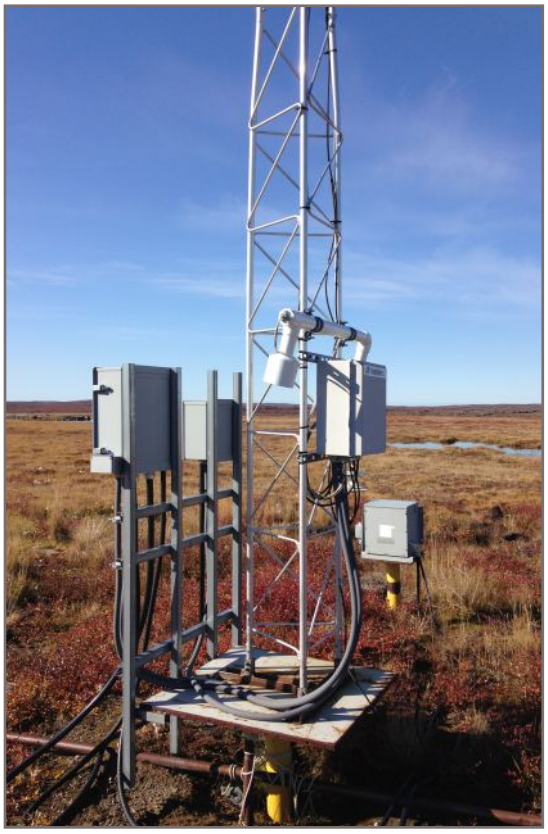


Photo E.32: Metal airstrip weather station.

Photo E.33: Metal trailers at Borrow Area A.

Photo E.34: Metal generator trailer at Borrow Area A.

Photo E.35: Wood and metal debris at the Carat Lake laydown area.

Photo E.36: Metal trailer and debris at the Carat Lake laydown area.

Photo E.37: Metal debris at the Carat Lake laydown area.

Photo E.38: Metal debris at the Carat Lake laydown area.

Photo E.39: Core box laydown area.

Photo E.40: Wood building and sea can by the water intake causeway.

Photo E.41: Metal building at the water intake causeway.

Photo E.42: Metal stockpile shed by the low grade stockpile area.

Photo E.43: Metal rock crusher by the main site laydown area.

Photo E.44: View east of the fueling sea cans and Phase 1 tank farm.

Photo E.45: Dewatering parts sheds.

Photo E.46: Laydown area wood and metal debris.

Photo E.47: Incinerator sea cans, truck shop, truck shop shed, and process plant.

Photo E.48: Machine and vehicle in truck shop.

Photo E.49: Metal equipment in the truck shop.

Photo E.50: Storage room in the truck shop.

Photo E.51: Machine in the truck shop.

Photo E.52: Truck shop shed.

Photo E.53: Camp Facility

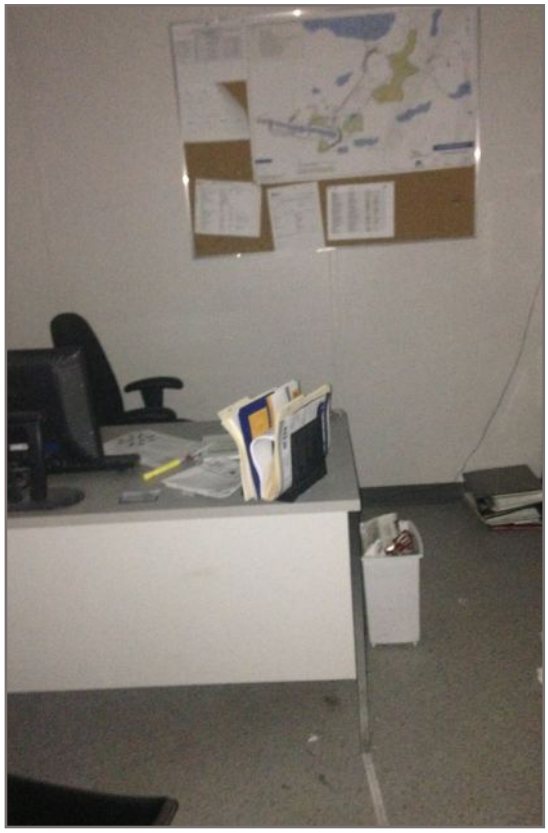


Photo E.54: Office in the main camp facility.

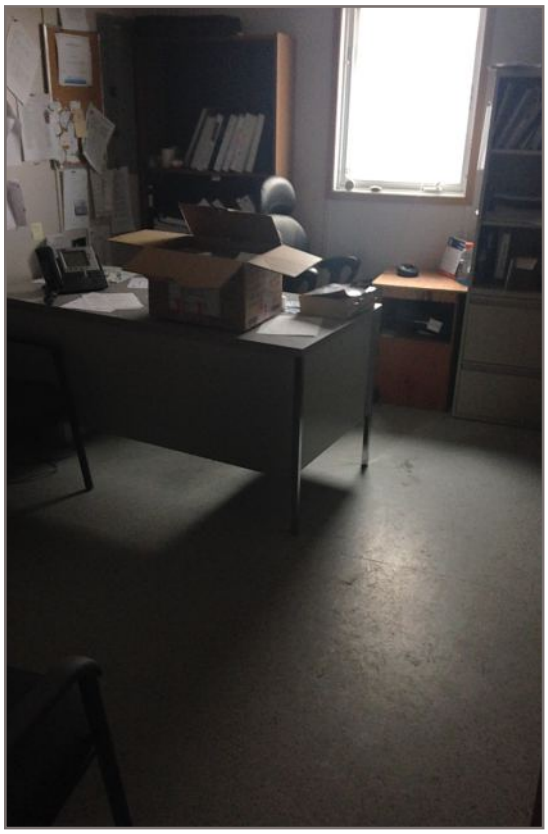


Photo E.55: Office in the main camp facility.

Photo E.56: Meeting room in offices at the main camp facility area.

Photo E.57: Safety supplies room in the main camp facility area.

Photo E.58: Diamond inspection room with miscellaneous inert items and safe at the main camp facility area.

Photo E.59: Medical room in the offices area of the main camp facility area.

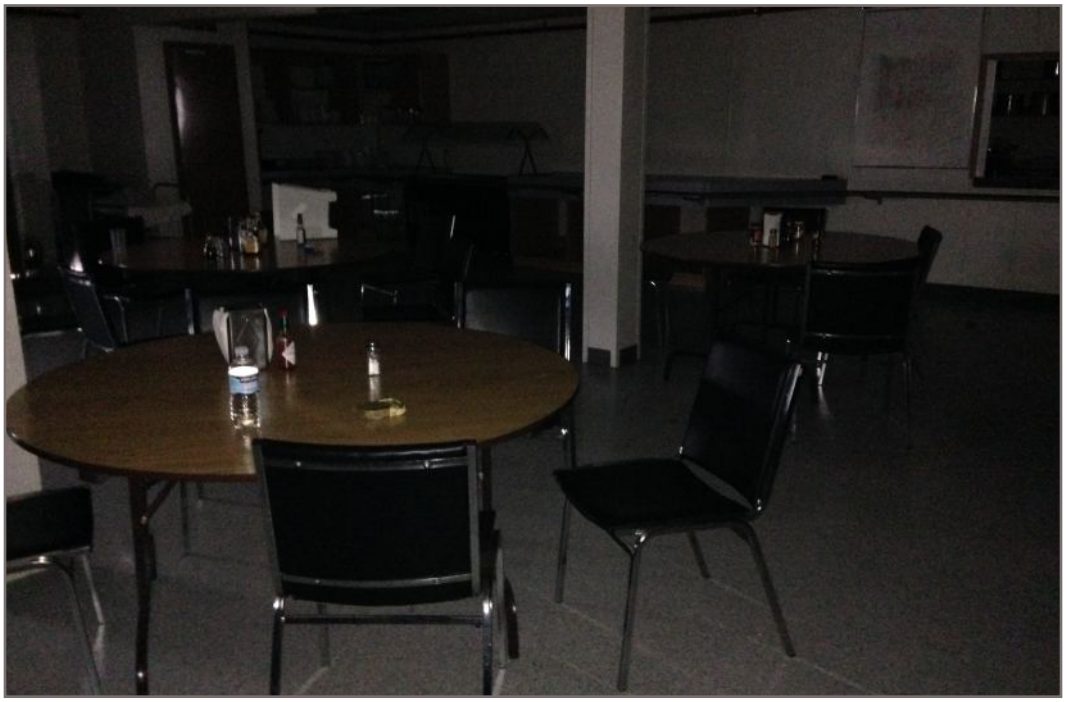


Photo E.60: Kitchen eating area at the main camp facility.

Photo E.61: Kitchen metal buffet serving table at the main camp facility.

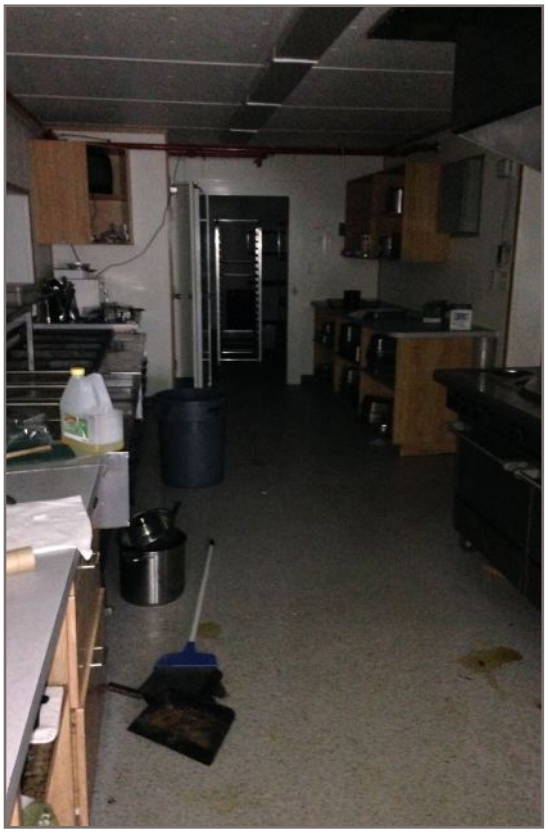


Photo E.62: Kitchen counters at the main camp facility.

Photo E.63: Food storage in the kitchen at the main camp facility.

Photo E.64: Recreation room at the main camp facility.

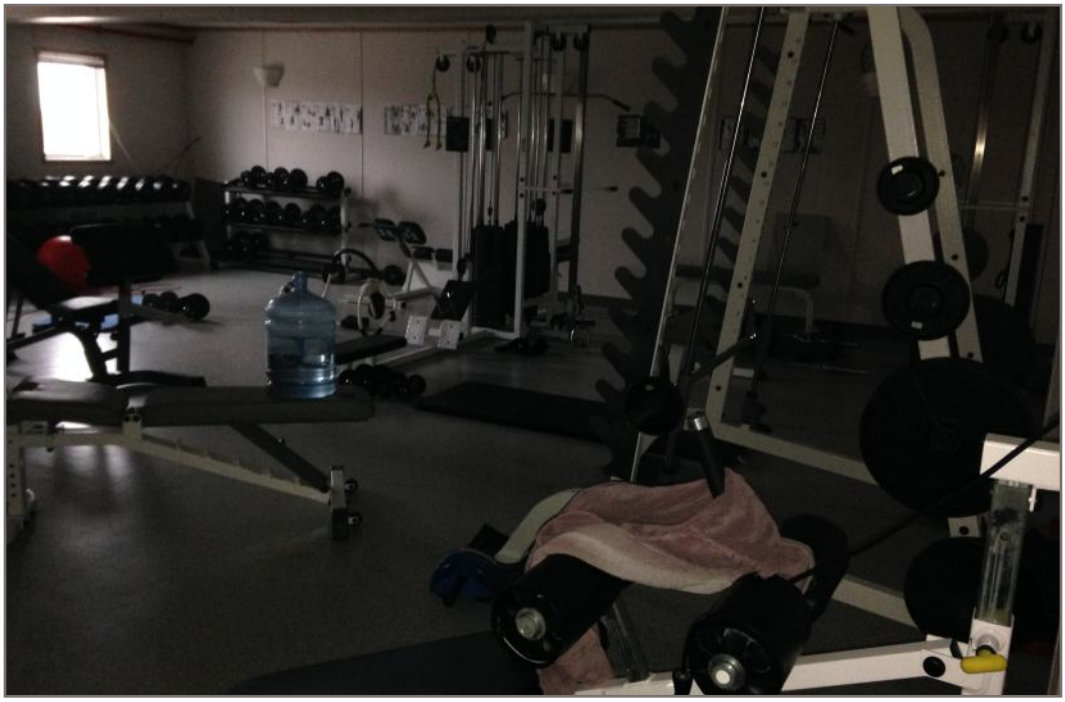


Photo E.65: Exercise room in the recreation facilities at the main camp facility.

Photo E.66: Reading and TV room in the recreation facilities at the main camp facility.

Photo E.67: Bathroom in the sleeping quarters at the main camp facility.

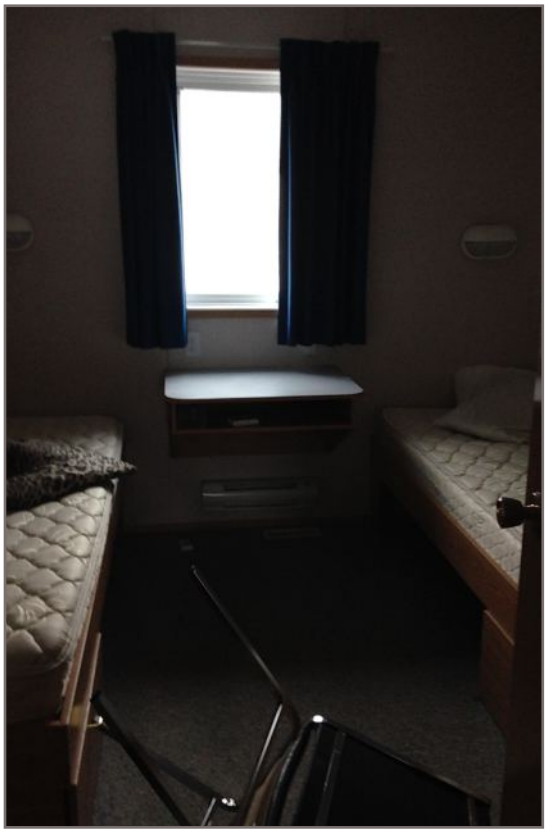


Photo E.68: Typical bedroom in the sleeping quarters at the main camp facility.

Photo E.69: Sleeping quarters hallway with fox feces.

Photo E.70: Parts wing with metal parts at the main camp facility.

Photo E.71: Parts wing exterior at the main camp facility.

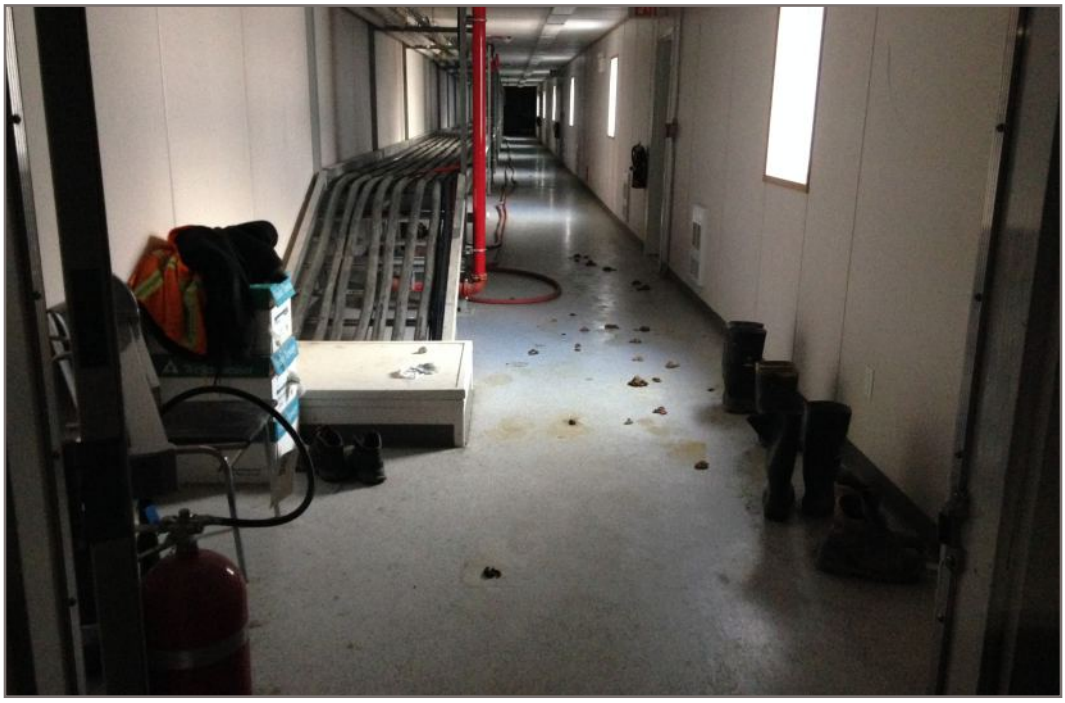


Photo E.72: Corridor and utilidor at the main camp facility.

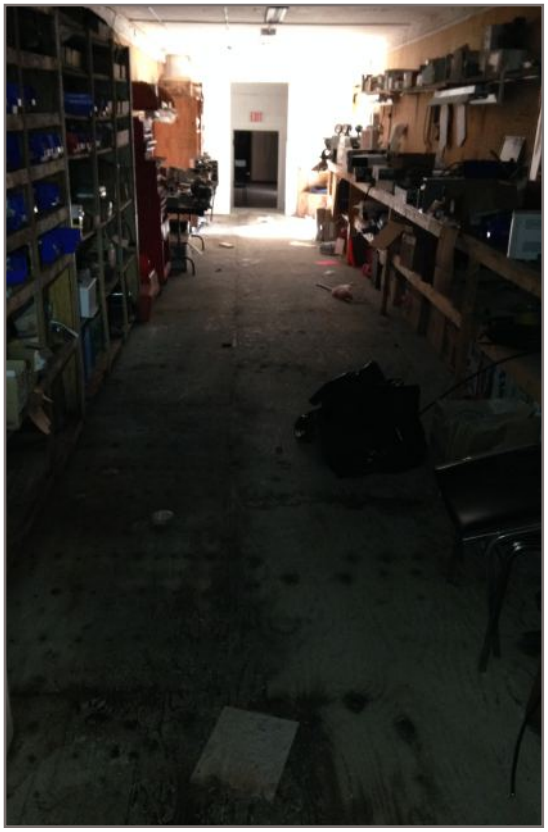


Photo E.73: Contractor offices at the main camp facility.

Photo E.74: Main camp storage shed at the main camp facility area

Photo E.75: Utilidor and wastewater treatment, wood shed, core shack, and environmental storage shed.

Photo E.76: Wastewater treatment interior tank at the main camp facility.

Photo E.77: Core shack at the main camp facility.

Photo E.78: Sea cans south of the process plant.

Photo E.79: View southeast of the truck shop, gensets, AST 18 and process plant.

Photo E.80: Lab equipment in the process plant.

Photo E.81: Lab in the process plant.

Photo E.82: Tool room in the process plant.

Photo E.83: Equipment in the process plant.

Photo E.84: Man lift in the process plant.

Photo E.85: Walkways in the process plant.

Photo E.86: Diamond inspection room in the process plant.

Table E-1: Hazardous and Non-hazardous Materials Inventory Table

General Location	Specific Location/ Building/ Item Name	Material Type	Material Description	Volume (Uncrushed m^3)	Quantity (Units)	Material Items Description (as required)
Airstrip	Terminal building	Non-hazardous	Metal exterior	134.64		3.3x17x2.4 m
			Desk		1	
			Tables		2	
			Beds		2	
			Sinks		4	
			Hot water tank, water tank		1.5	
			Smoke detectors		1	
			Stove		1	
			Electrical equipment		7	TV, 3 computer monitors, 3 towers
		Hazardous	Fluorescent lights		28	
			Fire extinguishers		1	
			Freezer and fridge with refrigerant		4	
			Helium cylinder		1	
	Outdoors, adjacent to the terminal building	Non-hazardous	UST cover	12		Cover and unknown size of UST
			Wood	1		2x4's and shack by water, wheel
			Metal	4		Tower and poles, water pump by lake
			Miscellaneous inert materials	1.2		Plastic secondary containment, plastic pipe, chairs
			Propane tanks		4	Empty
			Drums (205 L)		3	Empty
		Hazardous		0.205	1	Gasoline
				0.205	1	Jet A
	Red sleeping quarters shack, adjacent to the terminal building	Non-hazardous	Wood	7		Beds, closet
			Shack	44.55		Wood exterior and interior
			Metal	0.5		Wall heater
			Miscellaneous inert materials	2		Roof shingles, chairs
		Hazardous	Fire extinguisher		1	
			AC unit		1	
			Fluorescent lights		4	
	Emergency tent, adjacent to the red sleeping quarters	Non-hazardous	Miscellaneous inert materials	1		Plastic
			Metal	0.5		Stove
		Hazardous	Drums (205 L)	0.205	1	Diesel
	Airstrip shop #1	Non-hazardous	Shop	1080		Plastic tarped ceiling and walls
			Wood	7.5		Walls at two ends of tent, shelf, debris, boxes, wheels, boards
			Machines		2	Snowmobiles: Yamaha and Polaris snowmobiles
			Machines		2	Bobcats: S300 bobcat and S250 turbo bobcat
			Miscellaneous inert materials	4		Canvas, plastic, rubber tubing, empty jerry cans, clean spill pads, tarps, crates
			Metal	6		Generators, motors, air tank, pump motor, tool box, dryer, heater, boilers
		Hazardous	Fridge		1	
			Sulfacide brilliant blue	0.0025		5J50 by Albian Colors (powder)
			Bentonite	0.05		2 bags, 22.7 kg each
			Asbestos	0.01		1 labeled garbage bag containing vermiculite asbesots
			Propane ASTs		3	
			Waste filters/pads	2.5		Used on oil, fuel spills in 5 garbage bags
			Diesel jerry can	0.05		2 full of diesel
			Sodium hydroxide	0.02		
			Hydraulic oil	0.001		
			Windshield fluid	0.014		
			Oil	0.001		
	Outdoors, adjacent to airstrip shop #1	Non-hazardous	Miscellaneous inert materials	5		Rubber tires, spill kits and equipment, soil bags
			Drums (205 L)		282	Empty oil, black
					101	Empty diesel, black
				0.5	1	2 1/2 drums with concrete in them
					2	Empty Jet fuel, blue and yellow
			Metal	3.5		Metal piping in wood box, sleds
			Wood	6		Wood box, pallets
			Sea can	31		No roof, wood floor
			Miscellaneous inert materials	3		Miscellaneous plastic: crates, tarp
			Metal	19		Trailers full of rocks for compacting runway, electrical panels going to weather station, weather station boxes, tower, pole along airstrip
			Miscellaneous inert materials	3		Cable going to weather station, some buried unknown volume of cable
		Hazardous	Drums (205 L)	0.205	2	Full of soil, blue with yellow middle and black
				0.205	1	Diesel black
				0.205	1	Regular unleaded gas red
				0.051	11	1/4 full diesel
				0.01	16	Residual diesel
				0.051	1	1/4 full oil
				0.01	12	Residual oil
				0.205	3	Open with water, oil and diesel
				0.01	3	Residual Jet B with anti-icing additive
				0.205	1	Full Jet A
				0.01	1	Residual Aviation turbine engine A
				0.205		Full water open, diesel black
			Total lead in paint on AST	124		2 blue 62000L ASTs, built 1988: 20 (EC00016029), 21 (EC00016028)
	Airstrip (runway)	Non-hazardous	Miscellaneous inert materials		54	Lights along airstrip
	Airstrip genset	Non-hazardous	Wood shack	15.4		Steel roof, wood walls, fibreglass insulation
			Metal	2		Generator
			Operating vehicles		3	1 truck: power stroke turbo diesel V8 Ford F350 XL super duty, 1 truck: Ford F350 super duty with a diesel tank in the back, 1 large passenger van
		Hazardous	Battery		1	
	Sea can, adjacent to generator shack	Non-hazardous	Metal sea can	31.74		
			Metal	6		Generators
			Miscellaneous inert materials	0.5		Garbage bucket, spill pads
		Hazardous	Fire extinguisher		2	
			Diesel	2.2		2 Jerry cans, AST 2250 L
			Waste oil	0.025		1 Jerry can
	Freight outgoing shop	Non-hazardous	Wood shop	67.86		Wood, grey shingles, fuel on wood
			Metal	3		Tools, parts, pieces, pads, electrical panels
			Miscellaneous inert materials	1		Plastic containers, crates
		Hazardous	Methyl hydrate	0.004		
			Alcohol stove fuel	0.001		
			Aerosol paint can		1	
			Windshield washer	0.002		
			Vinyl cement	0.007		7 cans
			Jet fuel	0.002		
			Waste oil	0.21	1	In container and drum
			Battery		17	
			Fire extinguisher		3	
			Helium cylinders		5	
	Fire suppression red wood shack	Non-hazardous	Shack	8		Wood
		Hazardous	Nitrogen cylinder		1	One large 221 L compressed gas cylinder
			Fire extinguisher		1	Large, wheeled
		Non-hazardous	Drums (205L)		5	One empty (blue with red middle), one with small amount of water inside (all red) labelled regular unleaded gasoline, one empty spill kit drum, one empty heating oil drum, one empty drum (unspecified color)
			ASTs		1	One empty 900L red steel heating oil tank
			Pails (20L)		1	One empty pail (Mobil grease label)
			New Absorbent Pads		1	One white plastic drums with screw lid
			Drums (205 L) Jet A	3.383	17	One half full 205L drum of Jet A1 and water (Drum #2) (red with black middle), two full 205L drums (red with black middle), fourteen full 205L drums (black with yellow middle)
			Drums (205 L) Jet B	47.25	21	Five half-full and 80 full 205L drums (blue with yellow middle, Sample DR2-1), two full 205L drum Turbine Jet-B (black with yellow middle), 146 full 205L drums (unspecified color)
			Drums (205 L) Aviation Gasoline	2.46	39	Six full 205L drums (blue with red middle), three full 205L drums (blue with yellow middle), one full 205L drum (yellow with red middle), one full 205L drum (black with yellow middle), one full 205L drum (blue with red middle) assumed to be Av gas
			Drums (205 L) and ASTs Diesel	62.28	72 drums, 3 ASTs	Sixty-nine (sixty five full, three half full, one residual) 205L drums (all black), 2 full 205L drums (unspecified color), one half full silver AST wrapped in black tarp (Sample TANK2-1 ,says Methanol on it but is actually diesel, 1.7m^3 diesel in 3.39m^3 AST), one 3/4 full blue steel AST (AST #22) with serial no. EC00016031 (46.5m3 diesel in 62m3 AST)
			Drums (205 L), and AST Gasoline	1.15	9 drums, 1 AST	One 205L drum with residual 5L (all red), 440L red steel AST with residual (~20L), eight (four full, two half full, two quarter full) 205L drums (all red)

Table E-1: Hazardous and Non-hazardous Materials Inventory Table

General Location	Specific Location/ Building/ Item Name	Material Type	Material Description	Volume (Uncrushed m^3)	Quantity (Units)	Material Items Description (as required)
Hazardous Waste Transfer Area	Bermed area	Hazardous	Drums (205 L), and ASTs Antifreeze	4.22	3 drums, 3 ASTs	One full 205L drum (black with red middle), one full 205L drum (all black plastic), one full 205L drum (all black), three full 1200L all blue steel ASTs
			Drums (205 L), pail and ASTs Waste Oil	110.43	47 drums, 1 pail, 8 ASTs	One full 205L drum says Dowfrost HD (Drum#1) filled with mostly oil and some water, one half full 205L drum (Drum #7 - all black plastic), 43 full + 1 half full 205L plastic drums, one full 205L drum (blue with yellow middle), one full 20L pail, 284L in an 1100L Esso tank, 1200L full steel blue Esso tank, three full 1100L ASTs, three blue steel ASTs 62m^3 each (AST #17, Serial EC00016032, full, 62m^3) (AST# 23, Serial EC00016033, half full, 31m^3) (AST# 19, Serial EC00016030, residual, 3m^3)
			Drums (205 L) Lubricant/grease	0.41	2 drums	One full 205L drum (all blue) Stabyl HD Lubritech, one full 205L drum (all blue) unmarked- assumed to be Stabyl HD Lubritech
			Drums (205 L), pail and ASTs Oil	43.585	4 drums, 50 pails, 16 ASTs, 1 truck tank	Twenty 20L pails of Hydraulic Nuto H22 oil (400L), Voltesso 35 Esso electrical insulating oil (one 20L pail), Esso Arox EP22 rock drill oil (one 20 L pail), Mobil SHC 526 Synthetic Hydraulic Oil (one 20L pail), Mobil SHC634 Synthetic Bearing Oil (5L residual), twenty-six full 20L pails of NUTO H22 hydraulic oil, two full 205L black plastic drums with Spartan EP All Season Gear Oil, one full 205L drum of N23, one full 205L drum of N7A, thirteen 1100L ASTs with engine oil (eleven full, two partially full; 13350L total in thirteen ASTs), three full 1100L ASTs with gear oil, one full truck tanker (25.13m3)
			Drums (205 L) and ASTs Coolant	6	4 drums, 2 ASTs	Four full 205 L drums (black with red middle), one full 1200L tank, one partially full blue AST (AST #16 - sign below it says coolant, est. 3.98m3 coolant inside)
			Drums (205 L)Waste Coolant	0.615	3	One full 205L drum (all black) with waste coolant and water mix, two full 205L drums (unspecified color)
			ASTs Transmission fluid	14.3	13 ASTs	Thirteen full 1100L ASTs (one also with ~20L water mixed in)
			Drums (205L)and ASTs Sump and Floor Fluid/Sludge	1.715	3 drums, 1 tank	One full 205L (all black) steel drum of sump sludge, one full 205L drum of floor sludge, one full 205L (all blue) steel drum of sludge, one full 1100L AST of floor sludge
			Drums (205L) Emulsifier	0.308	2	One half full 205L (all black) steel drum of NP23 Emulsifier, one full 205L (all black) steel drum of Emulsifier
			Drums (205L)Heating oil	0.923	5	Four full 205L drums (all black), one half full 205L drum (unspecified color)
			Drums (205L)Waste fuel	2.255	11	Eleven full 205L drums (all black)
			Drums (205L)Dowfrost HD	0.41	2	Two full 205L drums (green with white middle)
			Drums (205L)Ethylene Glycol	0.82	4	Four full 205L drums (all black)
			Drums (205L)Used oil filters	820 L	4	One full 205 L drum (all blue), two full 205L drums (all black), one full 205L drum (unspecified color)
			Drums (205L)Used Spill Kits	205 L	1	One spill response drum
			Drums (205L)Used Absorbent Pads	225 L	2	One full 20L pail of used absorbent pads mixed with water, one full 205L drum of absorbent pads (all black)
			Drums (205L) and pails Contaminated soil	82.895	352 drums, 8 soil bags, 1 box, 43 pails	Twelve full 205L drums (all black), one full 205L drum (black with yellow middle), four full 205L drums (all blue), eight open full 205L drums (unknown color), 326 full 205L drums (unspecified color), one 205L drum with residual, eight full 1m^3 soil bags, one wooden box 2.25m^3, eighteen full 10L pails, twenty-three full 20L pails, two full 25L pails
			Drums (205L) Rags contaminated with coolant	0.205	1	One full 205L all black steel drum
			Drums (205L) Unknown materials	0.41	2	One full 205L drum (red with black middle), one full 205L drum (grey with white middle)
			Drums (205L) Aqueous liquid	1.435	7	One full 205L drum oil water mix (Drum #3 - all blue), one full 205L drum with diesel and water mix, one full 205L drum open with water (blue with yellow middle), one full 205L drum oil water mix (all black), two full 205L drum oil water mix (unspecified color), one full 205L drum glycol and water mix (grey with white middle)
			Paraffin Wax Waste	0.02		One full 20L pail inside wooden box
			Paint	0.01		One half full 20L pail of paint in wooden box
			Total lead in paint on ASTs	310		Five blue steel 62000 L ASTs: AST #22, EC00016031, AST #17, EC00016032, AST# 23, EC00016033, AST# 19, EC00016030), AST #16
	Carrot Lake Laydown Area	Non-hazardous	Drum (205L)		2	20 L oil/water/diesel mix
			Wood	32		Shack, 2.5 x 2.5 x 6 m, shack, empty core boxes, pieces, slight, platform, box
			Metal	686		Winch, crusher, pieces, heater, culverts, fence, pipe, sheeting, couplers, buckets, heat coils, wire, rebar, pins, empty drums, vents, tubes, sleighs, drums, ASTs
			Concrete	10		Pieces, pipe holders
			Sea-can sculpture	112.5		No sides or top, metal decorative pieces (15 x 3 x 2.5m)
			Trailer (15.5 x 2.5 x 2.5 m)	97		Metal exterior, wood inside
			Vehicle		1	Ford Inland cement truck, 24,300 kg
			Wood shack sleigh	19		Blue, 4.7 x 2 x 2m
			Metal container with soil inside	12		
			Miscellaneous inert materials	320		PVC pipe with metal couplers, fibreglass insulation, insulated pipes, boxes of PVC pipes, plastics, black plastic berm liner, white insulating liner, plastic dock, insulation mats, secondary containments, tarps, rubber tires, rubber mats and rubber pipe
		Hazardous	Gas in containers	0.15		Jerry cans and 500 L tank
			Heating oil AST (1135 L)	1		empty
			Kleen Blast black powder	12		
			Max gel bentonite	0.5		
			Fridge		1	R 134A refrigerant
			Drums (205L)		44	Empty: 170 Jet A/B, oil, diesel, gas, ethylene glycol, 7 plastic oil, 2 residual Jet A, some with residual water
			Oil (20L)	0.11		3 motor oil, 1 gear oil, 1 used oil, 1 lube in blue wood sleigh
		Non-hazardous	Water soluble polymer emulsion (20L)	0.02		E2MUO
			Sea-Can (2.4 x 2.4 x 7)	40.3		
			Inside Sea Can	0.0396		Supercizer 9, superplasticizer
				1.125		Portland cement grout
				1.08		Portland cement
				2.263		HiBar spray applied fire resistant material
			Sea-Can (2.4 x 2.4 x 7)	40.3		
			Inside Sea Can	5		Miscellaneous inert materials: water heater, spill kit, toilets, washer and dryer, insulating pads
				2		Metal pipes, doors, furnace
		Hazardous	Inside Sea Can:	0.027		Motor and engine oil, fuel stabilizer
	Borrow Area "A2"	Non-hazardous	Metal	800		Rebar, sheeting, misc. pieces
			Propane cylinders		206	Empty: 206 on skids, 108L each, some residual
			Sea-can blue (12 x 2.3 x 2.3m)	63		
		Hazardous	Inside Sea Can	0.227		Calcium chloride
					2	Lead acid batteries
				0.2		Cement bucket
		Non-hazardous	White trailer (2.4 x 3.4 x 17.5 m)			White trailer, mould inside
			Inside trailer	36		Miscellaneous inert materials: insulation, showers, sinks, water ASTs
				0.54		HiBar spray applied fire resistant material
					2	Smoke detectors
		Hazardous			1	Mercury in thermostat
		Non-hazardous	Wood	16		Empty wood core boxes
			Generator trailer (8x2.3x2.3m)			Made 1978, wood interior covered with diesel, foam top
			Inside trailer	33		Metal: generator, metal parts, electrical panels
		Hazardous			4	Batteries
				0.5		Diesel, oil, fluids in generator and a bucket
Core Box Laydown Area[1]	Cores storage area	Non-hazardous	Wood cores boxes	84		Full of cores
Water Intake Causeway	Jetty	Non-hazardous	Pipes	344		HDPE pipe for the water intake line (240 m buried), pit dewatering, PKCA discharge, reclaim line and west dam
			Concrete blocks	13.75		Pipe supports
			Sea can	31		2.3x5.8x2.3 m
			Inside sea can	8		Wood stakes
			Wood building	65		Wood interior and exterior, with fibreglass insulation 5.4x3.9x3.1m
			Inside wood building	1		Wood table
				2		Metal lockers, desk, box, transformer, electrical panels
				2		Metal tower

Table E-1: Hazardous and Non-hazardous Materials Inventory Table

General Location	Specific Location/ Building/ Item Name	Material Type	Material Description	Volume (Uncrushed m^3)	Quantity (Units)	Material Items Description (as required)
		Hazardous			2	Fluorescent lights
			Inside wood building		1	Fire extinguisher
				0.05		Aerosol paint cans
					1	Propane
		Non-hazardous	Pumphouse	805		Metal clad exterior and metal interior
			Inside pumphouse	6		Metal: Overhead winch, electrical panels, transformer, water pump
		Hazardous			8	Fluorescent lights
North of Laydown Area	Stockpile shed	Non-hazardous	Sea can	31		
			Metal with fibreglass insulation shed	800		Shed 12x37x6m, no floor, walls 0.3 m thickness (calculation is demolished volume)
			Wood	1		Pieces
			Metal	2		Pieces
			Miscellaneous inert materials	10		Electrical wire, rubber, tarp
	Rock Crusher	Non-hazardous	Metal	288		Crusher and road support
	Trailer	Non-hazardous	Trailer (7.8x2.4x2.6m)	49		Metal with tires
			Metal	4		Transformer, electrical panels, bolts, tools
		Hazardous	Lube, grease, oil	0.05		
			Methyl hydrate	0.008		Alcohol stove fuel
			Light ballasts		3	
			Fluorescent lights		6	
	Extec separator	Non-hazardous	Extec separator	45		Metal with tires
Phase 1 Tank Farm (Eight 500,000 L tanks #1-8)	ASTs	Non-hazardous	Pipes	8		Above ground, adjacent and within both tank farms
	Tanks	Hazardous	Diesel	Volume unknown		Eight 500,000 L tanks (#1-8), minimal diesel observed in the bottom and some may be in pipes
	AST			18.6		One partially full blue steel AST#15 (EC00015828), D8778-S14 (diesel in 62000L AST), one half full 20L diesel can
			Total lead in paint on AST	62		One partially full blue steel AST#15 (EC00015828)
	Dewatering parts shed 1 (7 x 9.5 m)	Non-hazardous	Wood	15		
			Metal	140		Intact building
			Motors (Generator and pump)		5	
			Miscellaneous inert materials	20		Plastic, tubing
		Hazardous	Paint cans (4L)		9	
			Oil/gas containers (23 L)		2	
			Diesel in containers (25L)	0.05		
			Oil in containers	0.019		
			Propane ASTs		3	1 quarter full, 1 half full and 1 empty
			Gas in container	0.015		
			Lye crystals in bottles (3 kg)		3	
			Fire extinguisher	1		
	Dewatering parts shed 2 (4.5 x 10 m)	Non-hazardous	Wood/cardboard	72		Shelves and boxes
			Metal	92		Intact building, shelves and tools
			Miscellaneous inert materials	16		Boat, motor filters, string, tarps
		Hazardous	Fridge		1	
			Fire extinguisher		4	
			Battery		1	Lead acid battery
			Fluorescent lights		12	
			Lubricants/oils/antifreeze (20 L)	Some		
			Sulfacide Brilliant Blue SJ 50 (25 kg)		1	
	Small Trailer Adjacent (6 x 2.4 x 2.2 m)	Non-hazardous	Cardboard	0.5		cardboard
			Metal	38		Includes intact trailer
			Miscellaneous inert materials	0.5		Plastic
		Hazardous	Fire extinguisher		1	
	2 Fueling Sea cans	Non-hazardous	Sea can	62		2 Seacans for fuel transfer
			Metal	4		Electrical panel, heaters, pipes
			Miscellaneous inert materials	1		Absorbent pads
			Propane tank		1	1 empty
			Spill kit	0.5		
			Sump	1		Under barrels, open
			Transformers	1		2 units
		Hazardous	Drums (205L)	0.205	2.5	1: Open 1/8 is soil, the remaining is oil/fuel/water mix, 1: Open 50 L of diesel/water mix, 1: Full oil
			Fire extinguisher		3	
	Wood shed	Non-hazardous	Wood	12		Shed (2 x 2 x 3 m)
			Spill kit	0.5		
		Hazardous	Fire extinguisher		1	
Phase 2 Tank Farm (Four 1,500,000 L Tanks #9-12)	Tank Farm	Non-hazardous	Concrete	4.5		Two concrete blocks by ASTs (2.25m^3 each)
		Hazardous	Drums (205 L)	4	93.5 drums	Contaminated soil: Fifty-five 205L drums full of water and about 1" soil on bottom (est. 5 full 205L drums), 38.5 full 205L full drums
			Aqueous	0.103	1 drum	One half full 205L plastic drum of oily water
			Diesel	19.5	4 tanks	Four 1,500,000 L size tanks. Remaining volumes (as viewed on side gauge): Tank #10 SE corner has 5.0m^3, Tank #12 NE corner has 5.0m^3, Tank #11 NW corner has 4.0m^3, Tank #9 SW corner has 5.5m^3, and some may be in
	Sea can north of phase 2 tank farm	Non-hazardous	Sea can	30		Empty
			Metal	20		Filtering unit for water in AST berm,
			Drums (205L)		1	Full of filters
			Miscellaneous inert materials			Tarp
Laydown Area	Two Grouped sea cans #1-2, north of laydown area	Non-hazardous	Sea cans	60		2 sea cans
			Sea can #1	0.5		Tarp
			Sea can #2	0.5		Metal: overhead door part, 3 empty drums
				2		Miscellaneous inert materials: 10 tires, 4 rain drain cartridges, tarps, rolls
	Four Grouped sea cans #3-6, north of laydown area	Non-hazardous	Sea cans	280		4 sea cans
			#3 Red sea can	10		Rubber piping
			#4 Green sea can	10		Miscellaneous inert materials: Tarps, pipe insulation, pvc piping
				10		Metal: pipes
		Hazardous		0.004		DuPont medium reducer
				0.04		Transmission oil
				0.02		Scalex DX-410
				0.02		Esso oil
				0.02		Cobra oil
				0.02		Hydraulic fluid
			#5 Green sea can	0.01		Aqua fix adhesive
		Non-hazardous		10		Metal: pipes, parts, bolts, overhead door
				8		Miscellaneous inert materials: Piping
			#6 Red sea can	0.5		Wood
				8		Miscellaneous inert materials: Insulation, booms, plastic, rubber track outside
	Four Grouped sea cans #7-10, southeast of laydown area	Non-hazardous	Sea cans	280		4 sea cans
		Hazardous	#7 Red sea can		100	Compressed gas cylinders, Oxygen, nitrogen and carbon dioxide (Praxair)
		Non-hazardous	#8 Red sea can	20		Rubber
		Hazardous	#9 Red sea can		33	Propane gas cylinders, 20 large, 13 small
			#10 Red sea can		4	Compressed gas cylinders, Acetylene, two helium and oxygen
		Non-hazardous	Metal adjacent to sea cans	10		Sheets
	Throughout the area	Non-hazardous	Wood	14		Empty wood core boxes, scrap, wheels
			Metal	62		Piece, portable light unit, generator, gas heater, trailer, 2 equipment buckets, 3 tidy ASTs empty, motors, water pumps, 3 tidy ASTs, metal debris in steel bin, metal and other non-burnable items in a large metal bin
			Vehicle		2	Vacuum truck: Sterling Kingland Sales Ltd. with AST on back, Back hoe 322CL CAT, Loader CAT 950 G
			Metal	34.2		
			Miscellaneous inert materials	2.5		Plastic tank, 1 drum oil filters, secondary spill containers, tires
			Garbage sea can bin	24		Full of garbage
			Drums		10	Various empty drums
			Spill kits	0.5		
		Hazardous	Oils	0.05	1	1 drum, various containers
			Diesel ASTs	2	3	2 1135 L ASTs, 1 red tidy AST (500 L)
			Secondary containment	0.6		Full of soil and debris
	Drums belong to ENR[1]	Hazardous	Aviation fuel A and B	8.9		42 full, 2.5 1/2 full
			Jet A	11	55	52 full, 3 residual
	Incinerator sea can (north)	Non-hazardous	Blue, north sea can	33		Sea can and metal incinerator inside
			Miscellaneous inert materials	15		Aerosol bottles, cans, plastic containers, all empty, tarp, hose, garbage bin
	Drums by incinerator	Hazardous	Drums (205 L)	1.025	5	Filled with ash
				0.41	2	Filled with water
	Incinerator sea can (south)	Non-hazardous	Red, south sea can	67.68		
			Metal	9		Incinerator and stack, air filtration box adjacent
			Miscellaneous inert materials	1		Garbage
		Hazardous	Drums	0.205	12	Filled with ash
			Fire extinguishers		2	

Table E-1: Hazardous and Non-hazardous Materials Inventory Table

General Location	Specific Location/ Building/ Item Name	Material Type	Material Description	Volume (Uncrushed m^3)	Quantity (Units)	Material Items Description (as required)
	Generator sea can	Non-hazardous	Sea can	34.56		Metal
			Metal	4.5		Generator
		Hazardous	Waste oil	0.1	0.5	1/2 full drum
			Antifreeze	0.05		2 jerry cans
	Generator sea can	Non-hazardous	White sea can, west of truck shop	34.56		Metal
			Metal	4.5		Generator
	Rows 1 to 5	Non-hazardous	Metal	75.7		Loader bucket (2.65m^3), chute/funnel (3.91m^3), steel grating (0.4m^3), motor (0.125m^3), sheet metal (1.66m^3), misc. racking (0.98m^3), flat deck (1.5m^3), pipe racks (estimated 12m^3), auger feeds (0.314m^3), steel bin (1.872m^3), one Kolberg Conveyor belt (19.2m^3), one 3000 gallon water AST (12m^3), dump truck box (10.5m^3), flat bed trailer (4.682m^3), hopper and auger assembly (3m^3), radiator (0.91m^3)
			Vehicles		7	One Inland cement truck #0058, four Ford F350s, one Ford F450, one Komatsu grader
			Plastic	4.248	1 tank	One plastic water AST (3.248m^3), snow fencing (1m^3)
			Miscellaneous inert materials	2		Belts, tubing
			Tires	13.2		Four tires (about 1.9m^3 each), eight tires (about 0.7m^3 each)
		Hazardous	Miscellaneous Fluids in Equip.		10	Motor, Kolberg Conveyor belt, radiator, seven vehicles
	Hitching Rail	Non-hazardous	Metal	10.38		Transformer (0.35m^3) and electrical panel (0.08m^3) in hitching rail electrical shack, one Ingersoll Rand Light tower (1m^3), loader forks (0.8m^3), loader bucket (2.65m^3), Godwin trash pump (4.5m^3), two steel job boxes (1m^3 total)
			Vehicles/Equipment		3	One DCD Cat (in disrepair), one Midnight Petroleum/ESSO fuel truck, one Super Pac 8410 Sheep's foot Packer
		Hazardous	Miscellaneous fluids contained in equipment		6	Transformer, light tower, trash pump, three vehicles
			Metal	5		Generator, CAT, electrical panels
	Major structure	Non-hazardous	Truck shop	10,464		Exterior dimensions of the structure (872 m^2 and 12 m height)
	Fire Truck Room		Vehicles/Equipment		1	Fire Truck - Heavy Duty Diesel SMI Firemaster CRV 1000
			Metal	10.44		Tables, storage racks (uncrushed), trolley, small water pump, small air compressor, tool box, front end loader bucket, sump grating, acetylene and oxygen ASTs, Miller Bobcat welder generator, Clark Builders portable heater
			Miscellaneous inert materials, plastic	1		Welding Screen, welders mask, hoses, rope, electrical cords
		Hazardous	Fire Extinguishers		111	
			Lubricant/oil/grease	0.005		
			Battery Acid fluid	0.004		
			Glycol	0.004		
			Antifreeze	0.004		
			Miscellaneous fluids contained in equipment		4	Fire Truck, air compressor, welder generator, portable heater
			Compressed air ASTs	0.214		Acetylene and oxygen gases
			Drums (205L)	0.1025	1	Half full of Dowfrost HD
	Compressor Room	Non-hazardous	Metal	6.8		Electrode Stabilizing Oven, Lincoln DC-600 Electric Welder, Sullair LS-100 (Air Ventilation Unit?) and adjoining Taco Inc. Air tank
			Miscellaneous inert materials	0.02		Ladder
		Hazardous	Miscellaneous fluids contained in equipment		3	Electrode Stabilizing Oven, Lincoln DC-600 Electric Welder, Sullair LS-100 (Air Ventilation Unit?)
	Parts Room	Non-hazardous	Metal	54.35		Snow blower, shelving units (uncrushed), office desk, filing cabinet, metal lockers, yellow flammable liquids cabinet, miscellaneous metal parts
			Fire Extinguishers		1	
			Windshield washer fluid	0.072		
			Miscellaneous inert material & plastic	3		Three chairs, stereos, plastic cooler, helmet
			Smoke Detectors		2	
		Hazardous	Antifreeze	0.089		Air brake, Home and Plumbing Antifreeze
			Batteries	1.5		
			Methanol	0.112		
			Methyl Hydrate	0.004		(with 99% pure alcohol)
			Diesel Fuel Conditioner	0.006		
			Engine Coolant	0.004		
			Degreaser	0.0346		
			Compressor Fluid	0.117		
			Brake Fluid	0.0005		
			Armour All	0.0035		
			Lubricant/oil/grease	0.034		
			Brake Cleaner	0.0025		
			Battery Maintenance Fluid	0.0009		
			Power Steering Fluid	0.0028		
			Nickel Anti-Seize	0.002		
			Butane	0.00024		
			Propane	0.0016		
			Starter Fluid	0.0016		
			Spray Paint Cans	0.008		
			Spray Adhesive	0.0005		
			Bug Spray	0.003		
			Solvent Cement	0.003		
			Computer with tower and monitor		1	
			Fluorescent Light Bulbs		24	
			Fire Extinguishers		7	
		Non-hazardous	Vehicles/Equipment		4	One 936E Cat loader with bucket, one passenger van, one S185 Turbo Bobcat, one 980G Cat Front End Loader with bucket
			Metal	51.69		Small air compressor, power jet washer, Miller Matic 251 welder, racks, tables, four metal spill basins, two cut-down drum oil catchers, door assembly (new in wood crate), used radiator, Godwin pump, Lubricant and Fluids Distribution system and attached sump tank, blue steel oil filter crusher, metal parts washer, mobile oil changer, 9000 Watt Generator, Honda water pump, red portable fuel pump, misc. metals: saw horses (2), metal parts, two metal tools boxes with tools, chains
			Miscellaneous inert material	1		Rubbers hoses, tires (3), alcohol wipes
			Wood	0.5		Misc. wood from crates etc.
			ASTs		1	One 250 gallon heating oil AST (empty)
			Drums (205L)		2	Black, empty
	Truck Shop	Hazardous	Lubricant/oil/grease	0.183	3 ASTs, several pails	Motor oil in pails, one jerry can motor oil, flushing oil, one 1100L plastic shipping container of Esso 15W40 oil with 750L inside, one 250 gallon heating oil AST (full), one 1718L steel AST Esso grease (assumed full)
			Waste Oil	3.596	3 ASTs, 1 sump tank, 2 drums, several pails	Waste oil in sump AST of Lubricant and Fluids Distribution system (about 0.09m^3), waste oil in four metal spill basins (about 0.548m^3), residual waste oil in two metal oil catchers (2L) , several pails (about 246L), one 1000L plastic shipping container (full), one 1000L plastic shipping container with 200L waste oil inside, one 1100L plastic shipping container with residual engine oil (full), two 205L black plastic drums (full)
			Antifreeze	1.2	1 tank	One 1200L steel blue shipping AST with 50/50 water/antifreeze inside (assumed full)
			Transmission Fluids and Oil	2.015	3 ASTs	One 1300L steel blue AST with 425L of Esso Trans 30 inside, one 1000L plastic shipping container with 940L of Esso Trans Extra inside, one 1100L plastic shipping container with 650L of waste transmission oil inside
			Coolant	1.05	1 tank	One 1300L steel blue shipping AST with 1050L inside, one small 500ml container
			Sump Fluids	2.5		Approx. volume of fluids/sludge in sump
			Nitrogen		1	Cylinder attached to fire extinguisher
			Kleen Flo Parts Cleaner	0.05	3 pails	Three pails
			Linseed Soap	0.025	1 pail	One full 25L pail
			Drums (205L) Diesel	0.01	1	One half full 205L drum (black)
			Gasoline	0.03	8 jerry cans	Eight jerry cans
			Diesel Fuel Conditioner	0.001		One 1L jug
			Miscellaneous fluids contained in equipment		16	Four vehicles, small air compressor, power jet washer, Miller Matic 251 welder, used radiator, Godwin pump, Lube and Fluid Distribution system, oil filter crusher, metal parts washer, mobile oil changer, 9000 watt generator, Honda water pump, red portable fuel pump

Table E-1: Hazardous and Non-hazardous Materials Inventory Table

General Location	Specific Location/ Building/ Item Name	Material Type	Material Description	Volume (Uncrushed m^3)	Quantity (Units)	Material Items Description (as required)
			Drums (205L) Used oil absorbent pads and rags	0.615	2	One 205L drum (full), one black 205L drum (half full), three garbage bags
			Drums (205L)Used oil filters	0.359	2	One 205L drum (full), one blue 205L drum (3/4 full)
			Drums (205L)Floor Sweepings	0.154	2	Two drums (one half full, one 1/4 full)
	Truck Shop Shed (tarp tent 1002.24m3)	**Non-Hazardous**	Vehicles		6	Six snowmobiles (one Polaris 550 Edge Touring, five Skidoo Expedition Rotax 500x)
			Equipment		1	One metal dishwasher
			Plastic	3		Two plastic snowmobile sleds ($1m^3$ each), plastic containers with parts ($1m^3$)
			Metal	13.125		One Herman Nelson Gas heater ($2m^3$), one Ingersoll portable light unit ($1m^3$), two fuel pumps ($1m^3$ each), one orange pump ($8m^3$), one small engine ($0.125m^3$)
			Poly Drill PD133x		29 pails	Twenty-nine 25L pails Poly Drill PD133x mixed with water
			Core boxes with core inside[2]	20		Ten pallets of full core boxes ($2m^3$ each)
			Tires		5	Five tires ($1m^3$ total)
			Drums (205L)		2	One empty 205L drum (blue), one empty 205L drum (blue with yellow middle)
		Hazardous	Waste Oil	1.7425		One half full 2000L Energy Logic AST of waste oil/transmission fluid (1000L), one partially full 1500L secondary containment container of oil/sump sludge (375L), one full 20L pail of grease, one 300L secondary containment container with oil/sump residual on bottom (est. 20L), one 500L secondary containment container with residual fluid on bottom (est. 20L), one half full 205L black plastic drum, one full 205L drum (blue), 20L in bottom of cut-off barrel
			Antifreeze		3	Three full 205L drums of Esso HD antifreeze (black with red middle)
			Transmission Fluid	0.002		One half full 4L container in flammable cabinet
			Spray paint cans		4	Inside flammable cabinet
			Batteries		4	Two on top of secondary containment containers, two in flammable cabinet
			Miscellaneous hazardous items		3	One auto trans cooler conditioning kit, 305mL silicone black sealant in flammable cabinet, fibreglass resin (4L)
			Used Absorbent Pads	0.205	1	One full 205L drum
			Compressed Gas	0.02		20L compressed refrigerant R-134A
			Used oil filters		2	Two beside fuel pumps
			Calcium Chloride	1.53		Forty-nine 22.7kg bags of Alkali Calcium Chloride
			Fire Extinguishers		4	
			Diesel	0.1	2	Two quarter full 205L drums (black)
	Room south end of truck shop	**Non-hazardous**	Metal	9		Toolboxes, tools, equipment, nuts, bolts, fasteners, filters etc. ($8m^3$), two metal trays (1m3 total)
			Tires		7	Seven truck tires
		Hazardous	Batteries		20	Sixteen batteries, one quarter full 205L drum
			Aerosol Cans		20	One quarter full 205L drum
			Fluorescent lights		12	
			ABS Cement	0.000236		236mL
			WD-40		1	1 can
			Sealant	0.021		Foam Sealant 340g, thread sealant 220mL, seventy flange assembly kits each with one 305mL silicone sealant (21.35L)
			Silicon	0.00105		350mL x 3
			Propane		2 ASTs	4000g x 2
			Cleaner	0.00255		One half full 4L container of Envirochem Glass cleaner, one 550g container
			Fuel Conditioner	0.00025		One quarter full 1L container
			Starter Fluid	0.000633		Three 211g containers
			Oil/Grease	0.006474		One half full 1L container of oil, one 220mL Anti-Seize, fourteen 411g containers of low temp grease
			Pressurized Duster	0.000156		One half full 312mL container
			Paint	0.0189		Five cans of paint (3.78L)
			Radiator Flush	0.0013		Two 650mL containers
	Sea Can northwest of the truck shop (31.74m3 with wood interior)	**Non-hazardous**	Metal	3		Steel shelves ($3m^3$), saw
			Miscellaneous Inert Materials	1		Four new oil filters, two small wall-mounted pipe wheels
		Hazardous	Fluorescent Lights		6	
			Oil/Grease	0.024		One quarter full 4L container compressor oil (1L), one full 20L pail of Esso Unirex grease on top of sea can
			Compressed gas		2	One 200L acetylene cylinder, one 108L oxygen cylinder
	Major structure	**Non-hazardous**	Camp Facility	18694		Exterior dimensions of the structure (5341 m^2 and 3.5 m height)
	Gensets adjacent to camp		Metal	6		2 generators
		Hazardous	Diesel in tank	1.8		2 ASTs, 1900 L, residual diesel in bottom of one and 87% full in the other
			Fire extinguisher		2	
			Fluorescent lights		12	
			Batteries		4	
	Adjacent to camp	**Non-hazardous**	Miscellaneous inert materials	0.5		Spill kit
		Hazardous	Battery		1	
		Non-hazardous	Sea can	35		Metal
				2		Wood: shelves
		Hazardous		0.04		Rat poison, bug spray, pioneer sanitizer, flo fluid
			Total lead in paint on AST	62		1 blue AST (62000 L), built 1988: 18 or EC00015828
			Diesel	62		1 blue AST, built 1988: 18 or EC00015828, currently in use, full of diesel
	Offices	**Non-hazardous**	11 offices, 1 medical room, 1 print shop, 1 misc. safety storage room, 1 environment lab, 1 mechanical room, 1 diamond inspection room, 1 PPE storage room, 1 computer server room		11	Metal filing cabinets
					13	Computer
					25	Chairs
					11	Desks
					30	Shelves
					4	Safe
					2	Medical beds
					5	Weigh scale with cover
				2		Safety equipment (face masks, filters, first air kits, etc.)
				0.5		Variety of pills and medications
				2		Variety of cleaning liquids/hand sanitation washing stations
					13	Tables
					13	Printers
					1	Fire extinguisher
					8	Computer server room equipment and shelves
					324	Fluorescent lights
					37	Smoke detectors
					1	AC unit
			8 furnace rooms	8		Metal furnaces
		Hazardous			2	Batteries
			Office 4	0.0005		Ammonium hydroxide 500 mL
				0.0015		50% buffered formalin 1.5 L
				0.0003		Lygol's iodine 300 mL
				0.002		Clear liquid (maybe DI water) 2 bottles
				0.00025		Engine lubricant 250 mL
				0.003		Buffer solution pH 10 3 L
				0.004		Buffer solution pH 4 4 L
				0.003		Buffer solution pH 7 3 L
				0.0005		Horiba pH 4 solution 500 mL
				0.001		Isopropyl 70% rubbing alcohol 1 L
				0.0005		EC calibration solution 50 mL
				0.001		ORP standard 1 L
				0.005		O2 probe electrolyte powder 5 mL
			Office 11		2	Batteries
				0.0005		Isopropyl 70% rubbing alcohol 500 mL
			Office 12	0.0025		SBS 46 protective cream solvent resistant 2.5L
				0.0011		Soap
				0.004		4 L eye wash solution
				0.006		900 g of Zochlor chlorine disinfectant tablets - 6 bottles
				0.036		Lense cleaning fluid - 9 bottles
					1	Oxygen cylinder
					7	Fire extinguisher
			Office 13	2.015		Printer ink/toner
					16	Aerosol paint cans
					1	Fire extinguisher
			Office 2	0.5		X-ray tube 191 lbs, contains beryllium
				0.5		Nitrogen azote (for fire extinguishers)
			Office 16	0.01		Sulphuric acid, nitric acid
				0.0013		NO3N Foil packets 130 mL
				0.0005		Formazin turbidity standard 500 mL
				0.001		Nitrate nitrogen standard solution 1 L
				0.0005		DO kit by Ladeotle: Thiosulfate 16 mL, alkaline potassium iodide azide 30 mL
	Main Camp Facility Area					

Table E-1: Hazardous and Non-hazardous Materials Inventory Table

General Location	Specific Location/ Building/ Item Name	Material Type	Material Description	Volume (Uncrushed m^3)	Quantity (Units)	Material Items Description (as required)
Main Camp Facility Area				0.005		Calibration buffer pH 10, 4 and 7, EC 1413 and 718 solutions
				0.0005		Chlorine reagent
			Office 1 - Medical room		7	Small oxygen cylinders
					2	Nitrous oxide cylinders
					2	Bear spray
					2	Bear bangers
				0.01		Variety of pills and medications
					1	Small fridge
				0.001		Biohazardous waste
	Corridors/Utilidors		Corridors throughout camp facility area		350	Fluorescent lights
					16	Fire extinguisher
		Non-hazardous			22	Smoke detectors
					40	Wall heater
				375		Metal trays holding electrical wiring, PVC pipes, metal fire suppression pipes
					1	Furnaces
					1	Transformer
					26	Metal lockers
					1.6872	Ear testing metal booth
	Kitchen		Wood		12	Counters, round tables
			Metal		73	Buffet table, juice dispenser, milk dispenser, cereal dispenser, coffee makers, large coffee dispenser, 1 sink, toaster, toaster oven, microwaves (2), washing area metal counters, dishwasher (large), 1 sink, steamer, stove and exhaust cover, buffet warmer table and buffet pans, oven steel wash sinks, steel mixer, food storage shelves, hot water tanks, janitor sink, transformer, panel,
			Chairs		41	
			Miscellaneous inert materials	2		Dishes, misc. canned food, recycling in bags, plastics
			Washer/dryers		2	
			Furnaces		3	
			Smoke detectors		14	
		Hazardous	AC units		2	
			Fluorescent lights		128	
			Fire extinguisher		3	
			Walk in fridges with refrigerant		2	
			Chlorofluoromethane AST 13.6 kg	0.01	1	
			Propane AST 4 gallon			
			Fridges and pop machines with refrigerant		3	
			Batteries		20	
	Recreational Facilities	Non-hazardous	Book/TV room		4	Wood tables/coffee tables
					3	TV's
					1	Microwave
					4	Couches
					8	Leather chairs
					3	Smoke detectors
		Hazardous			24	Fluorescent lights
					1	Fire extinguisher
		Non-hazardous	Gym	15		Equipment - elliptical, bike, 2 treadmills, punching bag, sit-up board, weight rack, 3 weight machines, matts, weights
					3	Smoke detectors
		Hazardous			36	Fluorescent lights
		Non-hazardous	Recreational room - water leak and mould	10		Recreational games: 2 Air hockey tables, 2 foosball, 1 pool table
					4	Phone booths
					2	Bathrooms
		Hazardous			88	Fluorescent lights
	Sleeping quarters	Non-hazardous	E Hall rooms - 33 rooms, 4 units with in suite washrooms		7	Furnaces
					3	Washer/dryers
					2	Hot water ASTs
				2		Dry type transformer, electrical panels in mechanical room
					12	Sinks
					10	Toilets
					9	Showers
					10	Electronics - TVs
					64	Double beds
					64	Closets
					60	Tables
					60	Chairs
					4	Desks
		Non-hazardous	Laundry room		5	Washer/dryers
					1	Hot water ASTs
					1	Transformer, electrical panels
					1	Smoke detectors
		Hazardous			4	Fluorescent lights
					1	Fire extinguisher
		Non-hazardous	D Hall rooms - 33 rooms, 4 units with in suite washrooms		7	Furnaces
					3	Washer/dryers
					2	Hot water ASTs
				2		Dry type transformer, electrical panels in mechanical room
					12	Sinks
					10	Toilets
					9	Showers
					10	Electronics - TVs
					64	Double beds
					64	Closets
					60	Tables
					60	Chairs
					4	Desks
		Non-hazardous	F Hall rooms - 34 rooms, some mould on ceiling tiles		7	Furnaces
					3	Washer/dryers
					2	Hot water ASTs
				2		Dry type transformer, electrical panels in mechanical room
					12	Sinks
					10	Toilets
					9	Showers
					10	Electronics - TVs
					64	Double beds
					68	Closets
					34	Tables
					34	Chairs
	Water ASTs	Non-hazardous	Water ASTs storage room	9		5 Water ASTs (1800 L)
				1		Metal: Electrical panels, piping
		Hazardous			1	Fire extinguisher
				0.05		Powder bacteria concentrate 50 lbs
				0.001		Methyl hydrate 1 L
				0.002		Chlorine buffer
				0.0005		Spray adhesive
				0.001		Cleaning solution AM + AX analyser
	Offices	Non-hazardous	Security Area	3		X-ray scanner
					1	Small TV
				0.5		Wall heater
				0.73125		Safe
					7	Filing cabinets
					3	Desks
					1	Shelf
					2	Overhead doors
		Hazardous		9		Miscellaneous inert materials: furnace filters, plastic tags
				0.001		Sulphuric/nitric/hydrochloric acid vials
				0.000025		Cyanide vials
					10	12 volt batteries
					24	Fluorescent lights
		Non-hazardous	Fire suppression equipment room		12	Fire fighter jacket, pants, boots sets
					11	Wood shelves
					11	Metal shelves
		Hazardous			2	Smoke detectors
					31	Fire extinguisher
					26	Fluorescent lights
				0.018		Isopropyl solution 50%
		Non-hazardous			3	Wood desks and tables
				3		Miscellaneous inert materials: plastic table, boxes of plastic and glass sample bottles

Table E-1: Hazardous and Non-hazardous Materials Inventory Table

General Location	Specific Location/ Building/ Item Name	Material Type	Material Description	Volume (Uncrushed m^3)	Quantity (Units)	Material Items Description (as required)
Main Camp Facility Area	Storage/Environmental Wing	Hazardous	Environment office		1	Freezer full of freezer packs
				0.001		Lugol solution 750 mL
					1	Turbidity meter and standard solution kits
				0.004		Ethanol/methanol/Isopropanol
				0.001		Silica gel
				0.025		Battery contaminated water
				0.008		Hydrochloric/sulphuric/nitric acid
				0.001		TSS standard
				0.004		Infusorial earth solution
					12	Fluorescent lights
					1	Compressed cylinder nitrogen dioxide
					1	Compressed cylinder carbon monoxide
		Non-hazardous	Equipment/storage room		2	Wood tables/shelves
				6		Paper
					4	Washer/dryers
					4	Chairs
					1	Furnace
					1	Sink
					1	Filing cabinets
				3		Miscellaneous inert materials: Camping coolers, cubical dividers, medical stretchers
				0.5		Metal tags
		Hazardous		0.001		Butane gas 2 bottles 230g
					2	Fire extinguisher
					22	Fluorescent lights
	Parts Wing	Non-hazardous	Sea can #1 Electrical equipment	62.422		Metal interior
				8		Miscellaneous inert materials: lights/fuses
				20		Metal equipment/parts
		Hazardous			100	Fluorescent lights
		Non-hazardous	Sea can #2 Fall safety equipment	31.211		Metal sea can
				4		Metal equipment: harnesses, nuts, bolts
		Hazardous	Corridor adjacent to sea cans	1		Metal parts and pieces, pipes
				0.016		Adhesive, many types, bonding agent
				0.03		Paint cans and aerosol paint cans
				0.5		Cement
				0.001		Propylene gas
		Non-hazardous	Sea can #3 Plumbing supplies	63.48		Metal sea can
				22		Metal piping
				2		Fibreglass insulation
			Sea can #4 Misc. metal	31.211		Metal sea can
				2		Metal: hanging chains, nails, bolts
			Sea can #5	31.211		Metal sea can
				4		Metal: crates of nuts and bolts
				4		Fibreglass insulation
			Sea can #6	62.422		Metal sea can
				2		Miscellaneous inert materials: carpet, plastic, insulation
				1		Metal debris
					2	Wood debris
		Hazardous		0.025		Motor oil
				0.025		Paint
	Outdoors, adjacent to parts wing	Non-hazardous	Metal	20		On top of sea cans, pipes, parts
			Miscellaneous inert materials	8.5		Electrical wire, PVC pipe, garbage bins
		Hazardous	Drums (205L)		1	Paraffin wax
	Contractor's Offices	Non-hazardous	15 offices, equipment/tools room, instrument shop		15	Desk
			Shelf		15	
			Cabinet		15	
			Chairs		15	
			Table		15	
			Furnace		1	
			Metal: Equipment/tool room shelf full of tools, parts, wiring	21		
			Smoke detectors		18	
		Hazardous	Fire extinguishers		6	
			Fluorescent lights		62	
			Calibration gas cylinders (small)		3	
			Flammable cabinet: RAID, comet 3, paint/stain, cleaner, foam sealant, sealing compound, coating, engine lube, glyptal aerosol, poly filla, cans of paint, grease.	1		
			Sewage AST	4		
	Outdoors, adjacent contractor's offices	Non-hazardous	Two blue electrical panel shacks	8		Wood shacks
				3		Metal: transformers, electrical panels
		Hazardous	White AST (62000 L)	500	1	Northern Steel double wall enviro-tank, EC00016023, made 2005, gauge read 1 foot, 7 inches
	Main Camp Storage Shed	Non-hazardous	Tent 36x7.6x15m	4104		Plastic covered tent
			Cement	9		Bags of cement
			Metal	153		Boxes, compressors, motors, parts, hot water ASTs, heater, stove, shelves, sea can base outside
			Miscellaneous inert materials	24		Rubber, tarp, spill kit, drywall, pipe insulation, electrical cable, tires
		Hazardous	Dry chemical for fire extinguishers	1		Foray dry chemical (Class A, B, C) in buckets
			Silica sand	6.4		
			Bentonite	0.5		
			Polymer	23.29		Flo and Fed Pac R polymer
			Oil	0.1		Esso oil pails, cutting oil
			Paint thinner, remover	0.05		Acrylic lacquer thinner
			Grease, lubricant	0.3		Esso boxes, Atlas Copco lubricant, Mobil
			Drums (205L)		4	Full "Collector DB" paraffin wax
			Fire extinguisher		14	
			Paint cans	1.5		Metal box full of empty spray paint cans
	Electrical building	Non-hazardous	White metal clad building	79.2		4.4x4.5x4m
			Wood	18		Shelves, tables
			Metal			Tools, nuts, bolts
			Miscellaneous inert materials	1		Plastic, chairs
			Ballasts		4	4 units do not contain PCBs
			Electronics	0.5		Computer
		Hazardous	Ballasts		1	1 electronic unit
			Fluorescent lights		30	30 units
	Electrical Sea Can (adjacent to electrical building)	Non-hazardous	Sea can	30		5.8x2.3x2.2m
			Metal	4		Motors, pieces, boxes, panels
			Miscellaneous inert materials	1		Electrical wire
		Hazardous	Fluorescent lights		70	
	Sewage AST building	Non-hazardous	Metal clad building	40		3.4x3.6x3.2
		Hazardous	Sewage tank	12		1/4 full of sewage
	Water treatment building	Non-hazardous	Building	254		22x3.6x3.2m
			Wood	29		Utilidors running to camp, fibreglass inside
			Metal	8		Shelf and pipe going to camp
			Drums (205L)	2		Empty drums
			Miscellaneous inert materials	3		Garbage, gloves, Tyvek suits, water tank, chair, desk
		Hazardous	ASTs	72		Metal with 1/4 full of untreated water
	Wood shed by water treatment plant	Non-hazardous	Wood	250		Building 3.6x15x4.6, fibreglass insulation, shelves, ladders
			Metal	3		Compressor and generator
			Concnrete floor	23		
			Boat	5		
		Hazardous	Fire extinguisher		15	
			Oil	0.01		
			Foam	0.1		Film forming foam concentrate
			Oxygen cylinders		3	
			Fluorescent lights	8		
			Light ballasts	4		
			Unknown cylinders		3	Adjacent to oxygen cylinders
	Road adjacent water treatment plant	Non-hazardous	Concrete	87		Concrete road wall supports
	Core shack	Non-hazardous	Building	193.752		Wood, shingles, fibreglass insulation
			Wood	20		Table, cabinet
			Metal	3		Desk
			Cores[2]	0.5		Cores on tables
			Miscellaneous inert materials	7		Plastic buckets, foam insulation outside
		Hazardous	Fluorescent lights		13	

Table E-1: Hazardous and Non-hazardous Materials Inventory Table

General Location	Specific Location/ Building/ Item Name	Material Type	Material Description	Volume (Uncrushed m^3)	Quantity (Units)	Material Items Description (as required)
Main Camp Facility Area	Environmental storage building	Non-hazardous	Metal exterior, wood interior building	53		4.7x2.4x4.7 m
			Wood	9		Shelves, tables
			Metal	1		Lockers, tools
			Miscellaneous inert materials	1		Tarp, containers
			Ballasts	5		
		Hazardous	Supercizer 7, superplasticizer	0.02		
			Plug N Dike	0.001		
			Spray paint can	0.003		
			Lubricant/oil/grease	0.02		SAE 30, bombardier grease, oils
			Batteries	0.03		3
			Transmission fluid	0.001		
			WD-40	0.001		
			Antifreeze	0.001		
			Formalin disinfectant	0.008		
			Bentonamit type R and S	0.008		
			Optimizer fuel stabilizer	0.004		
			Cement/silicone/sealer	0.004		PVC cement, ADSIL silicone, foam sealant
			Fluorescent lights	10		
			Bentonite	0.5		16 bags
	Sea can (adjacent environmental storage building)	Non-hazardous	Metal interior, wood floor sea can	32		2.3x6x2.3m
			Wood	5		Boxes
			Metal	0.75		Parts, tripods, stands
	Four Gensets	Non-hazardous	Desks	4		
			Tables	4		
			Metal	15		Lockers, tool box, electrical panels, air compressor, 2 small motors, motors by generators
			Miscellaneous inert materials	0.125		7 boxes of filters
		Hazardous	Fluorescent lights		42	
			Heptafluoropropane (or Pyrene) large cylinder		5	
			Motor oil	0.001		
			Generators		72	4, each 4.5x2x2
			Diesel	0.01		3, 50 gallon tank, 1 jerry can
				2.1		4: 2140 L tanks, make in 2005, all 1/4 full
			Batteries		16	
			Fire extinguishers		4	
			Glycol	0.8		4 pails
			Granular absorbent (Multi-Zorb)	0.05		
PKCA East Dike Tire Berm	Southeast of the Process Plant	Non-hazardous	Tires	1507.05	258 tires	168 of 3m x 0.7m tires (4.95m^3 each)
						45 of 3m x 1.5m tires (10.60m^3 each)
						11 of 4m x 1m tires (12.57m^3 each)
						34 of 1m x 1.5m tires (1.77m^3 each)
Process plant	Major structure	Non-hazardous	Process Plant	47104		Exterior dimensions of the structure (2408 m^2 and 23 m height)
	Processing plant offices		Chairs, desks		4	
			Metal	20		Lockers
			Sink		1	
			Toilets		1	
			Hot water tank		1	
		Hazardous	Fire extinguisher		2	
	Lab	Non-hazardous	Wood	6		Lab counter, desk, tables, counters
			Metal		4	Tables, lockers
			Rock machines	1		
			Oven	2		
			Furnace		2	
			Microwave		1	
			Sink		1	
			Toilet		1	
			Urinal		1	
			Smoke detectors		11	
			Chairs		12	
		Hazardous	Fridge		1	
			TSS standard	0.001		
			Citric acid	0.025		
			Fluorescent lights		51	
			Fire extinguisher		8	
	Plant operations area	Non-hazardous	Miscellaneous inert materials	1		Drums of garbage, welding screen
			Metal	8		Compressor, motors, generator, hydraulic shop press, water pumps, welding equipment
			JLG man-lift		1	
			Smoke detectors		3	
			Skyjack man lift		1	
		Hazardous	Fire extinguisher		18	
			Acetylene gas cylinders small		2	
			Grease	0.0001		Tip dip grease
			Oxygen gas cylinders small		2	
			Fluorescent lights		82	
			Coagulant flo polymer	1		
			Unknown white powder	0.05		In buckets and metal container
			Flocculent	1		SNF AE 4500
			Drums (205L)	2.46	12	Paraffin wax
				1.64	8	Black plastic industrial gear oil
				0.41	2	Univex grease
				1.025	5	Dowfrost HD 3 full of glycol
				0.41	2	Empty, previously oil or diesel
			Full sumps	1.28		Glycol
	Tools room, adjacent plant operations area	Non-hazardous	Simply green	0.016		Biodegradable cleaner
			Wood	5		Tables, shelves
			Metal	20		Tools, equipment, tables, cabinets, water tank
			Miscellaneous inert materials	5		Filters, supplies
		Hazardous	Aerosols cans in 2 flammable cabinets	2.4		Paint, RAID, OFF bug spray, adhesive, sealant, lubricants, oils, grease, etc.
	Second lab adjacent plant operations area	Non-hazardous	Metal	11		Over burner, fume hood, piping, burner with fume hood, counter, vent fume hood
			Smoke detectors		3	
		Hazardous	Nitric acid	0.14		
			Hydrochloric acid	0.087		
			Sodium hydroxide	4		Bottles and pellets
			Waste acid	0.6		In drum and tank
			Full sumps	0.35		Under acid
			Potassium nitrate	0.05		
			Fluorescent lights		16	
	Security offices within the plant operations area	Non-hazardous	Safe	2		
			Miscellaneous inert materials	0.35		Tables, shelves
			Chairs	8		
			Filing cabinets		3	
			Desks		2	
			Smoke detectors		2	
			Computers		5	
		Hazardous	Fluorescent lights		18	
			Fire extinguishers		6	
			Frigidaire AC unit		1	
	Outdoors, south of the process plant	Non-hazardous	Wood shack	6.5		Old outhouse, 1.7x1.9x2
			Wood shed	6		Wood exterior and fibreglass insulation, insulating the value
			AST	96		Empty truck AST on tires, truck cab is missing
			Metal	2		Metal covers
			Concrete	4.5		Blocks
			Water pump	9		Metal
			Sea can	31		2.3x5.8x2.3 m
		Hazardous	Inside sea can	1.1		Full heating oil AST (1135 L)
					1	Propane tank
			Propane tank		1	On road
			Drums (205L)	2.05	10	Full: 8 heating oil, 1 synthetic lube, 1 Jet B
			Oil	0.004		Engine oil, by water pump
			Battery		1	Large, by water pump
			Fire extinguisher		1	
			Flo polymer (25 kg)	10		600 bags

Table E-1: Hazardous and Non-hazardous Materials Inventory Table

General Location	Specific Location/ Building/ Item Name	Material Type	Material Description	Volume (Uncrushed m^3)	Quantity (Units)	Material Items Description (as required)
	Sea can south of the process plant	Non-hazardous	Red sea can for fire suppression water pump			2x2.5x11.5 m
			Metal	36		Pumps, motor, pipes, electric panels
		Hazardous	Fluorescent lights		20	
			Batteries		2	
			Diesel in tank	1		3/4 Full AST of diesel
			Sea cans	62		2 sea cans, joined together
	Outdoors, north of the process plant	Non-hazardous	Miscellaneous inert materials		1	Secondary spill containment
		Hazardous	Drums (205L)		1	Jet B empty
				0.001	1	Diesel residual all black,
				0.205	1	Jet B water mix, blue with yellow
				0.461	3	1/4 full, 2 full Jet A, black with yellow,

Notes:
1. **Core Samples located at the Camp Facility Core shack, the Truck Shop Shed and the Core Box Laydown Area are not included in the total, these may be left on site.**
2. **Drums belong to ENR at the Laydown Area and are to be removed by them. Therefore, these volumes were not included in the total.**
3. **Some specifications are included in Appendix F for the truck shop and process plant. These include more details for both their construction materials volumes and equipment.**
4. **Mould was observed throughout the camp facility, truck shop, and process plant.**
5. **Fox feces was observed throughout the camp facility**

Table E-2: Hazardous and Non-hazardous Materials Inventory Table - Totals

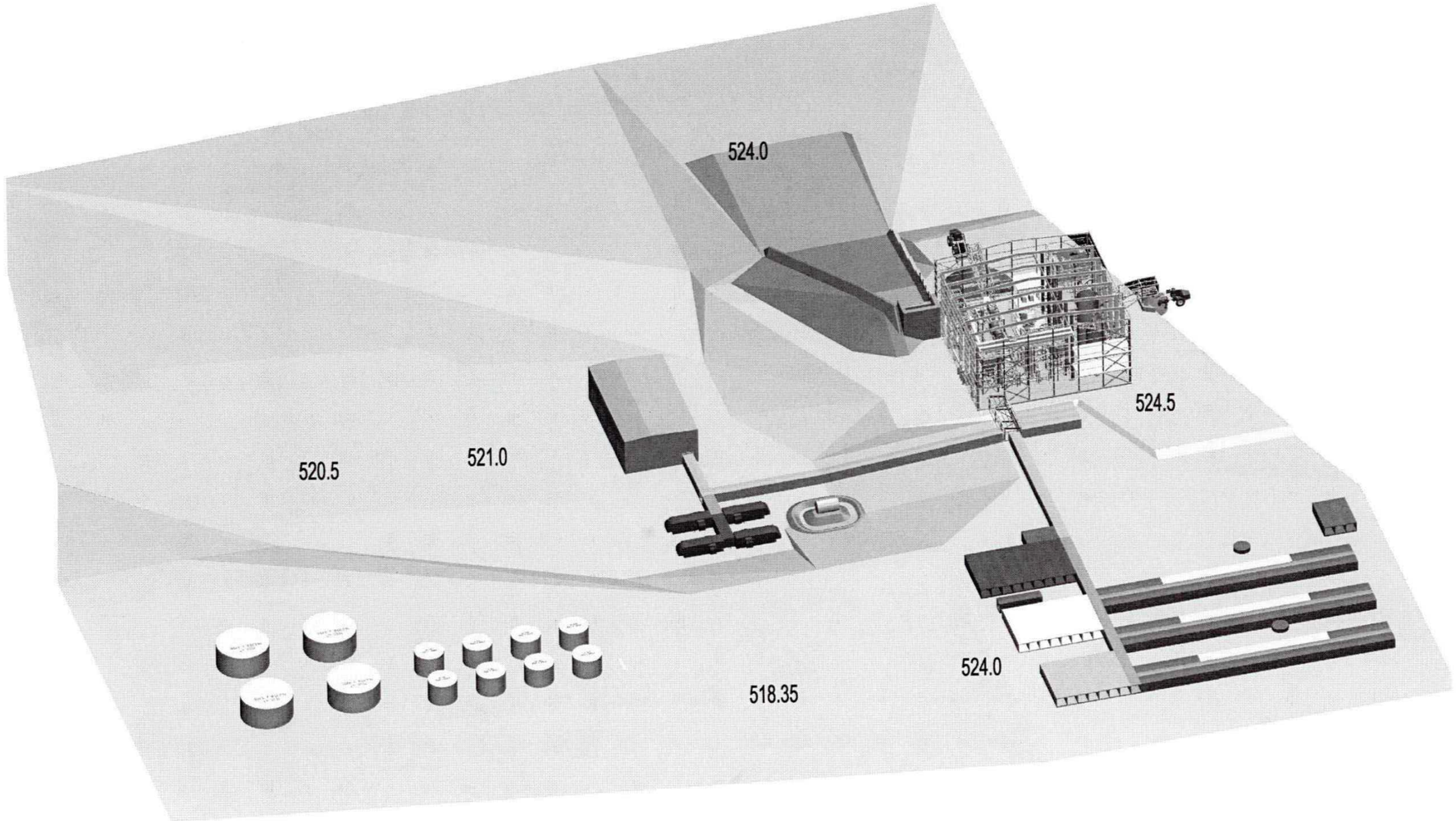
	Material Type	Material Description	Volume (Uncrushed)	Quantity	Material Items Description
			m^3	Units	
Total Volumes	Non-hazardous	Wood	980	-	This includes all wood buildings, not demolished calculations
		Wood items	-	702	Desks, shelves, beds, tables
		Metal	15,722	-	This includes trailers and metal buildings, all not demoed calculations, except stockpile shed
		Metal items	-	204	Furnaces, washers/dryers, kitchen sinks, kitchen washer, TV's, electrical equipment, filing cabinets, stove, water tanks, computers, wall heaters
		Sea cans	1,174	-	Many on site
		Miscellaneous inert materials	596	-	Canvas, plastic, rubber, empty containers, clean
		Miscellaneous inert materials items	-	494	Chairs, porcelain sinks, toilets, smoke detectors, etc.
		Concrete/cement	154	-	Blocks, floors, etc.
		Vehicles/ machine items	-	28	Trucks, construction equipment, machines.
		Drums: empty	-	587	Intact drums throughout site
		Large ASTs	124,000	-	Eight 50,000 L ASTs (#1-8) and four 1,500,000 L ASTs (#9-12)
		Tarp tented shops	6,186	-	Three tented shops on site
		Major structures - Truck shop	10,464	-	Exterior dimensions of the structure (872 m^2 and 12 m height)
		Major structures - Camp Facility	18,694	-	Exterior dimensions of the structure (5341 m^2 and
		Major structures - Process plant	47,104	-	Exterior dimensions of the structure (2408 m^2 and 23 m height)
Total Non-Hazardous Materials			**225,073**	**2,015**	
Total Volumes	Hazardous	Total lead in paint on ASTs	558	-	Nine 62,000 L ASTs
		Fluorescent lights	-	1,674	Mostly located in the major structures
		Fire extinguishers	-	284	Mostly located in the major structures
		Miscellaneous compressed gas cylinders	-	380	Oxygen, propane, etc.
		Refrigerant items	-	20	Fridges, freezers, AC units, refrigerant
		Drum items: organic content (item count is for the container only)	-	388	Gasoline, diesel, Jet A and B, oil, some grease and lubricant
		Soil in drums and containers	100	-	Unknown contaminants in soil
		Organic content in drums, ASTs, tanks, containers, pails (fluid volume only)	888	-	Note: Eight 50,000 L tanks (#1-8), volumes unknown, some diesel in the bottom observed and some in pipes
		Materials in ASTs, tanks, containers, flammable cabinets	270	-	Includes glycol, powder, liquid, solid hazardous chemicals and materials
		Batteries	-	109	Mostly vehicle lead acid batteries
Total Hazardous Materials			**1,816**	**2,855**	-

Table E.3: Analytical Results For Unknown Drum and AST Contents

Sample #			DR2-1	TANK2-1
Lab Order Number			KM5558	KM5557
Sampling Date			8/31/2014	8/31/2014
Parameter ID	**Units**	**Drum/AST Content Guidelines**[1]	Blue and yellow drum (205 L)	Silver Tank (34000 L)
Metals				
Cadmium (Cd)	mg/kg	<2	<0.02	<0.02
Chromium (Cr)	mg/kg	<10	<0.1	<0.1
Lead (Pb)	mg/kg	<100	<0.1	<0.1
PCBs				
Aroclor 1016	mg/kg	N/A	<1.0	<1.0
Aroclor 1221	mg/kg	N/A	<1.0	<1.0
Aroclor 1232	mg/kg	N/A	<1.0	<1.0
Aroclor 1242	mg/kg	N/A	<1.0	<1.0
Aroclor 1248	mg/kg	N/A	<1.0	<1.0
Aroclor 1254	mg/kg	N/A	<1.0	<1.0
Aroclor 1260	mg/kg	N/A	<1.0	<1.0
Aroclor 1268	mg/kg	N/A	<1.0	<1.0
Total Aroclor	mg/kg	<2 ppm	<1.0	<1.0
Miscellaneous Parameters				
Flash Point	Degrees Celsius	25 to 225 (To incinerate) <60 (TDG)	**50**	**51**
Total Chlorine	ppm	<1000	480	124
Hydrocarbon Product (Chromatorgram)	N/A	N/A	Jet Fuel	Diesel

Notes:
1. Criteria taken from the DEW Line Clean-up Barrel Protocol (CBP) Criteria for Abandoned Military Site
2. Valves exceeding the TDG criteria are **BOLDED**

APPENDIX F
SELECTED INFRASTRUCTURE DRAWINGS



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REFERENCE DRAWINGS			

NO.	DESCRIPTION	CHK. APPVL	DATE
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HATCH

TAHERA DIAMOND CORPORATION

PROJECT TITLE: JERICHO DIAMOND PROJECT

ISOMETRIC VIEW

HA PROJECT NO.: 316996

SCALE | DWG NO.: 012-01-0001 | SHEET NO. | REV.: P1

SHEET NO.
010-01-0002
DWG NO.

T.N.

AREA 150
DIESEL FUEL STORAGE AND DISTRIBUTION

AREA 010 & 013
GENERAL SITE DEVELOPMENT, LAYDOWN AND PLANT ROADS

N 7,318,827.864 m
E 477,382.898 m
(NAD27)

AREA 050
POWER PLANT & POWER DISTRIBUTION

AREA 016
TRUCKSHOP & WAREHOUSE

AREA 100
CAMP AND SERVICES BUILDING

AREA 030
PLANT BUILDING & OFFICES

N 7,318,640 m
E 477,355 m
(NAD27)

PROTECTION BARRIER
SEE DRAWING 010-01-0003

010-01-005 A
010-01-005 B
010-01-005 C
010-01-005 D
010-01-005 E
010-01-005 F

521 522 523 524 525 526

142-00-0001	UTILITIDORS
030-01-0002	PROCESS BUILDING CONCRETE FOUNDATION F.01
030-01-0003	PROCESS BUILDING CONCRETE FOUNDATION F.02
150-01-0001	DIESEL FUEL FARM
010-01-0003	GENERAL SITE DEVELOPMENT - ACCESS RAMP - PLAN & ISOMETRIC
010-01-0005	SITE GRADING - SECTIONS
DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK. APPR.	DATE
P2	COORDINATES ADDED		2005-02-17
P3	SECTIONS MOVED ON DRAWING 010-01-0005		2005-02-02

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P3	FOR INFORMATION CASBR/COSBL		2005-02-02

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DATE:	DATE:
CHECKED BY: R. HILDEBRAND	DISCIPLINE ENG.: R. PICOTTE
DATE:	DATE:
PREL. DES. COORD.	PROJECT ENG.: M. CAMPANELLI
DATE:	DATE:
PROJECT MGR.	
DATE:	

TAHERA DIAMOND CORPORATION

PROJECT TITLE
JERICHO DIAMOND PROJECT

SITE GRADING
PLAN

HK PROJECT NO.	316996		
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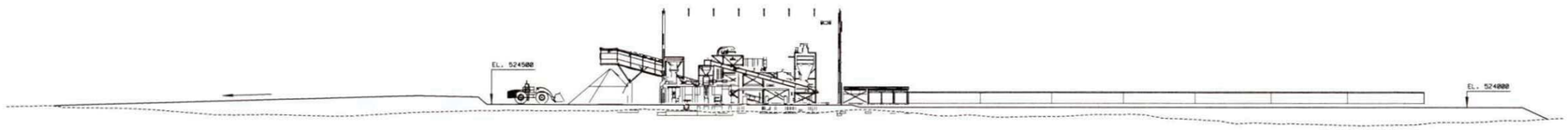
			REV. P2

SHEET NO.

S000-10-010

DWG NO.



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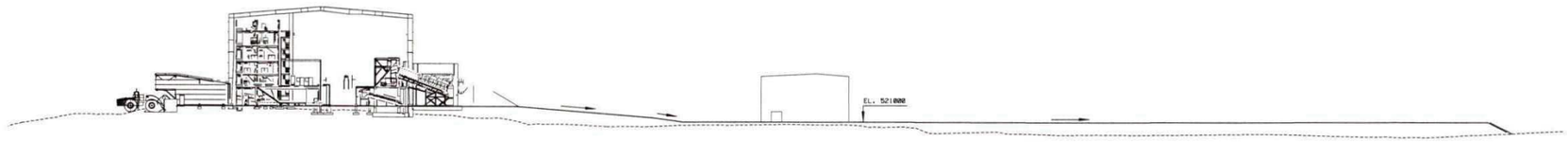
LOOKING SOUTH



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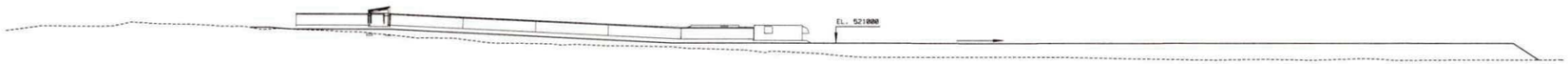

SECTION C-C
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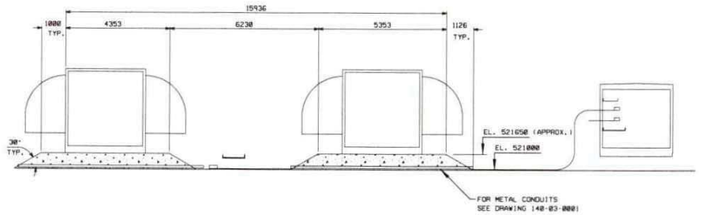
SECTION D-D
LOOKING WEST



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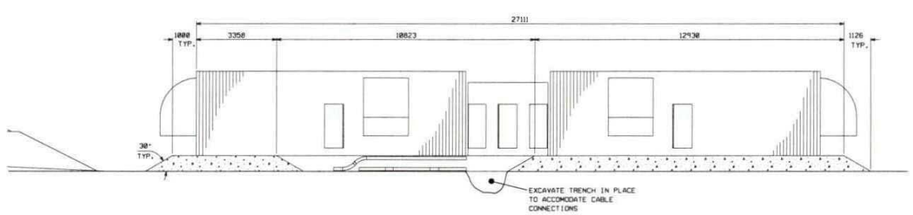

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140-03-0001	CABLE TRAYS - CROSS SECTIONS
010-01-0002	SITE GRADING - PLAN

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK. APPRL.	DATE

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DATE:	DATE:
PROJ. DES. COORD.	PROJECT ENG.: N. CAMPANELLI
DATE:	DATE:
PROJECT MGR.	
DATE:	

TAHERA DIAMOND CORPORATION

PROJECT TITLE
JERICHO DIAMOND PROJECT

SITE GRADING
SECTIONS

HA PROJECT NO.
316996

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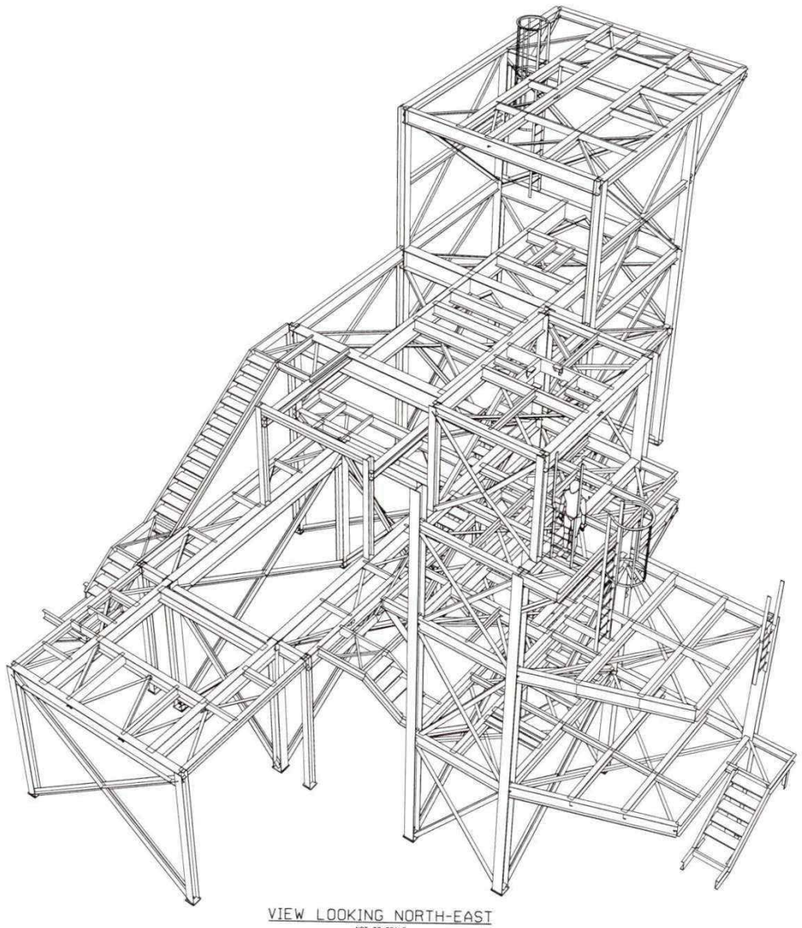
SHEET NO.

031-01-0001

DWG NO.



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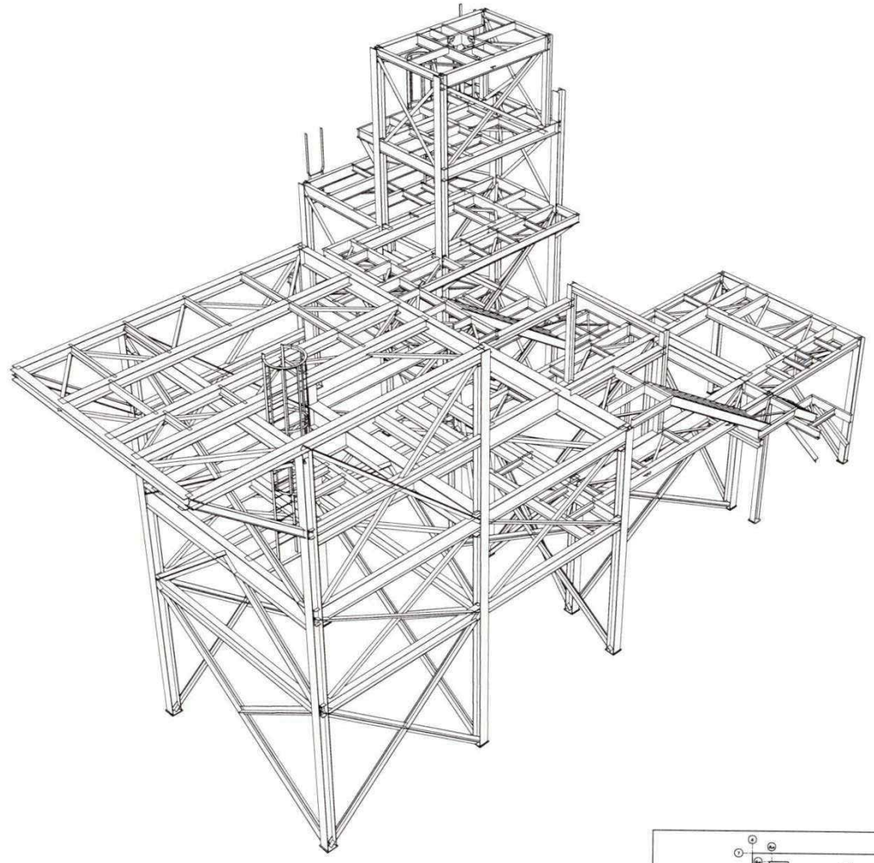

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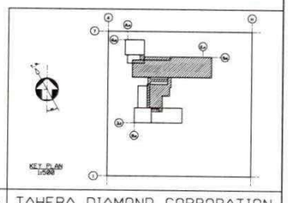

KEY PLAN
(NTS)

031-01-0007	STANDARD DETAILS	
031-01-0001	GENERAL NOTES	
031-01-0005	STAIRS & PLATFORMS - PLAN VIEWS, SECTIONS & DETAILS	
031-01-0006	DOUBLE DECK SCREEN & SCRUBBER PLATFORM - ELEVATION VIEWS	
031-01-0004	DOUBLE DECK SCREEN & SCRUBBER PLATFORM - ELEVATION & SECTION VIEWS	
031-01-0003	DEWATERING SCREEN EQUIPMENT PLATFORM - PLAN & ELEVATION VIEWS	
031-01-0002	DOUBLE DECK SCREEN, SCRUBBER & DEWATERING PLATFORMS-BASE PLATE LOCATION & PLAN VIEWS	
DRAWING NO.	DRAWING TITLE	

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NO.	DESCRIPTION	CHK. APPR.	DATE

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CHECKED BY: M. HASSAN	DISCIPLINE ENG.: R. PEDITTE
DATE: 12-17-04	DATE: 12-17-04
PROJECTS CONTROL: H. KHALILI	PROJECT ENG.: M. CAMPANELLI
DATE: 12-17-04	DATE: 12-17-04
PROJECT MGR.: G. LIEN	
DATE: 12-17-04	

TAHERA DIAMOND CORPORATION

PROJECT TITLE

JERICHO DIAMOND PROJECT

SCRUBBING AREA
STRUCTURAL STEEL
DOUBLE DECK SCREEN, SCRUBBER & DEWATERING
EQUIPMENT PLATFORMS - PERSPECTIVE VIEWS

HA PROJECT NO.: 316996

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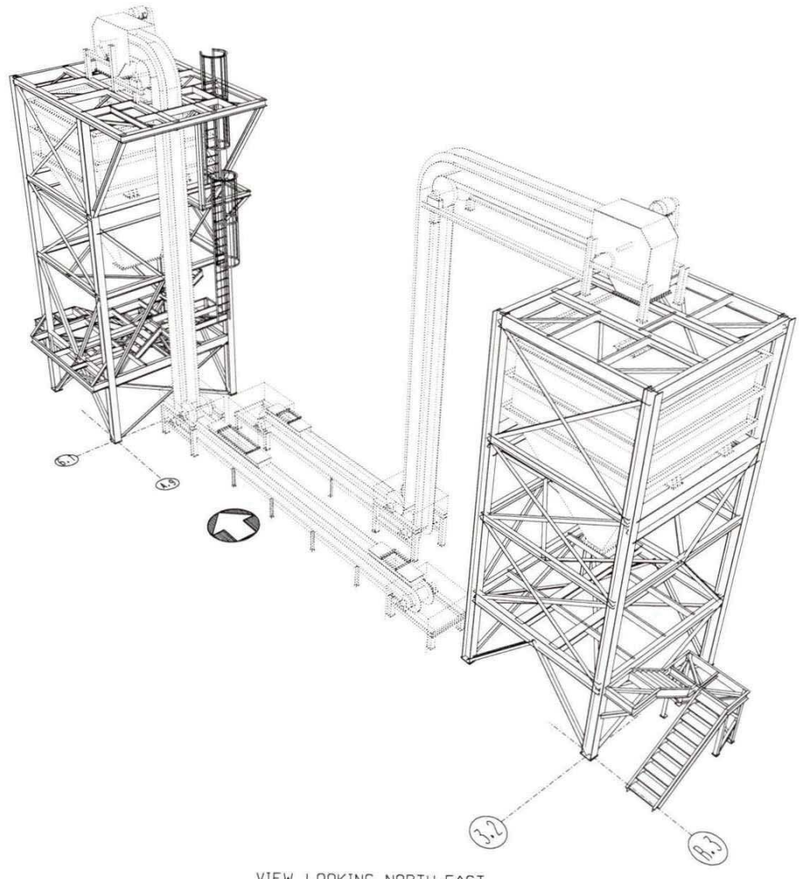

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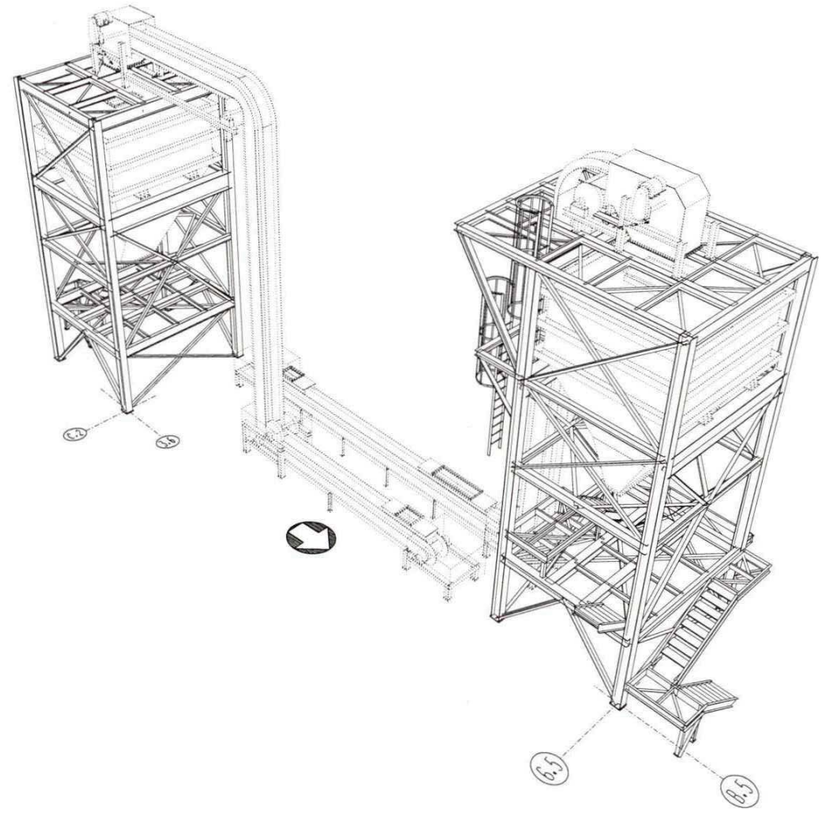

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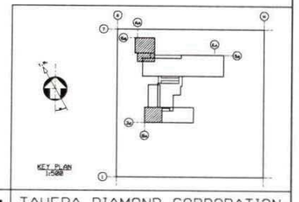

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031-01-0010	NORTH & SOUTH TOWER STAIRS - PLAN AND SECTION VIEWS
031-01-0009	NORTH & SOUTH TOWERS - ELEVATION VIEWS
031-01-0008	NORTH & SOUTH TOWERS - PLAN VIEWS, SECTIONS AND DETAILS

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REFERENCE DRAWINGS

NO.	DESCRIPTION	ENG. APPR.	DATE

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1	IFR FOR COORDINATION			

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DATE: 11-19-24	DATE: 11-19-24
CHECKED BY: M. HASSAN	DISCIPLINE ENG.: R. PICOTTE
DATE: 11-19-24	DATE: 11-19-24
PROJ. MGR./COORD.: M. KHALILI	PROJECT ENG.: M. CAMPANELLI
DATE: 11-19-24	DATE: 11-19-24
PROJECT MGR.: D. LAM	
DATE: 11-19-24	

TAHERA DIAMOND CORPORATION

PROJECT TITLE
JERICHO DIAMOND PROJECT

SCRUBBING AREA
STRUCTURAL STEEL
NORTH & SOUTH TOWERS
PERSPECTIVE VIEWS

HA PROJECT NO.
316996

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NOT TO SCALE	031-01-0007		2

SHEET NO.

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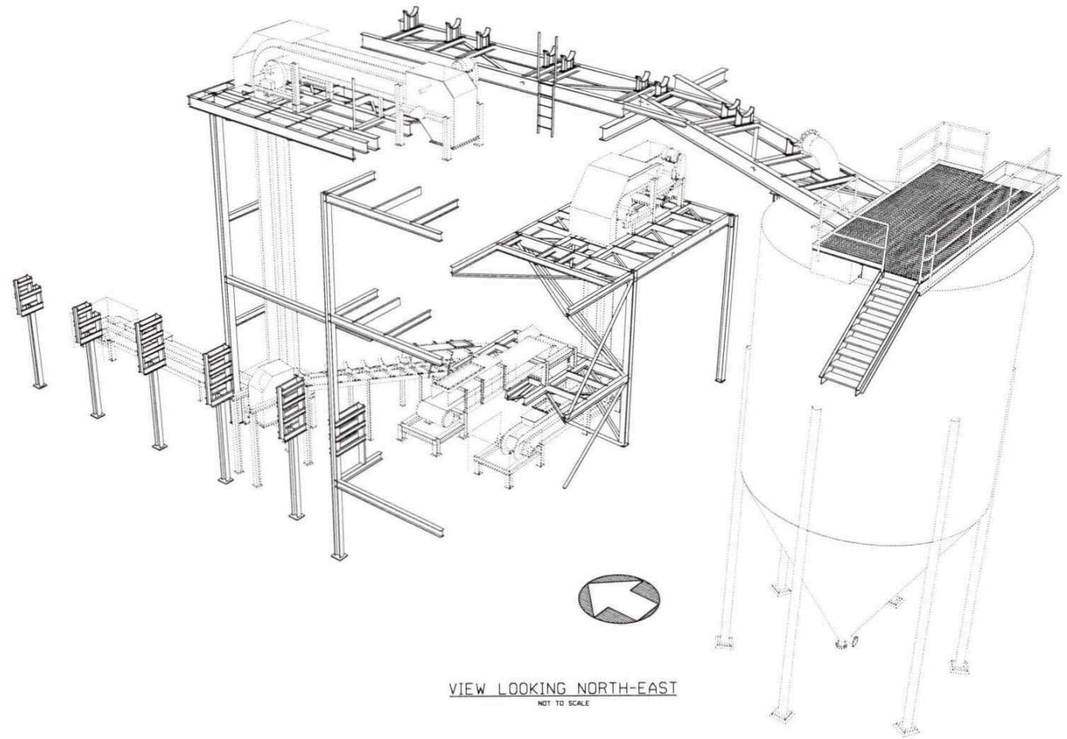

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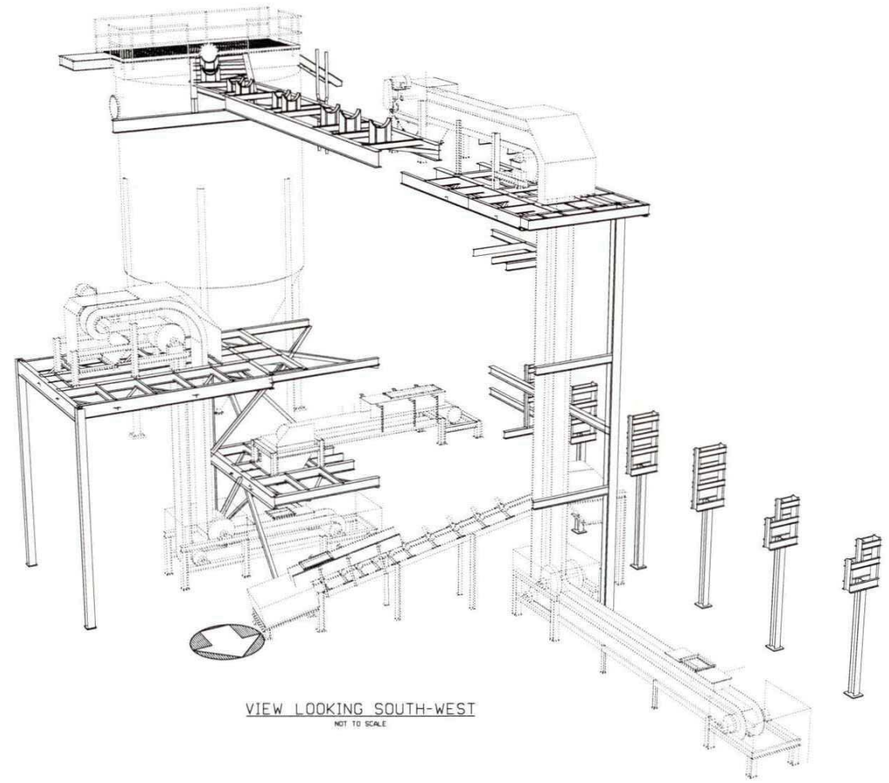

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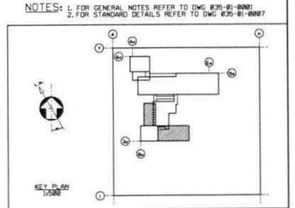
NOTES: 1. FOR GENERAL NOTES REFER TO DWG 035-01-0000
2. FOR STANDARD DETAILS REFER TO DWG 035-01-0007



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DRAWING NO.	DRAWING TITLE
035-01-0007	STANDARD DETAILS
031-01-0014	PIPE RACK & CABLE TRAY SUPPORTS - PLAN, ELEVATION VIEWS, SECTIONS & DETAILS
031-01-0013	MISC. PLATFORMS - PLAN VIEWS, SECTIONS & DETAILS - SHEET 2 OF 2
031-01-0012	MISC. PLATFORMS - PLAN VIEWS, SECTIONS & DETAILS - SHEET 1 OF 2

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H.JOWKSON/H.KHALILI	K. DE FOREST	
DATE: 12-17-04	DATE: 12-17-04	
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M. HASSAN	R. PICOTTE	
DATE: 12-17-04	DATE: 12-17-04	
PROJECT ENG. COORD.	PROJECT ENG.	
H. KHALILI	M. CAMPANELLI	
DATE: 12-17-04	DATE: 12-17-04	
PROJECT MGR.		
D. LAM		
DATE: 12-17-04		

TAHERA DIAMOND CORPORATION

PROJECT TITLE
JERICHO DIAMOND PROJECT

SCRUBBING AREA
STRUCTURAL STEEL
MISCELANEOUS STAIRS & PLATFORMS
PERSPECTIVE VIEWS

HATCH PROJECT NO.
316996

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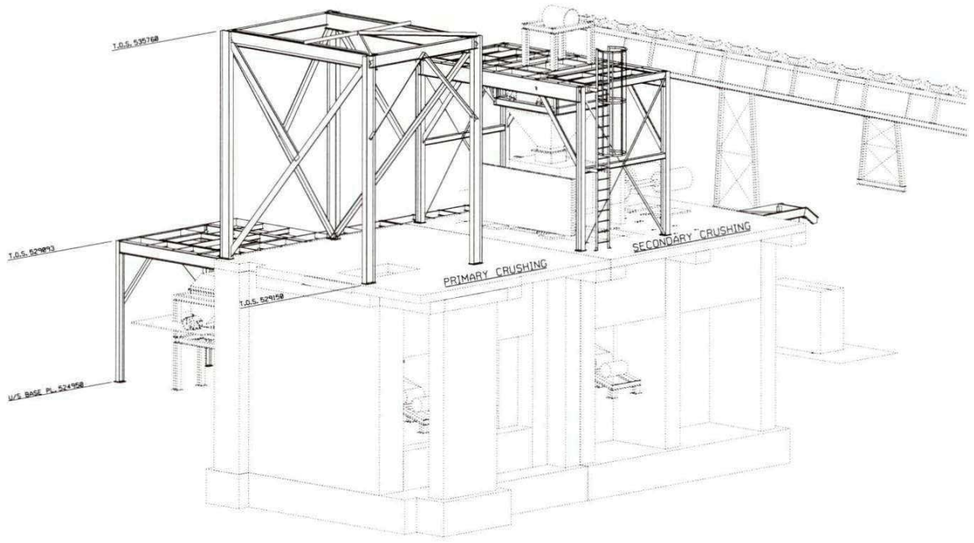
NOT TO SCALE	031-01-0011		B

SHEET NO.

DWG NO. 032-01-0001



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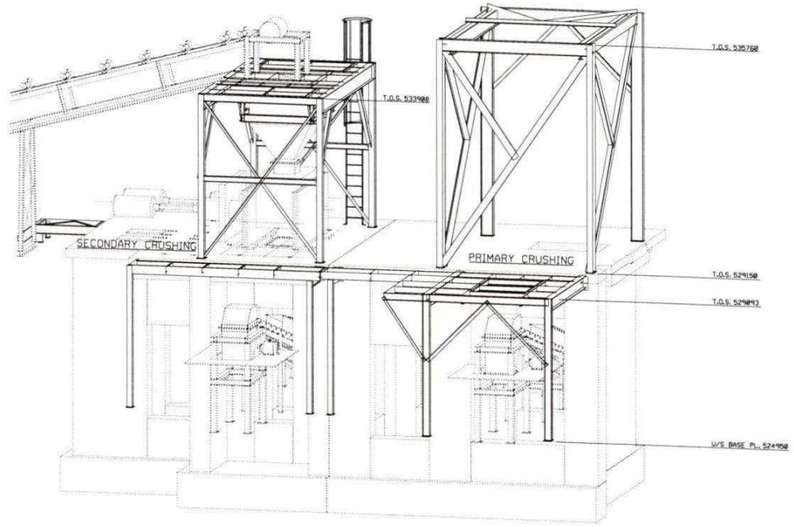

ISOMETRIC VIEW NORTH

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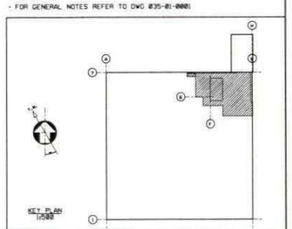
HATCH LTD.
ORIGINAL SIGNED BY
RAYMOND PICOTTE
12/17/04
PERMIT NUMBER: P512
The Owners and Professionals Act, RSA 2000

NOTE:
- FOR GENERAL NOTES REFER TO DWG 035-01-0001



032-01-0003	APRON FEEDER STRUCTURAL STEEL SUPPORT AND PLATFORMS
035-01-0007	RECOVERY AREA STRUCTURAL STEEL STANDARD DETAILS

DRAWING NO. | DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK.	APPR.	DATE
1	VIEWS REVISED			

REVISIONS

STAMP

NKT/INL
ORIGINAL SIGNED BY
RAYMOND PICOTTE
P.Eng.
L1548
12/17/04

REV.	ISSUE FOR	AUTH. BY	DATE
1	BID/CONST. 316996-PSMM2-D-E	R.P.	28-01-2005
0	BID/CONST. 316996-PSMM2-D	R.P.	17-12-2004

ISSUE AUTHORIZATION

HATCH

DESIGNED BY	DRAWN BY
N. PICOTTE/J.F.M	P. LAMER
DATE 17-12-2004	DATE 17-12-2004
CHECKED BY	DISCIPLINE ENG.
M. HASSAN	N. PICOTTE
DATE 17-12-2004	DATE 17-12-2004
PROJ. DIRECTOR	PROJECT ENG.
J.F. MARCHAND	M. CAMPANELLI
DATE 17-12-2004	DATE 17-12-2004
PROJECT MGR.	
DAT LAM	
DATE 17-12-2004	

TAHERA DIAMOND CORPORATION

PROJECT TITLE
JERICHO DIAMOND PROJECT

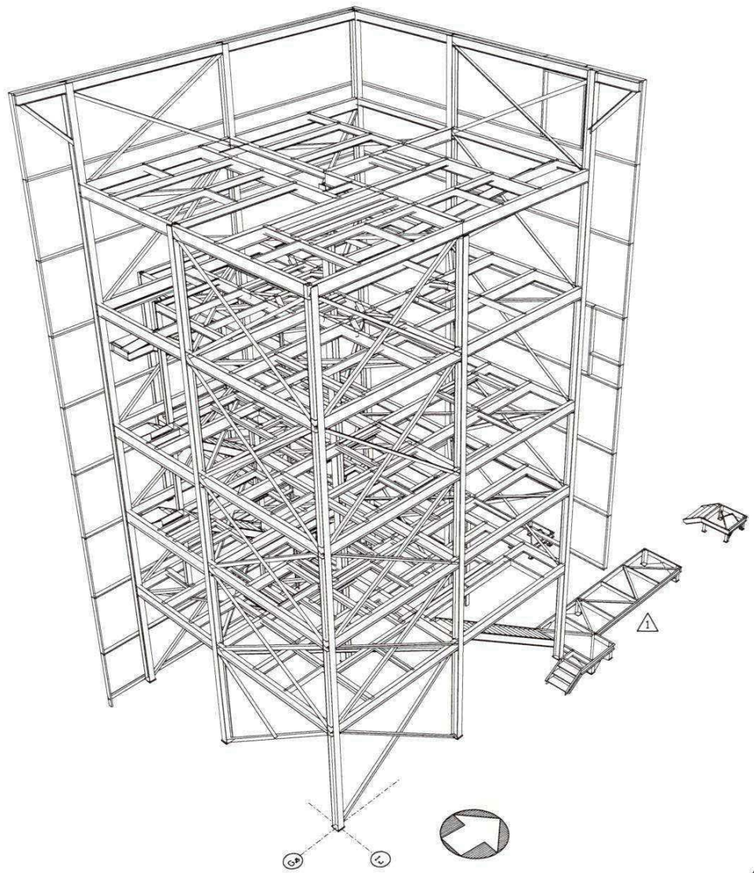
SECONDARY CRUSHING
STRUCTURAL STEEL
SUPPORT AND PLATFORMS
ISOMETRICS

HK PROJECT NO.
316996

SCALE	DWG NO.	SHEET NO.	REV.
1:50	032-01-0001		1

SHEET NO.

DWG NO. 035-01-0001



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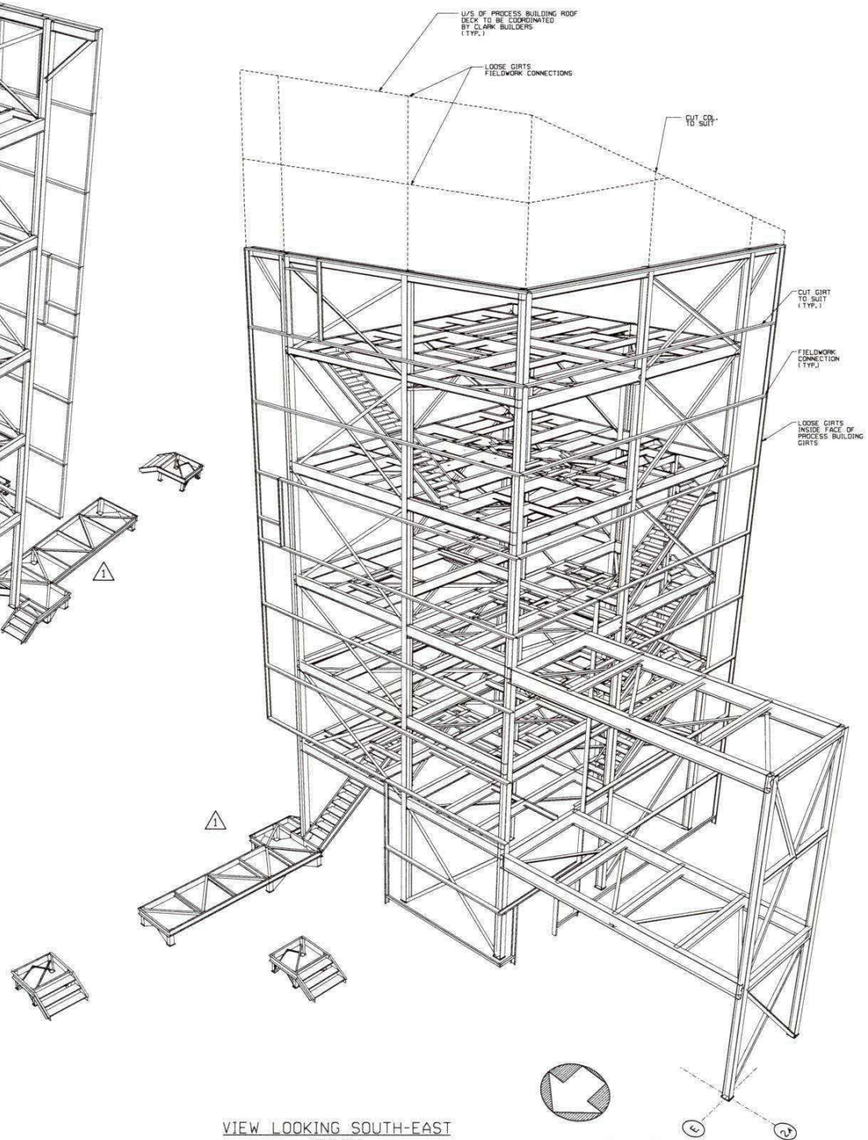
NOT TO SCALE



VIEW LOOKING SOUTH-EAST
NOT TO SCALE

PERMIT TO PRACTICE
HATCH LTD.
ORIGINAL SIGNED BY
RAYMOND PICOTTE
09/25/04
PERMIT NUMBER: P512
The Association of Professional Engineers and Geoscientists of Alberta

GENERAL NOTES

STEEL

1. FOR ADDITIONAL INFORMATION REFER TO SPECIFICATIONS.

2. DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL TO COMPLY WITH LATEST REVISIONS OF NATIONAL BUILDING CODE OF CANADA AND CSA S16. WELDING TO COMPLY WITH LATEST REVISION OF CSA W59.

3. MATERIALS:
   - STRUCTURAL STEEL: CSA G40.21M TYPE 350W, EXCEPT CHANNELS, ANGLES, AND PLATES: TYPE 300W
   - BOLTS: HIGH STRENGTH ASTM A325 TENSION CONTROLLED -¾" DIA MIN.
   - GALVANIZED GRATING: TYPE 30-102M, 32x4.8 SERRATED BEARING BARS BY FISHER-LUDLOW OR APPROVED EQUAL.
   - FLOOR METAL DECKING: P-2432 COMPOSITE, 76mm DEEP, 22 GAUGE BY CANAM OR APPROVED EQUAL. (GALVANIZED ONLY).
   - APRON FEEDER WALL PROTECTION PLATE: CSA G40.21M, TYPE 300W.
   - ALL EXTERIOR WALL AND ROOF CLADDING: TYPE CL 7840, 40mm x 22 GAUGE BY VICWEST OR APPROUVED EQUAL, COLOUR SPECIFIED BY THE CLIENT.
     - ALL INTERIOR CLADDING CAN BE REDUCED TO 24 GAUGE.

4. GUSSET PLATES:
   - MINIMUM THICKNESS 10mm, ACCORDING TO ASTM A36.

5. PAINT:
   - PREPARATION: SP3 MIN. AND AS PER MANUFACTURER'S RECOMMANDATIONS.
   - STRUCTURAL STEEL: MICRON COATING MC412B (GREY) 3 TO 4 MIL DRY TOTAL. 1 OR 2 COATS DEPENDING ON PAINT MANUFACTURER'S RECOMMENDATIONS.
   - HANDRAILS: SECURITY YELLOW.

CONCRETE

6. ALL CONCRETE SHALL BE DESIGNED AND PLACED IN ACCORDANCE WITH HATCH AND ASSOCIATES SPECIFICATION 03300 AND IN CONJUNCTION WITH CSA STANDARDS A23.1, A23.2 AND A23.3.

7. COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 25MPa AT 28 DAYS UNLESS NOTED OTHERWISE ON THE DRAWINGS.

REINFORCING

8. ALL REINFORCING BARS SHALL BE NEW, DEFORMED BILLET STEEL BARS CONFORMING TO CAN/CSA G30.18, GRADE 400R U.N.O.

9. WELD WIRE FABRIC (WWF) SHALL MEET THE REQUIREMENTS OF CAN/CSA G30.5. PROVIDE IN FLAT SHEETS ONLY.

10. BAR SUPPORTS SHALL BE:
    - PRECAST CONCRETE BLOCKS WHEN CONCRETE IS CAST ON GRADE.
    - CHAIRS, BOLSTERS, BAR SUPPORTS AND SPACERS IN ACCORDANCE WITH CSA-A23.1.

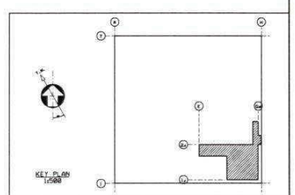
CONCRETE PROTECTION FOR REINFORCING

11. MINIMUM CLEAR DISTANCES BETWEEN FACE OF CAST IN PLACE CONCRETE AND OUTSIDE OF BAR SHALL BE AS FOLLOWS UNLESS NOTED:
    - CONCRETE SURFACES CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH: 75mm
    - CONCRETE SURFACES EXPOSED TO EARTH OR WEATHER AFTER REMOVAL OF FORMS:
      - 40mm FOR 15M OR SMALLER.
      - 50mm 20M TO 55M.
    - CONCRETE SURFACES NOT EXPOSED TO EARTH OR WEATHER:
      - SLABS, WALLS AND JOISTS:
        - 20mm FOR 35M AND SMALLER.
        - 40mm FOR 45M AND 55M.
      - BEAMS, GIRDERS AND COLUMNS (PRINCIPAL REINFORCING, TIES STIRRUPS AND SPIRALS): 40mm

SLAB FINISHES

12. THE SURFACE FINISH OF THE CONCRETE SLABS SHALL BE EXECUTED WITH A STEEL TROWEL TO OBTAIN A SMOOTH CLASS "A" SURFACE AS SPECIFIED BY TABLE 16 OF THE LATEST EDITION OF THE STANDARD A23.1

13. APPLY 5 kg/m² OF SURFACE HARDENER ON ALL SLAB WHERE HEAVY TRAFFIC IS EXPECTED.



3	NKT/NL ORIGINAL SIGNED BY RAYMOND PICOTTE P.Eng. L1548 02/25/05	
2	NKT/NL ORIGINAL SIGNED BY HOSSEIN KHALILI P.Eng. L1545 01/20/05	
1	NKT/NL ORIGINAL SIGNED BY HOSSEIN KHALILI P.Eng. L1545 11/19/04	

DRAWING NO.	DRAWING TITLE
030-01-0001	CONCRETE FOUNDATIONS - GENERAL NOTES AND PERSPECTIVE VIEW
035-01-0001	CONCRETE PLAN VIEWS
035-01-0002	STANDARD DETAILS
035-01-0004	PLAN & SECTION VIEWS - STAIRS & PLATFORM
035-01-0005	ELEVATION VIEWS - LINES 2,4,E & SECTION A-A
035-01-0006	ELEVATION VIEWS - LINES 1,3,C/5 & F/2
035-01-0003	FLOOR PLANS EL. 534980, 539080 & 543038
035-01-0002	FLOOR PLANS EL. 529180, 529380 & BASE PLATE & ANCHOR BOLT LOCATION PLAN

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK.	APPR.	DATE
3	GENERAL NOTES MODIFIED	M.J.L.	R.P.	02-25-05
2	GENERAL NOTES MODIFIED	R.P.	H.K.	01-20-05
1	GENERAL NOTES ADDED/MODIFIED & PLATFORM MODIFIED	M.H.	H.K.	11-19-04

REVISIONS

STAMP

NKT/NL
ORIGINAL SIGNED BY
HOSSEIN KHALILI
P.Eng.
L1545
10/19/04

REV.	ISSUE FOR	AUTH. BY	DATE
3	CONSTRUCTION 316996-PSM01-A-B-C-D-E	R.P.	D.L.L.	02-25-05
2	ADD/CONSTRUCTION 316996-PSM01-A-B-C-D-E	R.P.	D.L.L.	01-28-05
1	ADD/CONSTRUCTION 316996-PSM01-A-B-C-D	R.P.	D.L.L.	11-19-04
0	ADD/CONSTRUCTION 316996-PSM01	D. LAM		

ISSUE AUTHORIZATION

HATCH

DESIGNED BY	DRAWN BY
R.JOHNSON/HOSSEIN KHALILI	K. DE FOREST
DATE: 10-20-04	DATE: 10-20-04
CHECKED BY	DISCIPLINE ENG.
M. HASSAN	R. PICOTTE
DATE: 10-18-04	DATE: 10-18-04
PROJ. DEC. COORD.	PROJECT ENG.
M. LAFLEUR	M. CAMPANELLI
DATE: 10-18-04	DATE: 10-18-04
PROJECT MGR.	
D. LAM	
DATE: 10-18-04	

TAHERA DIAMOND CORPORATION

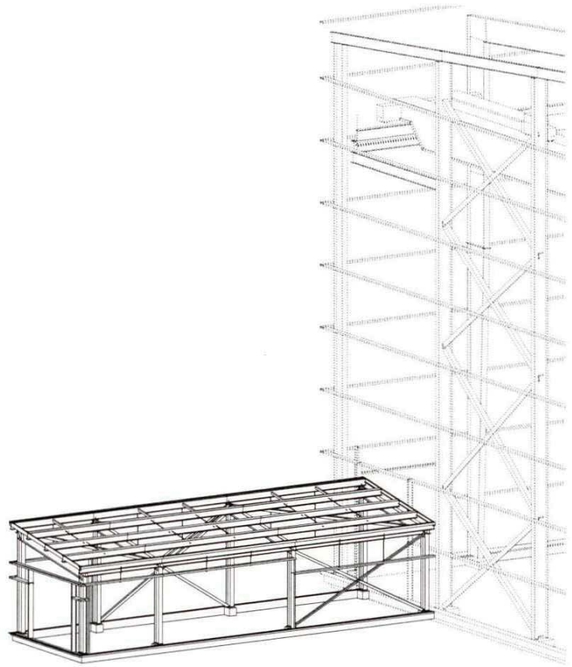
PROJECT TITLE
JERICHO DIAMOND PROJECT

RECOVERY AREA
STRUCTURAL STEEL
PERSPECTIVE VIEWS & GENERAL NOTES

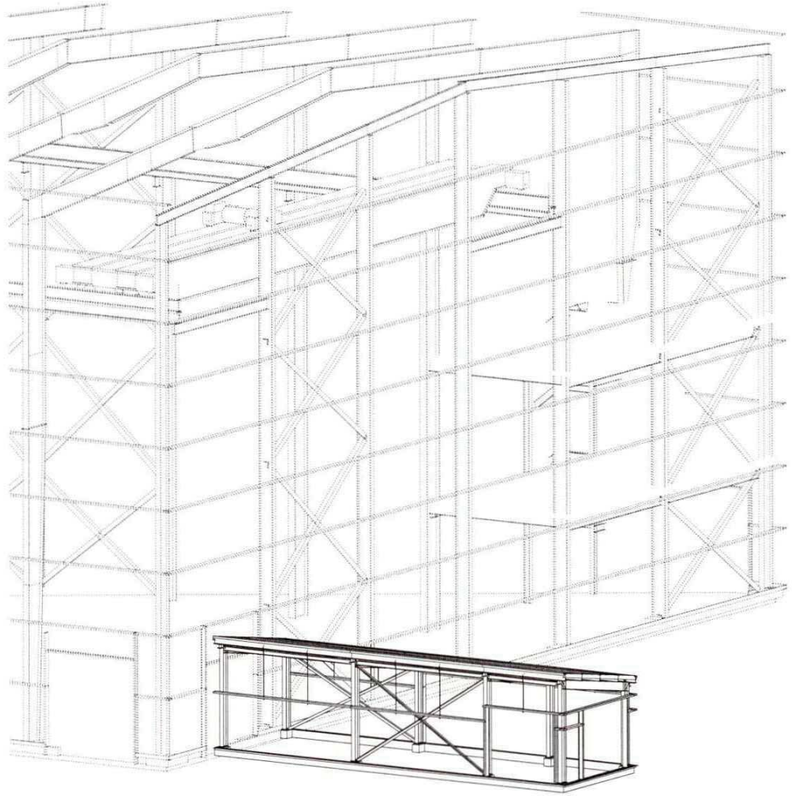
HATCH PROJECT NO.
316996

SCALE: NOT TO SCALE
DWG NO. 035-01-0001
SHEET NO.
REV. 3

SHEET NO.
058-01-0001
DWG NO.

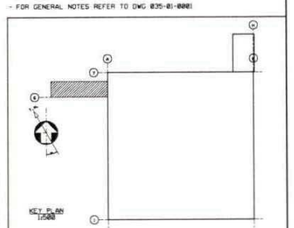


ISOMETRIC VIEW LOOKING NORTH



ISOMETRIC VIEW LOOKING SOUTH

NOTE:
- FOR GENERAL NOTES REFER TO DWG 035-01-0001



PERMIT TO PRACTICE
HATCH LTD.
ORIGINAL SIGNED BY
RAYMOND PICOTTE
17/12/04
PERMIT NUMBER: P512
The Association of Professional Engineers, Geologists and Geophysicists of Alberta

INCHES 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

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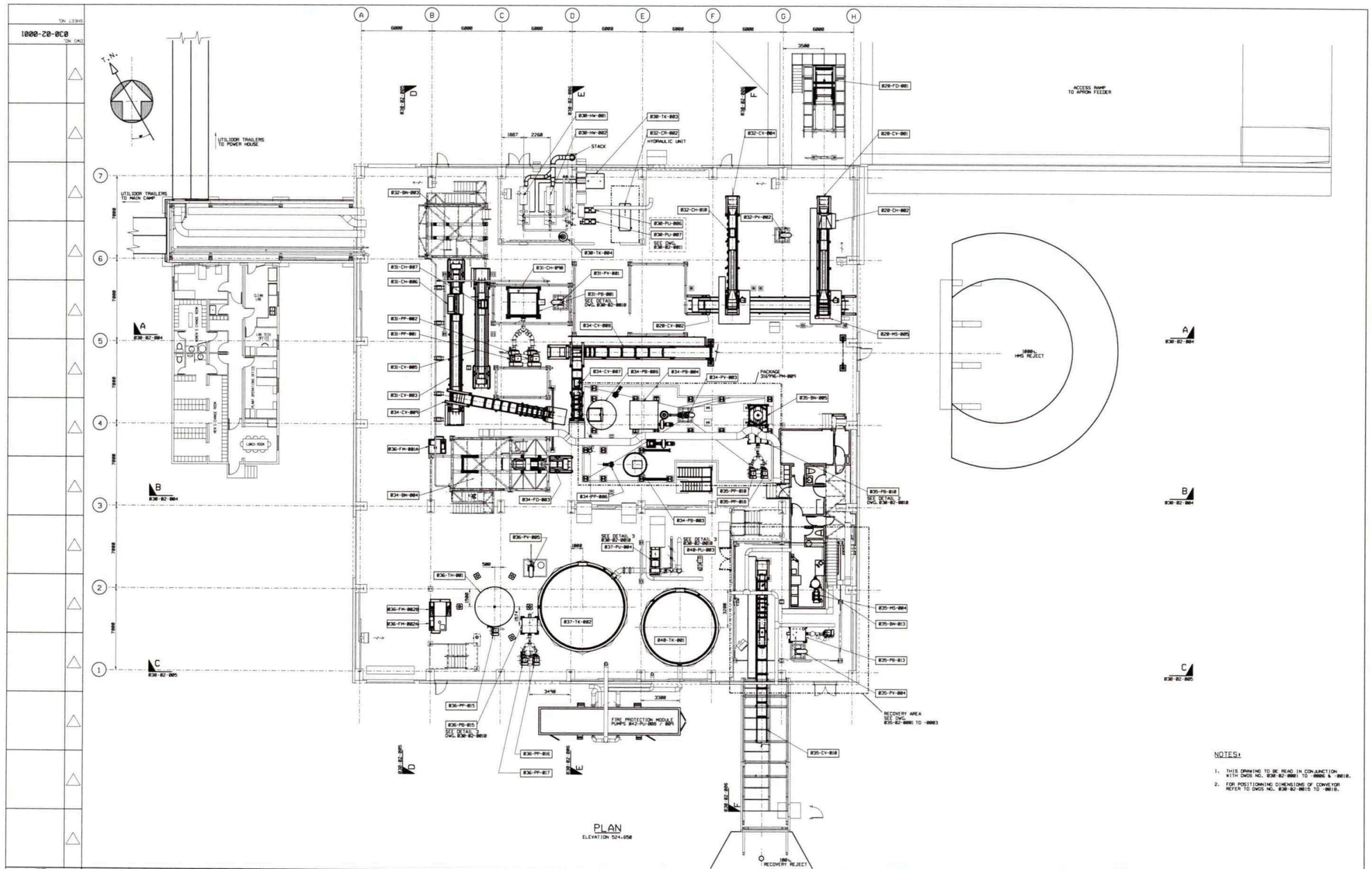
030-02-0001
DWG NO.



NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DWGS NO. 030-02-0001 TO -0006 & -0010.
2. FOR POSITIONNING DIMENSIONS OF CONVEYOR REFER TO DWGS NO. 030-02-0015 TO -0018.

DRAWING NO.	DRAWING TITLE
030-02-0006	GENERAL ARRANGEMENT - SECTION E-E & F-F
030-02-0005	GENERAL ARRANGEMENT - SECTION C-C & D-D
030-02-0004	GENERAL ARRANGEMENT - SECTION A-A & B-B
030-02-0003	GENERAL ARRANGEMENT - PLAN - ELEVATION 545.550R
030-02-0002	GENERAL ARRANGEMENT - PLAN - ELEVATION 525.338R
030-02-0010	PUMP ARRANGEMENT - PLAN
030-02-0016	CONVEYORS LAYOUT - GENERAL ARRANGEMENT - SECT. F-F TO J-J
030-02-0017	CONVEYORS LAYOUT - GENERAL ARRANGEMENT - SECT. C-C, D-D & E-E
030-02-0015	CONVEYORS LAYOUT - GENERAL ARRANGEMENT - SECT. A-A & B-B
030-02-0018	CONVEYORS LAYOUT - GENERAL ARRANGEMENT - PLAN VIEW

REFERENCE DRAWINGS

STAMP

NO.	DESCRIPTION	CHK. APPRV.	DATE

REVISIONS

REV.	ISSUE FOR	AUTH. BY	DATE
B	CONSTRUCTION CM-RW		

ISSUE AUTHORIZATION

HATCH

DESIGNED BY: M. BRUNET
DRAWN BY: Y. TREMBLAY
CHECKED BY:
DISCIPLINE ENG.
PROJ. DES. COORD.
PROJECT ENG.
PROJECT MGR.

TAHERA DIAMOND CORPORATION

PROJECT TITLE
JERICHO DIAMOND PROJECT

PROCESS PLANT LAYOUT
GENERAL ARRANGEMENT
PLAN
ELEVATION 524.650

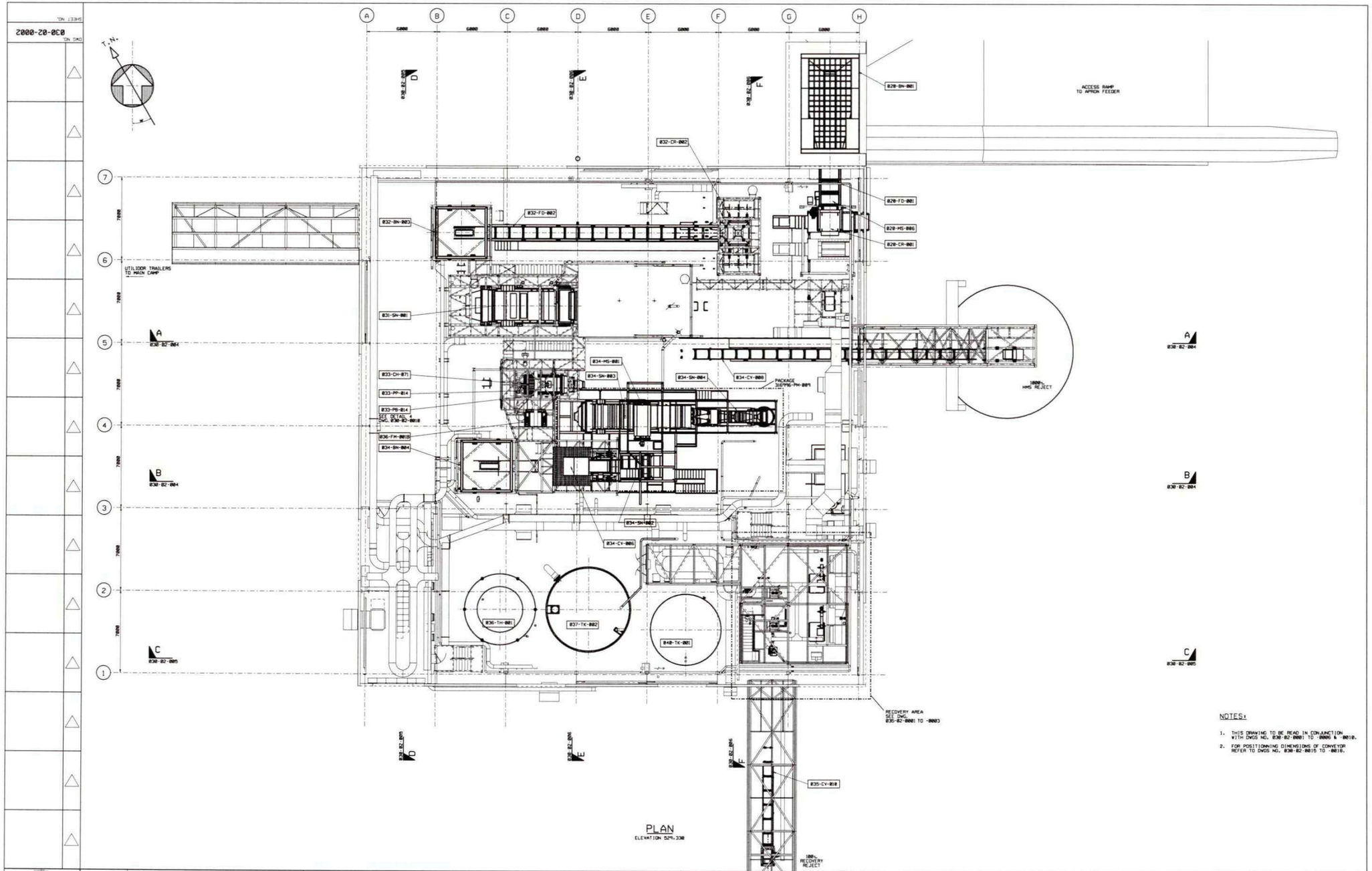
HATCH PROJECT NO.
316996

SCALE: 1:100
DWG NO.: 030-02-0001
SHEET NO.:
REV.: B

SHEET NO.

030-02-0002

DWG NO.



PLAN
ELEVATION 529.330

NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DWGS NO. 030-02-0001 TO -0006 & -0010.
2. FOR POSITIONNING DIMENSIONS OF CONVEYOR REFER TO DWGS NO. 030-02-0015 TO -0018.

DRAWING NO.	DRAWING TITLE
030-02-0006	GENERAL ARRANGEMENT - SECTION E-E & F-F
030-02-0005	GENERAL ARRANGEMENT - SECTION C-C & D-D
030-02-0004	GENERAL ARRANGEMENT - SECTION A-A & B-B
030-02-0003	GENERAL ARRANGEMENT - PLAN - ELEVATION 545.550
030-02-0001	GENERAL ARRANGEMENT - PLAN - ELEVATION 524.650
030-02-0010	PUMP ARRANGEMENT - PLAN
030-02-0018	CONVEYORS LAYOUT - GENERAL ARRANGEMENT - SECT. F-F TO J-J
030-02-0017	CONVEYORS LAYOUT - GENERAL ARRANGEMENT - SECT. C-C, D-D & E-E
030-02-0016	CONVEYORS LAYOUT - GENERAL ARRANGEMENT - SECT. A-A & B-B
030-02-0015	CONVEYORS LAYOUT - GENERAL ARRANGEMENT - PLAN VIEW

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK. APPRL.	DATE

REVISIONS

STAMP

REV.	ISSUE FOR	AUTH. BY	DATE
B	CONSTRUCTION - CM-001		

ISSUE AUTHORIZATION

HATCH

DESIGNED BY: M. BRUNET	DRAWN BY: Y. TREMBLAY
DATE:	DATE:
CHECKED BY:	DISCIPLINE ENG.:
DATE:	DATE:
PROJ. DES. COORD.:	PROJECT ENG.:
DATE:	DATE:
PROJECT MGR.:	
DATE:	

TAHERA DIAMOND CORPORATION

PROJECT TITLE: JERICHO DIAMOND PROJECT

PROCESS PLANT LAYOUT
GENERAL ARRANGEMENT
PLAN
ELEVATION 529,330

HATCH PROJECT NO.: 316996

SCALE	DWG NO.	SHEET NO.	REV.
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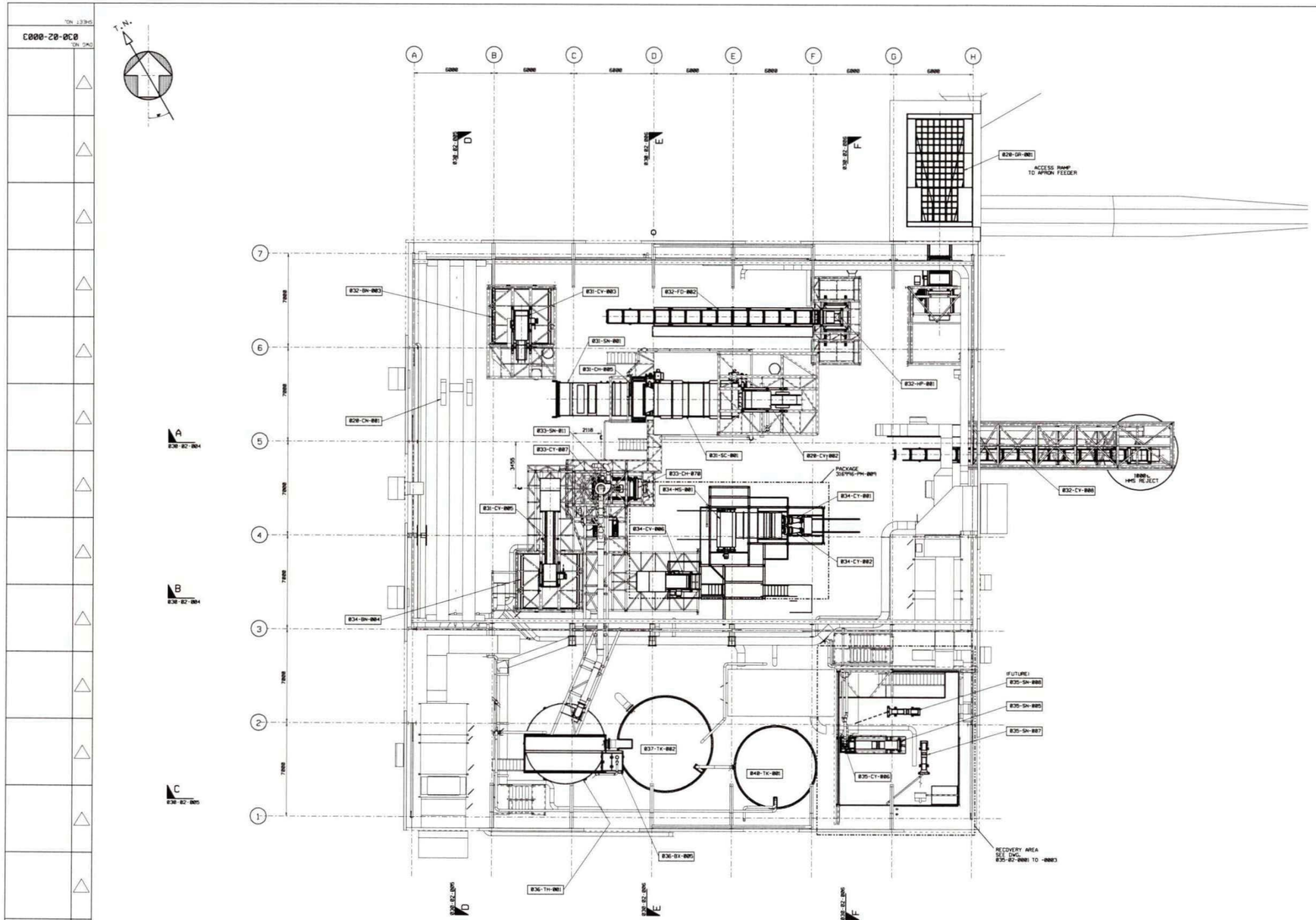

PLAN
ELEVATION 545.550

NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DWGS NO. 030-02-0001 TO -0006 & -0010.
2. FOR POSITIONNING DIMENSIONS OF CONVEYOR REFER TO DWGS NO. 030-02-0015 TO -0018.

DRAWING NO.	DRAWING TITLE
030-02-0006	GENERAL ARRANGEMENT - SECTION E-E & F-F
030-02-0005	GENERAL ARRANGEMENT - SECTION C-C & D-D
030-02-0004	GENERAL ARRANGEMENT - SECTION A-A & B-B
030-02-0002	GENERAL ARRANGEMENT - PLAN - ELEVATION 524.338
030-02-0001	GENERAL ARRANGEMENT - PLAN - ELEVATION 524.650
030-02-0018	PUMP ARRANGEMENT - PLAN
030-02-0010	CONVEYORS LAYOUT - GENERAL ARRANGEMENT - SECT. F-F TO J-J
030-02-0017	CONVEYORS LAYOUT - GENERAL ARRANGEMENT - SECT. C-C, D-D & E-E
030-02-0016	CONVEYORS LAYOUT - GENERAL ARRANGEMENT - SECT. A-A & B-B
030-02-0015	CONVEYORS LAYOUT - GENERAL ARRANGEMENT - PLAN VIEW

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK.	APPR.	DATE

REVISIONS

STAMP

REV.	ISSUE FOR	AUTH. BY	DATE
B	CONSTRUCTION CM-001		

ISSUE AUTHORIZATION

HATCH

DESIGNED BY: M. BRUNET
DRAWN BY: Y. TREMBLAY
CHECKED BY:
DISCIPLINE ENG.
PROJ. DES. COORD.
PROJECT ENG.
PROJECT MGR.
DATE:

TAHERA DIAMOND CORPORATION

PROJECT TITLE
JERICHO DIAMOND PROJECT

PROCESS PLANT LAYOUT
GENERAL ARRANGEMENT
PLAN
ELEVATION 545,550

HA PROJECT NO.
316996

SCALE: 1 : 100
DWG NO.: 030-02-0003
SHEET NO.:
REV.: B

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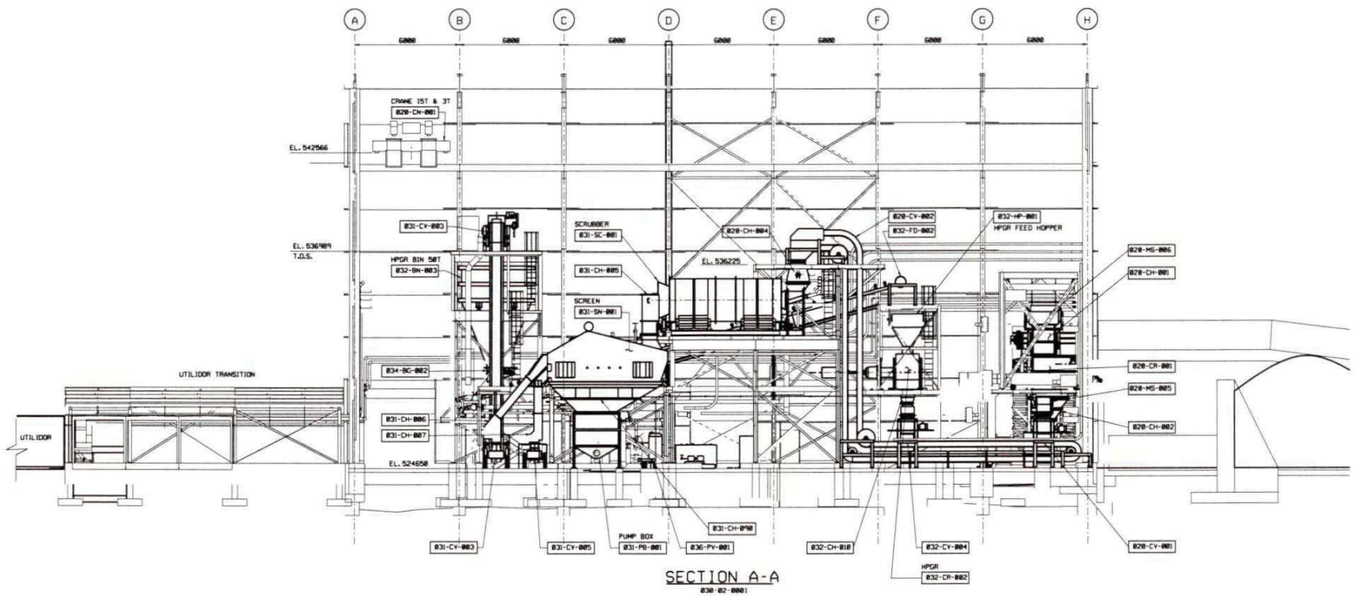
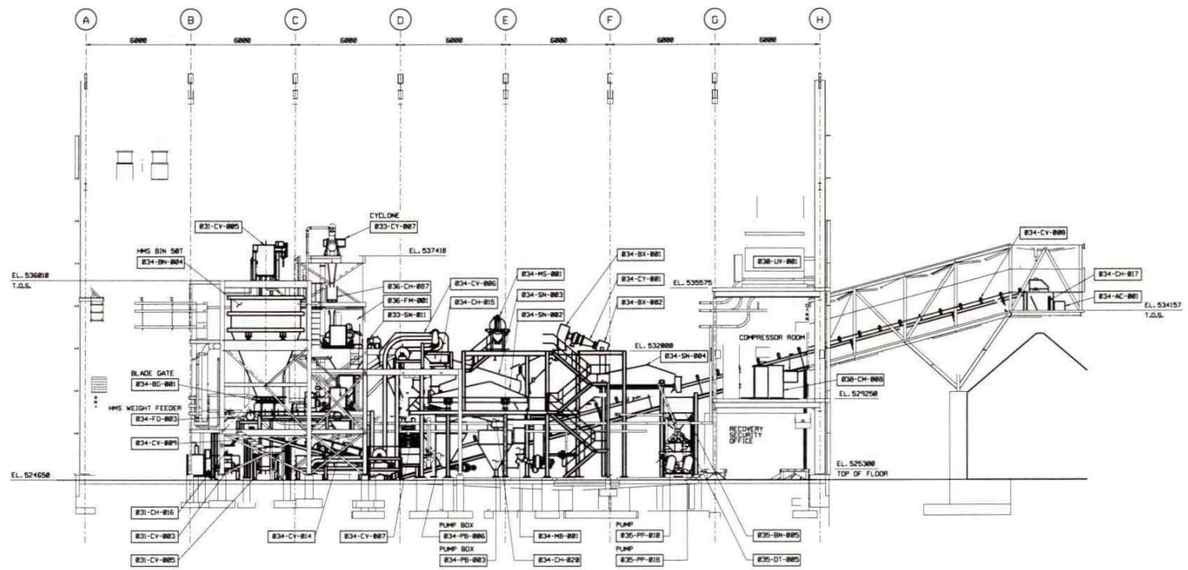


SECTION A-A
030-02-0001



SECTION B-B
030-02-0001

NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DWGS NO. 030-02-0001 TO -0006 & -0010.
2. FOR POSITIONING DIMENSIONS OF CONVEYOR REFER TO DWGS NO. 030-02-0015 TO -0018.

030-02-0006	GENERAL ARRANGEMENT - SECTION E-E & F-F
030-02-0005	GENERAL ARRANGEMENT - SECTION C-C & D-D
030-02-0003	GENERAL ARRANGEMENT - PLAN - ELEVATION 545,658
030-02-0002	GENERAL ARRANGEMENT - PLAN - ELEVATION 529,338
030-02-0001	GENERAL ARRANGEMENT - PLAN - ELEVATION 524,658
030-02-0010	PLANT ARRANGEMENT - PLAN
030-02-0018	CONVEYORS LAYOUT - GENERAL ARRANGEMENT - SECT. F-F TO J-J
030-02-0017	CONVEYORS LAYOUT - GENERAL ARRANGEMENT - SECT. C-C, D-D & E-E
030-02-0016	CONVEYORS LAYOUT - GENERAL ARRANGEMENT - SECT. A-A & B-B
030-02-0015	CONVEYORS LAYOUT - GENERAL ARRANGEMENT - PLAN VIEW

DRAWING NO. | DRAWING TITLE

REFERENCE DRAWINGS

P2 (IDP NUMBER ADDED)

NO.	DESCRIPTION	CHK. APPR.	DATE

REVISIONS

STAMP

REV.	ISSUE FOR	AUTH. BY	DATE
0	CONSTRUCTION CM-001		

ISSUE AUTHORIZATION

HATCH

DESIGNED BY: M. BRUNET | DRAWN BY: Y. TREMBLAY | DATE:
CHECKED BY: | DISCIPLINE ENG.: | DATE:
PROJ. DES. COORD.: | PROJECT ENG.: | DATE:
PROJECT MGR.: | DATE:

TAHERA DIAMOND CORPORATION

PROJECT TITLE: JERICHO DIAMOND PROJECT

PROCESS PLANT LAYOUT
GENERAL ARRANGEMENT
SECTION A-A & B-B

HATCH PROJECT NO.: 316996

SCALE: 1:100 | DWG NO.: 030-02-0004 | SHEET NO.: | REV.: 0

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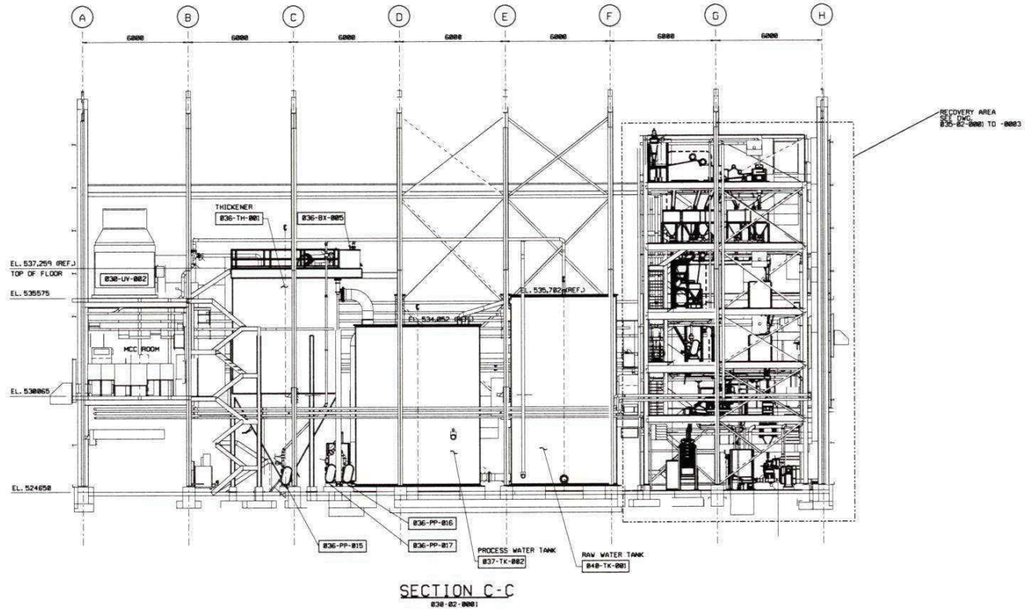
SHEET NO.

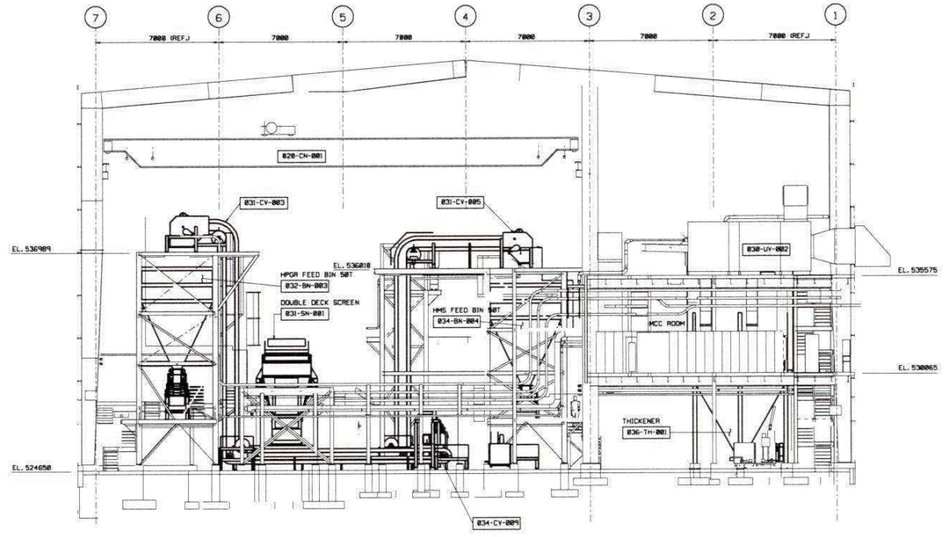
030-02-0005

DWG NO.



SECTION C-C

030-02-0001



SECTION D-D

030-02-0001

NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DWGS NO. 030-02-0001 TO -0006 & -0010.
2. FOR POSITIONNING DIMENSIONS OF CONVEYOR REFER TO DWGS NO. 030-02-0015 TO -0016.

DRAWING NO.	DRAWING TITLE
030-02-0006	GENERAL ARRANGEMENT - SECTION E-E & F-F
030-02-0004	GENERAL ARRANGEMENT - SECTION A-A & B-B
030-02-0003	GENERAL ARRANGEMENT - PLAN - ELEVATION 545,550
030-02-0002	GENERAL ARRANGEMENT - PLAN - ELEVATION 529,338
030-02-0001	GENERAL ARRANGEMENT - PLAN - ELEVATION 524,658
030-02-0018	PUMP ARRANGEMENT - PLAN
030-02-0018	CONVEYORS LAYOUT - GENERAL ARRANGEMENT - SECT. F-F TO J-J
030-02-0017	CONVEYORS LAYOUT - GENERAL ARRANGEMENT - SECT. C-C, D-D & E-E
030-02-0016	CONVEYORS LAYOUT - GENERAL ARRANGEMENT - SECT. A-A & B-B
030-02-0015	CONVEYORS LAYOUT - GENERAL ARRANGEMENT - PLAN VIEW

REFERENCE DRAWINGS

P.O.(EQP.) NUMBER ADDED

NO.	DESCRIPTION	CHK. APPRL.	DATE

REVISIONS

STAMP

REV.	ISSUE FOR	AUTH.BY	DATE
B	CONSTRUCTION (CM-001)		

ISSUE AUTHORIZATION

HATCH

DESIGNED BY: M. BRUNET	DRAWN BY: Y. TREMBLAY
DATE:	DATE:
CHECKED BY:	DISCIPLINE ENG.:
DATE:	DATE:
PROJECTS COORD.:	PROJECT ENG.:
DATE:	DATE:
PROJECT MGR.:	
DATE:	

TAHERA DIAMOND CORPORATION

PROJECT TITLE:

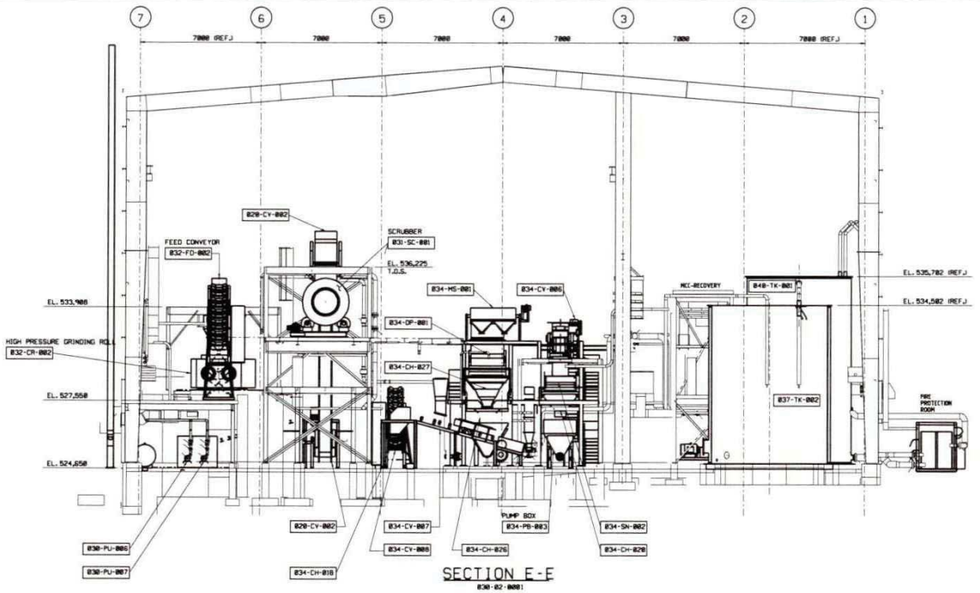
JERICHO DIAMOND PROJECT

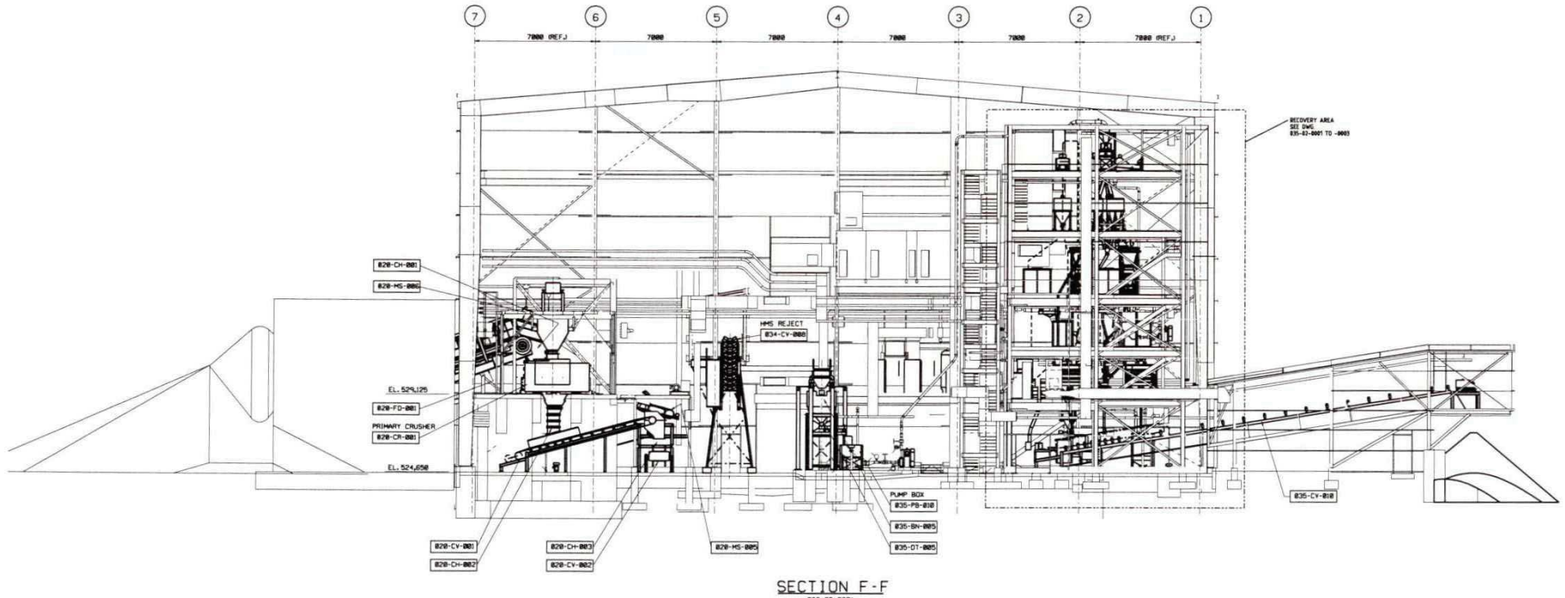
PROCESS PLANT LAYOUT
GENERAL ARRANGEMENT
SECTION C-C & D-D

HA PROJECT NO.: 316996

SCALE	DWG NO.	SHEET NO.	REV.
1:100	030-02-0005		Ø

\CAD\MDWG\030-02-0005.dgn 5/10/2005 1:36:07 PM





NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DWGS NO. 830-02-0001 TO -0006 & -0010.
2. FOR POSITIONNING DIMENSIONS OF CONVEYOR REFER TO DWGS NO. 830-02-0015 TO -0018.

DRAWING NO.	DRAWING TITLE
830-02-0005	GENERAL ARRANGEMENT - SECTION C-C & D-D
830-02-0004	GENERAL ARRANGEMENT - SECTION A-A & B-B
830-02-0003	GENERAL ARRANGEMENT - PLAN - ELEVATION 545,550
830-02-0002	GENERAL ARRANGEMENT - PLAN - ELEVATION 529,038
830-02-0001	GENERAL ARRANGEMENT - PLAN - ELEVATION 524,650
830-02-0010	PUMP ARRANGEMENT - PLAN
830-02-0018	CONVEYORS LAYOUT - GENERAL ARRANGEMENT - SECT.F-F TO J-J
830-02-0017	CONVEYORS LAYOUT - GENERAL ARRANGEMENT - SECT.C-C, D-D & E-E
830-02-0016	CONVEYORS LAYOUT - GENERAL ARRANGEMENT - SECT.A-A & B-B
830-02-0015	CONVEYORS LAYOUT - GENERAL ARRANGEMENT - PLAN VIEW

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK. APPR.	DATE
P2 (EGP) NUMBER ADDED			

REVISIONS

STAMP

REV.	ISSUE FOR	AUTH. BY	DATE
A	CONSTRUCTION FM-001		

ISSUE AUTHORIZATION

HATCH

TAHERA DIAMOND CORPORATION

PROJECT TITLE
JERICHO DIAMOND PROJECT

PROCESS PLANT LAYOUT
GENERAL ARRANGEMENT
SECTION E-E & F-F

DESIGNED BY	DRAWN BY
M. BRUNET	Y. TREMBLAY
DATE:	DATE:
CHECKED BY	DISCIPLINE ENG.
DATE:	DATE:
PROJ. DES. COORD.	PROJECT ENG.
DATE:	DATE:
PROJECT MGR.	
DATE:	

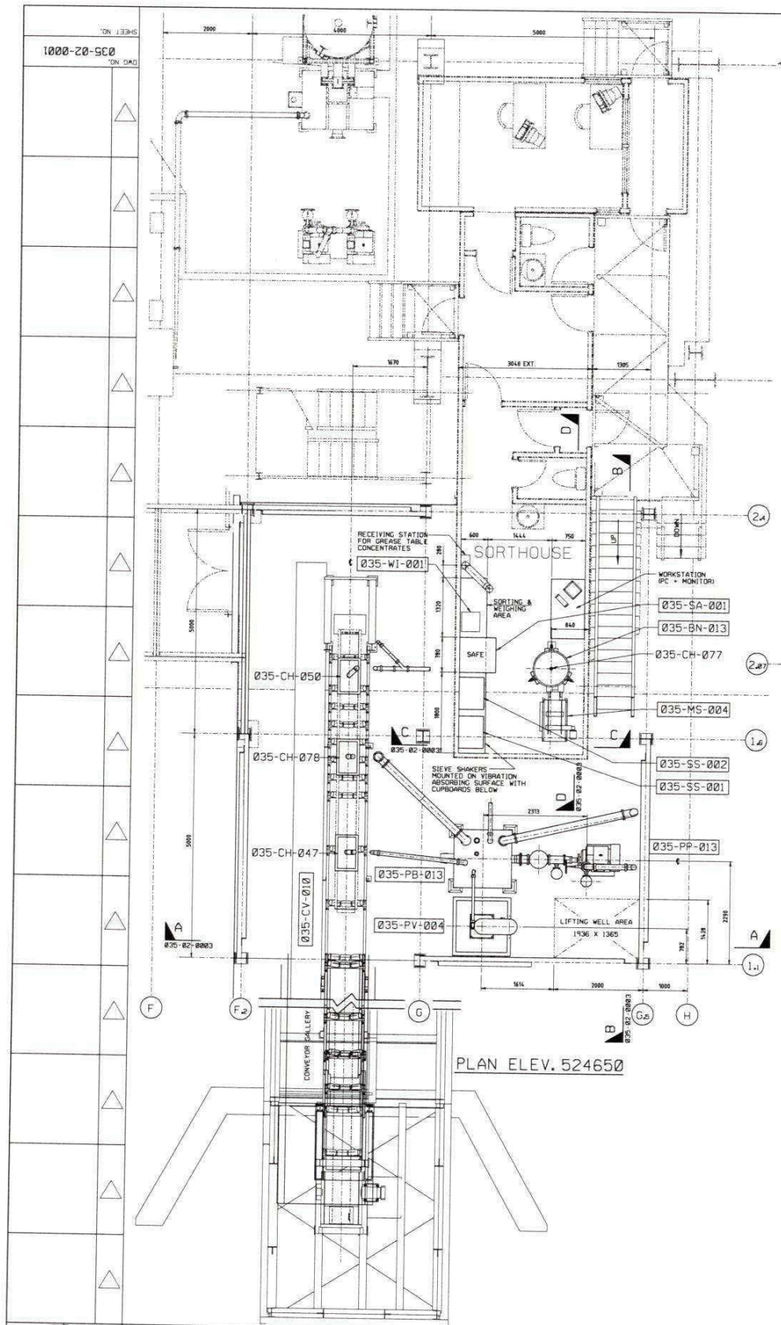
HATCH PROJECT NO.
316996

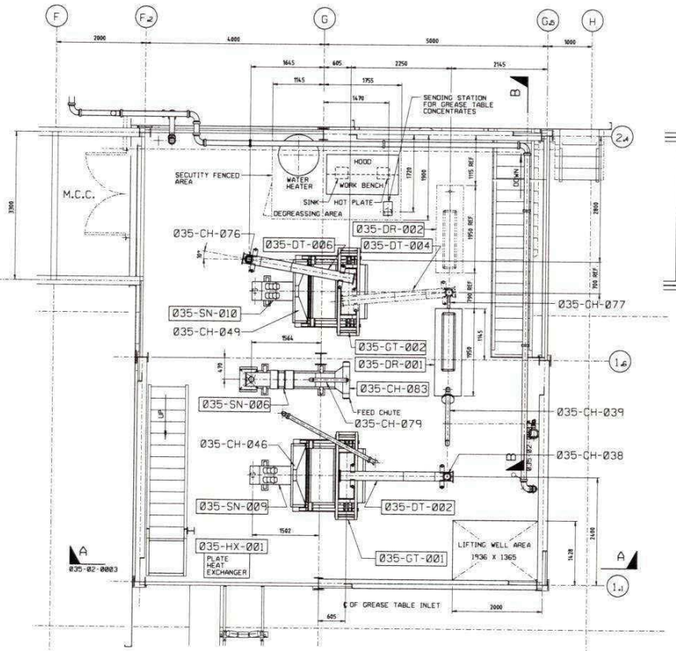
SCALE	DWG NO.	SHEET NO.	REV.
1:100	830-02-0006		A

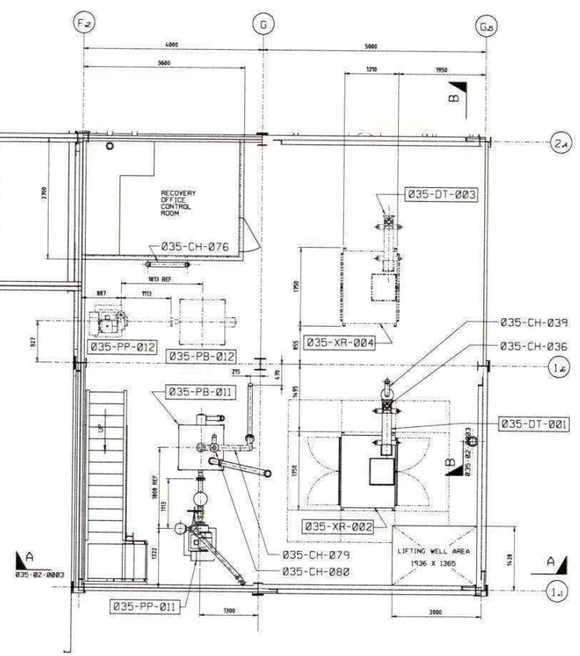
K:\ACAD\DWG\830-02-0006.dgn 5/11/2005 1:16:26 PM

DWG NO. 035-02-0001

SHEET NO.







Ø30-B6-0007 Ø35-B1-0001 TC 0008	SORTHOUSE / SECURITY TRAILERS STRUCTURAL STEEL	
DRAWING NO.	DRAWING TITLE	
REFERENCE DRAWINGS		

NO.	DESCRIPTION	CHK. APPR.	DATE
2	GENERAL DRAWING UPDATE		
REVISIONS			

STAMP

REV.	ISSUE FOR	AUTH. BY	DATE
2	CONSTRUCTION CM-002		
1	INFORMATION CM-001		
0	PREFERENCE PS-002	S.B.	15-10-2004
ISSUE AUTHORIZATION			

HATCH

DESIGNED BY	J.M.& M.P.	DRAWN BY	J.MARTINEAU
DATE	15-10-2004	DATE	15-10-2004
CHECKED BY	V.GAVRILENCO	DISCIPLINE MGR.	S.BIBAS
DATE		DATE	
PROJ. DES. COORD.		PROJECT ENG.	
DATE		DATE	
PROJECT MGR.			
DATE			

TAHERA DIAMOND CORPORATION

PROJECT TITLE: JERICHO DIAMOND PROJECT

RECOVERY
GENERAL ARRANGEMENT - PLAN VIEWS
LEVELS 524650 , 528900 , 531900
DETAILS

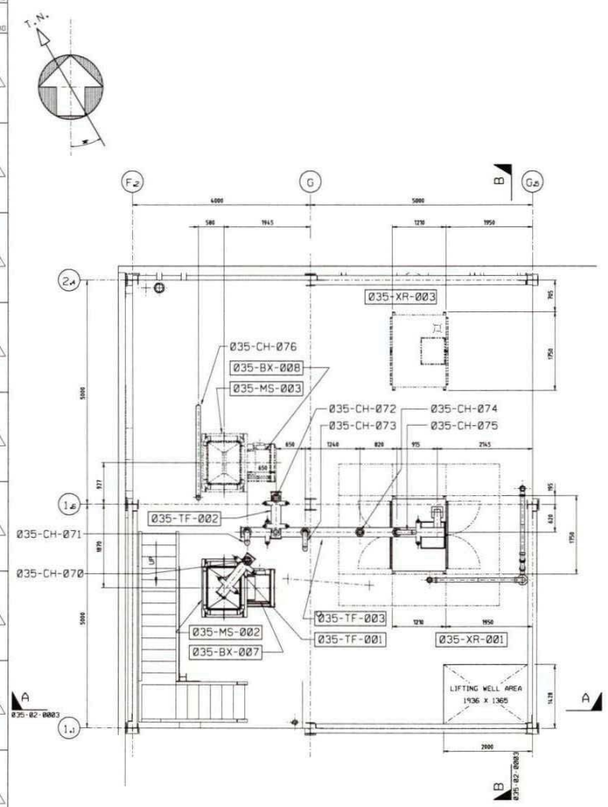
HA PROJECT NO. 316996

SCALE	DWG NO.	SHEET NO.	REV.
1 : 40	035-02-0001		2

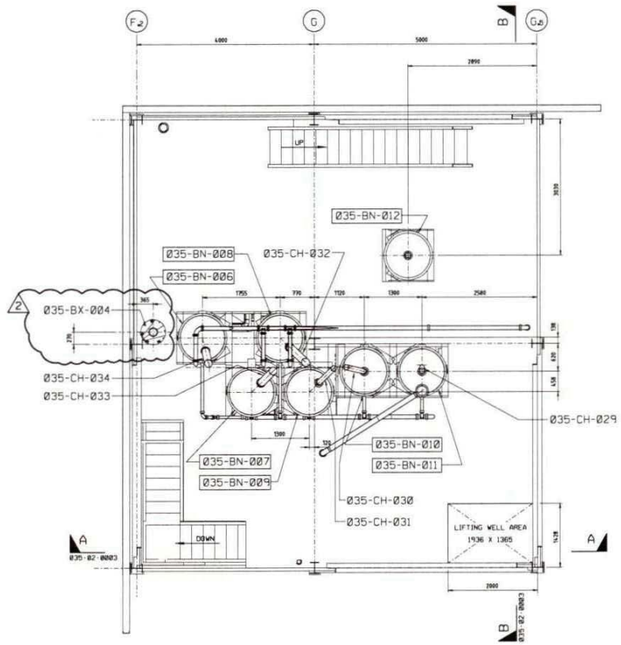
SHEET NO.

035-02-0002

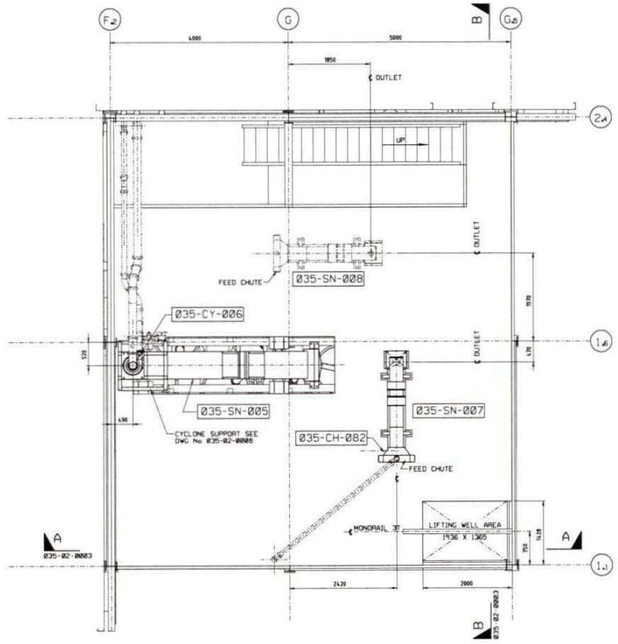
DWG NO.



PLAN ELEV. 534900



PLAN ELEV. 538580



PLAN ELEV. 542030

035-01-
0001 TO 0007 STRUCTURAL STEEL
DRAWING NO. DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK.	APPR.	DATE
2	GENERAL DRAWING UPDATE / ADD 35-BX-004			

REVISIONS

STAMP

REV.	ISSUE FOR	AUTH. BY	DATE
2	CONSTRUCTION CM-0001		
1	INFORMATION CM-0001		
0	REFERENCE PS-0002	S.B.	15-12-2004

ISSUE AUTHORIZATION

HATCH

DESIGNED BY	J.M. & M.R.	DRAWN BY	J.MARTINEAU
DATE:	05-12-2004	DATE:	05-12-2004
CHECKED BY		DISCIPLINE ENG.	
DATE:		DATE:	
PROJ. DES. COORD.		PROJECT ENG.	
DATE:		DATE:	
PROJECT MGR.	D.LAM		
DATE:			

TAHERA DIAMOND CORPORATION

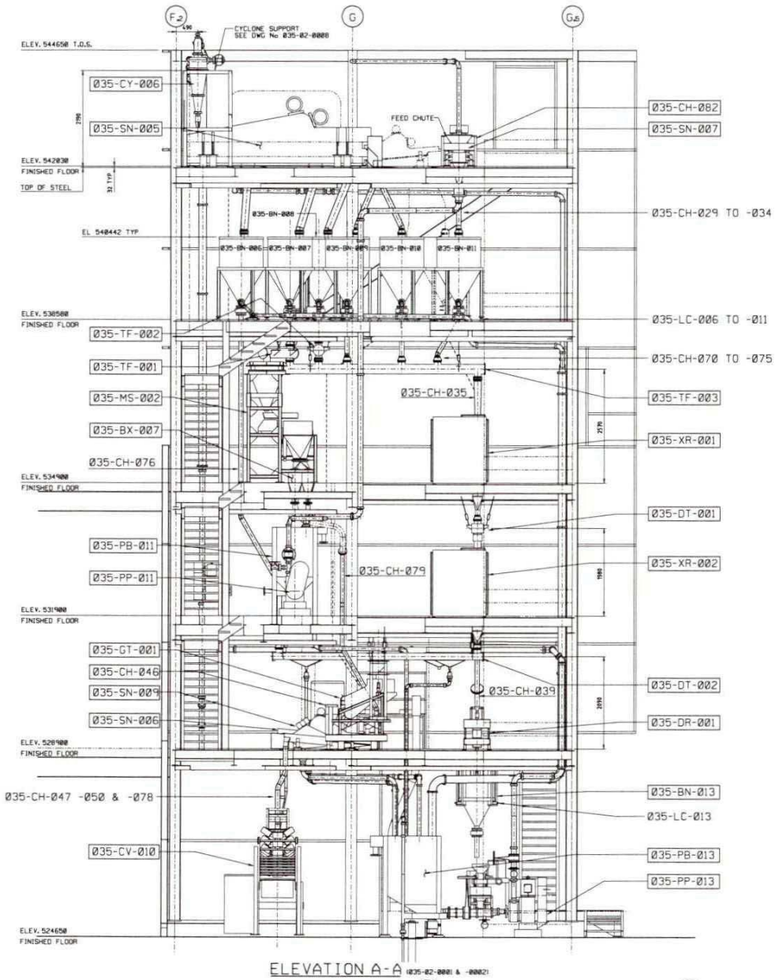
PROJECT TITLE
JERICHO DIAMOND PROJECT

RECOVERY
GENERAL ARRANGEMENT - PLAN VIEWS
LEVELS , 534900 , 538580 , 542030
DETAILS

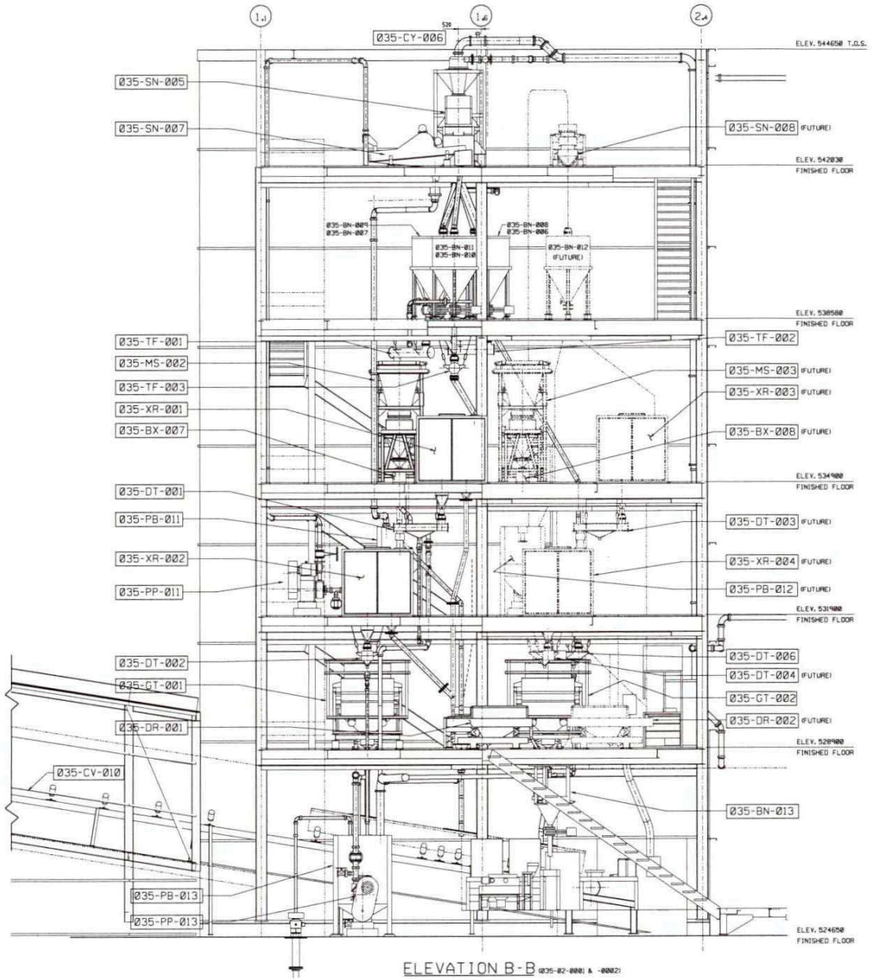
HA PROJECT NO.
316996

SCALE	DWG NO.	SHEET NO.	REV.
1 : 40	035-02-0002		2

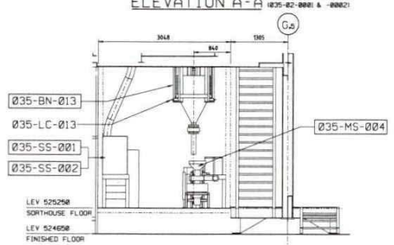
SHEET NO. 035-02-0003 DWG NO.



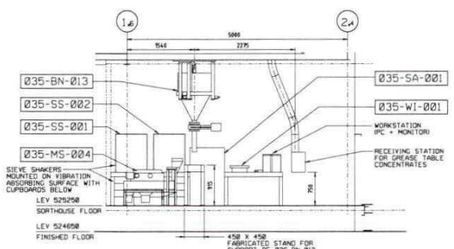
ELEVATION A-A (035-02-0001 & -0002)



ELEVATION B-B (035-02-0001 & -0002)



ELEVATION C-C (035-02-0001)



ELEVATION D-D (035-02-0001)

035-01-0001 TO 0008 — STRUCTURAL STEEL
DRAWING NO. — DRAWING TITLE
REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK.	APPR.	DATE
2	GENERAL DRAWING UPDATE			

REVISIONS

STAMP

REV.	ISSUE FOR	AUTH. BY	DATE
2	CONSTRUCTION CM-001		
1	INFORMATION CM-001		
0	REFERENCE PS-002	S.G.	15-12-2004

ISSUE AUTHORIZATION

HATCH

DESIGNED BY: J.M. & M.R. DATE: 15-12-2004 CHECKED BY: DATE: PROJ. DES. COORD. DATE: PROJECT MGR. G.LAM DATE:
DRAWN BY: J.MARTINEAU DATE: 15-12-2004 DISCIPLINE ENG. DATE: PROJECT ENG. DATE:

TAHERA DIAMOND CORPORATION

PROJECT TITLE: JERICHO DIAMOND PROJECT

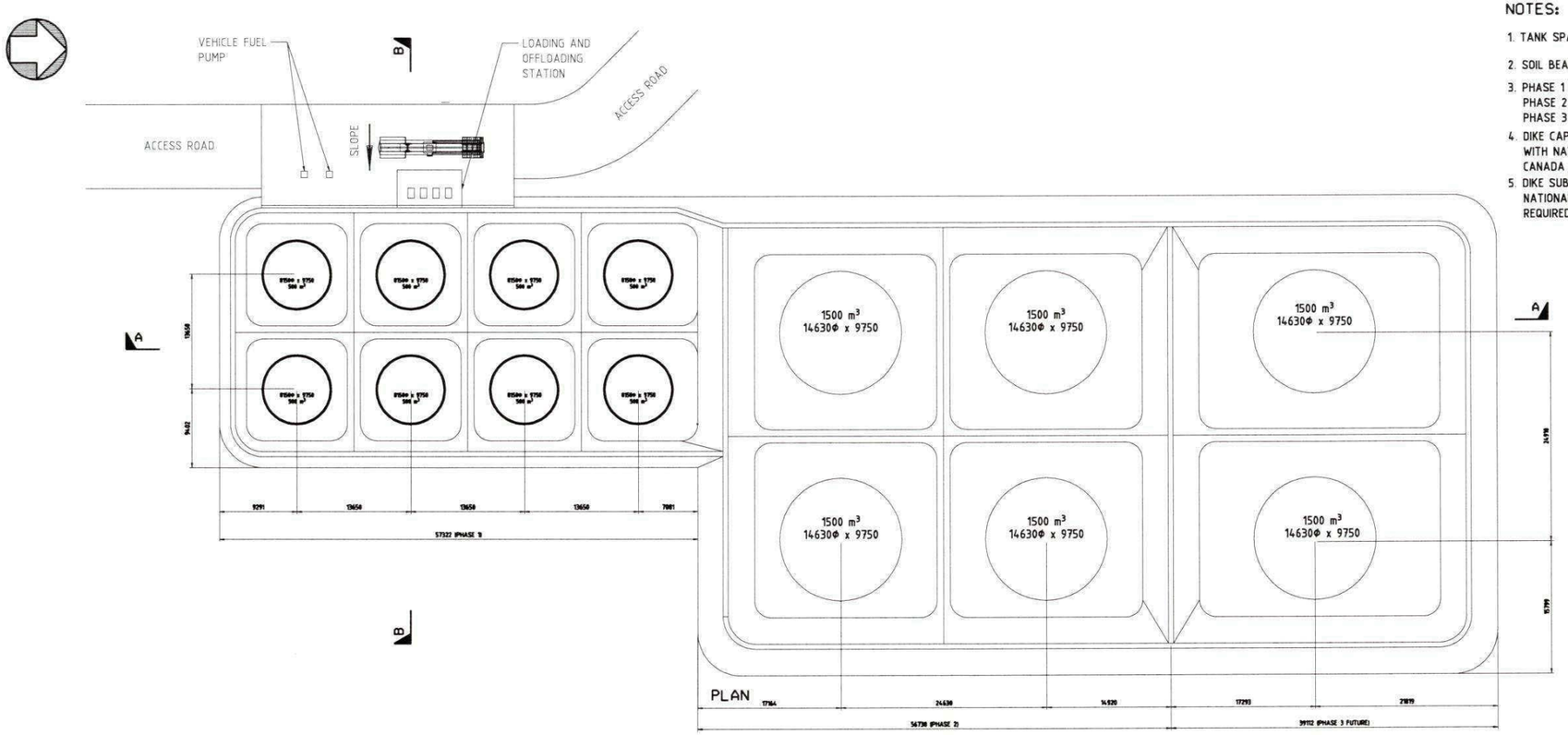
RECOVERY
GENERAL ARRANGEMENT
ELEVATIONS
DETAILS

HA PROJECT NO.: 316996

SCALE: 1 : 40 | DWG NO.: 035-02-0003 | SHEET NO. | REV.: 2

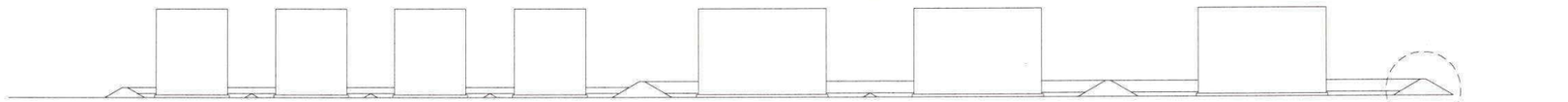
SHEET NO.

DWG NO. 150-02-0001

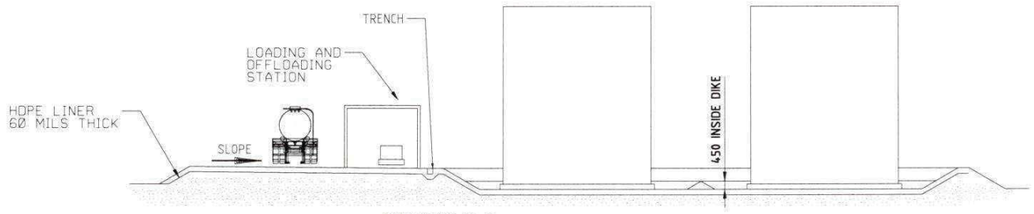


NOTES:

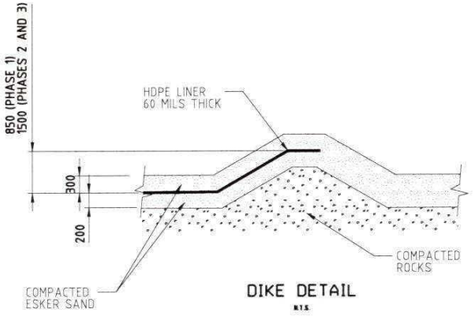
1. TANK SPACING IN ACCORDANCE WITH NFPA 30.
2. SOIL BEARING CAPACITY TO BE CONFIRMED.
3. PHASE 1 DIKE VOLUME: 876 m^3
   PHASE 2 DIKE VOLUME: 2260 m^3
   PHASE 3 DIKE VOLUME 1652 m^3 (FUTURE)
4. DIKE CAPACITIES IN ACCORDANCE WITH NATIONAL FIRE CODE OF CANADA (CL 4.3.7.3)
5. DIKE SUBDIVISION NOT REQUIRED BY NATIONAL FIRE CODE OF CANADA, BUT REQUIRED BY NFPA 30.



SECTION B-B



SECTION B-B
1:100



DIKE DETAIL
N.T.S.

FOR INFORMATION

...\CAD\P\DWG\150-02-0001.dgn 5/31/2005 4:02:21 PM

DRAWING NO. | DRAWING TITLE
REFERENCE DRAWINGS

NO. | DESCRIPTION | CHK. APPRD. | DATE
REVISIONS

STAMP

REV.	ISSUE FOR	AUTH. BY	DATE
P2	FOR INFORMATION	JCP	7.18.04
P1	FOR INFORMATION		

ISSUE AUTHORIZATION

HATCH

DESIGNED BY: J. C. PARADIS — DATE: 7.18.04
DRAWN BY: B. KRICKOVIC — DATE:
CHECKED BY — DISCIPLINE ENG.
PROJ.DES.COORD. — PROJECT ENG.
PROJECT MGR.

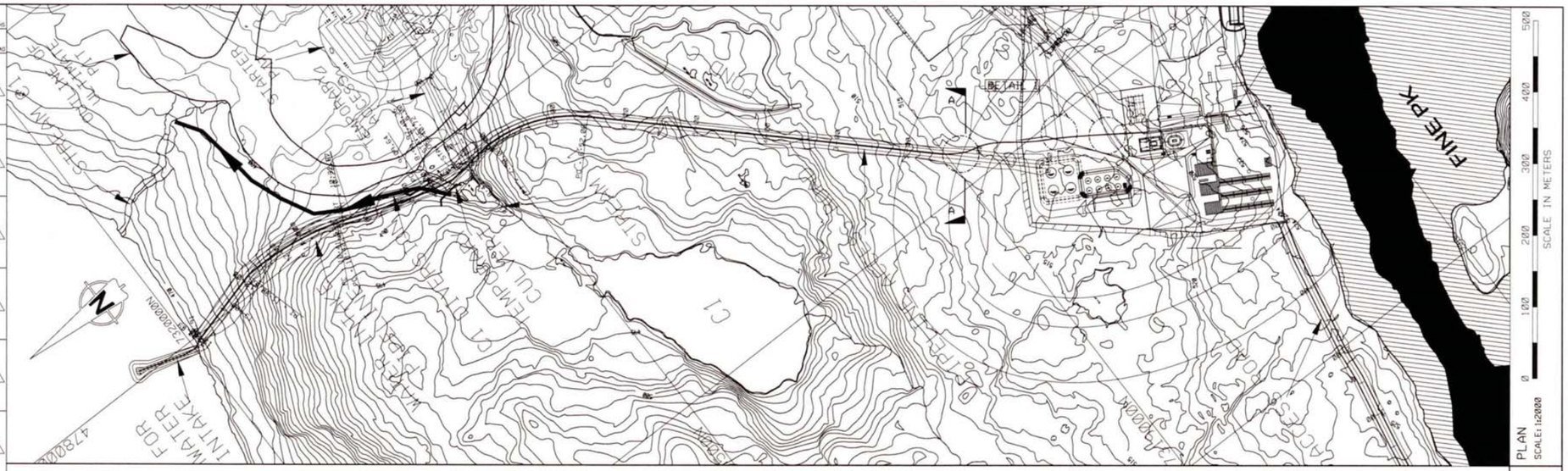
TAHERA DIAMOND CORPORATION

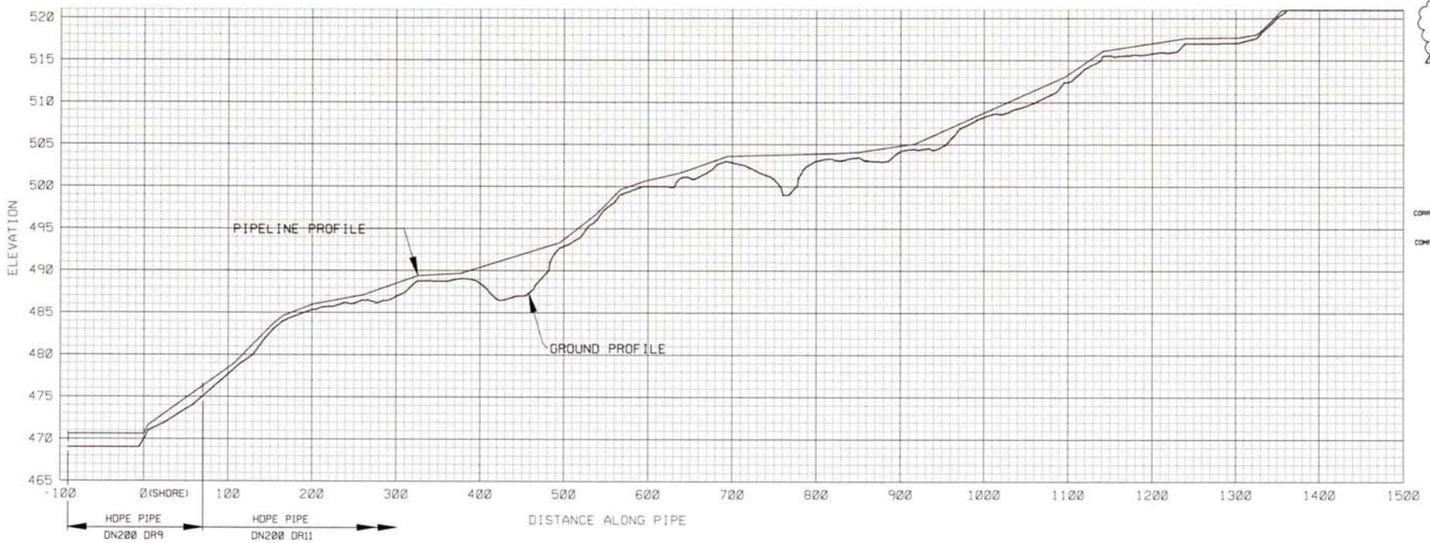
PROJECT TITLE: JERICHO DIAMOND PROJECT

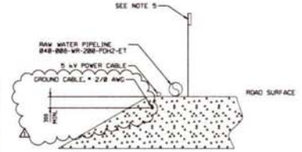
DIESEL FUEL FARM
PRELIMINARY LAYOUT
PERMIT APPLICATION

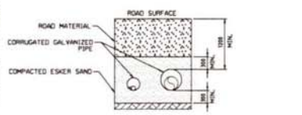
HA PROJECT NO. 316996

SCALE: 1:200 | DWG NO.: 150-02-0001 | SHEET NO.: | REV.: P2









NOTE:

1. PIPELINE LOCATION IS APPROXIMATE ONLY. PIPELINE TO FOLLOW ROADSIDE.
2. PIPELINE SHOULD RISE CONTINUOUSLY FROM PUMP HOUSE TO PROCESS PLANT. IF NOT POSSIBLE DRAIN VALVE SHALL BE INSTALLED IN AN UNHEATED SMALL ENCLOSURE AT EVERY LOW POINT.
3. FOR ROAD CROSSING DETAIL, SEE DETAIL 1.
4. PIPELINE PROFILE SHOWN ELEVATED FOR CLARITY ONLY.
5. VISIBLE POST MARKER TO BE INSTALLED EVERY 50 METERS ALONG PIPE. MARKER SHALL READ "RAW WATER PIPELINE -5 KV CABLE- DANGER - HIGH VOLTAGE."
6. AFTER PIPELINE IS PUT INTO SERVICE, SECTIONS SHALL BE BURIED EVERY 100M TO HOLD THE PIPE IN PLACE.

ELEVATION
HORIZONTAL SCALE: 1:2000
VERTICAL SCALE: 1:200

DWG NO. 848-84-2001
SHEET NO.

PERMIT TO PRACTICE
(WATER, LTD.)
ORIGINAL SIGNED BY
G. BRUMM
16/02/95
PERMIT NUMBER: P512
The Association of Professional Engineers of Ontario

NOT ONLY
ORIGINAL SIGNED BY
J.-C. PARADIS
P.Eng.
L1541
16/02/95

NO.	DESCRIPTION	CHK. (APPR.)	DATE
1	GROUND CABLE NOW UNDERGROUND		

REVISIONS

NO.	ISSUE FOR	AUTH. BY	DATE
1	CONSTRUCTION CP-RWI/CE-02	JCH	16.02.95
A	CONSTRUCTION (2988)		

ISSUE AUTHORIZATION

REFERENCE DRAWINGS

HATCH

DESIGNED BY	J.-C. PARADIS
DATE	94.02.95
CHECKED BY	H. RUPNIK
DATE	16.02.95
PROJ. DES. COORD.	J.-C. PARADIS
DATE	16.02.95
PROJECT MGR.	D. LAM
DATE	16.02.95
DRAWN BY	J. CHARRON
DATE	29.01.95
DISCIPLINE ENG.	J.-C. PARADIS
DATE	16.02.95
PROJECT ENG.	M. CAMPANELLI
DATE	16.02.95

TAHERA DIAMOND CORPORATION

PROJECT TITLE: JERICHO DIAMOND PROJECT

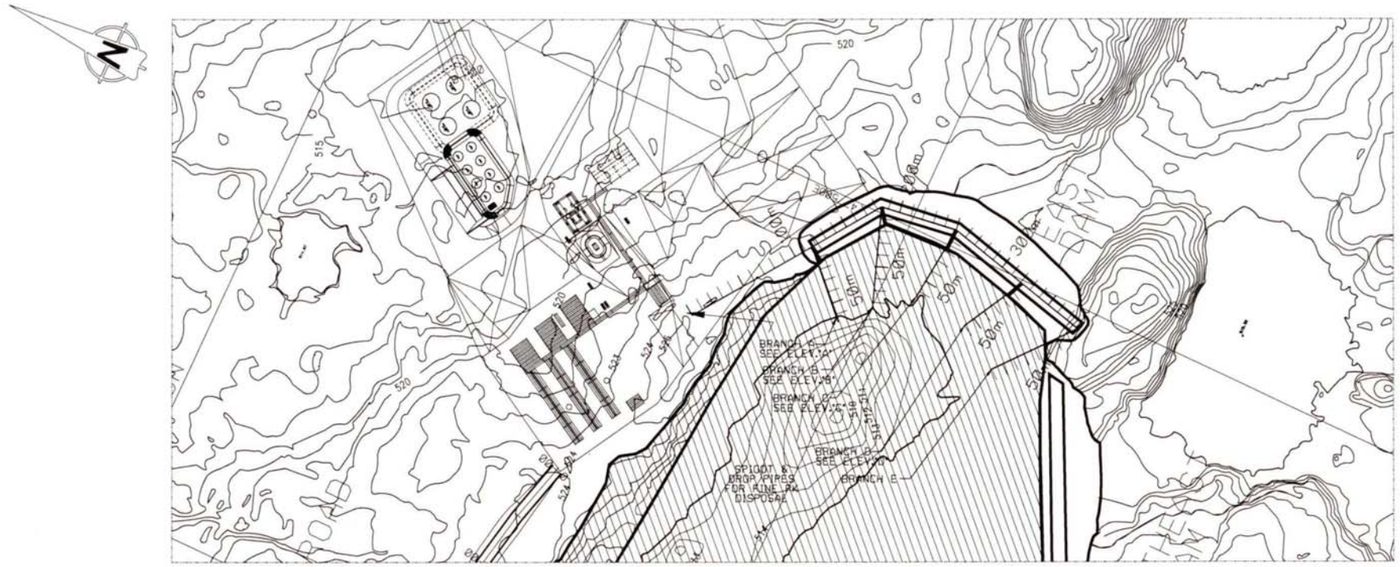
PROCESSING PLANT
RAW WATER PIPELINE
PLAN AND ELEVATION

HATCH PROJECT NO. 316996

SCALE	DWG NO.	SHEET NO.	REV.
1:2000	848-84-2001		1

SHEET NO.

DWG NO.

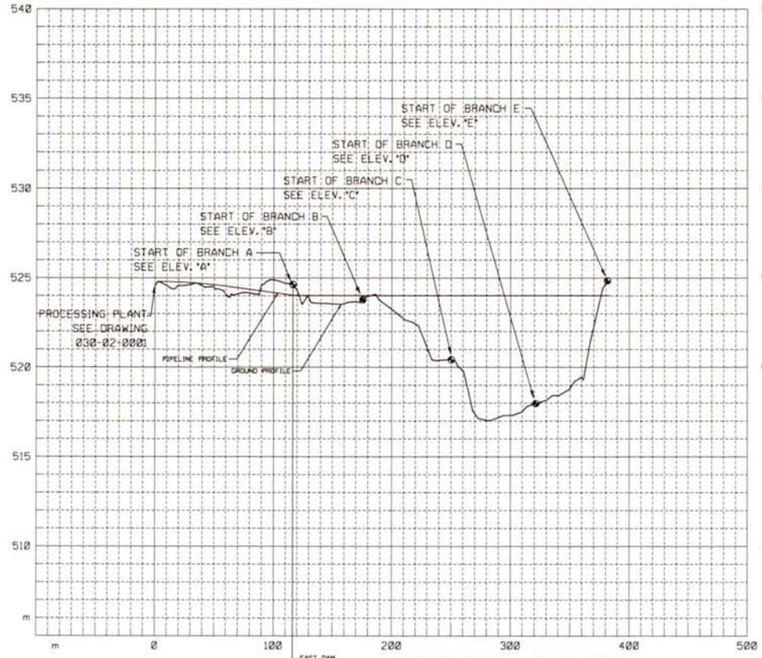


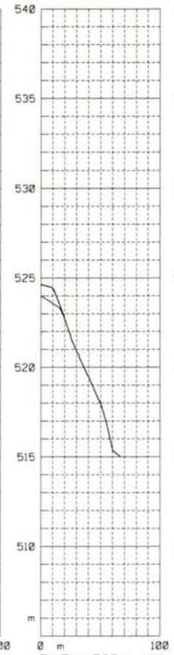
NOTES:

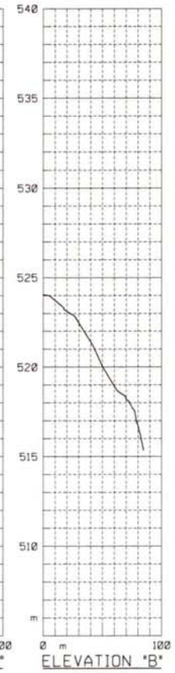
1. FOR PROCESS PLANT TIE-IN, CONNECT TO LINE 836-828-ST-100-L1A1
2. PIPELINE POSITION IS APPROXIMATE ONLY. FINAL PIPE POSITION TO SUIT SITE REQUIREMENT.
3. PROVIDE DRAIN AT ALL LOW POINTS. DRAINS TO BE INSTALLED IN A SMALL UNHEATED ENCLOSURE.
4. PUT VISIBLE MARKER ALONG PIPE AT EVERY 30M. MARKER SHALL READ "TAILINGS PIPELINE".
5. REFER TO 842-04-0001 FOR TYPICAL INSTALLATION DETAILS.

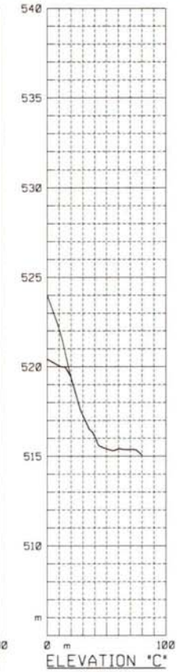
0 50 100 150 200 250
SCALE IN METERS

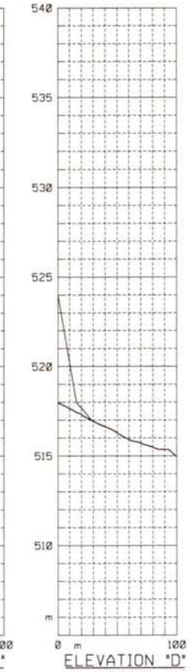
PLAN
SCALE: 1:1500

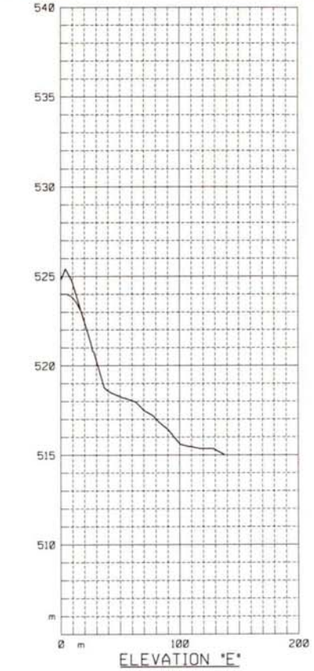












ELEVATION
HORIZONTAL SCALE: 1:1500
VERTICAL SCALE: 1:100

242-24-0001 PROCESSING PLANT - RAW WATER PIPELINE - PLAN AND ELEVATION
DRAWING NO. DRAWING TITLE

REFERENCE DRAWINGS

STAMP

NO. DESCRIPTION CHK. APPR. DATE

REVISIONS

R	CONSTRUCTION CP002		
REV.	ISSUE FOR	AUTH. BY	DATE

ISSUE AUTHORIZATION

HATCH

DESIGNED BY J-C. PARADIS DATE:
DRAWN BY J. CHARRON DATE:
CHECKED BY DATE:
DISCIPLINE ENG. DATE:
PROJECT MGR. DATE:
PROJECT ENG. DATE:

TAHERA DIAMOND CORPORATION

PROJECT TITLE
JERICHO DIAMOND PROJECT

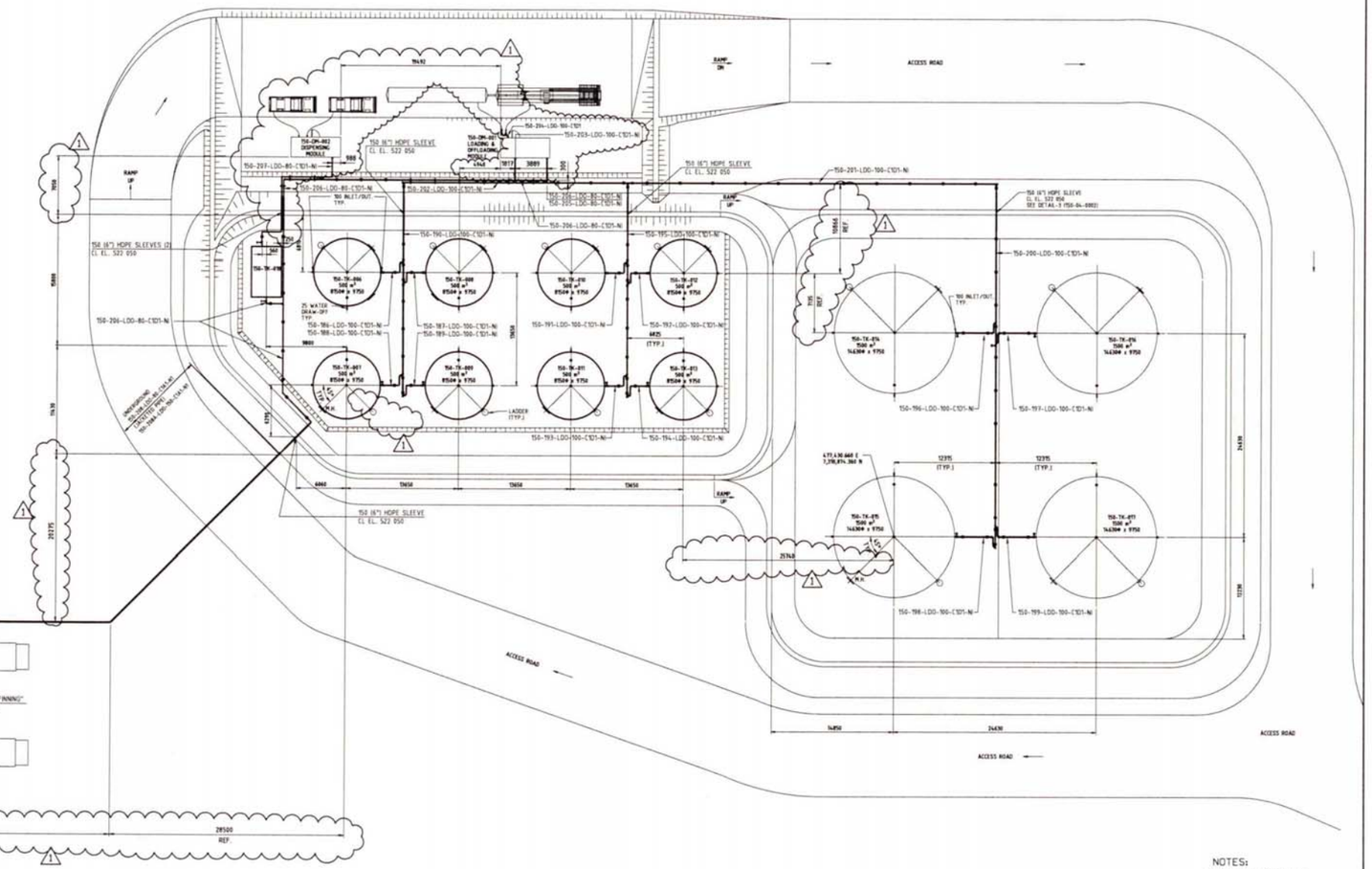
PROCESSING PLANT
THICKENER AREA
TAILING PIPELINE
PLAN AND SECTIONS

HATCH PROJECT NO. 316996

SCALE AS SHOWN
DWG NO. 030-04-0001
SHEET NO.
REV. 2

SHEET NO.

DWG NO. 150-04-2001


RAMP UP
RAMP DN
ACCESS ROAD
150 (6") HDPE SLEEVE
EL EL. 522 050
150 (6") HDPE SLEEVE
EL EL. 521 850
SEE DETAIL-3 150-04-0002
150 (6") HDPE SLEEVES (2)
EL EL. 522 050
150 INLET/OUT TYP.
25 WATER DRAW-OFF TYP.
LADDER (TYP.)
UNDERGROUND LAGGED PIPE
DAY TANK 2200 LITERS EACH (TYP 4x)
GENERATOR SET G-1
GENERATOR SET G-2
GENERATOR SET G-3
GENERATOR SET G-4
FOR CONT. SEE "PIPING" DWG G080528-2001
UNDERGROUND LAGGED PIPE
62783
REF.
29500
REF.
ACCESS ROAD
ACCESS ROAD
ACCESS ROAD
14850
24690
12375 (TYP.)
12375 (TYP.)
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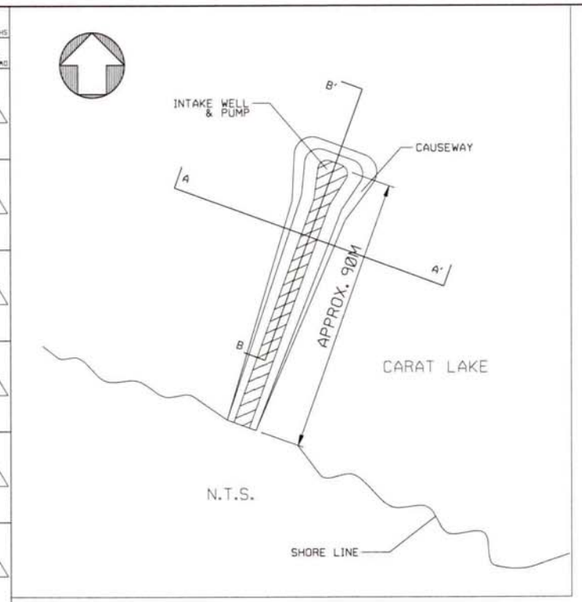
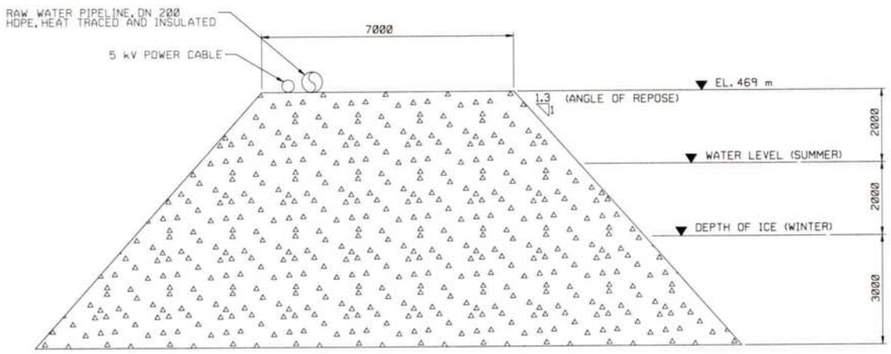
6350





CAUSEWAY SECTION A-A'

NTS

NOTES:

1- FISH SCREEN DESIGN BASED ON DEPARTMENT OF FISHERIES AND OCEANS "FRESHWATER INTAKE END-OF-PIPE FISH SCREEN GUIDELINE" -1995 AND THE FOLLOWING CRITERIA:

A) FISH SWIMMING MODE: SUBCARANGIFORM

B) WATER INTAKE DESIGN FLOWRATES:
1. 50 M3/HR (CONTINUOUS AVERAGE)
2. 100 M3/HR (INSTANTANEOUS MAXIMUM)

C) REQUIRED AREA, BASED ON 50 M3/HR
1. OPEN SCREEN AREA: 0.13 SQ.M
2. EFFECTIVE SCREEN AREA: 0.22 SQ.M.

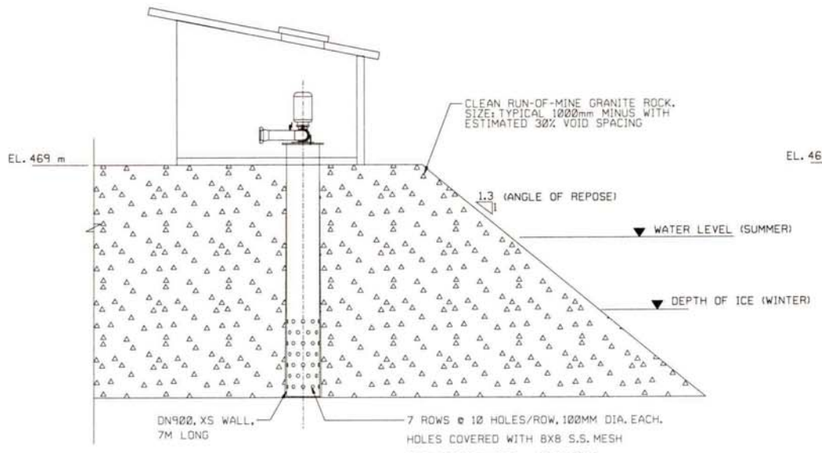
D) REQUIRED AREA, BASED ON 100 M3/RH
1. OPEN SCREEN AREA: 0.26 SQ.M.
2. EFFECTIVE SCREEN AREA: 0.43 SQ.M.

E) FOR ACTUAL PHYSICAL EFFECTIVE AND OPEN SCREEN AREAS, REFER TO NOTES ON EACH ALTERNATIVE SECTION.

F) SCREEN MATERIAL: 8x8 STAINLESS STEEL ALLOY MESH. ALL PIPE OPENINGS TO BE WRAPPED WITH MESH AND SECURED WITH S.S. SELF-TAPPING SCREWS AS REQUIRED.

G) SCREEN MAINTENANCE TO BE DONE MANUALLY, EITHER BY BACK-FLUSHING THE INTAKE OR BY PHYSICALLY REMOVING TRAPPED DEBRIS.

H) PUMP: WEIR/FLOWAY 10 JKM, 6 STAGES, 50 HP MOTOR

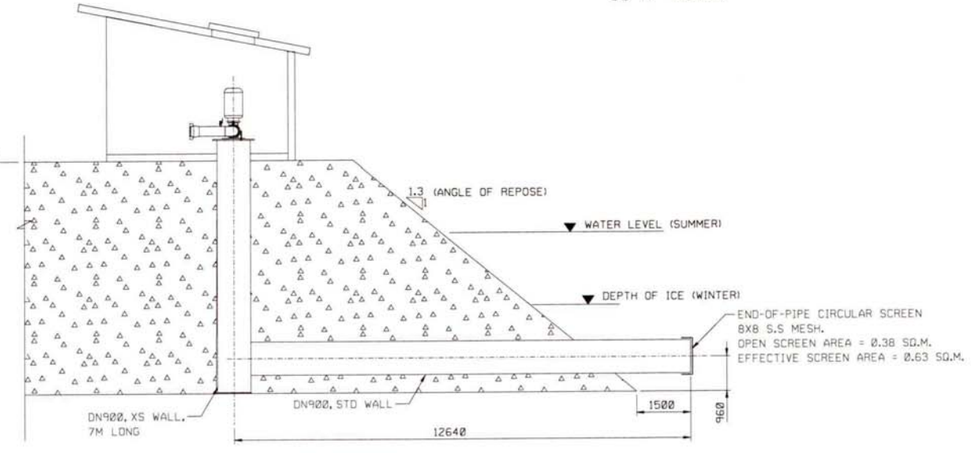


VELOCITIES BASED ON AVERAGE FLOW (50M3/HR):

A) AT SCREEN: 0.046 M/S
B) AT EDGE OF ROCKS:
1. WINTER CONDITIONS: 0.000125 M/S
2. SUMMER CONDITIONS: 0.000075 M/S

CAUSEWAY AND INTAKE WELL - SECTION B-B'

ALTERNATIVE 1



VELOCITY BASED ON AVERAGE FLOW (50M3/HR):

A) AT SCREEN: 0.037 M/S

CAUSEWAY AND INTAKE WELL - SECTION B-B'

ALTERNATIVE 2

FOR WATER LICENSE APPLICATION

DRAWING NO. 316996-SK-P-100

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK.	APPR.	DATE
P2	REVISED WITH CLIENT'S COMMENTS	JCP		23/11/24

REVISIONS

REV.	ISSUE FOR	AUTH. BY	DATE
P2	INFORMATION	JCP	23/11/24

ISSUE AUTHORIZATION

HATCH

DESIGNED BY: J.-C. PARADIS DATE: 23/11/24
DRAWN BY: J.-C. PARADIS DATE: 23/11/24
CHECKED BY: DATE:
DISCIPLINE ENG.: DATE:
PROJ. DES. COORD.: DATE:
PROJECT ENG.: DATE:
PROJECT MGR.: DATE:

TAHERA DIAMOND CORPORATION

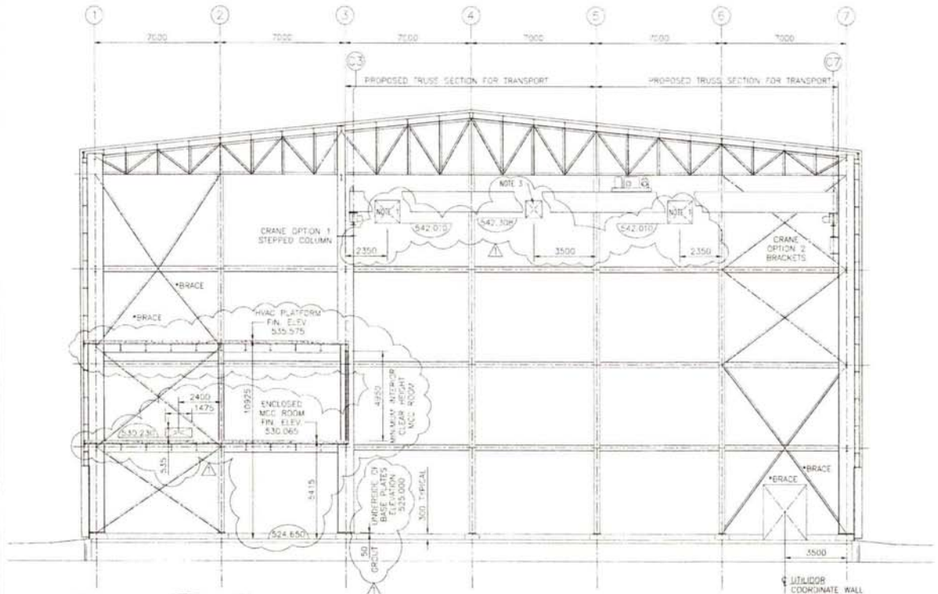
PROJECT TITLE: JERICHO DIAMOND PROJECT

CARAT LAKE WATER INTAKE
PLAN AND SECTIONS
FOR LICENSE APPLICATION

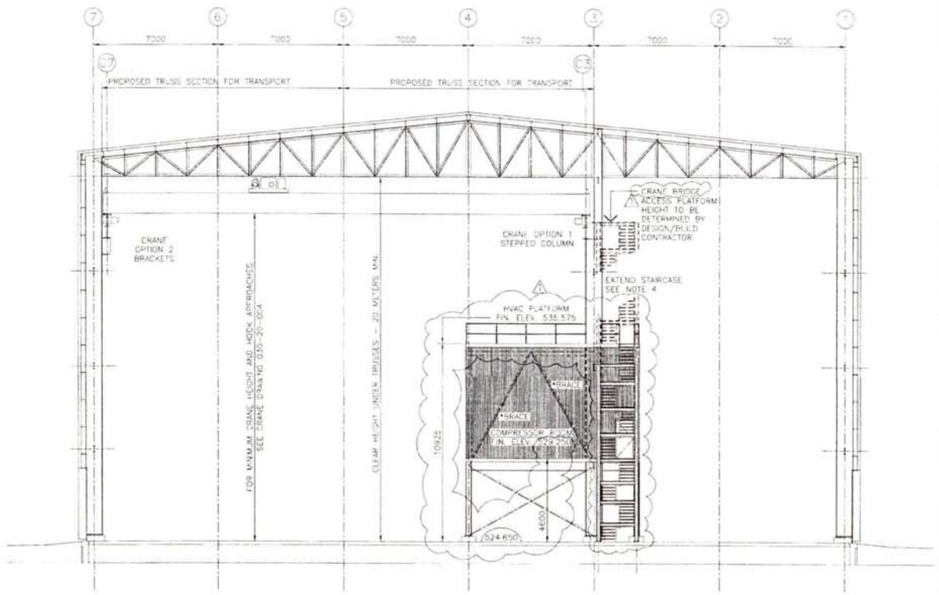
HA PROJECT NO.: 316996

SCALE: N.T.S.
DWG NO.: 316996-SK-P-1000
SHEET NO.:
REV.: P2

DWG NO 030-08-0002

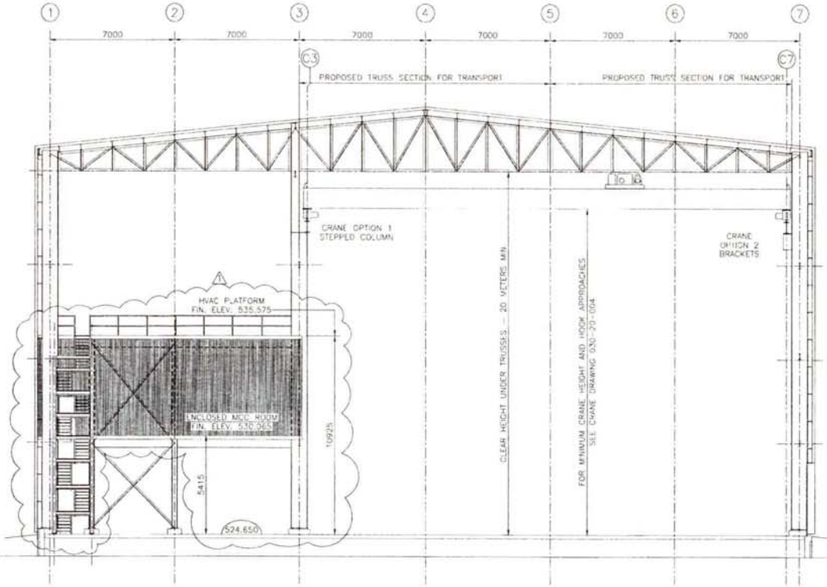


SECTION A–A / STRUCTURAL ELEVATION LINE A



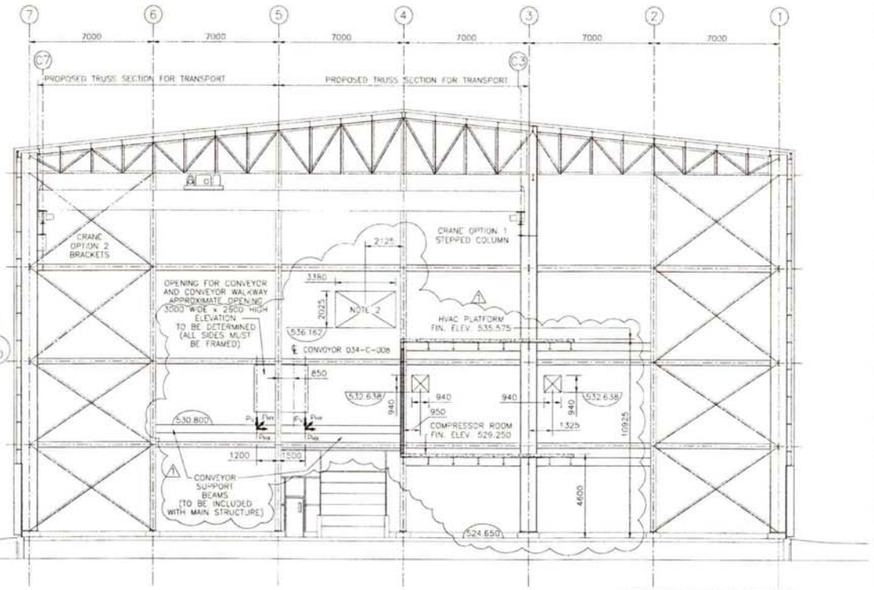
SECTION C–C / STRUCTURAL ELEVATION LINE G (INVERTED)

ACCESS TO EQUIPMENTS FROM OVERHEAD BRIDGE CRANE:
THE BRIDGE CRANE MUST BE SUPPLIED WITH A MAINTENANCE PLATFORM, CONTINUOUS ALONG THE WEST SIDE OF THE BRIDGE, POSITIONNED SO IT IS POSSIBLE TO ACCOMPLISH REGULAR MAINTENANCE TO THE 3 MECHANICAL VENTILATORS LOCATED NEAR THE UNDERSIDE OF THE TRUSSES ON STRUCTURAL ELEVATION LINE A. FURTHERMORE, THIS PLATFORM WILL ALSO BE USED TO DO MAINTENANCE ON THE HIGH BAY LIGHTING BETWEEN AXIS 3 AND 7.



SECTION B–B / STRUCTURAL ELEVATION LINE B

NOTE 5
PRELIMINARY TOTAL SERVICE REACTION FROM CONVETOR AND CONVEYOR GALLERY ON SUPPORT BEAM
Fv = 110 kN (2 LOCATIONS)
Fwx = +/- 15 kN (2 LOCATIONS)
Fwy = 15 kN ⊥ TO WALL (2 LOCATIONS)



SECTION D–D / STRUCTURAL ELEVATION LINE H (INVERTED)

A FOR Fv , Fwx AND Fwy VALUES, SEE NOTE 5 ON THIS DRAWING AND SPECIFICATION APPENDIX "C"

DRAWING MUST BE READ IN CONJUNCTION WITH SPEC 316996-PS-001
ALL NOTES ON DRAWING 030-08-003

NO.	DESCRIPTION	CHK. APPR.	DATE
1	MECH. OPENINGS ADDED/REVISED + CONVEYOR SUPPORT BEAM ADDED		2004-10-20
0	MCC & HVAC PLATFORM ELEV. REVISED/BOILER ROOM ADDED		

REVISIONS

REV.	ISSUE FOR	AUTH. BY	DATE
1	REVISED TENDER 316996-PS-001		
0	FOR TENDER 316996-PS-001		

ISSUE AUTHORIZATION

HATCH

TAHERA DIAMOND CORPORATION

PROJECT TITLE
JERICHO DIAMOND PROJECT

PROCESS PLANT BUILDING
INFORMATION FOR PRE-ENGINEERED DESIGN
BUILDING SECTIONS
NORTH–SOUTH SECTIONS A–A, B–B, C–C, D–D

DESIGNED BY	R. LEDUC
DATE	2004-09-23
CHECKED BY	M. PICOTTE
DATE	2004-09-23
PROJ. DES. COORD.	R. LEDUC
DATE	2004-09-23
PROJECT MGR	D.A.T. LAM
DATE	2004-09-23
DRAWN BY	R. LEDUC
DATE	2004-09-23
DISCIPLINE ENG.	M. PICOTTE
DATE	2004-09-23
PROJECT ENG.	M. CAMPANELLI
DATE	2004-09-23

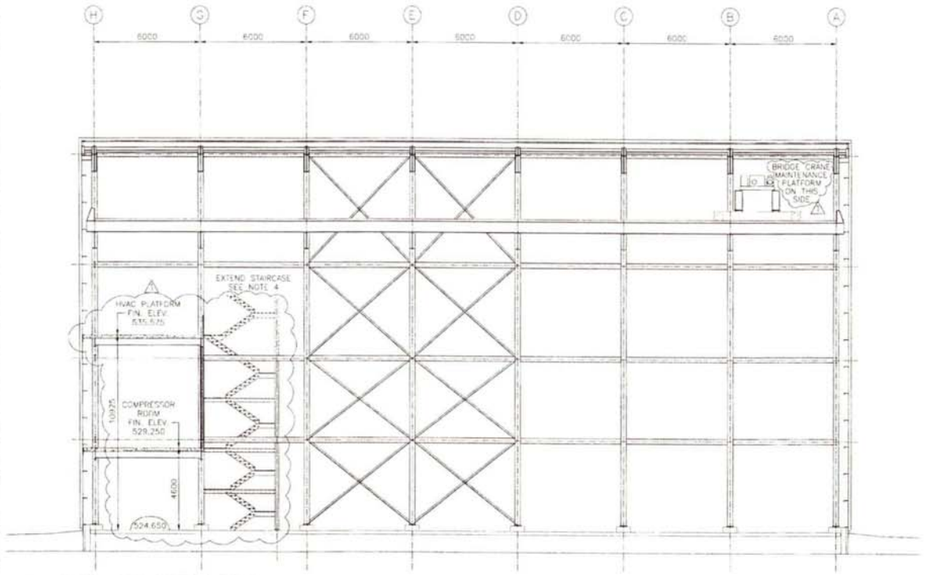
HA PROJECT NO. 316996
SCALE 1 : 100
DWG NO. 030-08-0002
SHEET NO. –
REV. 1

REFERENCE DRAWINGS

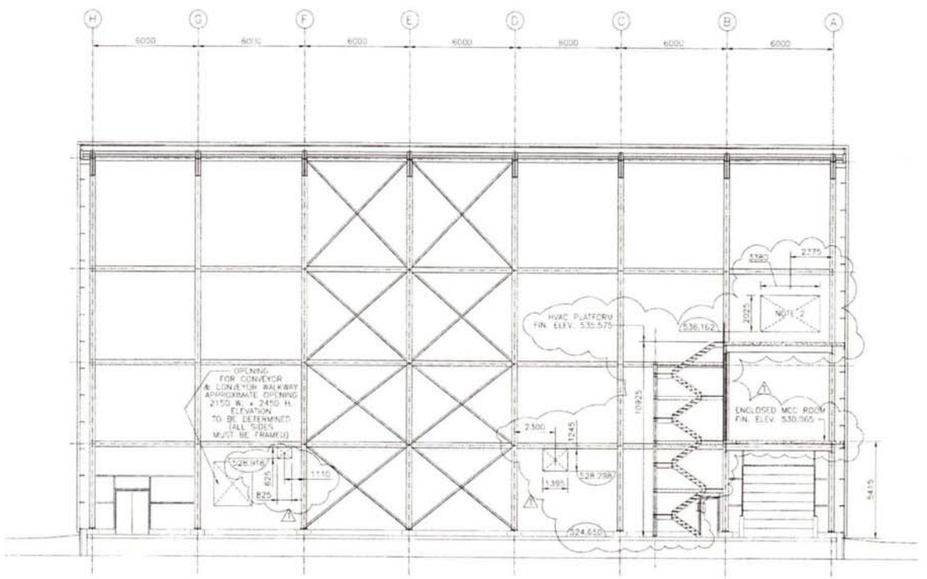
DRAWING NO.	DRAWING TITLE

STAMP
010
ORIGINAL SIGNE PAR RAYMOND POITTE NO. 24041 23/09/04

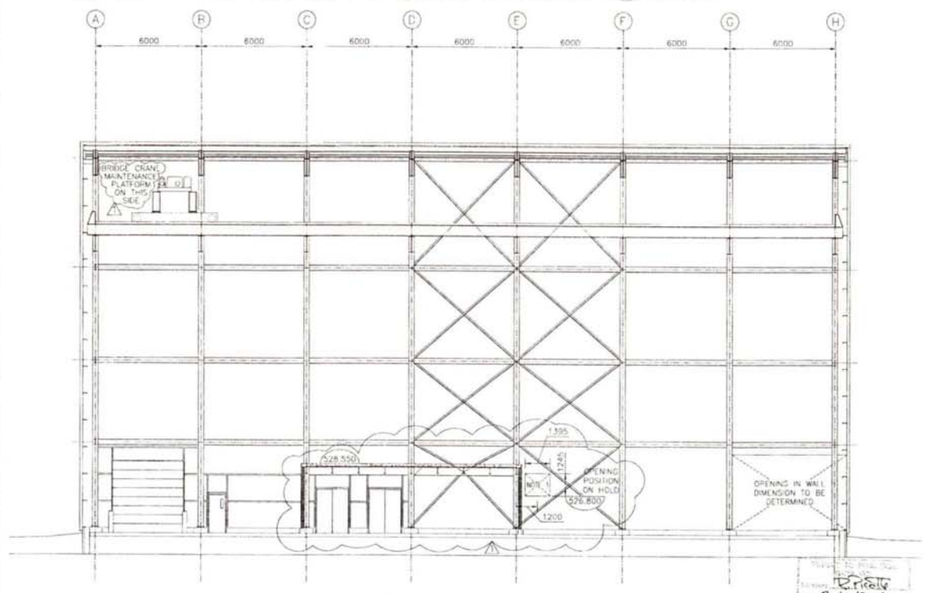
20/10/2004



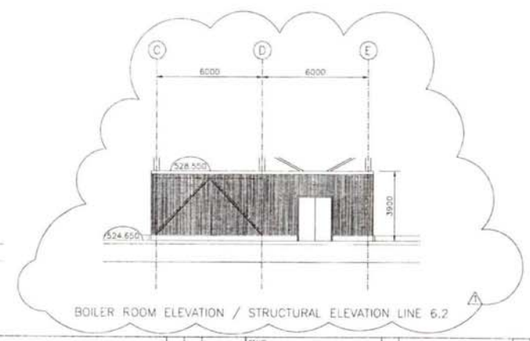
SECTION F-F / STRUCTURAL ELEVATION LINE 3



SECTION E-E / STRUCTURAL ELEVATION LINE 1



SECTION G-G / STRUCTURAL ELEVATION LINE 7 (INVERTED)



BOILER ROOM ELEVATION / STRUCTURAL ELEVATION LINE 6.2

DRAWING MUST BE READ IN CONJUNCTION WITH SPEC 316996-PS-001

NOTE 1
MECHANICAL OPENING FOR EXHAUST FAN
PROJECTED SIZE : (2345 WIDE x 2345 HIGH)
ELEVATION IN WALL TO BE CONFIRMED
COORDINATION OF VENTILATION OPENINGS
IS THE RESPONSABILITY OF CLARK BUILDERS
(4 REQUIRED WITH SNOW HOODS / SEE OTHER ELEVATIONS)

NOTE 2
MECHANICAL OPENING FOR AIR INTAKE
PROJECTED SIZE : (2340 WIDE x 2625 HIGH)
ELEVATION IN WALL TO BE CONFIRMED
COORDINATION OF VENTILATION OPENINGS
IS THE RESPONSABILITY OF CLARK BUILDERS
(2 REQUIRED WITH SNOW HOODS / SEE WEST ELEVATIONS)

NOTE 3
MECHANICAL OPENING FOR REVERSIBLE WALL VENTILATOR
PROJECTED SIZE : (2340 WIDE x 2520 HIGH)
ELEVATION IN WALL TO BE CONFIRMED (MAX 20000)
COORDINATION OF VENTILATION OPENINGS
IS THE RESPONSABILITY OF CLARK BUILDERS
(1 REQUIRED)

NOTE 4
COMPRESSOR ROOM STAIRCASE TO BE EXTENDED FROM HVAC PLATFORM TO A HIGHER PLATFORM FROM WHICH IT IS POSSIBLE TO ACCESS THE MAINTENANCE CATWALK BUILT INTO THE CRANE DESIGN.
CLARK BUILDERS IS RESPONSIBLE FOR COORDINATING SUPPLYING AND ERECTING THE EXTENSION OF THE STAIRCASE AND THE CRANE ACCESS PLATFORM

GENERAL NOTE ON BRACING CONFIGURATION AND LOCATION
BRACING TO BE DESIGNED FOR TENSION AND COMPRESSION IN ORDER TO REDUCE FOUNDATION LOAD
BRACING MARKED WITH AN ASTERISK (*) SHOULD BE DESIGNED AS ILLUSTRATED
DESIGN / BUILD CONTRACTOR IS RESPONSIBLE FOR FINAL COORDINATION BETWEEN HVAC DUCTWORK AND BRACING LOCATION

ACCESS TO EQUIPMENTS FROM OVERHEAD BRIDGE CRANE:
THE BRIDGE CRANE MUST BE SUPPLIED WITH A MAINTENANCE PLATFORM, CONTINUOUS ALONG THE WEST SIDE OF THE BRIDGE, POSITIONNED SO IT IS POSSIBLE TO ACCOMPLISH REGULAR MAINTENANCE TO THE 3 MECHANICAL VENTILATORS LOCATED NEAR THE UNDERSIDE OF THE TRUSSES ON STRUCTURAL ELEVATION LINE A. FURTHERMORE, THIS PLATFORM WILL ALSO BE USED TO DO MAINTENANCE ON THE HIGH BAY LIGHTING BETWEEN AXIS 3 AND 7.

NO	REVISION	DES	APPR	DATE
1	MECHANICAL OPENINGS ADDED AND REVISED + NOTES ADDS + MCC & HVAC PLATFORM ELEV. REVISED/BOILER ROOM ADDED			2004-10-20

NO	ISSUE FOR	AUTH. BY	DATE
1	REVISED TENDER 316996-PS-001		
0	FOR TENDER 316996-PS-001		

HATCH

TAHERA DIAMOND CORPORATION

PROJECT TITLE
JERICHO DIAMOND PROJECT

PROCESS PLANT BUILDING
INFORMATION FOR PRE-ENGINEERED DESIGN
BUILDING SECTIONS
EAST / WEST SECTIONS E-E, F-F, G-G

DESIGNED BY	R. LEDUC
DATE	2004-09-21
CHECKED BY	A. PICOTTE
DATE	2004-09-23
PROJ. DES. COORD.	R. LEDUC
DATE	2004-09-21
PROJECT MGR.	D.A.T. LAM
DATE	2004-09-22
DRAWN BY	P. JEAN
DATE	2004-09-21
DISCIPLINE ENG.	A. PICOTTE
DATE	2004-09-23
PROJECT ENG.	M. CAMPAGNOLO
DATE	2004-09-23

HA PROJECT NO. 316996

SCALE 1 : 100 | DWG NO. 030-08-0003 | SHEET NO. – | REV. 1

REFERENCE DRAWINGS

DRAWING NO. | DRAWING TITLE

STAMP: P.Q. ORIGINAL SIGNED FOR RAMON PICOTTE NO. 74041 23/09/04

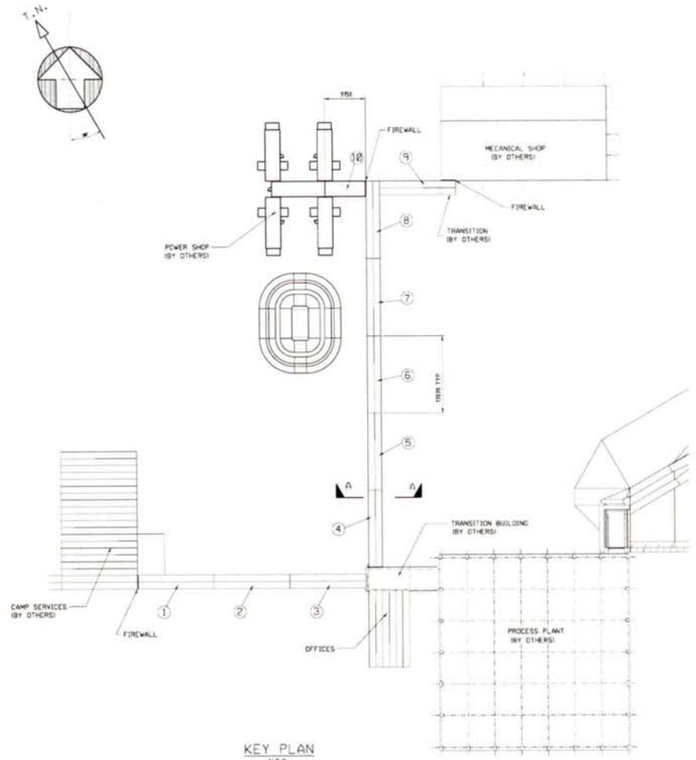
ISSUE AUTHORIZATION

Picotte 20/10/2004

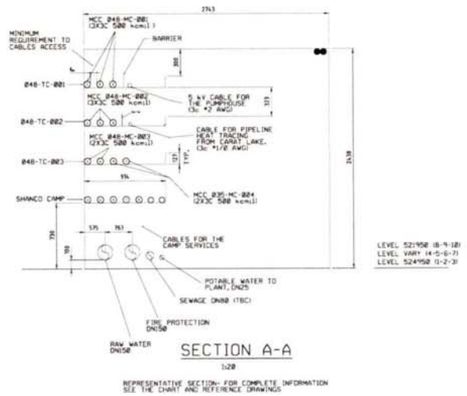
Picotte 20/10/2004

030-08-0003
SHEET NO. –

140-00-0001

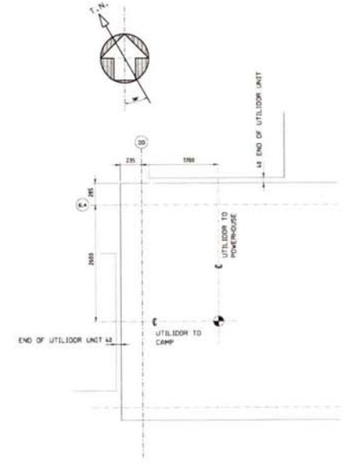


KEY PLAN
N.T.S.



SECTION A-A
1:20

REPRESENTATIVE SECTION- FOR COMPLETE INFORMATION SEE THE CHART AND REFERENCE DRAWINGS



TRANSITION BUILDING
N.T.S.

UTILIDOR SECTION PERFORMANCE SPECIFICATION

TRAILER	ELEVATION (METERS)	EXTERIOR DOOR WITH 610x610 (24in x 24in) WINDOW	WINDOWS	CABLE TRAYS	PIPE SUPPORTS	FIRE WALLS	NOTES
1	524.95	CENTERED ON SOUTH WALL	3 ON SOUTH WALL	1 ON NORTH WALL	NORTH WALL	AT WEST END	NOTE 1, 3 &7
2	524.95	CENTERED ON SOUTH WALL	2 ON SOUTH WALL	1 ON NORTH WALL	NORTH WALL		NOTE 2
3	524.95	CENTERED ON SOUTH WALL	3 ON SOUTH WALL	1 ON NORTH WALL	NORTH WALL		NOTE 3
4	SLOPED	NO	3 ON EAST WALL	4 ON WEST WALL	WEST WALL		
5	SLOPED	NO	3 ON EAST WALL	4 ON WEST WALL	WEST WALL		
6	SLOPED	CENTERED ON EAST WALL	2 ON EAST WALL	4 ON WEST WALL	WEST WALL		NOTE 3
7	SLOPED	NO	3 ON EAST WALL	4 ON WEST WALL	WEST WALL		
8	521.95	ON NORTH END WALL	3 ON EAST WALL	4 ON WEST WALL (PARTIAL)	WEST WALL		NOTE 4
9	521.95	NO	3 ON SOUTH WALL	1 ON NORTH WALL	NORTH WALL		NOTE 5
10	521.95	CENTERED ON SOUTH WALL	1 EACH / NORTH & SOUTH WALLS	NO	NO	AT EAST END	NOTE 3, 6 &7

NOTE 1- CABLE TRAYS AND PIPING DIP UNDER INTO CAMP UTILIDOR (COORDINATION BY SHANCO)

NOTE 2- DOOR LEADS INTO STORAGE STRUCTURE / PROVIDE STAIR (STORAGE STRUCTURE EXISTING ON SITE TO BE RELOCATED DURING CONSTRUCTION)

NOTE 3- DOOR FOR EXIT / PROVIDE PREFABRICATED METAL STAIR TO GRADE, WITH HANDRAILS

NOTE 4- OPENING IN WEST WALL FOR 3 CABLES TRAYS / PIPING UNDER FLOOR (SEE REFERENCE DRAWINGS

NOTE 5- 20 FT TRANSITION WITH STAIRS TO BE BUILT ON SITE BY CLARK BUILDERS

NOTE 6- PROVIDE OPENING FOR AIR INTAKE FROM ELECTRICAL ROOM

NOTE 7- FIREWALL SHALL BE CONSTRUCTED OF 2-5/8 INCH TYPE X PLASTER BOARD ON EITHER SIDE OF A MINERAL WOOL INSULATED WOOD STUD WALL.

NOTE 8- FOR COMPLETE CABLE TRAY AND PIPE SUPPORT LAYOUT AND INFORMATION SEE REFERENCE DRAWINGS #140-03-2001, 140-04-2001 & 0002

NOTE 9- ALL DIMENSIONS IN MM UNLESS OTHERWISE INDICATED.

140-01-0002	UTILIDORS PIPING SERVICES SCHEMATIC
140-01-2001	UTILIDORS PIPING ISOMETRIC VIEWS
140-01-2201	TYPICAL UTILIDOR CABLE TRAYS

DRAWING NO. | DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	INIT. APPR.	DATE
1	DETAIL TRANSITION BUILDING		

REVISIONS

NOTICE: ORIGINAL SIGNED BY J.-C. PARADIS P.Eng. 1596 01/26/05

PERMIT TO PRACTICE HATCH LTD. ORIGINAL SIGNED BY SAMUEL BOMA 01/26/05 PERMIT NUMBER: P512

NO.	DESCRIPTION	INIT.	DATE
A	FOR CONSTRUCTION (A-560)	J.G.	2004-12-20
B	FOR CONSTRUCTION (A-560)	J.G.	2004-12-20
C	LAM		26-01-2005

ISSUE AUTHORIZATION

HATCH

DESIGNED BY R. HILDEBRAND	DRAWN BY J. G. & C.L.	DATE 20-12-2004
CHECKED BY R. HILDEBRAND	ENGINEERING APPR. J.-C. PARADIS	DATE 26-01-2005
APPROVED BY J.C. PARADIS	PROJECT APPR. M. CAMPANELLI	DATE 26-01-2005
AUTHORIZED BY C. LAM		DATE 26-01-2005

TAHERA DIAMOND CORPORATION

PROJECT TITLE: JERICHO DIAMOND PROJECT

UTILIDORS
GENERAL ARRANGEMENT
PLAN AND SECTIONS

H PROJECT NO. 316996

SCALE	DWG. NO.	SHEET NO.	REV.
1:50	140-00-0001		A

GENERAL NOTES - CONCRETE

1.0 GENERAL

1.1 ALL CONCRETE SHALL BE DESIGNED AND PLACED IN ACCORDANCE TO THE LATEST EDITIONS OF CAN/CSA A23.1, A23.2, AND A23.3; THE NBC; THE STANDARDS OF THE CLIENT; AND THE PROJECT CONTRACT SPECIFICATIONS UNLESS STATED OTHERWISE ON THE DRAWINGS.

1.2 THE CONTRACTOR SHALL, BEFORE THE START OF THE WORK, FIELD VERIFY ALL THE EXISTING ELEVATIONS AND DIMENSIONS. INFORM THE ENGINEER OF ALL DISCREPANCIES.

1.3 THE CONTRACTOR SHALL, AT HIS COST, DISPLACE ALL OBSTACLES WHICH INTERFERE WITH THE WORK AND REPLACE THEM TO THEIR ORIGINAL STATE AND TO THE SATISFACTION OF THE CLIENT AT THE END OF THE WORK.

1.4 DO NOT SCALE DIMENSIONS FROM THE DRAWINGS.

2.0 EXCAVATION AND BACKFILL

2.1 THE GEOTECHNICAL INFORMATION SHALL BE FOUND IN PROCESS PLANT, GEOTECHNICAL REPORT, JERICHO DIAMOND PROJECT, NWL PROJECT No.1100006Z, JANUARY 2005 FROM EBA ENGINEERING CONSULTANTS LTD. ALL EXCAVATION AND BACKFILL WORK SHALL COMPLY TO THIS REPORT AND TO THE INSTRUCTIONS GIVEN ON SITE BY THE GEOTECHNICAL OWNER REPRESENTATIVE.

2.2 THE CONTRACTOR SHALL VERIFY THE PRESENCE AND LOCATIONS OF ANY EXISTING OPENINGS AND UNDERGROUND SERVICES AND PROVIDE ADEQUATE PROTECTION DURING THE COURSE OF THE WORK.

2.3 THE CONTRACTOR SHALL, AT ALL TIMES, MAINTAIN THE EXCAVATIONS DRY AND FREE OF FOREIGN MATERIAL.

2.4 EXCAVATION WORK MUST BE EXECUTED SO THAT ALL FOOTINGS REST ON A LEVEL SURFACE. CARE MUST BE TAKEN NOT TO CREATE POCKETS WHERE WATER CAN ACCUMULATE. USE TRENCHES OR SLOPE THE GROUND TO ALLOW WATER TO DRAIN FREELY, AWAY FROM BUILDING FOUNDATION.

2.5 UNLESS NOTED OTHERWISE, THE FOUNDATIONS MUST BE POURED DIRECTLY ON SOUND ROCK.

2.6 THE ALLOWABLE BEARING PRESSURE AT THE BASE OF THE FOUNDATIONS SHALL BE 5000 KPA.

2.7 WHERE ROCK AT THE MINIMUM ELEVATION SHOWN ON DRAWING IS UNSUITABLE FOR FOUNDATIONS, THE GEOTECHNICAL OWNER REPRESENTATIVE SHOULD IN WRITING ADVISE THE OWNER AND THE DESIGN ENGINEER OF THE EXISTING CONDITION. NO CONSTRUCTION WORK SHOULD PROCEED IN THE CORRESPONDING AREA UNTIL A WRITTEN CONFIRMATION IS RELEASED FROM THE DESIGN ENGINEER.

3.0 MATERIALS

3.1 THE PORTLAND CEMENT SHALL CONFORM TO THE LATEST EDITION OF CAN/CSA-A5.

3.2 WATER SHALL BE NATURAL POTABLE WATER CLEAR AND FREE FROM ANY DELETERIOUS SUBSTANCE AND SHALL CONFORM TO THE LATEST EDITION OF CAN/CSA A23.1.

3.3 AIR ENTRAINMENT AGENTS SHALL BE "DARAX AEA" MANUFACTURED BY W.R. GRACE LTD. OR APPROVED EQUIVALENT AND SHALL CONFORM TO THE LATEST EDITION OF ASTM C260 OR EQUIVALENT.

3.4 CHEMICAL ADDITIVES SHALL BE "SUPER PLASTICIZER WRA 20" MANUFACTURED BY W.R. GRACE LTD. OR APPROVED EQUIVALENT AND SHALL CONFORM TO THE LATEST EDITION OF ASTM C494.

3.5 DEFORMED REINFORCING BARS SHALL CONFORMED TO THE LATEST EDITION OF CAN/CSA G30.18, GRADE 400R U.N.O.

3.6 WELD WIRE FABRIC SHALL CONFORM TO THE LATEST EDITION OF CAN/CSA G30.5. SUPPLY IN FLAT SHEETS ONLY.

3.7 ALL CONCRETE SHALL BE CLASS F-2 EXPOSURE.

3.8 THE COMPRESSIVE STRENGTH OF THE CONCRETE SHALL BE 25 MPA AT 28 DAYS WITH 4 TO 7% OF AIR ENTRAINED.

3.9 LEAN CONCRETE SHALL BE 15 MPA AT 28 DAYS.

3.10 CHEMICAL CURING AGENTS SHALL BE A TRANSLUCENT TYPE CONTAINING A TEMPORARY DYE CONFORMING TO THE LATEST EDITION OF ASTM C309. CHEMICAL CURING AGENTS SHALL ONLY BE USED WITH THE APPROVAL OF THE ENGINEER.

3.11 ANCHOR BOLTS SHALL CONFORM TO THE LATEST EDITION OF ACNOR G30.18, GRADE 400W UNLESS NOTED OTHERWISE ON THE DRAWINGS. ANCHOR BOLTS SHALL BE SUPPLIED WITH HARDENED FLAT WASHERS AND WITH DOUBLE NUTS GRADE C CONFORM TO THE LATEST EDITION OF ASTM A563.

3.12 SURFACE HARDENER SHALL BE A NON-METALLIC HARDENER LIKE "EMERICRETE" MANUFACTURED BY "STERNSON" OR APPROVED EQUIVALENT.

3.13 ROCK ANCHORS SHALL BE 25mm DIAMETER CSA G30.18M GRADE 400R UNCOATED REBAR OR APPROUVED EQUIVALENT, WITH ARTIC GROUT 100 OR SIKA DEPENDING ON ROCK TEMPERATURE (SEE CONCRETE SPECIFICATIONS).

4.0 EXECUTION

4.1 ROCK ANCHORS SHALL BE TESTED AS DESCRIBED IN SOIL REPORT UNDER THE SUPERVISION OF THE GEOTECHNICAL OWNER REPRESENTATIVE.

4.2 BEFORE PLACING THE CONCRETE, THE CONTRACTOR SHALL CLEAN THE FORMWORK AND REMOVE ALL FOREIGN MATERIAL.

4.3 THE CONTRACTOR MUST OBTAIN AUTHORIZATION TO POUR FROM THE OWNER'S REPRESENTATIVE AFTER ALL THE REINFORCING STEEL, ANCHOR BOLTS, EMBEDDED PLATES AND SLEEVES HAVE BEEN ADEQUATELY INSTALLED AND APPROVED BY THE ENGINEER OR OWNER'S REPRESENTATIVE.

4.4 ALL CORNERS SHALL HAVE A 20 CHAMFER.

4.5 COVER FOR THE REINFORCING STEEL SHALL CONFORM TO THE LATEST EDITIONS OF CAN/CSA A23.3.

CONCRETE CAST AGAINST THE EARTH: 75 MM
CONCRETE EXPOSED TO EARTH AND WEATHER
- SLABS AND WALLS (20M AND SMALLER): 30 MM
- BEAMS AND COLUMNS (35M AND SMALLER):
  - PRINCIPAL REINFORCEMENT (35M AND SMALLER): 50 MM
  - TIES, STIRRUPS AND SPIRALS: 40 MM
- FOR BARS WITH A DIAMETER db LARGER THAN LISTED ABOVE, THE COVER SHALL BE AT LEAST 1.5 db.

CONCRETE NOT EXPOSED TO EARTH AND WEATHER
- SLABS AND WALLS (20M AND SMALLER): 20 MM
- BEAMS AND COLUMNS (35M AND SMALLER):
  - PRINCIPAL REINFORCEMENT (35M AND SMALLER): 40 MM
  - TIES, STIRRUPS AND SPIRALS: 30 MM
- FOR BARS WITH A DIAMETER db LARGER THAN LISTED ABOVE, THE COVER SHALL BE AT LEAST 1.0 db.

4.6 THE CONTRACTOR SHALL SUPPLY AND INSTALL THE ANCHOR BOLTS AS SHOWN ON THE DRAWINGS.

4.7 ALL EXPOSED ANCHOR BOLT SURFACES, INCLUDING WASHERS AND NUTS, MUST BE GALVANIZED WITH 600 g/m² OF ZINC ACCORDING TO CAN/CSA-G164 STANDARD.

4.8 ALL ANCHOR BOLT GROUPS SHALL BE SUPPORTED AND SET USING A TEMPLATE WITH THE EMBEDDED ENDS SECURELY TIED TO PREVENT DISPLACEMENT DURING PLACEMENT OF THE CONCRETE. FIELD TACK WELDING OF REINFORCING, PIPE SLEEVES, ETC. TO ANCHOR BOLTS IS PROHIBITED.

4.9 THE CONTRACTOR SHALL INSTALL THE ANCHOR BOLTS AT THE ELEVATIONS INDICATED ON THE DRAWINGS AND PERFECTLY VERTICAL.

4.10 ROCK ANCHORS SHALL BE INSTALLED WITHIN 75 mm OF THE PLAN LOCATION SHOWN ON THE DRAWINGS.

5.0 CURING

5.1 THE CONCRETE SHALL BE ADEQUATELY CURED FOR A MINIMUM PERIOD OF 7 DAYS. CURING SHALL COMMENCE AS SOON AS POSSIBLE AFTER THE CONCRETE HAS SET SUFFICIENTLY, NORMALLY 4 HOURS AFTER THE END OF CONCRETING OPERATIONS.

5.2 CURING OF THE CONCRETE SHALL BE CONDUCTED WITH WATER AND BURLAP, MAINTAINED CONTINUALLY WET. THE USE OF A CHEMICAL CURING AGENT IS PROHIBITED.

6.0 SLAB FINISHES

6.1 THE SURFACE FINISH OF THE CONCRETE SLABS SHALL BE EXECUTED WITH A STEEL TROWEL TO OBTAIN A SMOOTH CLASS 'A' SURFACE AS SPECIFIED BY TABLE 16 OF THE LATEST EDITION OF THE STANDARD A23.1

6.2 APPLY 5 kg/m² OF SURFACE HARDENER ON ALL SLAB WHERE HEAVY TRAFFIC IS EXPECTED.

7.0 SHOP DRAWINGS

7.1 BAR LISTS, BENDING DETAILS, AND REINFORCING STEEL PLACEMENT DRAWINGS SHALL BE SUBMITTED FOR APPROVAL PRIOR TO FABRICATION OF THE REINFORCING STEEL.

8.0 DEVELOPMENT LENGTHS AND SPLICES

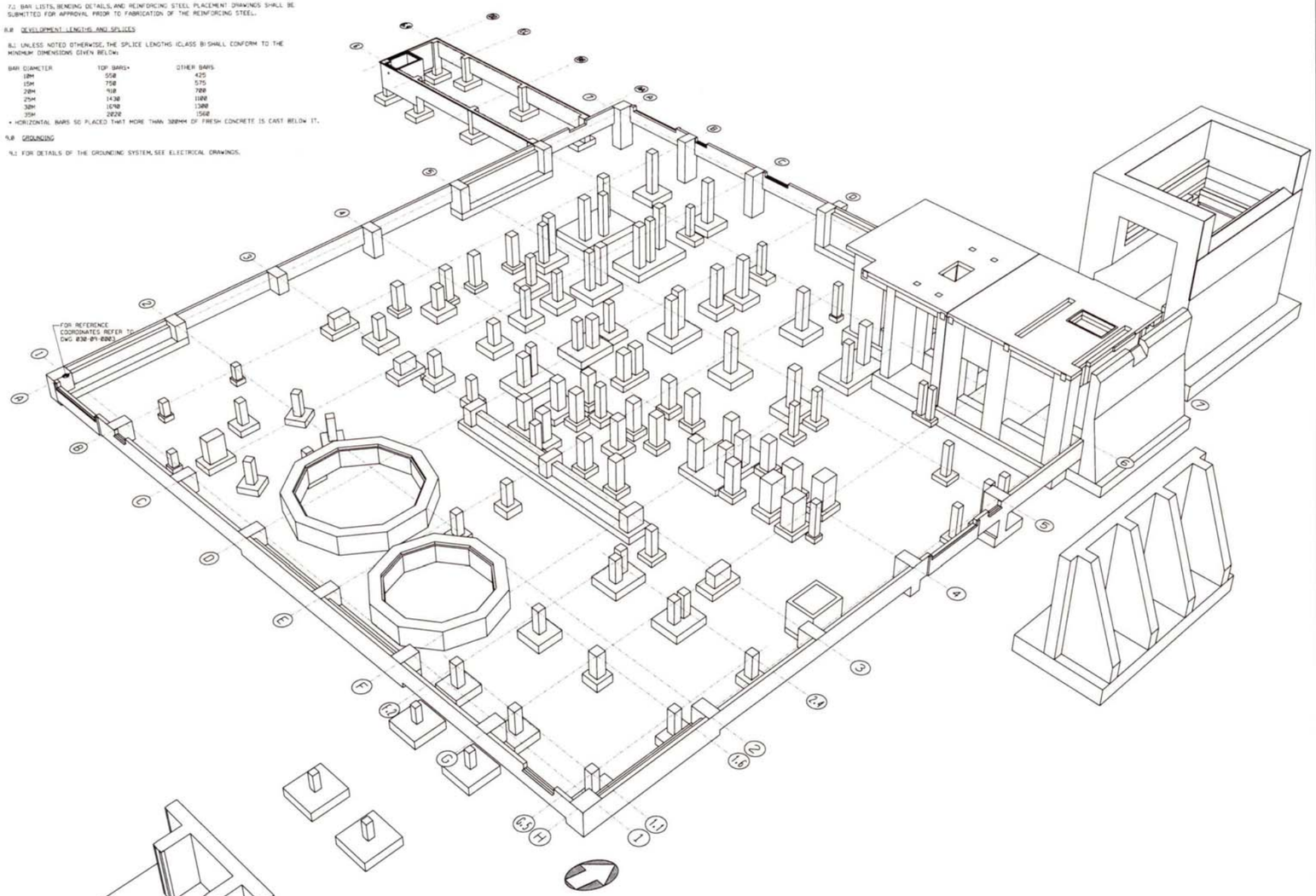
8.1 UNLESS NOTED OTHERWISE, THE SPLICE LENGTHS (CLASS B) SHALL CONFORM TO THE MINIMUM DIMENSIONS GIVEN BELOW:

BAR DIAMETER	TOP BARS*	OTHER BARS
10M	550	425
15M	750	575
20M	910	700
25M	1430	1100
30M	1690	1300
35M	2020	1560

* HORIZONTAL BARS SO PLACED THAT MORE THAN 300MM OF FRESH CONCRETE IS CAST BELOW IT.

9.0 GROUNDING

9.1 FOR DETAILS OF THE GROUNDING SYSTEM, SEE ELECTRICAL DRAWINGS.



PERSPECTIVE VIEW LOOKING NORTH-WEST
NOT TO SCALE

NO.	DESCRIPTION	BY	APP'D	DATE
3	ISSUE UPDATE			
2	ISSUE UPDATE & NOTE ADDED	M.L.	R.P.	02-06-05
1	ISSUE UPDATE	R.P.		02-17-05

REVISIONS

NAME
ORIGINAL SIGNED BY
RAYMOND PICOTTE
P.Eng.
L1540
02/28/05

REV.	ISSUE DESCRIPTION	DATE
3	ISSUED FOR CONSTRUCTION (NOTE ADDED)	02-28-05
2	ISSUED FOR CONSTRUCTION (REVISED)	02-28-05
1	ISSUED FOR CONSTRUCTION (REVISED)	02-17-05
0	ISSUED FOR CONSTRUCTION	02-08-05

ISSUE AUTHORIZATION

PERMIT TO PRACTICE
HATCH LTD.
ORIGINAL SIGNED BY
RAYMOND PICOTTE
02/08/05
PERMIT NUMBER: P512
The Association of Professional Engineers, Geologists and Geophysicists of Alberta

DESIGNED BY	DRAWN BY
R. PICOTTE	M. LAFLEUR
DATE: 02-08-05	DATE: 02-08-05
CHECKED BY	CHECKED BY
M. LAFLEUR	R. PICOTTE
DATE: 02-08-05	DATE: 02-08-05
APPROVED BY	APPROVED BY
M. LAFLEUR	M. CAMPANELLI
DATE: 02-08-05	DATE: 02-08-05
Q.A.	
DATE: 02-08-05	

HATCH

TAHERA DIAMOND CORPORATION

PROJECT NAME: JERICHO DIAMOND PROJECT

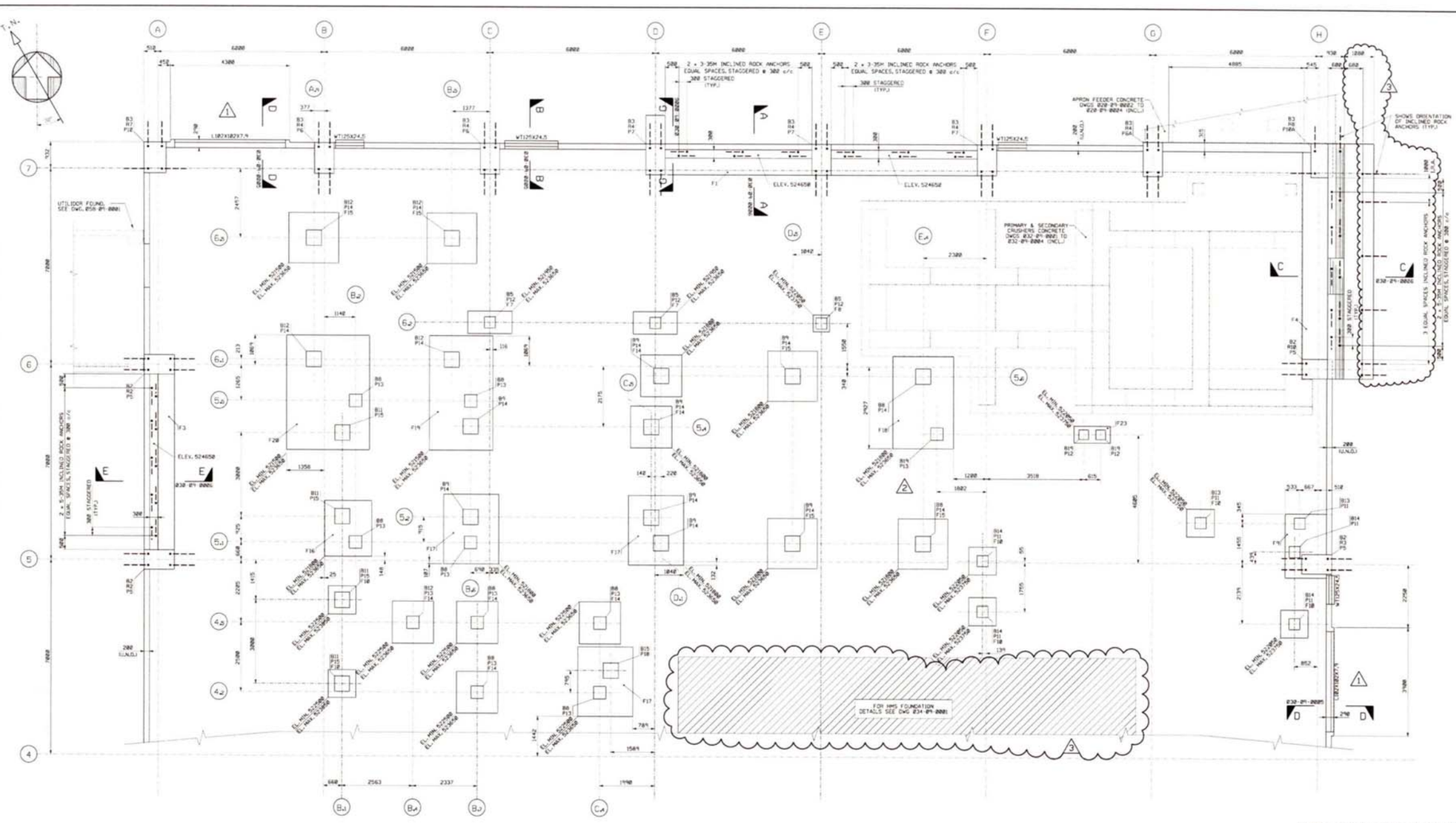
PROCESS BUILDING
CONCRETE FOUNDATIONS
GENERAL NOTES & PERSPECTIVE VIEW

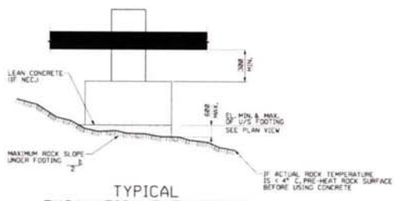
HATCH JOB No.: 316996

SCALE	UNIT	SHEET No.	REV.
N.T.S.	030-09-0001		/3

DRAWING No.	TITLE	REFERENCE DRAWINGS
030-09-0010	CONCRETE SLAB - PERSPECTIVE VIEW	
030-09-0011	MISCELLANEOUS DETAILS - SHEET 1 OF 2	
030-09-0012	MISCELLANEOUS DETAILS - SHEET 2 OF 2	
030-09-0020	CONCRETE SLAB - PLAN VIEW - SHEET 1 OF 2	
030-09-0021	CONCRETE SLAB - PLAN VIEW - SHEET 2 OF 2	050-01-0001 SITE WORK - EXCAVATION - PLAN, SECTIONS & DETAILS
030-09-0022	RETAINING WALL & DETAILS - SHEET 1 OF 2	210-01-0001 CONCRETION & ALLIED - FOUNDATIONS - PLAN & SECTIONS & DETAILS
030-09-0023	RETAINING WALL & DETAILS - SHEET 2 OF 2	220-01-0001 MASONRY - FOUNDATIONS - PLAN & SECTIONS
030-09-0030	SLAB ELEVATIONS & DETAILS - SHEET 1 OF 2	230-01-0001 HEAVY MILLWORK ELEVATIONS, SECTIONS AND DETAILS
030-09-0031	SLAB ELEVATIONS & DETAILS - SHEET 2 OF 2	230-01-0002 HEAVY MILLWORK ELEVATIONS, SECTIONS AND DETAILS
030-09-0040	WALL ELEVATIONS	230-01-0003 HEAVY MILLWORK ELEVATIONS, SECTIONS AND DETAILS
030-09-0050	CONCRETE FOUNDATIONS - PLAN & DETAILS	230-01-0004 HEAVY MILLWORK ELEVATIONS, SECTIONS AND DETAILS
030-09-0051	CONCRETE FOUNDATIONS - PLAN VIEW - SHEET 1 OF 2	230-01-0005 HEAVY MILLWORK ELEVATIONS, SECTIONS AND DETAILS
030-09-0052	CONCRETE FOUNDATIONS - PLAN VIEW - SHEET 2 OF 2	270-01-0001 PRIMARY & SECONDARY FRAMING - PLAN & SECTIONS
030-09-0053	CONCRETE FOUNDATIONS - PLAN VIEW - SHEET 3 OF 3	270-01-0002 PRIMARY & SECONDARY FRAMING - PLAN & SECTIONS
DRAWING No.	TITLE	REFERENCE DRAWINGS

030-09-0002





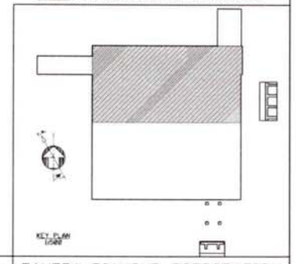
TYPICAL
EXCAVATION ELEVATIONS
NOT TO SCALE

PLAN VIEW PROCESS BUILDING FOUNDATIONS
1:50

FOR ANCHOR BOLTS (B) / ROCK ANCHORS (R) / PILASTER (P) / FOOTING (F) TABLES REFER TO DWG 030-09-0004

FOR ALL DOOR FRAMES USE 2-20 DIA. HILTI BOLTS

NOTES: 1. FOR GENERAL NOTES REFER TO DWG 030-09-0001



PERMIT TO PRACTICE
HATCH LTD.
ORIGINAL SIGNED BY
RAYMOND PICOTTE
02/09/05
PERMIT NUMBER: P512
The Association of Professional Engineers of Ontario

NAME/SIG.	
ORIGINAL SIGNED BY	3
JOSEPH LAPKO P.Eng. L1572 03/08/05	
NAME/SIG.	
ORIGINAL SIGNED BY	2
JOSEPH LAPKO P.Eng. L1572 02/28/05	
NAME/SIG.	
ORIGINAL SIGNED BY	1
HOSSEIN KHALILI P.Eng. L1545 02/17/05	

NAME/SIG.
ORIGINAL SIGNED BY
HOSSEIN KHALILI P.Eng. L1545 02/08/05
NAME/SIG.
ORIGINAL SIGNED BY
JOSEPH LAPKO P.Eng. L1572 02/08/05

030-09-2201 SITE ARTERIOR DRAWING
DRAWING NO. DRAWING TITLE
REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK.	APPR.	DATE
3	WALL & FOOTING MODIFIED	M.L.	J.L.	03-08-05
2	2-3-35H INCLINED ROCK ANCHORS ADDED	M.L.	J.L.	02-28-05
1	WALL FOOTING & BENCHED & PILASTER ADDED	M.L.	J.L.	02-17-05

REVISIONS

ISSUE AUTHORIZATION			
3	ISSUED FOR	M.L.	03-08-05
2	ISSUED FOR	M.L.	02-28-05
1	ISSUED FOR	M.L.	02-17-05
NO.	ISSUE FOR	ACTING BY	DATE

HATCH

DESIGNED BY A.J./M.K./J.L.	DRAWN BY L.L. / K.D.	02-08-05
CHECKED BY M. LAFLEUR	02-08-05	N. PICOTTE 02-08-05
DETAILED BY M. KHALILI	02-08-05	CHECKED BY M. CAMPANELLI 02-08-05
PROJ. MGR. D. LOW	02-08-05	

TAHERA DIAMOND CORPORATION

JERICHO DIAMOND PROJECT

PROCESS BUILDING
CONCRETE FOUNDATIONS
PLAN VIEW
SHEET 1 OF 2

316996

SCALE	DWG. NO.	REV.
1:50 U.N.O.	030-09-2002	3

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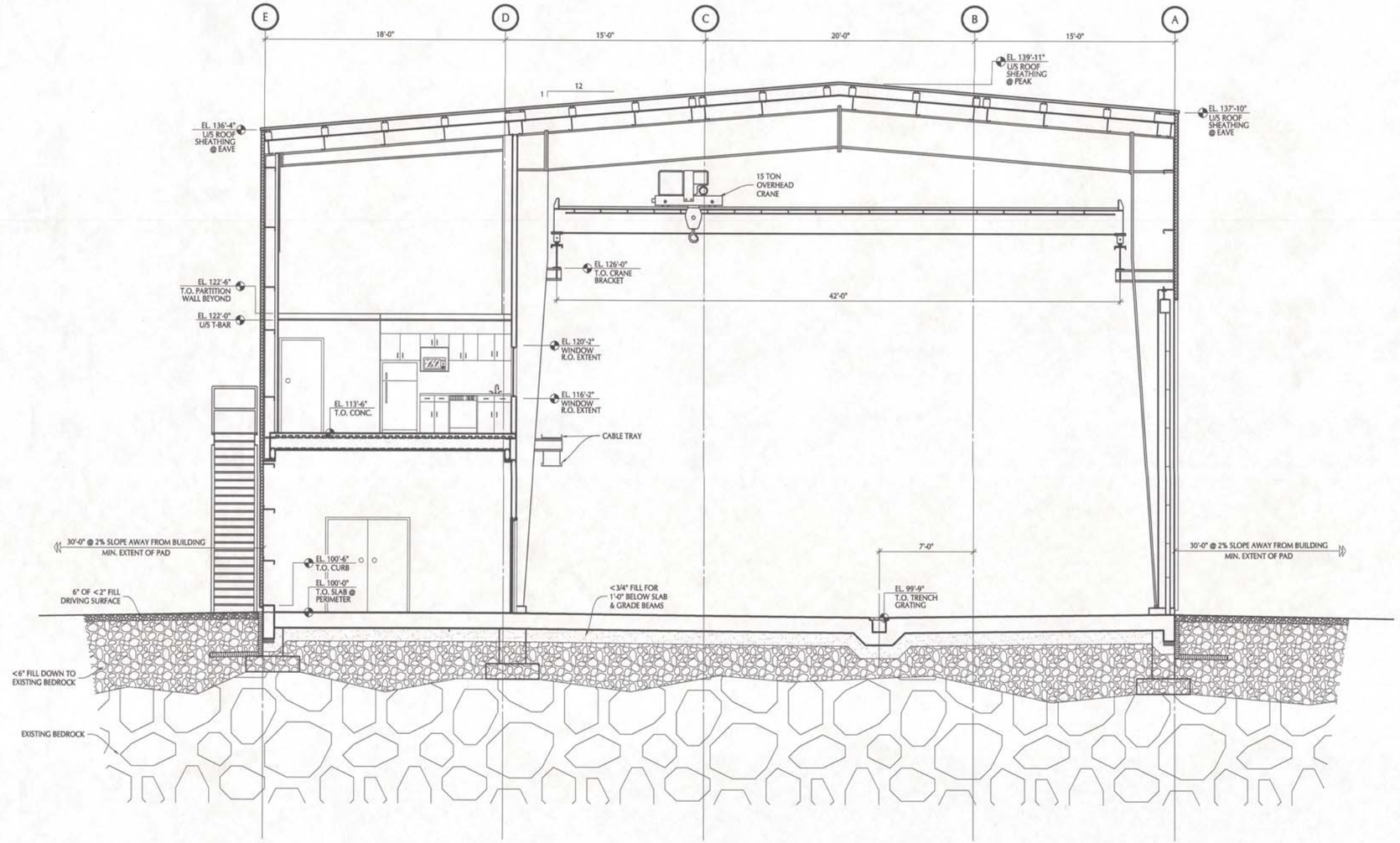

AA SECTION A2.01
1/4" = 1'-0"

WALTERS CHAMBERS
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PROGRESS PLOT: MONTH, DAY, YEAR

No.	Date	Subject
-	JAN. 14/2005	ISSUED FOR BUILDING CODE REVIEW

Drawing Issue

Seals

Project

JERICHO
WORKSHOP

TAHERA, NUNAVUT

Title

BUILDING
SECTION

Scale	AS NOTED
Date	NOV. 25, 2004
Drawn By	CH
Checked By	DC
Designed By	HR
Job Number	04-2990

Drawing No.

A4.01

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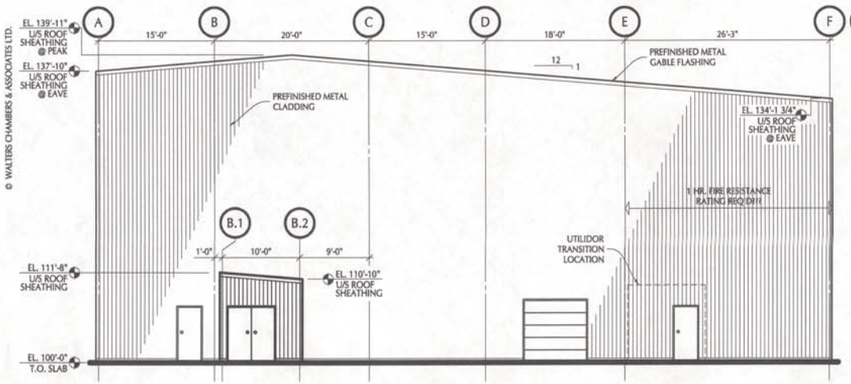
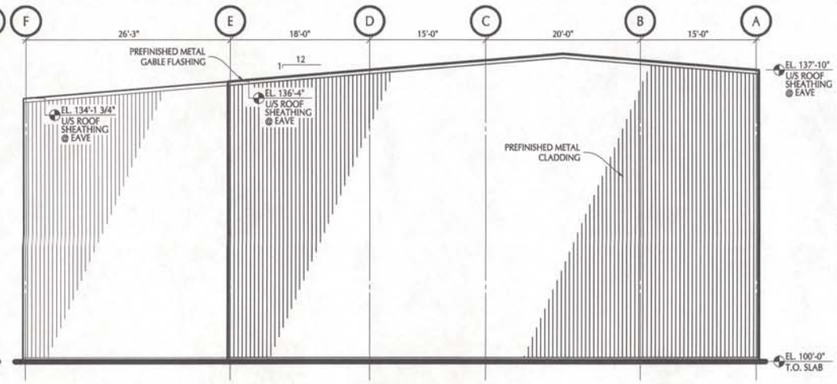
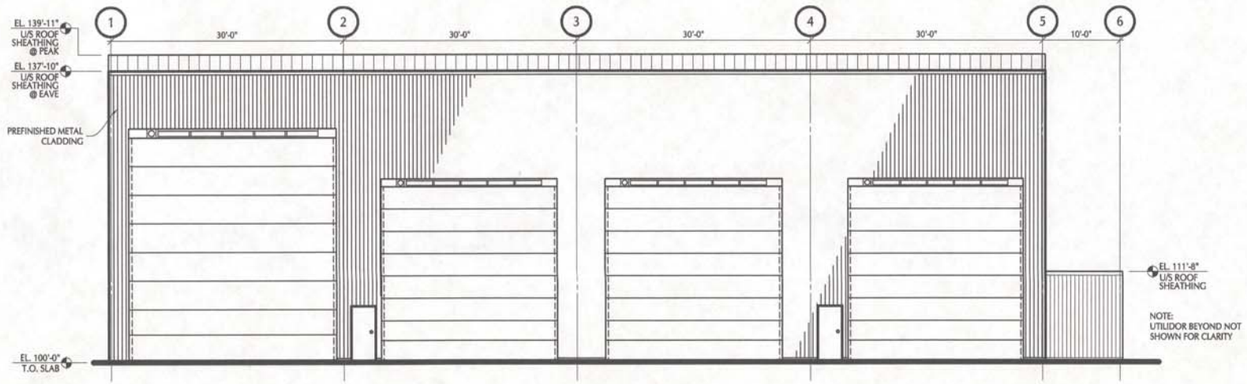


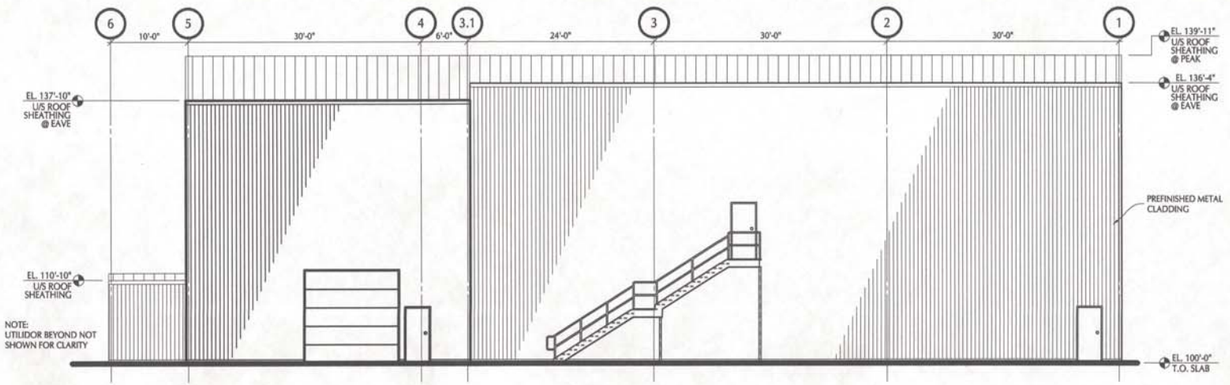
WEST ELEVATION
1/8" = 1'-0"



EAST ELEVATION
1/8" = 1'-0"



NORTH ELEVATION
1/8" = 1'-0"



SOUTH ELEVATION
1/8" = 1'-0"

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fax (780) 423-3735

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PROGRESS PLOT: MONTH, DAY, YEAR

No.	Date	Subject
-	JAN. 14/2005	ISSUED FOR BUILDING CODE REVIEW

Drawing Issue

Seals

Project

JERICHO
WORKSHOP

TAHERA, NUNAVUT

Title

ELEVATIONS

Scale	AS NOTED
Date	NOV. 25, 2004
Drawn By	CH
Checked By	DC
Designed By	HR
Job Number	04-2990

Drawing No.

A3.01

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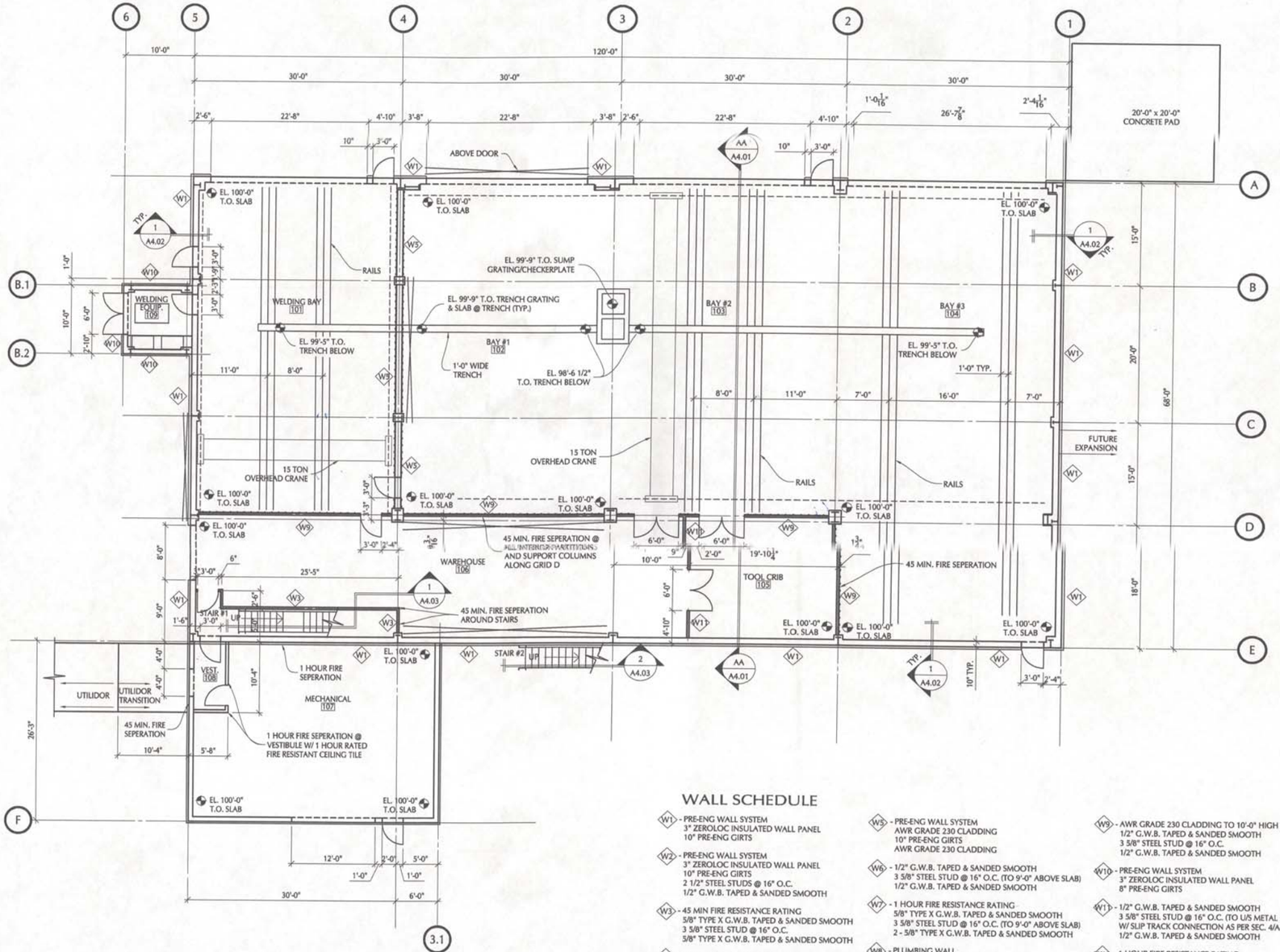

MAIN FLOOR PLAN
1/8" = 1'-0"

WALL SCHEDULE

W1 - PRE-ENG WALL SYSTEM
3" ZEROLOC INSULATED WALL PANEL
10" PRE-ENG GIRTS

W2 - PRE-ENG WALL SYSTEM
3" ZEROLOC INSULATED WALL PANEL
10" PRE-ENG GIRTS
2 1/2" STEEL STUDS @ 16" O.C.
1/2" G.W.B. TAPED & SANDED SMOOTH

W3 - 45 MIN FIRE RESISTANCE RATING
5/8" TYPE X G.W.B. TAPED & SANDED SMOOTH
3 5/8" STEEL STUD @ 16" O.C.
5/8" TYPE X G.W.B. TAPED & SANDED SMOOTH

W4 - 45 MIN FIRE RESISTANCE RATING
5/8" TYPE X G.W.B. TAPED & SANDED SMOOTH
3 5/8" STEEL STUD @ 16" O.C.
2 1/2" STEEL STUD @ 24" O.C. HORIZONTAL (CUT STUDS ON SITE TO SUIT CROSS BRACING)
5/8" TYPE X G.W.B. TAPED & SANDED SMOOTH

W5 - PRE-ENG WALL SYSTEM
AWR GRADE 230 CLADDING
10" PRE-ENG GIRTS
AWR GRADE 230 CLADDING

W6 - 1/2" G.W.B. TAPED & SANDED SMOOTH
3 5/8" STEEL STUD @ 16" O.C. (TO 9'-0" ABOVE SLAB)
1/2" G.W.B. TAPED & SANDED SMOOTH

W7 - 1 HOUR FIRE RESISTANCE RATING
5/8" TYPE X G.W.B. TAPED & SANDED SMOOTH
3 5/8" STEEL STUD @ 16" O.C. (TO 9'-0" ABOVE SLAB)
2 - 5/8" TYPE X G.W.B. TAPED & SANDED SMOOTH

W8 - PLUMBING WALL
1/2" G.W.B. TAPED & SANDED SMOOTH
6" STEEL STUD @ 16" O.C.
1/2" G.W.B. TAPED & SANDED SMOOTH

W9 - AWR GRADE 230 CLADDING TO 10'-0" HIGH (SHOP SIDE)
1/2" G.W.B. TAPED & SANDED SMOOTH
3 5/8" STEEL STUD @ 16" O.C.
1/2" G.W.B. TAPED & SANDED SMOOTH

W10 - PRE-ENG WALL SYSTEM
3" ZEROLOC INSULATED WALL PANEL
8" PRE-ENG GIRTS

W11 - 1/2" G.W.B. TAPED & SANDED SMOOTH
3 5/8" STEEL STUD @ 16" O.C. (TO U/S METAL DECK W/ SLIP TRACK CONNECTION AS PER SEC. 4/A4.02)
1/2" G.W.B. TAPED & SANDED SMOOTH

W12 - 1 HOUR FIRE RESISTANCE RATING
5/8" TYPE X G.W.B. TAPED & SANDED SMOOTH
3 5/8" STEEL STUD @ 16" O.C.
2 - 5/8" TYPE X G.W.B. TAPED & SANDED SMOOTH

WALTERS CHAMBERS
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No.	Date	Subject
-	JAN. 14/2005	ISSUED FOR BUILDING CODE REVIEW

Drawing Issue

Seals

Project
JERICHO
WORKSHOP
TAHERA, NUNAVUT

Title
MAIN
FLOOR PLAN

Scale	AS NOTED
Date	NOV. 25, 2004
Drawn By	CH
Checked By	DC
Designed By	HR
Job Number	04-2990

Drawing No.
A2.01

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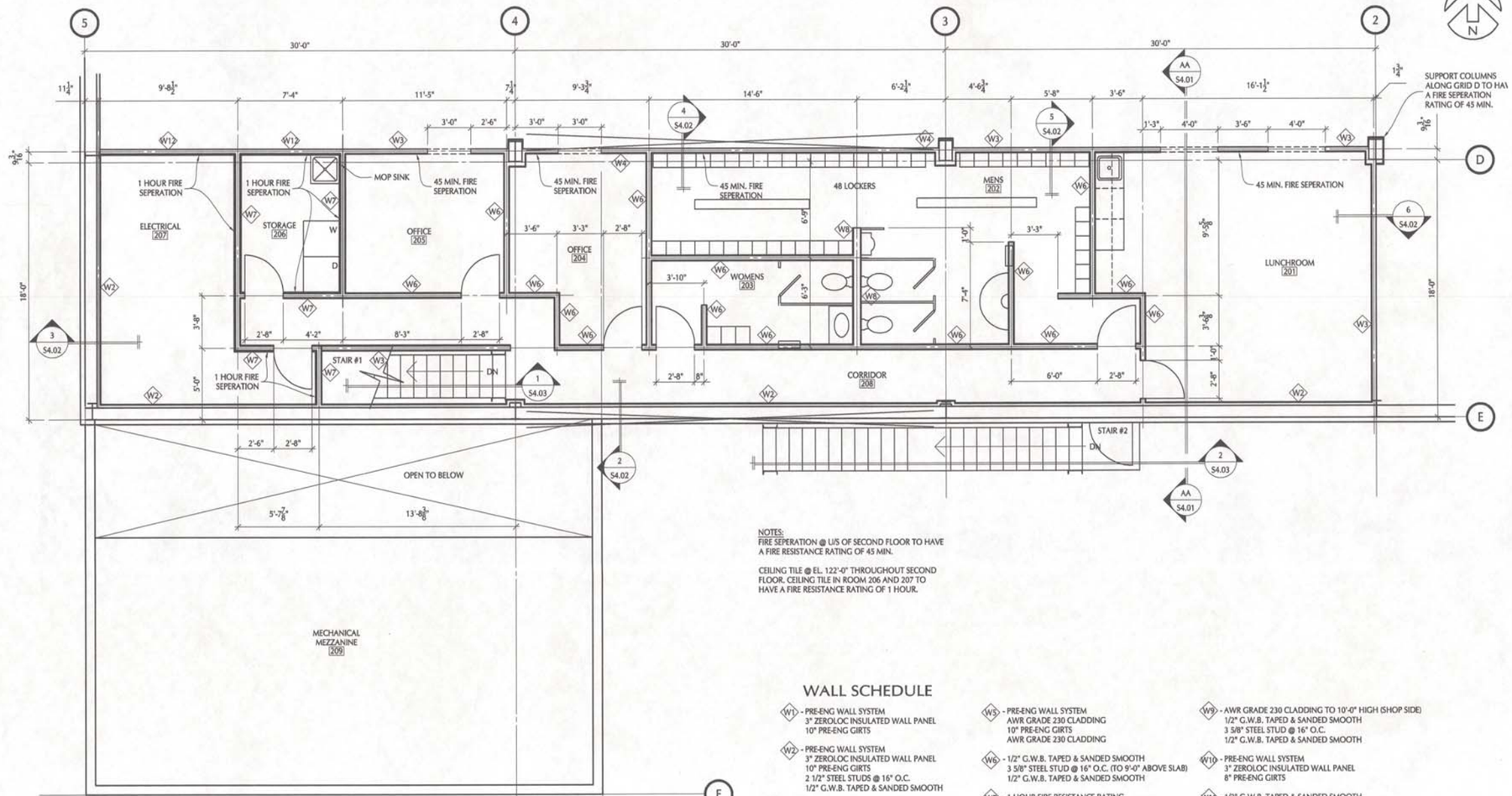

SECOND FLOOR AND MEZZANINE PLAN

1/4" = 1'-0"

NOTES:
FIRE SEPERATION @ U/S OF SECOND FLOOR TO HAVE A FIRE RESISTANCE RATING OF 45 MIN.

CEILING TILE @ EL. 122'-0" THROUGHOUT SECOND FLOOR. CEILING TILE IN ROOM 206 AND 207 TO HAVE A FIRE RESISTANCE RATING OF 1 HOUR.

WALL SCHEDULE

W1 - PRE-ENG WALL SYSTEM
3" ZEROLOC INSULATED WALL PANEL
10" PRE-ENG GIRTS

W2 - PRE-ENG WALL SYSTEM
3" ZEROLOC INSULATED WALL PANEL
10" PRE-ENG GIRTS
2 1/2" STEEL STUDS @ 16" O.C.
1/2" G.W.B. TAPED & SANDED SMOOTH

W3 - 45 MIN FIRE RESISTANCE RATING
5/8" TYPE X G.W.B. TAPED & SANDED SMOOTH
3 5/8" STEEL STUD @ 16" O.C.
5/8" TYPE X G.W.B. TAPED & SANDED SMOOTH

W4 - 45 MIN FIRE RESISTANCE RATING
5/8" TYPE X G.W.B. TAPED & SANDED SMOOTH
3 5/8" STEEL STUD @ 16" O.C.
2 1/2" STEEL STUD @ 24" O.C. HORIZONTAL (CUT STUDS ON SITE TO SUIT CROSS BRACING)
5/8" TYPE X G.W.B. TAPED & SANDED SMOOTH

W5 - PRE-ENG WALL SYSTEM
AWR GRADE 230 CLADDING
10" PRE-ENG GIRTS
AWR GRADE 230 CLADDING

W6 - 1/2" G.W.B. TAPED & SANDED SMOOTH
3 5/8" STEEL STUD @ 16" O.C. (TO 9'-0" ABOVE SLAB)
1/2" G.W.B. TAPED & SANDED SMOOTH

W7 - 1 HOUR FIRE RESISTANCE RATING
5/8" TYPE X G.W.B. TAPED & SANDED SMOOTH
3 5/8" STEEL STUD @ 16" O.C. (TO 9'-0" ABOVE SLAB)
2 - 5/8" TYPE X G.W.B. TAPED & SANDED SMOOTH

W8 - PLUMBING WALL
1/2" G.W.B. TAPED & SANDED SMOOTH
6" STEEL STUD @ 16" O.C.
1/2" G.W.B. TAPED & SANDED SMOOTH

W9 - AWR GRADE 230 CLADDING TO 10'-0" HIGH (SHOP SIDE)
1/2" G.W.B. TAPED & SANDED SMOOTH
3 5/8" STEEL STUD @ 16" O.C.
1/2" G.W.B. TAPED & SANDED SMOOTH

W10 - PRE-ENG WALL SYSTEM
3" ZEROLOC INSULATED WALL PANEL
8" PRE-ENG GIRTS

W11 - 1/2" G.W.B. TAPED & SANDED SMOOTH
3 5/8" STEEL STUD @ 16" O.C. (TO U/S METAL DECK W/ SLIP TRACK CONNECTION AS PER SEC. 4/A4.02)
1/2" G.W.B. TAPED & SANDED SMOOTH

W12 - 1 HOUR FIRE RESISTANCE RATING
5/8" TYPE X G.W.B. TAPED & SANDED SMOOTH
3 5/8" STEEL STUD @ 16" O.C.
2 - 5/8" TYPE X G.W.B. TAPED & SANDED SMOOTH

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PROGRESS PLOT: MONTH, DAY, YEAR

No.	Date	Subject

Drawing Issue

Seals

Project

JERICHO
WORKSHOP

TAHERA, NUNAVUT

Title

SECOND FLOOR AND
MEZZANINE PLAN

Scale	AS NOTED
Date	NOV. 25, 2004
Drawn By	CH
Checked By	DC
Designed By	HR
Job Number	04-2990

Drawing No.

A2.02

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BY-LAW AND BUILDING CODE ANALYSIS

BUILDING CODE INFORMATION

BUILDING CODE: NBC 1995

NOTE:
THESE COMMENTS ARE PREPARED FOR THE PURPOSE OF THE APPROVAL AUTHORITIES REVIEW. CONTRACTORS ARE CAUTIONED NOT TO USE THESE FIGURES FOR CONSTRUCTION. REFER TO FULL DOCUMENT SET FOR CONSTRUCTION TYPES AND QUANTITIES.

BUILDING CLASSIFICATION:

BUILDING:	SHOP/WAREHOUSE
CLASSIFICATION:	GROUP F, DIVISION 2, ARTICLE 3.2.2.69
BUILDING AREA:	8,160 ft2 (758 m2)
BUILDING HEIGHT:	2 STOREY
BUILDING FACING:	1 STREET
FIRE PROTECTION:	UN-SPRINKLERED
BUILDING CONSTRUCTION:	NON-COMBUSTIBLE (COMBUSTIBLE ALLOWED)

TOTAL FLOOR AREA

SHOP MAIN	8,160 ft2 (758 m2)
SHOP OFFICE 2ND	2,160 ft2 (200 m2)
SUBTOTAL	10,320 ft2 (958 m2)

FIRE SEPARATIONS AND RATINGS

WAREHOUSE		
FLOORS	NON-COMBUSTIBLE	
OFFICE		
FLOORS	NON-COMBUSTIBLE	
SERVICE SPACES		
WALLS & CEILINGS AROUND JANITOR ROOM		45 min. RATING REQUIRED
WALLS & CEILINGS AROUND MECHANICAL ROOM		1 HOUR RATING REQUIRED

FIRE RESISTANCE RATINGS

OFFICE	
FLOORS	NON-COMBUSTIBLE (45 min. REQ'D)
LOAD BEARING WALLS/COLUMNS	NON-COMBUSTIBLE (45 min. REQ'D)

SPATIAL SEPARATIONS (LIMITING DISTANCE, EXTERIOR WALLS)

WALL DESCRIPTION	DISTANCE	% OPENINGS ALLOWED	RATING REQUIRED
WAREHOUSE WEST WALL	17m	36%	NO RATING

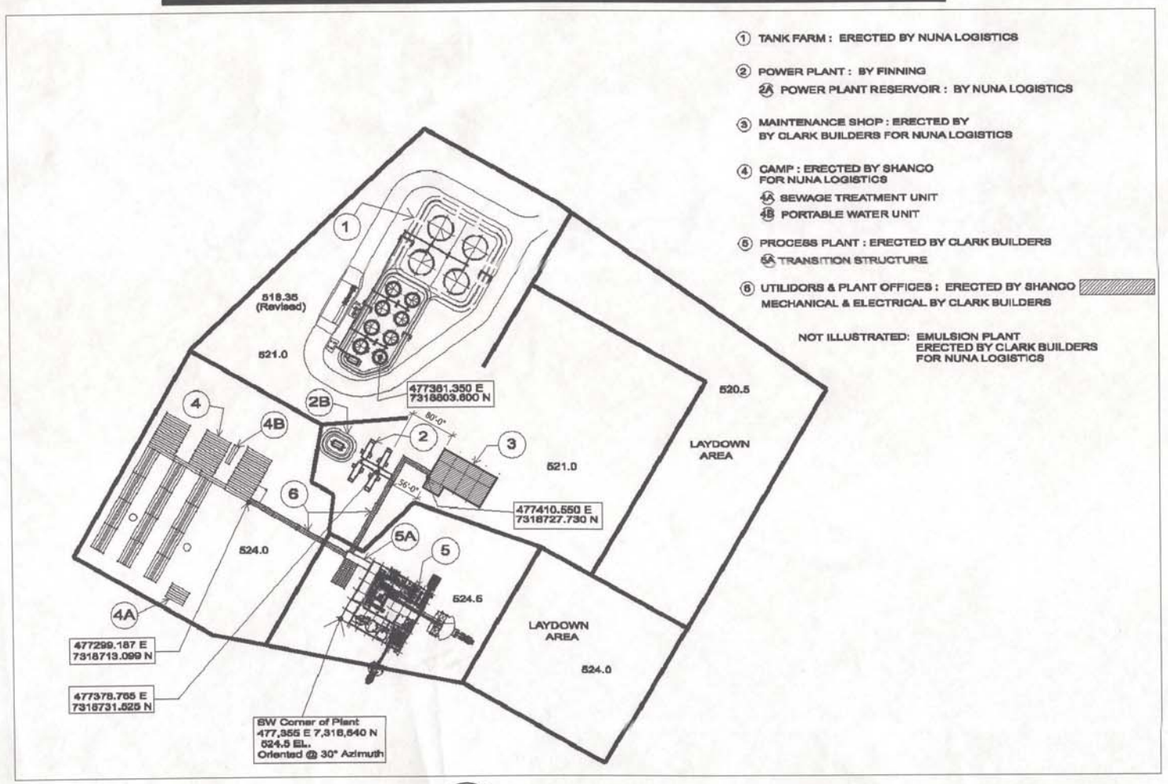
NO BUILDINGS ARE LOCATED WITHIN 35m OF NEW SHOP/WAREHOUSE ON THE NORTH, EAST OR SOUTH SIDES, THEREFORE NO RATING IS REQUIRED ON THESE WALLS DUE TO LIMITING DISTANCE

OCCUPANT LOAD
REFER TO 3.1.16 OCCUPANT LOAD, ALBERTA BUILDING CODE 1997

TYPE OF USE OF FLOOR AREA & AREA per PERSON	No. OF PERSONS (CODE REQUIRED)	No. OF PERSONS (OWNER SPECIFIED)
SHOP & OFFICE	88	12

EXIT TRAVEL DISTANCE
REFER TO ARTICLE 3.4.2. NUMBER AND LOCATION OF EXITS FROM FLOOR AREAS, NATIONAL BUILDING CODE 1995

AREA NAME	MAXIMUM TRAVEL DISTANCE
WAREHOUSE	100' (30m)



① TANK FARM : ERECTED BY NUNA LOGISTICS

② POWER PLANT : BY FINNING
2A POWER PLANT RESERVOIR : BY NUNA LOGISTICS

③ MAINTENANCE SHOP : ERECTED BY BY CLARK BUILDERS FOR NUNA LOGISTICS

④ CAMP : ERECTED BY SHANCO FOR NUNA LOGISTICS
4A SEWAGE TREATMENT UNIT
4B PORTABLE WATER UNIT

⑤ PROCESS PLANT : ERECTED BY CLARK BUILDERS
5A TRANSITION STRUCTURE

⑥ UTILIDORS & PLANT OFFICES : ERECTED BY SHANCO
MECHANICAL & ELECTRICAL BY CLARK BUILDERS

NOT ILLUSTRATED: EMULSION PLANT
ERECTED BY CLARK BUILDERS
FOR NUNA LOGISTICS

SITE PLAN
N.T.S.

WALTERS CHAMBERS
& Associates Ltd.
Structural Engineers

1330, 10130 – 103 Street
Edmonton, Alberta T5J 3N9

tel (780) 428–1740
fax (780) 423–3735

PROGRESS PRINTS ONLY
NOT FOR CONSTRUCTION
PROGRESS PLOT: MONTH, DAY, YEAR

No.	Date	Subject
-	JAN. 14/2005	ISSUED FOR BUILDING CODE REVIEW

Drawing Issue

Seals

Project
JERICHO
WORKSHOP
TAHERA, NUNAVUT

Title
SITE PLAN &
BUILDING CODE ANALYSIS

Scale	AS NOTED
Date	NOV. 25, 2004
Drawn By	CH
Checked By	DC
Designed By	HR
Job Number	04-2990

Drawing No.
A1.01

APPENDIX G
PKCA INSPECTION

Photo G.1 (PKCA): Cell A looking upstream from Divider Dyke A

Photo G.2 (PKCA): Cell A looking downstream from East Dam. Jetty constructed over upper beach area to wet down tailings

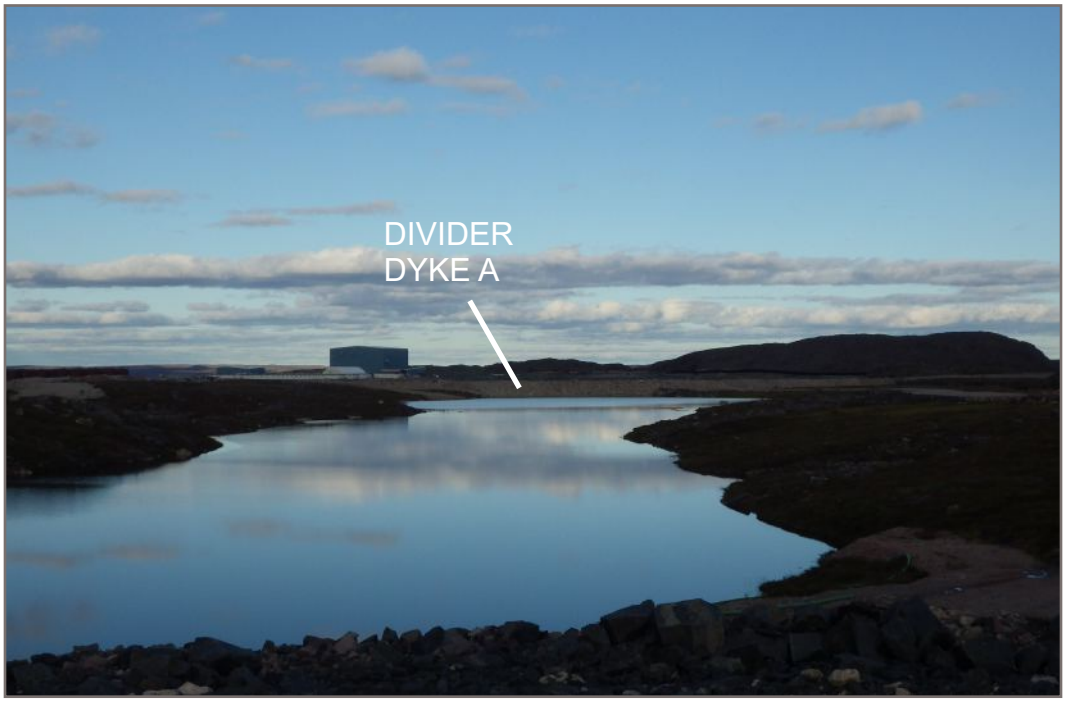


Photo G.3 (PKCA): Cell C looking upstream from West Dam. Divider Dyke A in background

Photo G.4 (West Dam): West dam discharge location and downstream face

Photo G.5 (West Dam): Elbow discharge at end of dewatering line

Photo G.6 (West Dam): West dam looking north. Dam crest is in good condition with no problems noted

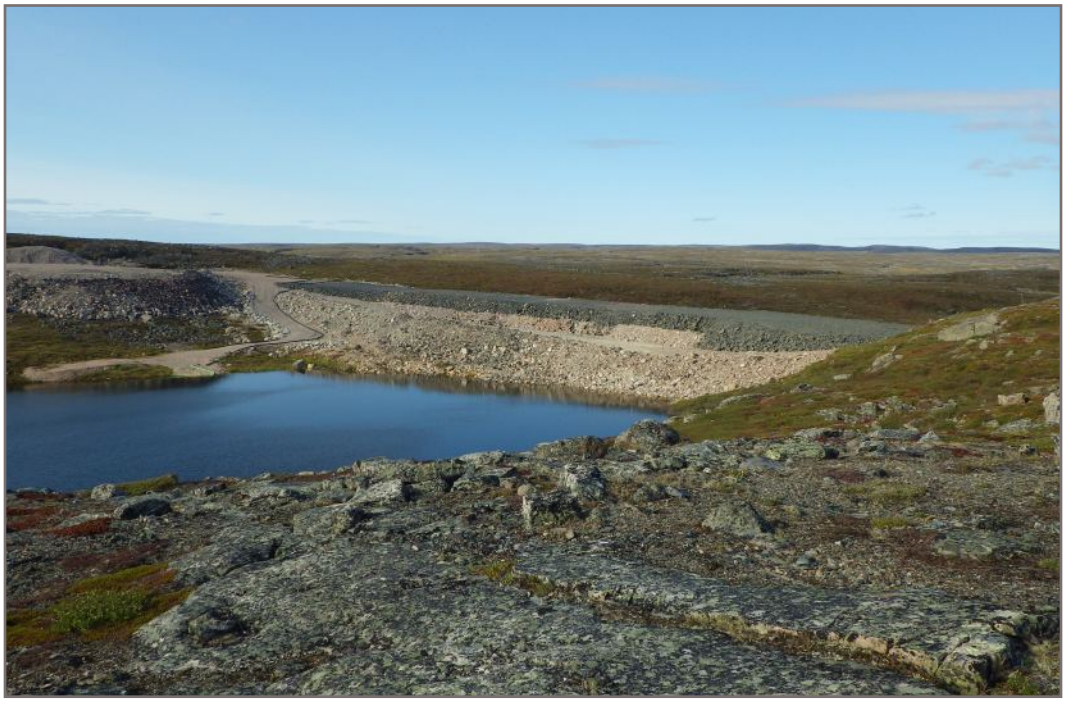


Photo G.7 (West Dam): Upstream slope of dam is in good condition. Upstream water elevation approximately 1m higher than levels observed in previous inspection (2011)

Photo G.8 (West Dam): Downstream slope of dam generally in good condition. Some settlement and cracking at south end of dam. Condition appears unchanged from 2011 inspection. Does not impact dam performance or function

Photo G.9 (West Dam): Cracking and settlement at south end of dam. Does not impact dam performance

Photo G.10 (East Dam): Dam crest in good condition with no problems noted

Photo G.11 (East Dam): Upstream face of dam in good condition. Some localized scour at former discharge locations; however, this does not impact dam performance or function

Photo G.12 (East Dam): Downstream slope of dam in good condition

Photo G.13 (East Dam): Windblown processed kimberlite deposited on downstream slope

Photo G.14 (East Dam): Localized erosion on upstream face of dam at spigot locations

Photo G.15 (Southeast Dam): Crest of Southeast Dam in good condition

Photo G.16 (Southeast Dam): Upstream slope of dam in good condition. Localized erosion around former spigot location does not impact dam performance

Photo G.17 (Southeast Dam): Downstream slope in good condition. Localized ponding in depressions along the toe. Windblown processed kimberlite deposited on downstream slope. Limited deposition on adjacent tundra

Photo G.18 (Southeast Dam): Upstream face of Southeast Dam showing localized erosion at spigot locations

Photo G.19 (Southeast Dam):

Localized erosion on upstream face of dam at spigot locations

Photo G.20 (Coffer Dam): Downstream slope of coffer dam in good condition

Photo G.21 (Coffer Dam): Upstream slope in good condition with no problems noted

Photo G.22 (Coffer Dam): Crest of coffer dam in good condition

Photo G.23 (Dyke A): Crest of Divider Dyke A in good condition with no problems noted

Photo G.24 (Dyke A): Downstream face of Dyke A in good condition

Photo G.25 (Dyke A): Upstream face looking south. Slope in good condition

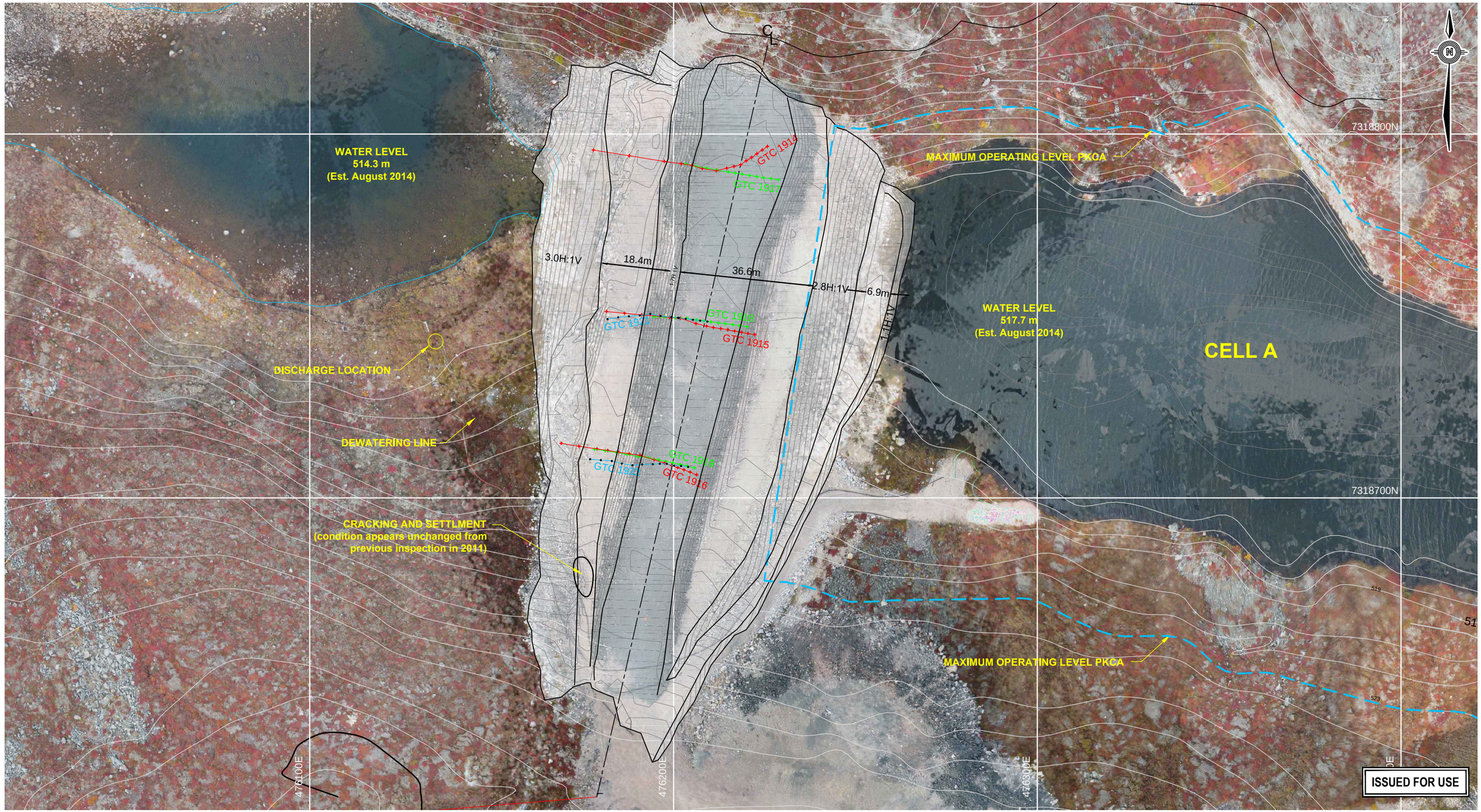
Photo G.26 (Dyke A): Upstream facing looking north. Slope in good condition. Note processed kimberlite placed along toe of slope to inhibit fines migration under dyke

Photo G.27 (North Coffer Dam): North coffer dam crest in good condition. Upstream and downstream water at approximately the same elevation

Photo G.28 (North Coffer Dam): Downstream slope in good condition

Photo G.29 (North Coffer Dam): Upstream slope in good condition

Photo G.30 (North Coffer Dam): Ponding visible at downstream toe. Dead vegetation suggests a former larger area of ponding



LEGEND

0 50m

Scale: 1:1,000 @ 11"x17"

NOTES
1. BASE IMAGE FROM 2014 DRONE SURVEY.
2. COORDINATES BASED ON NAD 27.

CLIENT

Aboriginal Affairs and Northern Development Canada

TETRA TECH EBA

Closure Assessment
Jericho Diamond Mine, Nunavut

WEST DAM
SITE INSPECTION

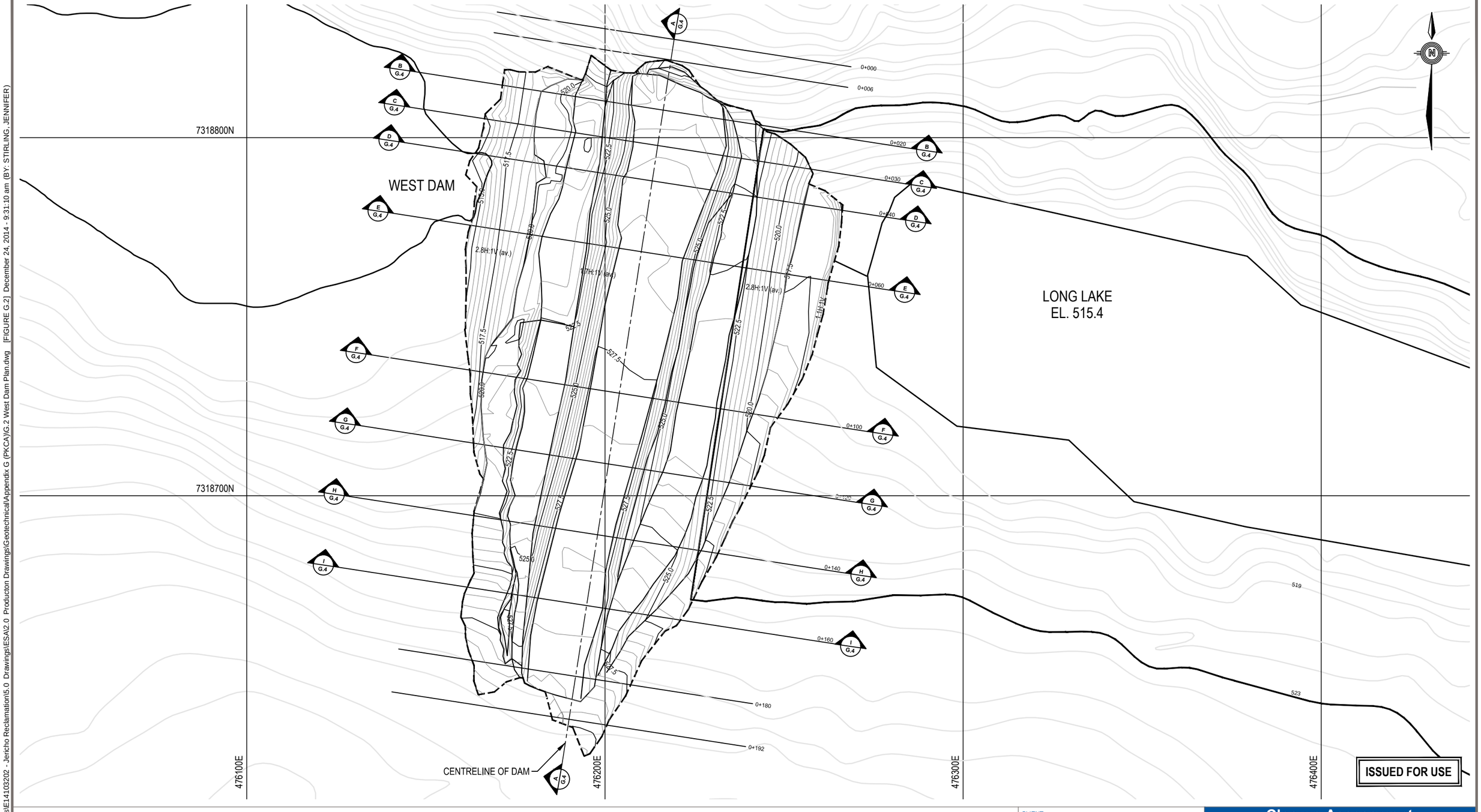
PROJECT NO.	DWN	CKD	REV
E14103202	GDK	WTH	0

OFFICE	DATE
EDM	October 2014

Figure G.1

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Geotechnical\Appendix G (PKCA)\G.1 West Dam - inspection notes.dwg [FIGURE G.1] December 24, 2014 - 9:25:44 am (BY: STIRLING, JENNIFER)

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Geotechnical\Appendix G (PKCA)\G.2 West Dam Plan.dwg [FIGURE G.2] December 24, 2014 - 9:31:10 am (BY: STIRLING, JENNIFER)



LEGEND

0 50m

Scale: 1:1,000 @ 11"x17"

NOTES
1. AS-BUILT SURVEY DATA PROVIDED BY SUB-ARCTIC SURVEY LTD., DECEMBER 2007.
2. DATA PRESENTED AS RECEIVED FROM SUB-ARCTIC SURVEY LTD. ALL EDITS FOR PRESENTATION ONLY.
3. COORDINATES BASED ON NAD 27.

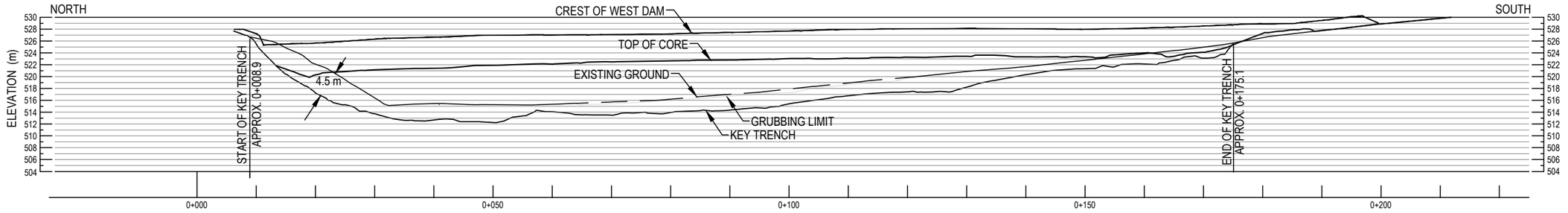
CLIENT
Aboriginal Affairs and Northern Development Canada

TETRA TECH EBA

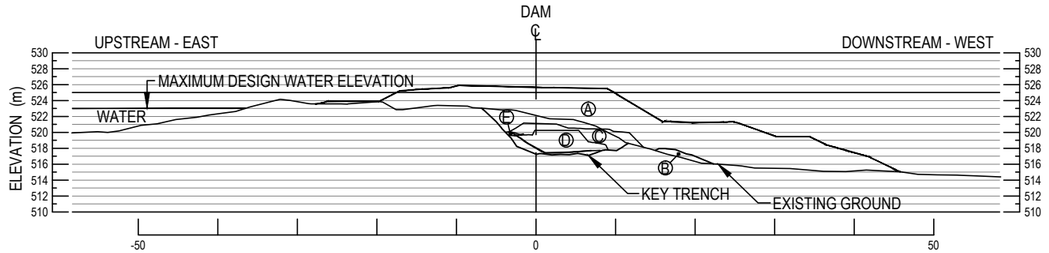
Closure Assessment
Jericho Diamond Mine, Nunavut
WEST DAM
PLAN VIEW

PROJECT NO.	DWN	CKD	REV
E14103202	GDK	WTH	0
OFFICE: EDM	DATE: October 2014		

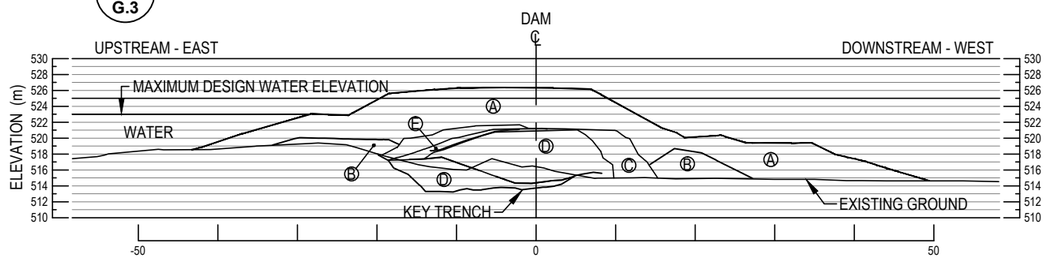
Figure G.2



LONGITUDINAL PROFILE A / G.3



SECTION (STATION 0+020) B / G.3



SECTION (STATION 0+030) C / G.3

ISSUED FOR USE

LEGEND

- (A) RUN OF MINE
- (B) TILL
- (C) 200 mm MINUS
- (D) 20 mm MINUS
- (E) PROCESSED KIMBERLITE

0 25m

Scale: 1:750 @ 11"x17"

NOTES
1. AS-BUILT SURVEY DATA PROVIDED BY SUB-ARCTIC SURVEY LTD., DECEMBER 2007.
2. DATA PRESENTED AS RECEIVED FROM SUB-ARCTIC SURVEY LTD. ALL EDITS FOR PRESENTATION ONLY.
3. COORDINATES BASED ON NAD 27.

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TETRA TECH EBA

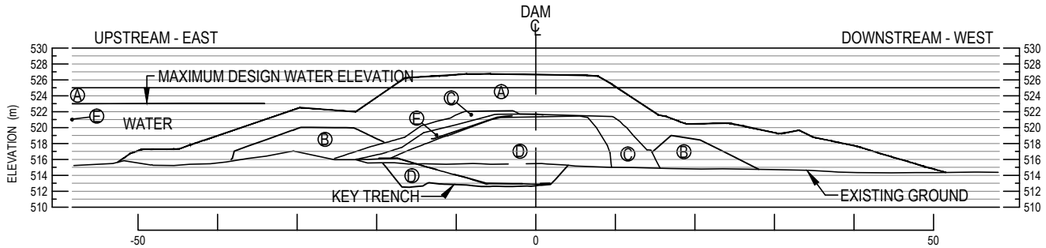
Closure Assessment
Jericho Diamond Mine, Nunavut

WEST DAM
AS-BUILT SECTIONS AND PROFILE

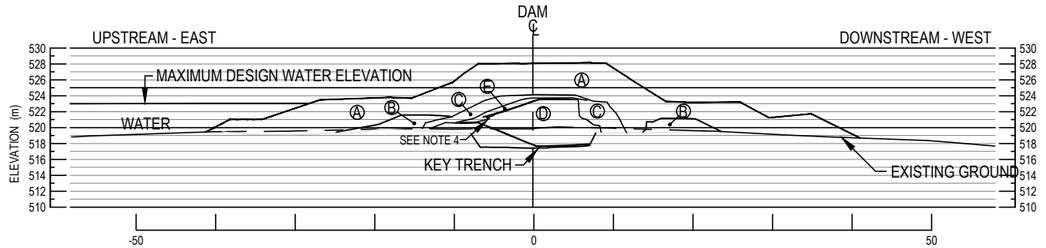
PROJECT NO.	DWN	CKD	REV
E14103202	GDK	WTH	0
OFFICE: EDM	DATE: October 2014		

Figure G.3

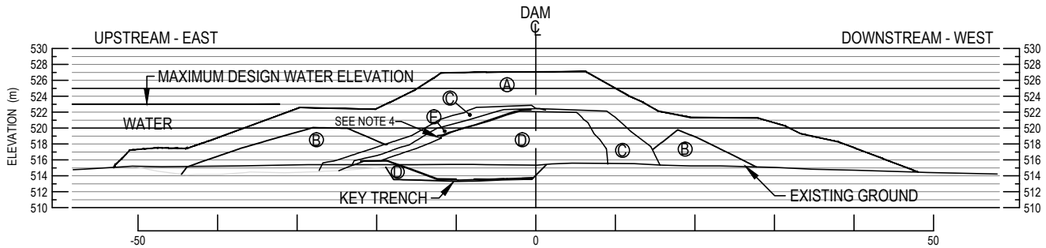
Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Geotechnical\Appendix G (PKCA)\G.3-4 West Dam Sections.dwg [FIGURE G.3] December 24, 2014 - 9:32:23 am (BY: STIRLING, JENNIFER)



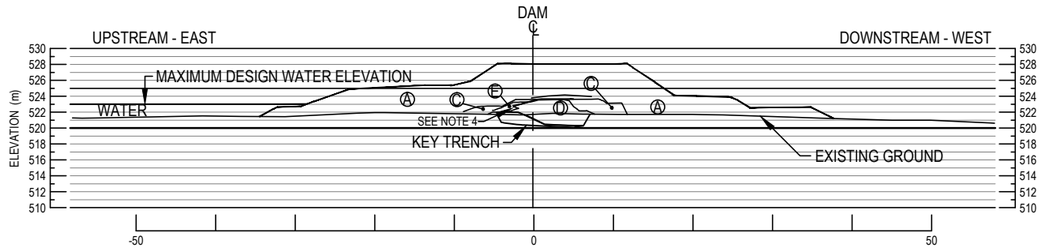
SECTION D (STATION 0+040) G.4



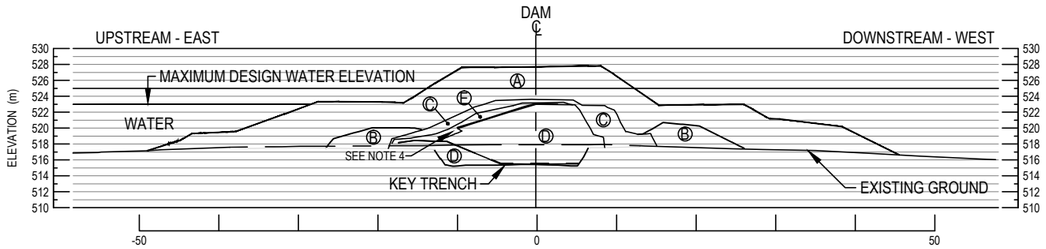
SECTION G (STATION 0+120) G.4



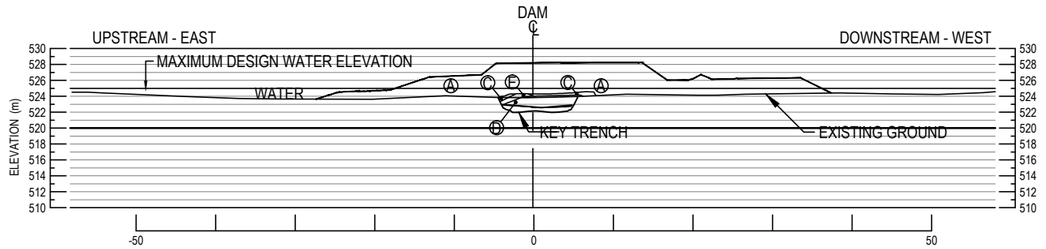
SECTION E (STATION 0+060) G.4



SECTION H (STATION 0+140) G.4



SECTION F (STATION 0+100) G.4



SECTION I (STATION 0+160) G.4

ISSUED FOR USE

LEGEND

- (A) RUN OF MINE
- (B) TILL
- (C) 200 mm MINUS
- (D) 20 mm MINUS
- (E) PROCESSED KIMBERLITE

0 25m

Scale: 1:750 @ 11"x17"

NOTES
1. ZIG SHOWN ON LINEWORK IS AT LOCATION OF 2007 PEELBACK.
2. AS-BUILT SURVEY DATA PROVIDED BY SUB-ARCTIC SURVEY LTD., DECEMBER 2007.
3. DATA PRESENTED AS RECEIVED FROM SUB-ARCTIC SURVEY LTD. ALL EDITS FOR PRESENTATION ONLY.
4. COORDINATES BASED ON NAD 27.

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Closure Assessment
Jericho Diamond Mine, Nunavut

WEST DAM
SECTIONS AND PROFILE

TETRA TECH EBA

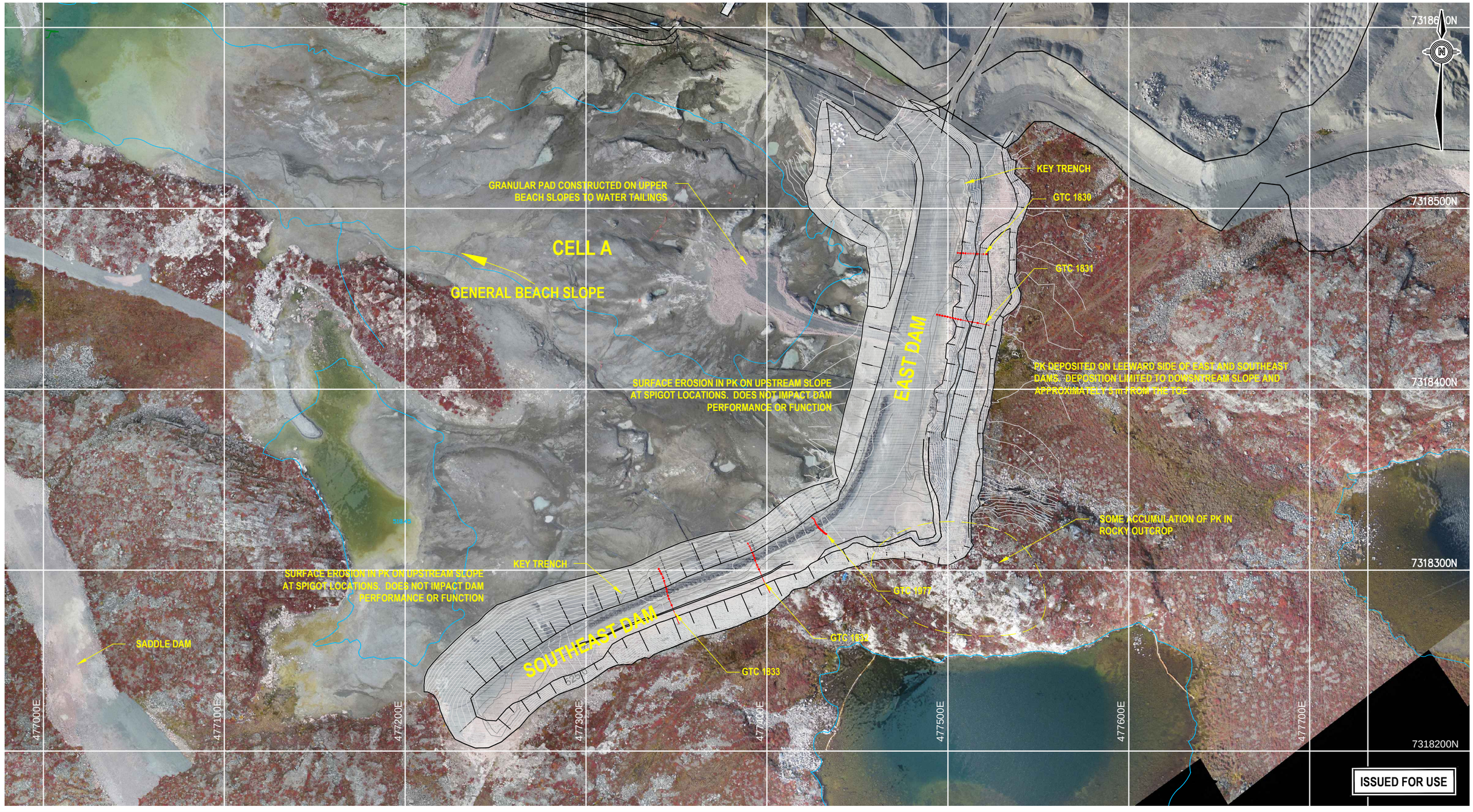
PROJECT NO.	DWN	CKD	REV
E14103202	GDK	WTH	0

OFFICE: EDM

DATE: October 2014

Figure G.4

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Production Drawings\Geotechnical\Appendix G (PKCA)\G (PKCA)G.3-4 West Dam Sections.dwg [FIGURE G.4] December 24, 2014 - 9:33:44 am (BY: STIRLING, JENNIFER)



LEGEND

0 100m

Scale: 1:2,000 @ 11"x17"

NOTES
1. BASE IMAGE FROM 2014 DRONE SURVEY..
2. COORDINATES BASED ON NAD 27.

CLIENT

Aboriginal Affairs and Northern Development Canada

TETRA TECH EBA

Closure Assessment
Jericho Diamond Mine, Nunavut

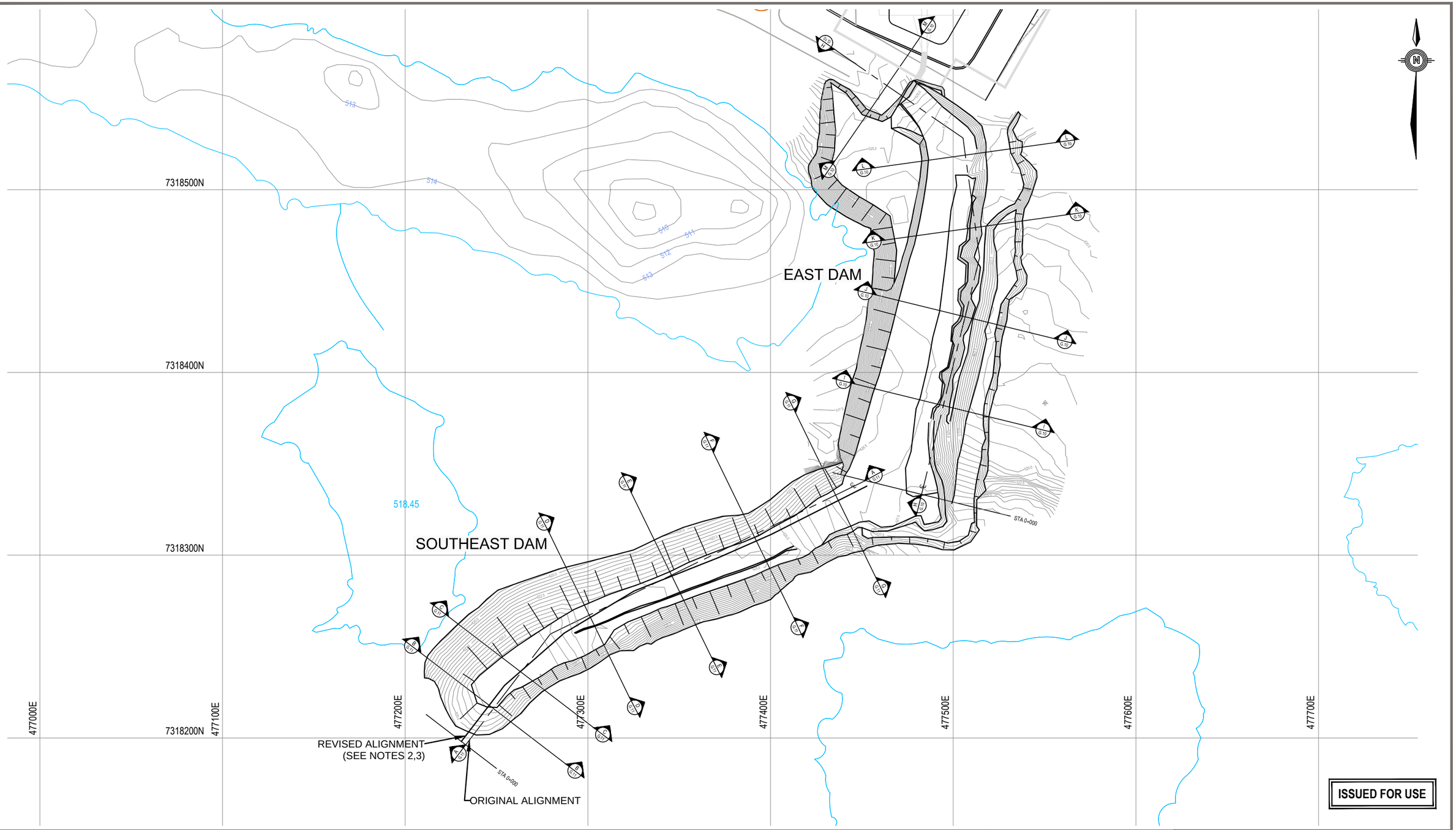
EAST AND SOUTHEAST DAM SITE INSPECTION

PROJECT NO.	DWN	CKD	REV
E14103202	GDK	WTH	0
OFFICE: EDM	DATE: October 2014		

Figure G.5

Q:\Edmonton\Engineering\E14\1Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Production Drawings\Geotechnical\Appendix G (PKCA)\G.5 East Dam - inspection notes.dwg [FIGURE G.5] December 24, 2014 - 9:38:01 am (BY: STIRLING, JENNIFER)

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Geotechnical\Appendix G (PKCA)\East Dam AB (G.6 - G.11)\G.6 1100060015Q03.dwg [FIGURE G.6] December 24, 2014 - 9:39:52 am (BY: STIRLING, JENNIFER)



LEGEND

0 100m

Scale: 1:2,000 @ 11"x17"

NOTES
1. DRAWINGS REPRODUCED FROM EBA 2007 CONSTRUCTION RECORD REPORT.
2. REVISED ALIGNMENT RECEIVED FROM MINE SITE ON AUGUST 17, 2007 (REV2).
3. AS-BUILT SECTIONS/PROFILES WERE SAMPLED WITH THE ORIGINAL ALIGNMENT.
4. COORDINATES BASED ON NAD 27.

CLIENT

Aboriginal Affairs and Northern Development Canada

Closure Assessment
Jericho Diamond Mine, Nunavut

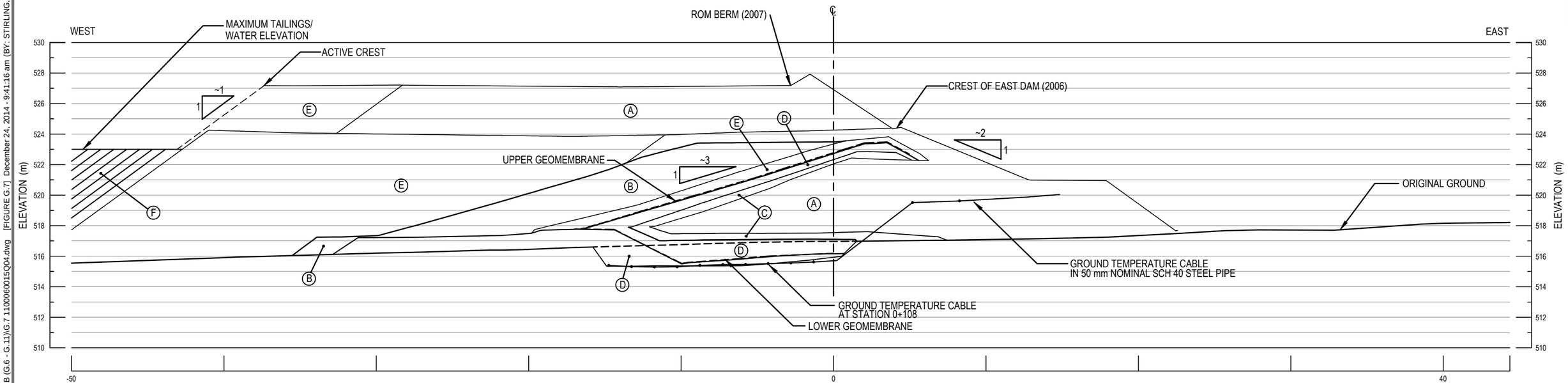
EAST DAM AND SOUTHEAST DAM LOCATION PLAN

TETRA TECH EBA

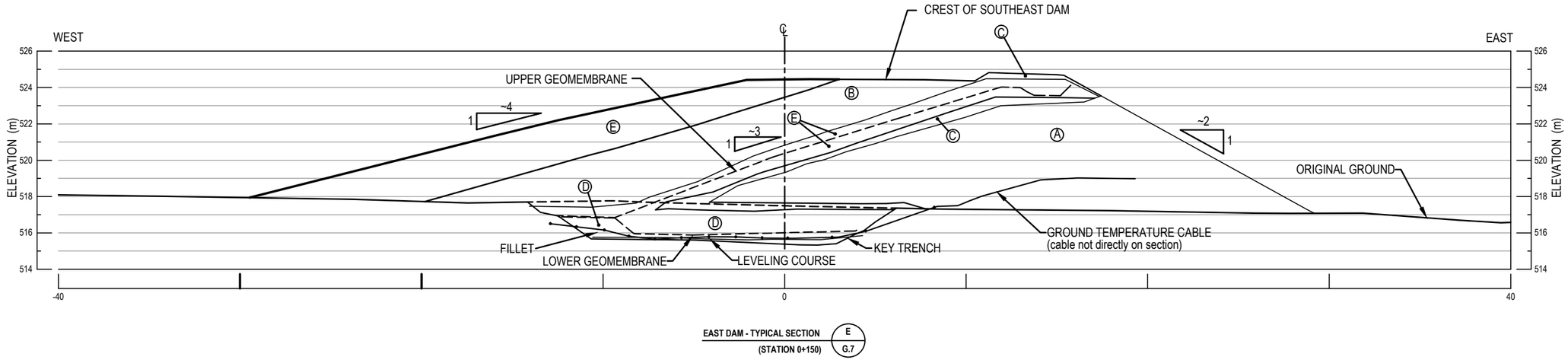
PROJECT NO.	DWN	CKD	REV
E14103202	DBD	WTH	0

OFFICE	DATE
EDM	October 2014

Figure G.6



EAST DAM - TYPICAL SECTION (STATION 0+100) — J / G.7



EAST DAM - TYPICAL SECTION (STATION 0+150) — E / G.7

ISSUED FOR USE

LEGEND

- (A) RUN OF MINE
- (B) TILL
- (C) 200 mm MINUS
- (D) 20 mm MINUS
- (E) COARSE TAILINGS
- (F) PROCESSED KIMBERLITE

0 10m

Scale: 1:250 @ 11"x17"

NOTES
1. DRAWINGS REPRODUCED FROM EBA 2007 CONSTRUCTION RECORD REPORT.
2. COORDINATES BASED ON NAD 27.

CLIENT

Aboriginal Affairs and Northern Development Canada

TETRA TECH EBA

Closure Assessment
Jericho Diamond Mine, Nunavut

EAST DAM AND SOUTHEAST DAM TYPICAL CROSS-SECITONS

PROJECT NO.	DWN	CKD	REV
E14103202	DBD	WTH	0
OFFICE: EDM	DATE: October 2014		

Figure G.7

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Geotechnical\Appendix G (PKCA)\East Dam AB (G.6 - G.11)\G.7 1100060015Q04.dwg [FIGURE G.7] December 24, 2014 - 9:41:16 am (BY: STIRLING, JENNIFER)

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Geotechnical\Appendix G (PKCA)\East Dam AB (G.6 - G.11)\G.8 1100060015Q05 2222.dwg [FIGURE G.8] December 24, 2014 - 9:41:55 am (BY: STIRLING, JENNIFER

LONG LAKE
EL. 515.4

EAST DAM

SOUTHEAST DAM

RECORD KEY TRENCH

GROUND TEMPERATURE CABLES

TEMPERATURE GROUND CABLES

RECORD KEY TRENCH

REVISED ALIGNMENT
(SEE NOTES 2,3)

ORIGINAL ALIGNMENT

STA 0+000

STA 0+000

EP-5
EP-4
EP-3
EP-2
EP-1

SP-7
SP-6
SP-5
SP-4
SP-3
SP-2
SP-1

7318500N
7318400N
7318300N
7318200N

477000E
477100E
477200E
477300E
477400E
477500E
477600E
477700E

ISSUED FOR USE

LEGEND

SETTLEMENT POINTS

0 100m

Scale: 1:2,000 @ 11"x17"

NOTES
1. DRAWINGS REPRODUCED FROM EBA 2007 CONSTRUCTION RECORD REPORT.
2. REVISED ALIGNMENT RECEIVED FROM MINE SITE ON AUGUST 17, 2007 (REV2).
3. AS-BUILT SECTIONS/PROFILES WERE SAMPLED WITH THE ORIGINAL ALIGNMENT.
4. COORDINATES BASED ON NAD 27.

CLIENT

Aboriginal Affairs and Northern Development Canada

Closure Assessment
Jericho Diamond Mine, Nunavut

EAST DAM AND SOUTHEAST DAM KEY TRENCH LAYOUT PLAN

TETRA TECH EBA

PROJECT NO.	DWN	CKD	REV
E14103202	DBD	WTH	0

OFFICE	DATE
EDM	October 2014

Figure G.8

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Geotechnical\Appendix G (PKCA)\East Dam AB (G.6 - G.11)\G.9 1100060015Q06.dwg [FIGURE G.9] December 24, 2014 - 9:43:30 am (BY: STIRLING, JENNIFER)

LONG LAKE
EL. 515.4

EAST DAM

SOUTHEAST DAM

RECORD LINER UPPER

RECORD LINER LOWER

STA 0+000

REVISED ALIGNMENT
(SEE NOTES 2,3)

ORIGINAL ALIGNMENT

7318500N

7318400N

7318300N

7318200N

477000E

477100E

477200E

477300E

477400E

477500E

477600E

477700E

ISSUED FOR USE

LEGEND

0 100m

Scale: 1:2,000 @ 11"x17"

NOTES
1. DRAWINGS REPRODUCED FROM EBA 2007 CONSTRUCTION RECORD REPORT.
2. REVISED ALIGNMENT RECEIVED FROM MINE SITE ON AUGUST 17, 2007 (REV2).
3. AS-BUILT SECTIONS/PROFILES WERE SAMPLED WITH THE ORIGINAL ALIGNMENT.
4. COORDINATES BASED ON NAD 27.

CLIENT

Aboriginal Affairs and Northern Development Canada

Closure Assessment
Jericho Diamond Mine, Nunavut

EAST DAM AND SOUTHEAST DAM LINER LAYOUT PLAN

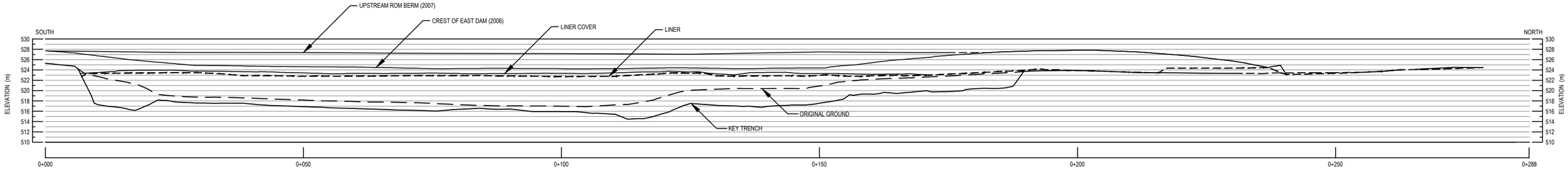
TETRA TECH EBA

PROJECT NO.	DWN	CKD	REV
E14103202	DBD	WTH	0

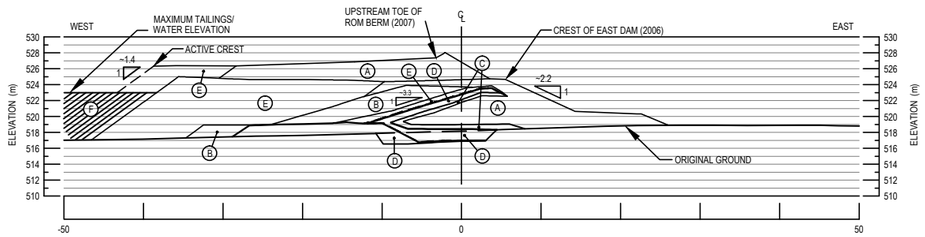
OFFICE: EDM

DATE: October 2014

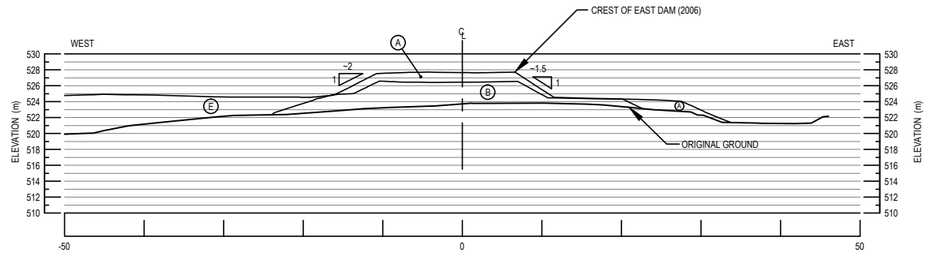
Figure G.9



LONGITUDINAL PROFILE H / G.10



SECTION (STATION 0+050) I / G.10



SECTION (STATION 0+190) L / G.10

SECTION (STATION 0+100) J / G.10

SECTION (STATION 0+250) M / G.10

SECTION (STATION 0+150) K / G.10

ISSUED FOR USE

LEGEND

- (A) RUN OF MINE
- (B) TILL
- (C) 200 mm MINUS
- (D) 20 mm MINUS
- (E) COARSE TAILINGS
- (F) PROCESSED KIMBERLITE

0 25m

Scale: 1:750 @ 11"x17"

NOTES
1. DRAWINGS REPRODUCED FROM EBA 2007 CONSTRUCTION RECORD REPORT.
2. COORDINATES BASED ON NAD 27.

CLIENT
Aboriginal Affairs and Northern Development Canada

TETRA TECH EBA

Closure Assessment
Jericho Diamond Mine, Nunavut

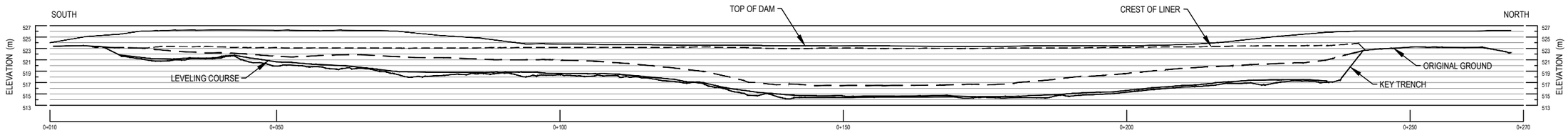
EAST DAM
PROFILE AND CROSS SECTIONS

PROJECT NO.	DWN	CKD	REV
E14103202	DBD	WTH	0

OFFICE: EDM
DATE: October 2014

Figure G.10

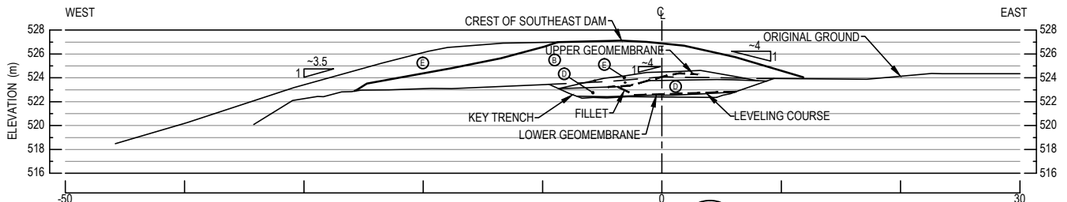
Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Geotechnical\Appendix G (PKCA)\East Dam AB (G.6 - G.11)\G.10 1100060015Q07.dwg [FIGURE G.10] December 24, 2014 - 9:44:18 am (BY: STIRLING, JENNIFER)



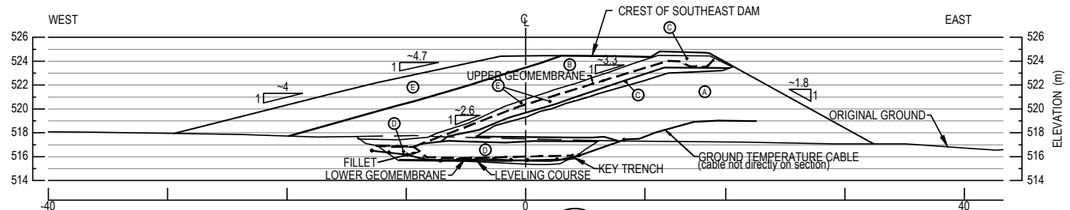
0 25m

Scale: 1:750 @ 11"x17"

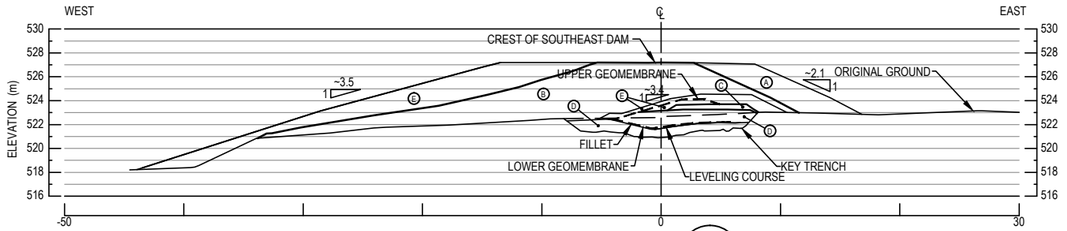
LONGITUDINAL PROFILE (A / G.11)



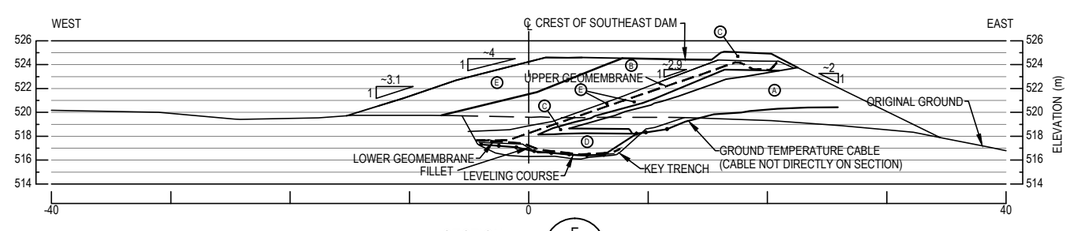
SECTION (STATION 0+250) (B / G.11)



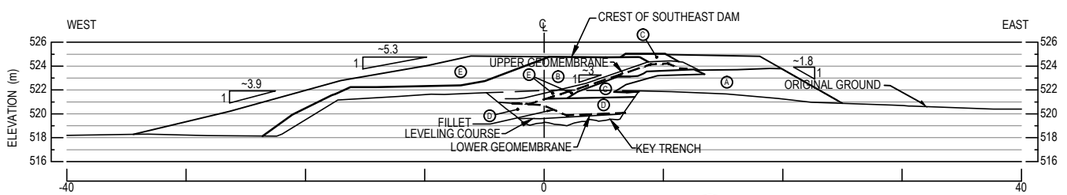
SECTION (STATION 0+150) (E / G.11)



SECTION (STATION 0+050) (C / G.11)



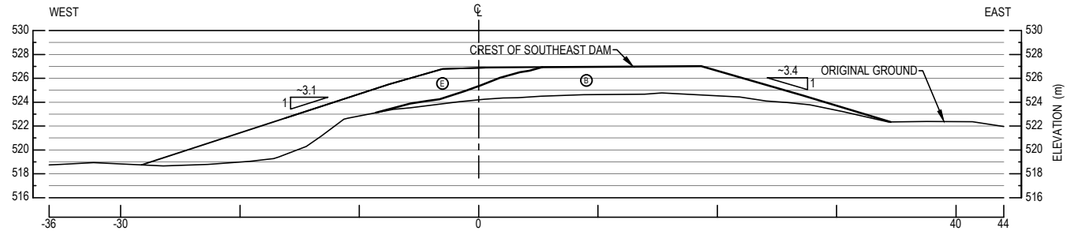
SECTION (STATION 0+200) (F / G.11)



0 25m

Scale: 1:500 @ 11"x17"

SECTION (STATION 0+100) (D / G.11)



SECTION (STATION 0+250) (G / G.11)

ISSUED FOR USE

LEGEND

- (A) RUN OF MINE
- (B) TILL
- (C) 200 mm MINUS
- (D) 20 mm MINUS
- (E) COARSE TAILINGS
- (F) PROCESSED KIMBERLITE

NOTES
1. DRAWINGS REPRODUCED FROM EBA 2007 CONSTRUCTION RECORD REPORT.
2. COORDINATES BASED ON NAD 27.

CLIENT
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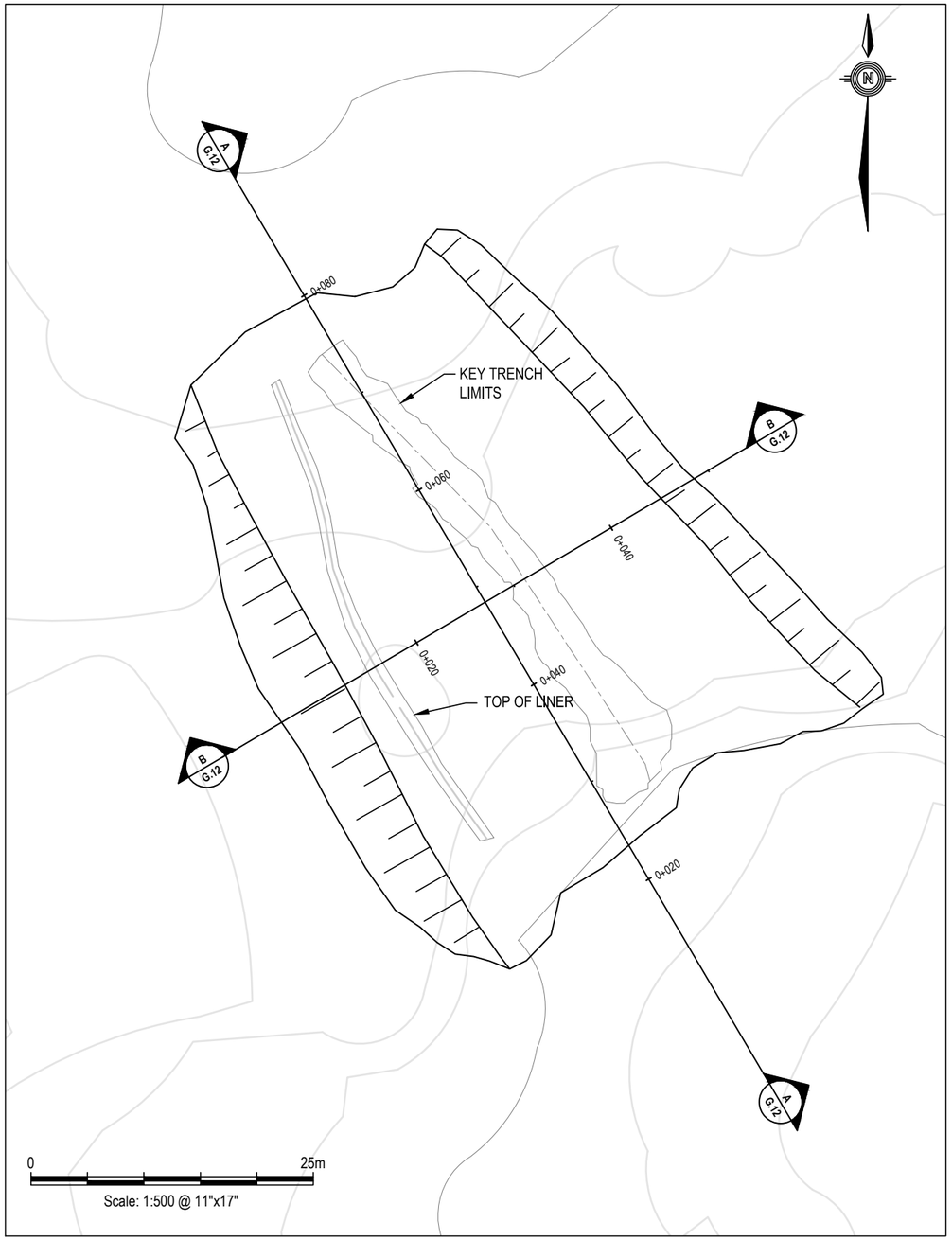
Closure Assessment
Jericho Diamond Mine, Nunavut
SOUTHEAST DAM
PROFILE AND CROSS SECTIONS

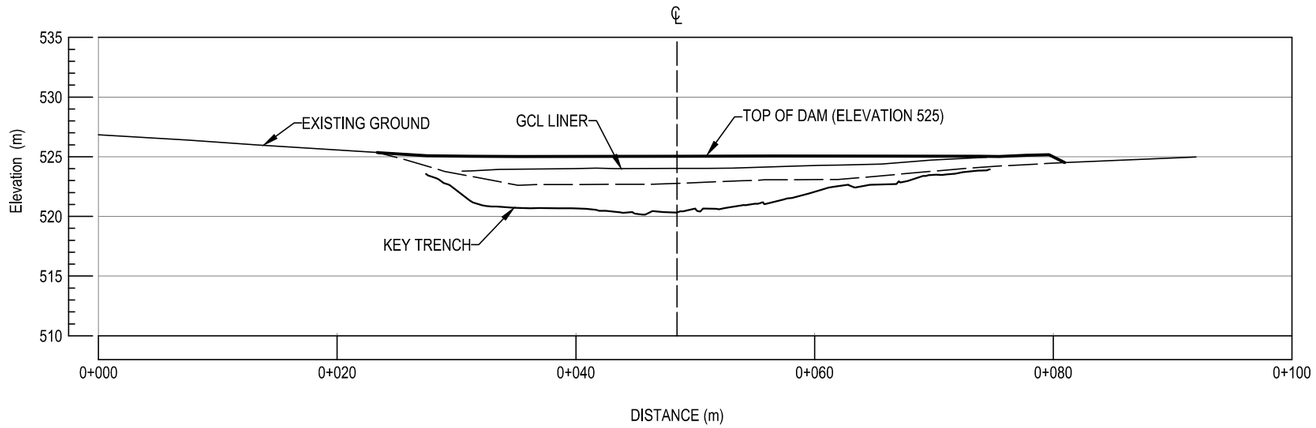
TETRA TECH EBA

PROJECT NO.	DWN	CKD	REV
E14103202	DBD	WTH	0
OFFICE: EDM	DATE: October 2014		

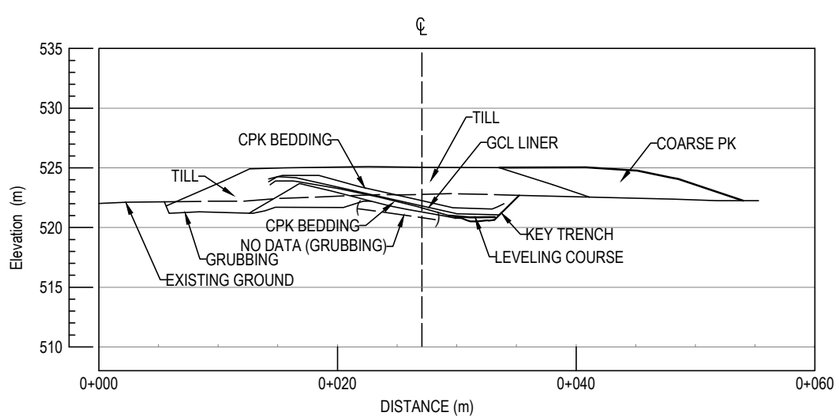
Figure G.11

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Production Drawings\Geotechnical\Appendix G (PKCA)\East Dam AB (G.6 - G.11)\G.11 1100060015Q08.dwg [FIGURE G.11] December 24, 2014 - 9:45:04 am (BY: STIRLING, JENNIFER)





LONGITUDINAL PROFILE A / G.12



SECTION (0+048) B / G.12

ISSUED FOR USE

LEGEND

0 25m

Scale: 1:500 @ 11"x17"

NOTES
1. AS-BUILT SURVEY DATA PROVIDED BY SUB-ARCTIC SURVEY LTD., DECEMBER 2007.
2. DATA PRESENTED AS RECEIVED FROM SUB-ARCTIC SURVEY LTD. ALL EDITS FOR PRESENTATION ONLY.
3. COORDINATES BASED ON NAD 27.

CLIENT
Aboriginal Affairs and Northern Development Canada

Closure Assessment
Jericho Diamond Mine, Nunavut
SADDLE DAM
PLAN AND SECIONS

TETRA TECH EBA

PROJECT NO.	DWN	CKD	REV
E14103202	GDK	WTH	0

OFFICE: EDM
DATE: October 2014

Figure G.12

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Geotechnical\Appendix G (PKCA)\G.12 Saddle Dam.dwg [FIGURE G.12] December 24, 2014 - 9:47:01 am (BY: STIRLING, JENNIFER)

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Geotechnical\Appendix G (PKCA)\G.13 Dyke A - notes.dwg [FIGURE G.13] December 24, 2014 - 9:49:59 am (BY: STIRLING, JENNIFER)

7318700N

7318600N

7318500N

7318400N

476700E

476800E

476900E

477000E

477100E

477200E

CELL C

CELL A

WATER LEVEL
517.7 m
(Est. August 2014)

DIVIDER DYKE B
(FUTURE)

DIVIDER DYKE A
(INTERIM AS-BUILT ELEV.
CREST ELEV. 519.2 m - 521.6 m)

ACCESS ROAD

PK PLACED ON UPSTREAM FACE OF DYKE

WATER PONDED
UPSTREAM OF DYKE

0+300

0+250

0+200

0+150

0+100

0+050

0+000

514

ISSUED FOR USE

LEGEND

0 50m

Scale: 1:1,500 @ 11"x17"

NOTES
1. BASE IMAGE FROM 2014 DRONE SURVEY.
2. COORDINATES BASED ON NAD 27.

CLIENT

Aboriginal Affairs and Northern Development Canada

Closure Assessment
Jericho Diamond Mine, Nunavut

DIVIDER DYKE A
SITE OBSEVATIONS

TETRA TECH EBA

PROJECT NO.	DWN	CKD	REV
E14103202	GDK	WTH	0

OFFICE: EDM

DATE: October 2014

Figure G.13

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Geotechnical\Appendix G (PKCA)\G.14 Dyke A Plan.dwg [FIGURE G.14] December 24, 2014 - 9:51:30 am (BY: STIRLING, JENNIFER)

7318720.006N
476935.554E

7318677.206N
476937.011E

7318520.269N
476942.354E

7318389.076N
476946.820E

A G.15

B G.15

C G.15

D G.15

0+300

0+250

0+200

0+150

0+100

0+050

0+000

DIVIDER DYKE A
(AS-BUILT ELEV. APPROX. 524m)

ACCESS ROAD

LONG LAKE
EL. 515.4

7318700N

7318600N

7318500N

7318400N

476700E

476800E

476900E

477000E

477100E

477200E

N

ISSUED FOR USE

LEGEND

NOTES
1. AS-BUILT SURVEY DATA PROVIDED BY SUB-ARCTIC SURVEY LTD., DECEMBER 2007.
2. DATA PRESENTED AS RECEIVED FROM SUB-ARCTIC SURVEY LTD. ALL EDITS FOR PRESENTATION ONLY.
3. COORDINATES BASED ON NAD 27.

0 50m

Scale: 1:1,500 @ 11"x17"

CLIENT

Aboriginal Affairs and Northern Development Canada

Closure Assessment
Jericho Diamond Mine, Nunavut

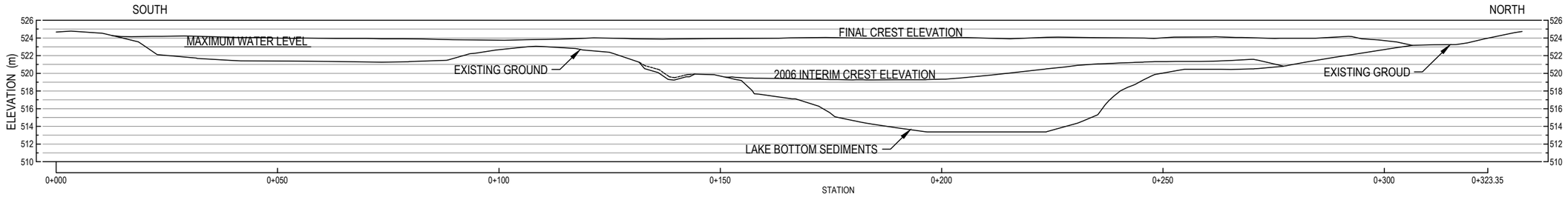
DIVIDER DYKE A
AS-BUILT PLAN VIEW

TETRA TECH EBA

PROJECT NO.	DWN	CKD	REV
E14103202	GDK	WTH	0

OFFICE	DATE
EDM	October 2014

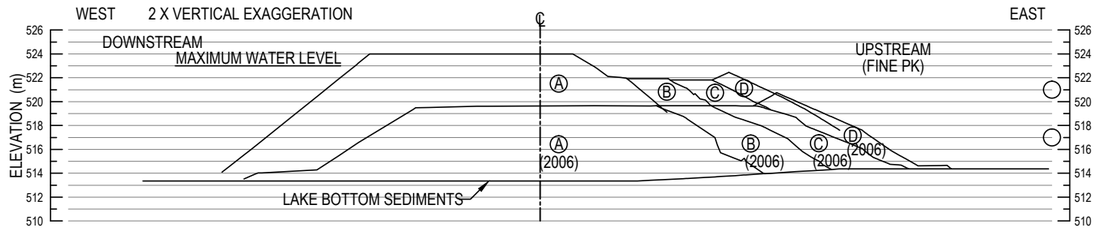
Figure G.14



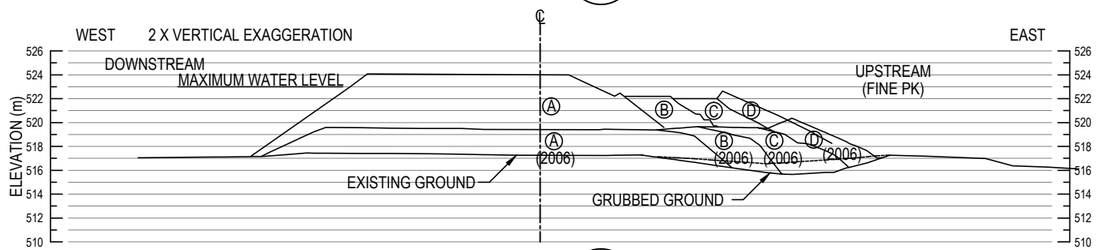
0 50m

Scale: 1:1,000 @ 11"x17"

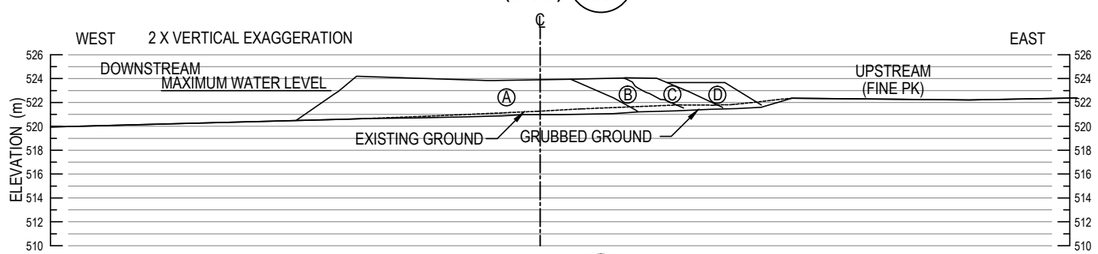
LONGITUDINAL PROFILE A / G.15



SECTION B (0+205) / G.15



SECTION C (0+165) / G.15



SECTION D (0+075) / G.15

0 25m

Scale: 1:500 @ 11"x17"

ISSUED FOR USE

LEGEND

- (A) RUN OF MINE WASTE ROCK
- (B) TRANSITION ZONE (200 mm MINUS WASTE ROCK)
- (C) FILTER ZONE (ESKER ZONE)
- (D) RIP RAP

NOTES
1. AS-BUILT SURVEY DATA PROVIDED BY SUB-ARCTIC SURVEY LTD., DECEMBER 2007.
2. DATA PRESENTED AS RECEIVED FROM SUB-ARCTIC SURVEY LTD. ALL EDITS FOR PRESENTATION ONLY.
3. COORDINATES BASED ON NAD 27.

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Jericho Diamond Mine, Nunavut

DIVIDER DYKE A
AS-BUILT PROFILE AND SECTIONS

TETRA TECH EBA

PROJECT NO.	DWN	CKD	REV
E1410302	GDK	WTH	0
OFFICE: EDM	DATE: October 2014		

Figure G.15

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\GeotechnicalAppendix G (PKCA)\G.15 Divider Dyke Sections.dwg [FIGURE G.15] December 24, 2014 - 9:52:17 am (BY: STIRLING, JENNIFER)

ISSUED FOR USE

LEGEND

0 50m

Scale: 1:1,000 @ 11"x17"

NOTES
1. BASE IMAGE FROM 2014 DRONE SURVEY.
2. COORDINATES BASED ON NAD 27.

CLIENT

Aboriginal Affairs and Northern Development Canada

TETRA TECH EBA

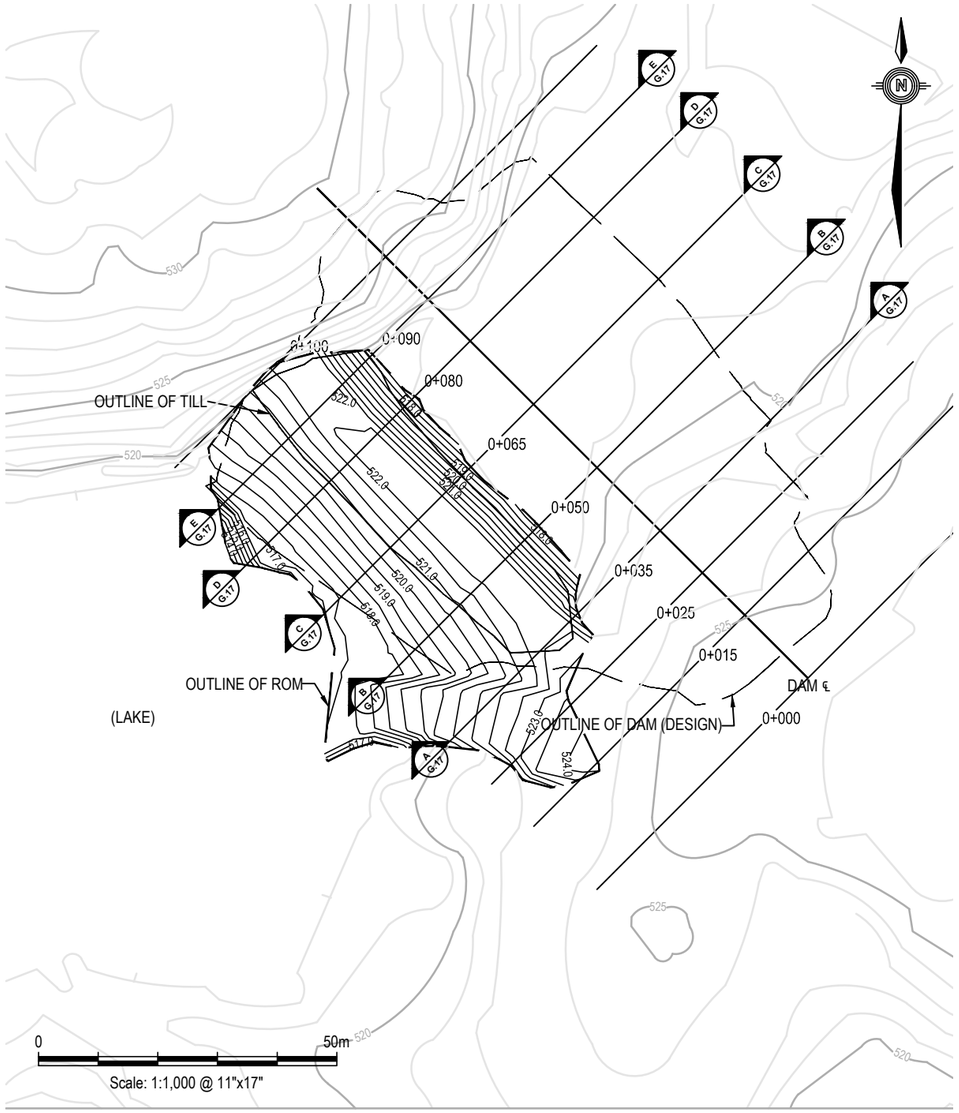
Closure Assessment
Jericho Diamond Mine, Nunavut

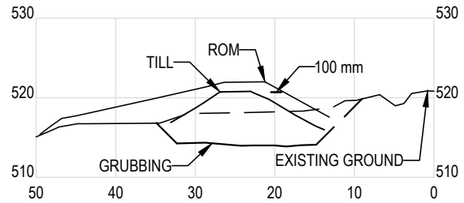
NORTH COFFER DAM INSPECTION NOTES

PROJECT NO.	DWN	CKD	REV
E14103202	GDK	WTH	0
OFFICE: EDM	DATE: October 2014		

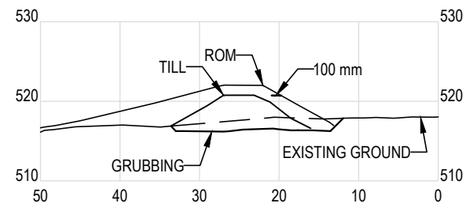
Figure G.16

Q:\Edmonton\Engineering\E1411\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Geotechnical\Appendix G (PKCA)\G.16 North Dam notes.dwg [FIGURE G.16] December 24, 2014 - 9:54:43 am (BY: STIRLING, JENNIFER)

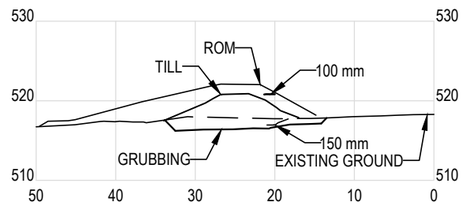




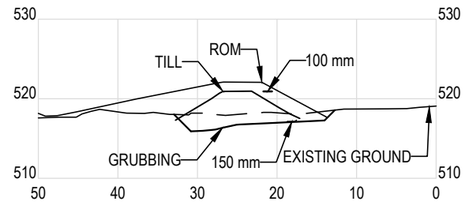
SECTION (0+090) E G.17



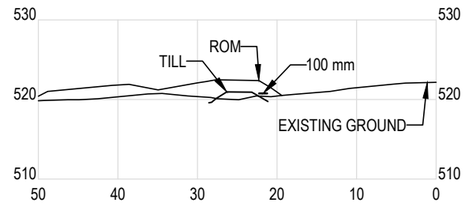
SECTION (0+080) D G.17



SECTION (0+065) C G.17



SECTION (0+050) B G.17



SECTION (0+035) A G.17

0 25m

Scale: 1:750 @ 11"x17"

ISSUED FOR USE

LEGEND

NOTES
1. AS-BUILT SURVEY DATA PROVIDED BY SUB-ARCTIC SURVEY LTD., DECEMBER 2007.
2. DATA PRESENTED AS RECEIVED FROM SUB-ARCTIC SURVEY LTD. ALL EDITS FOR PRESENTATION ONLY.
3. COORDINATES BASED ON NAD 27.
4. BACKGROUND CONTOURS (GREY) OBTAINED FROM DRAWING 1100060013Q01, CONTOUR INTERVAL IS 1m.

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Aboriginal Affairs and Northern Development Canada

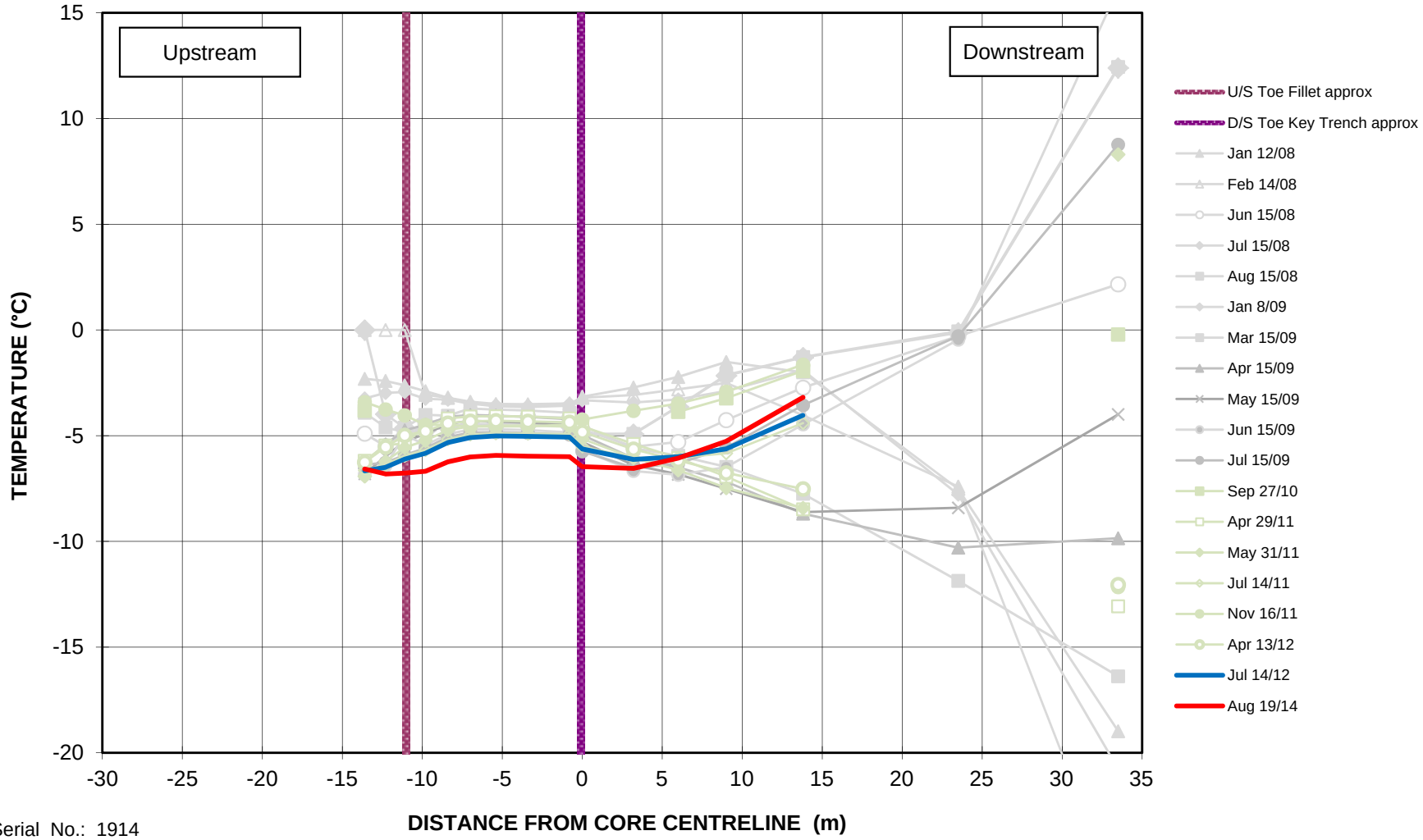
TETRA TECH EBA

Closure Assessment
Jericho Diamond Mine, Nunavut
NORTH COFFER DAM
AS-BUILT PLAN AND SECTIONS

PROJECT NO.	DWN	CKD	REV
E14103202	GDK	WTH	0
OFFICE	DATE		
EDM	October 2014		

Figure G.17

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Geotechnical\Appendix G (PKCA)\G.17 North Dam.dwg [FIGURE G.17] December 24, 2014 - 9:55:27 am (BY: STIRLING, JENNIFER)



Serial No.: 1914
Date Installed: 2006.1.21

Figure G-18
Horizontal Ground Temperature Distribution
West Dam
Station 0+035, Trench Elevation 513 m

TETRA TECH EBA

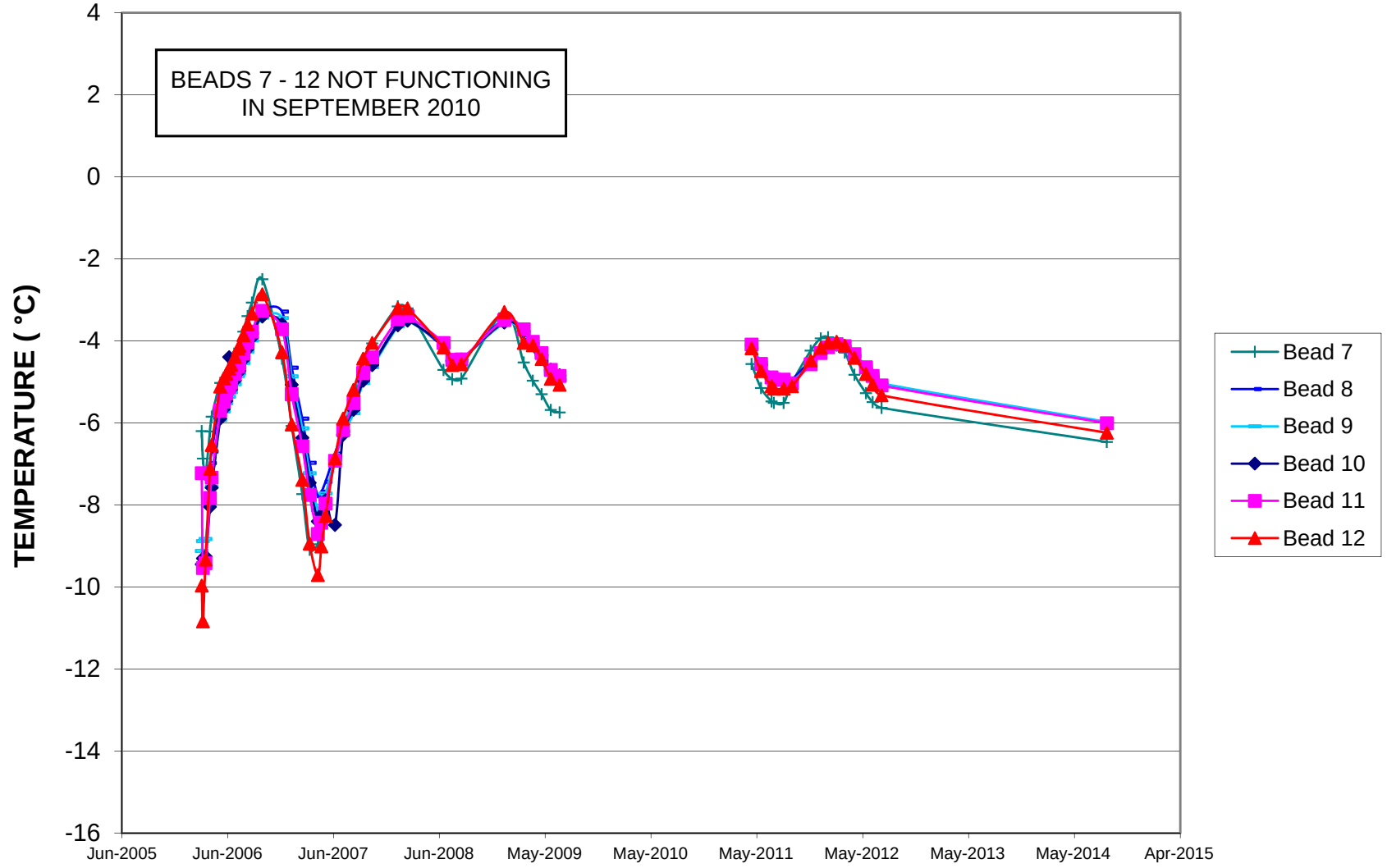
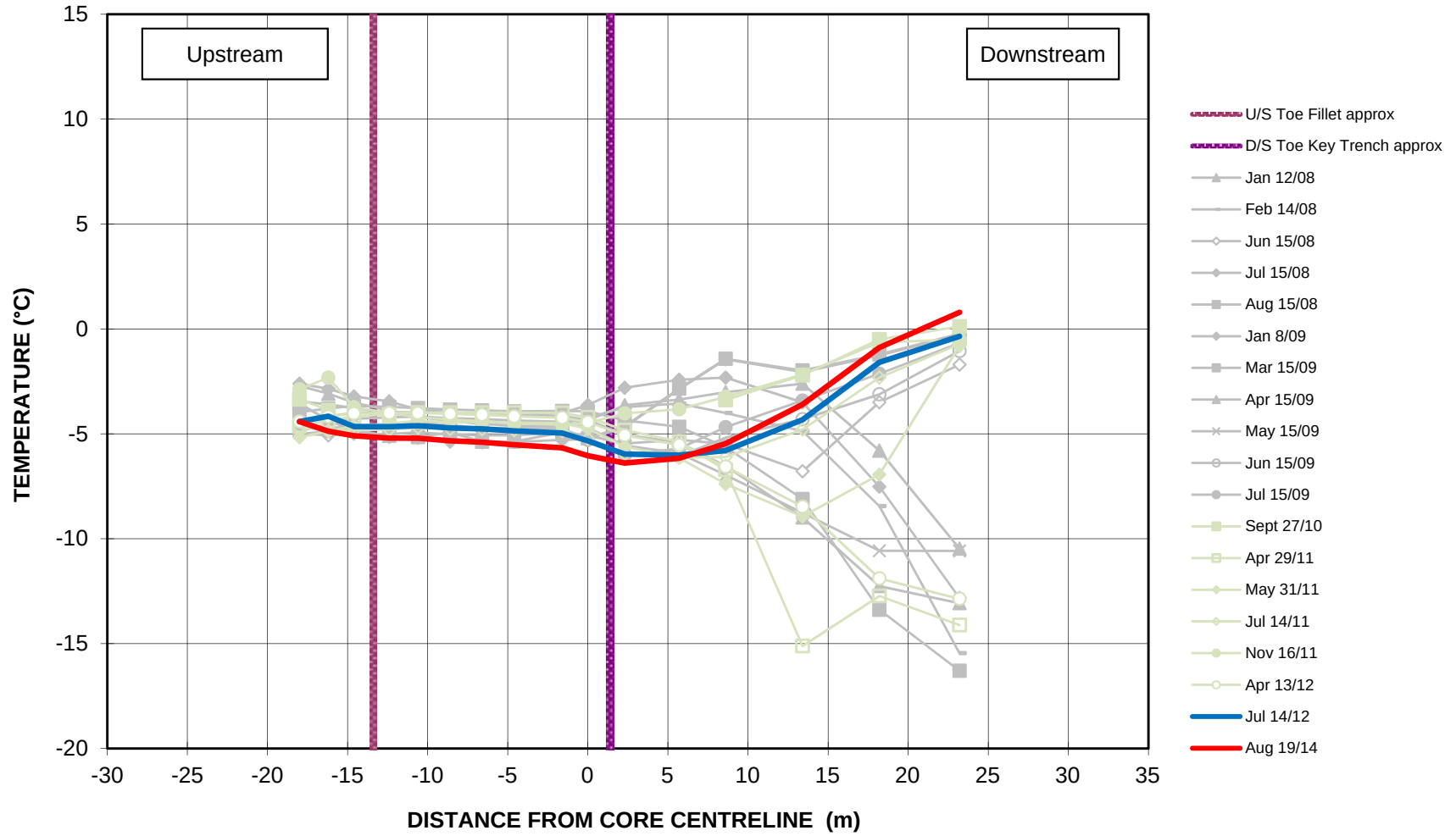


Figure G-19
Horizontal Ground Temperature Distribution
West Dam
Station 0+035, Trench Elevation 513 m

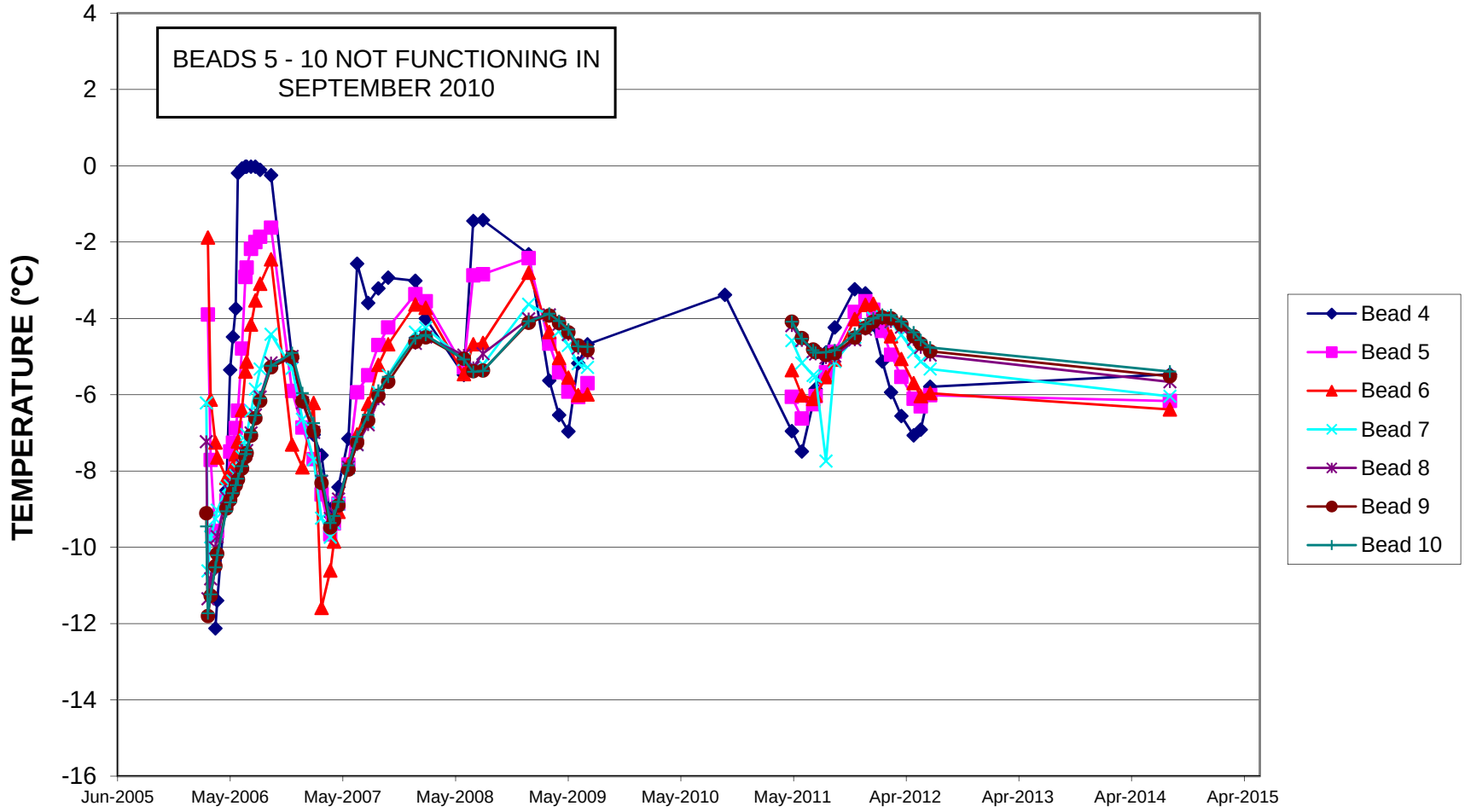
TETRA TECH EBA



Serial No.: 1915
Date Installed: 2006.1.20

Figure G-20
Horizontal Ground Temperature Distribution
West Dam
Station 0+080, Trench Elevation 514 m

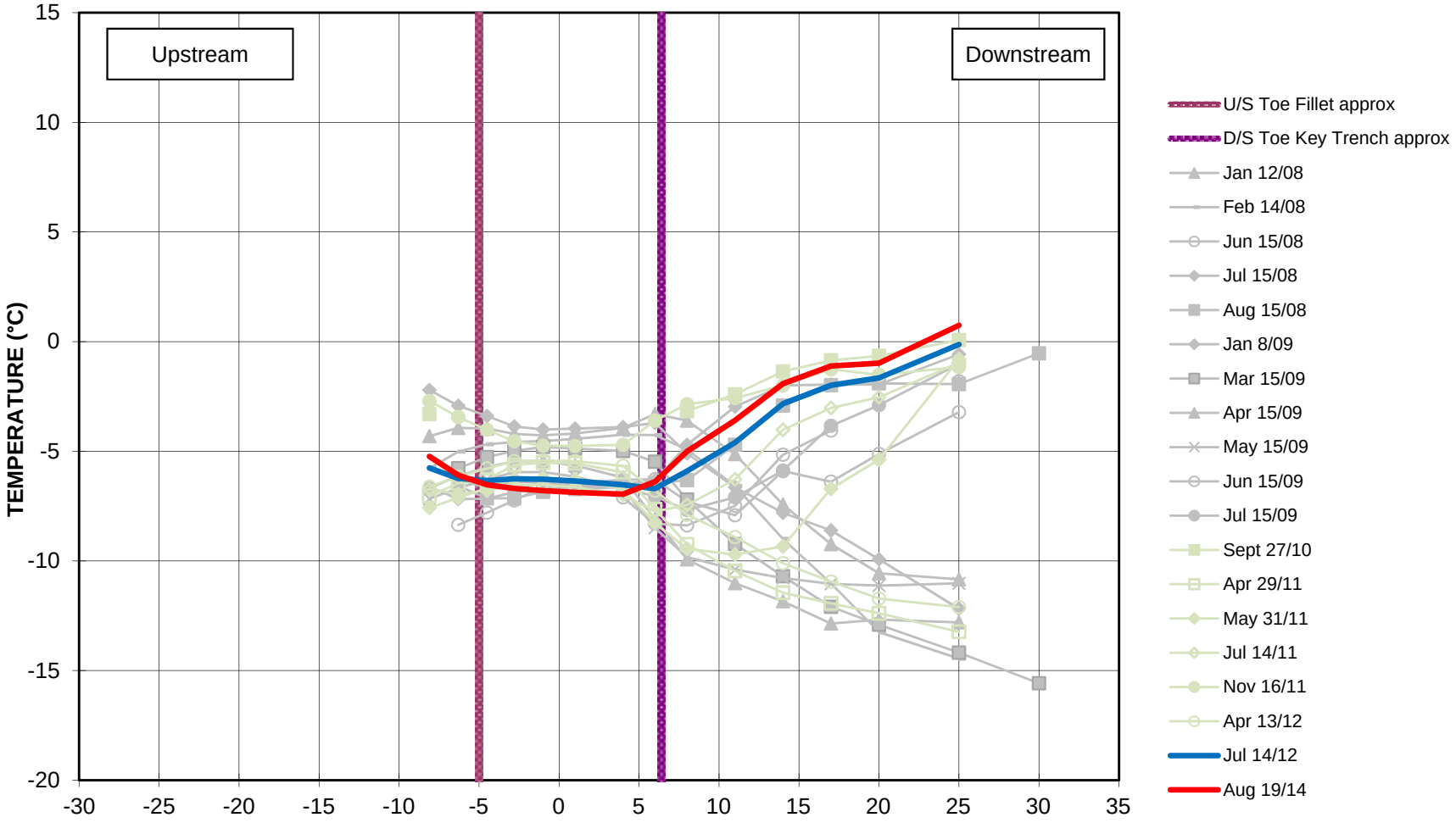
TETRA TECH EBA



Serial No.: 1915
Date Installed: 2006.1.20

Figure G-21
Horizontal Ground Temperature Distribution
West Dam
Station 0+080, Trench Elevation 514 m

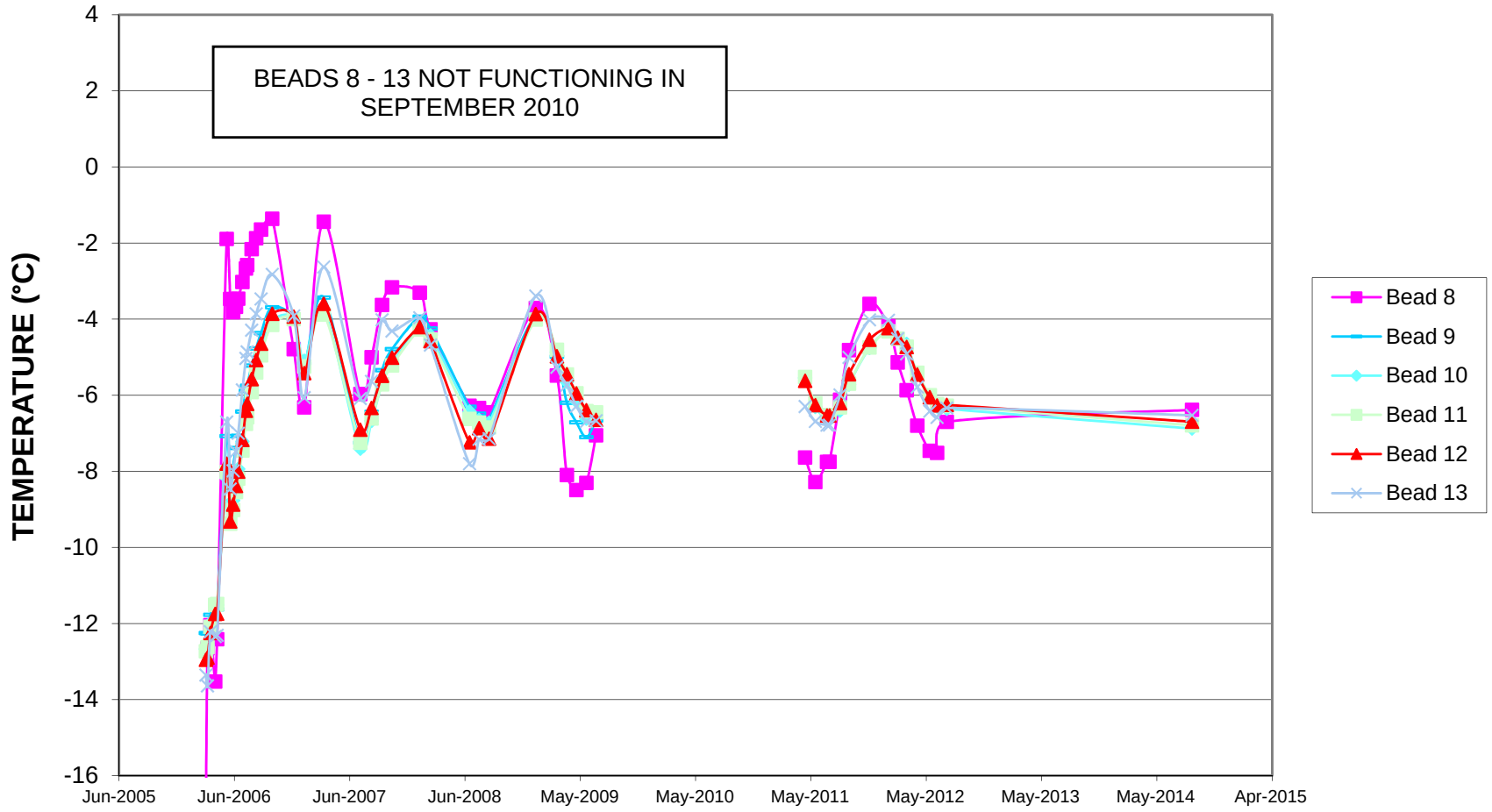
TETRA TECH EBA



Serial No.: 1916
Date Installed: 2006.1.20

Figure G-22
Horizontal Ground Temperature Distribution
West Dam
Station 0+120, Trench Elevation 518 m

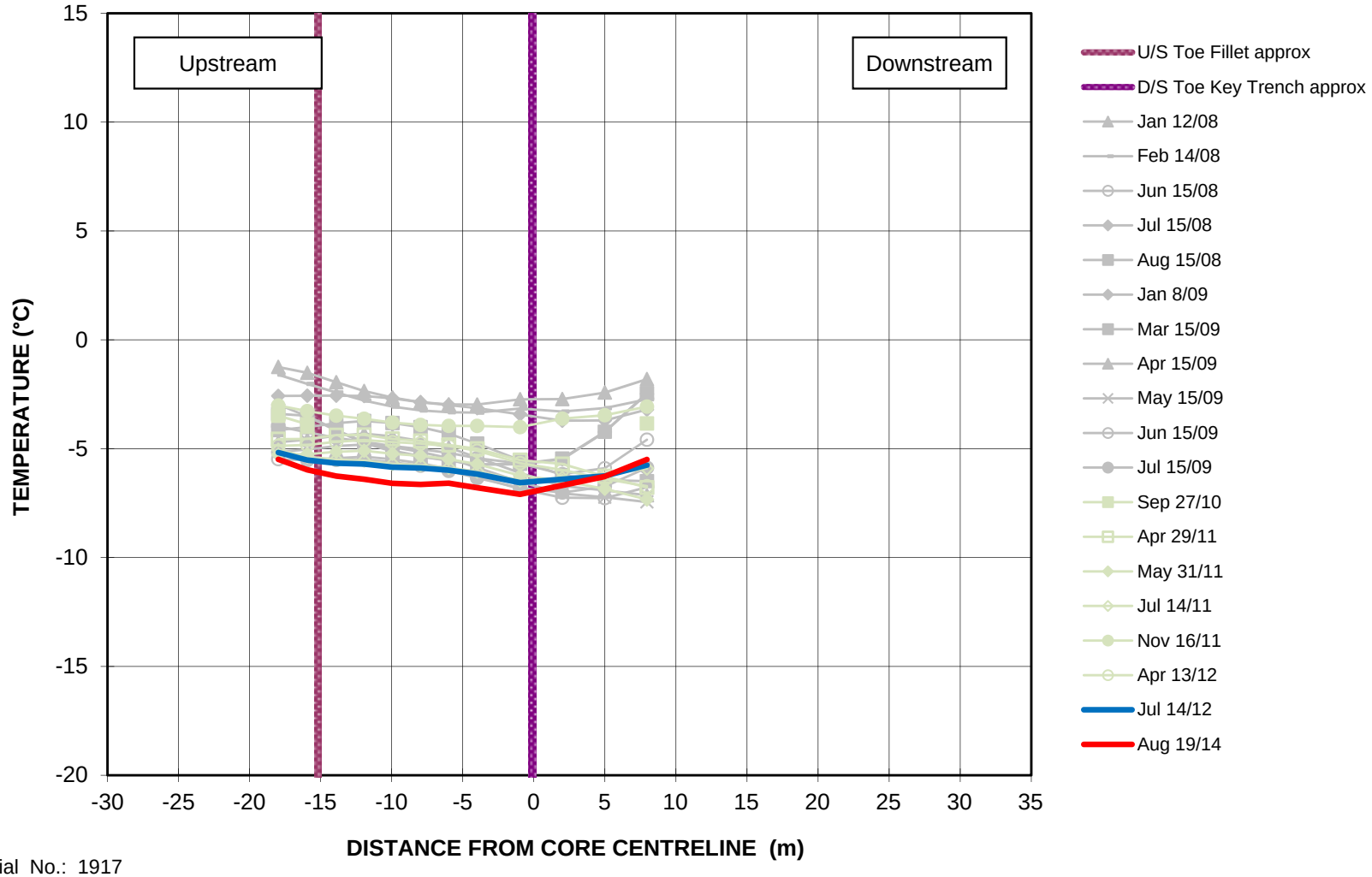
TETRA TECH EBA



Serial No.: 1916
Date Installed: 2006.1.20

Figure G-23
Horizontal Ground Temperature Distribution
West Dam
Station 0+120, Trench Elevation 518 m

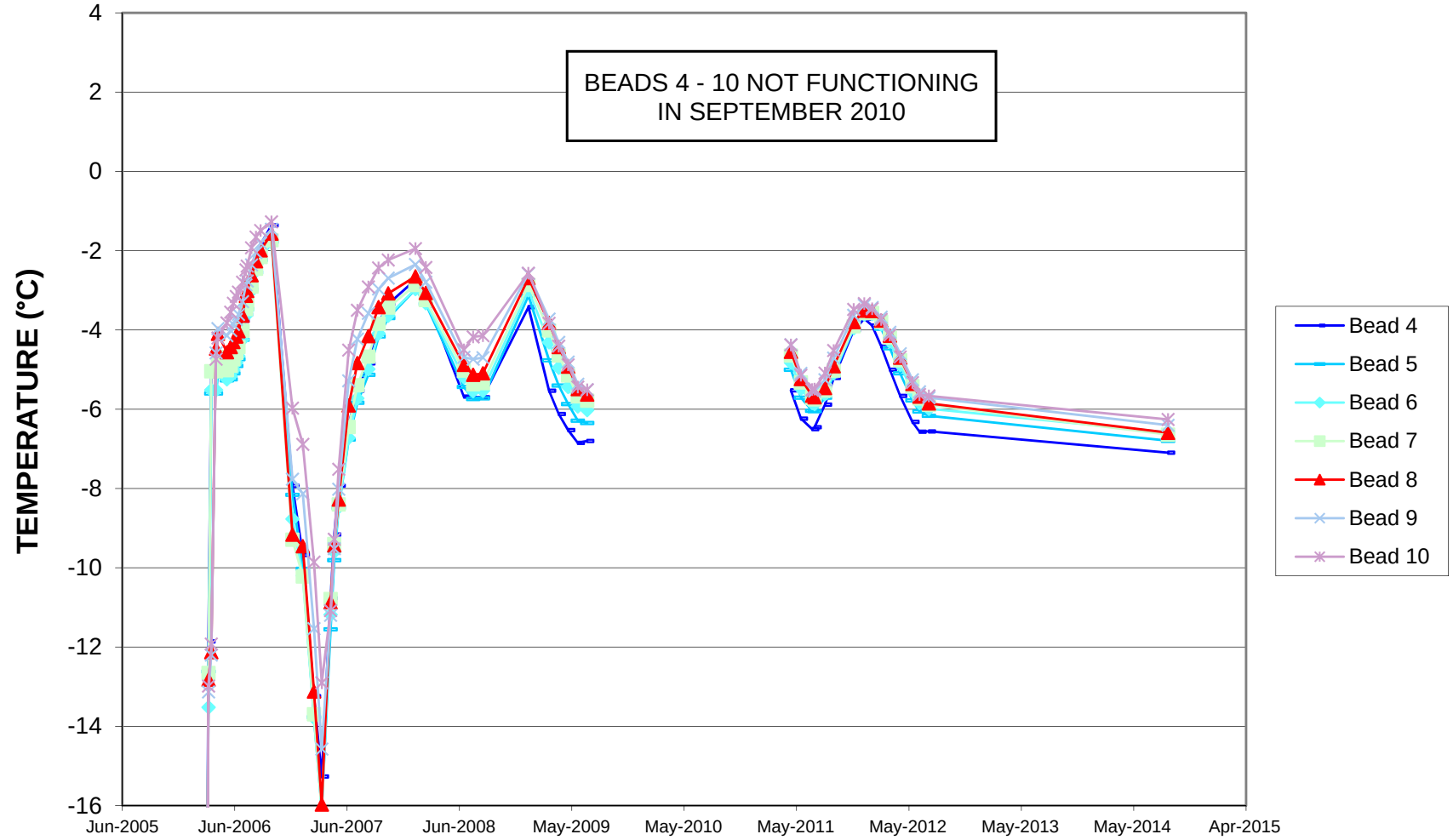
TETRA TECH EBA



Serial No.: 1917
Date Installed: 2006

Figure G-24
Horizontal Ground Temperature Distribution
West Dam
Station 0+035, Trench Elevation 516 m

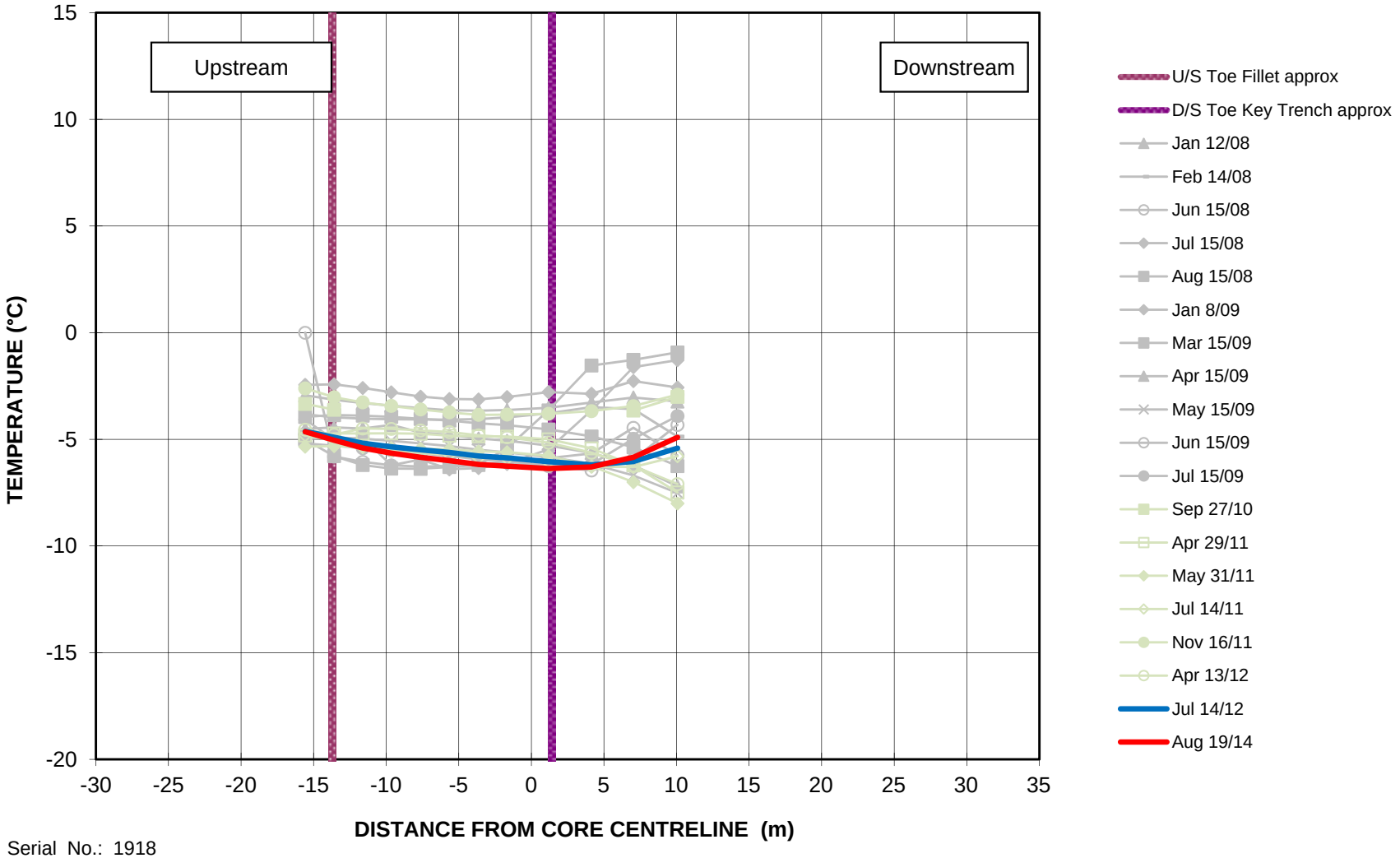
TETRA TECH EBA



Serial No.: 1917
Date Installed: 2006

Figure G-25
Horizontal Ground Temperature Distribution
West Dam
Station 0+035, Trench Elevation 516 m

TETRA TECH EBA



Serial No.: 1918
Date Installed: 2006

Figure G-26
Horizontal Ground Temperature Distribution
West Dam
Station 0+080, Trench Elevation 518 m

TETRA TECH EBA

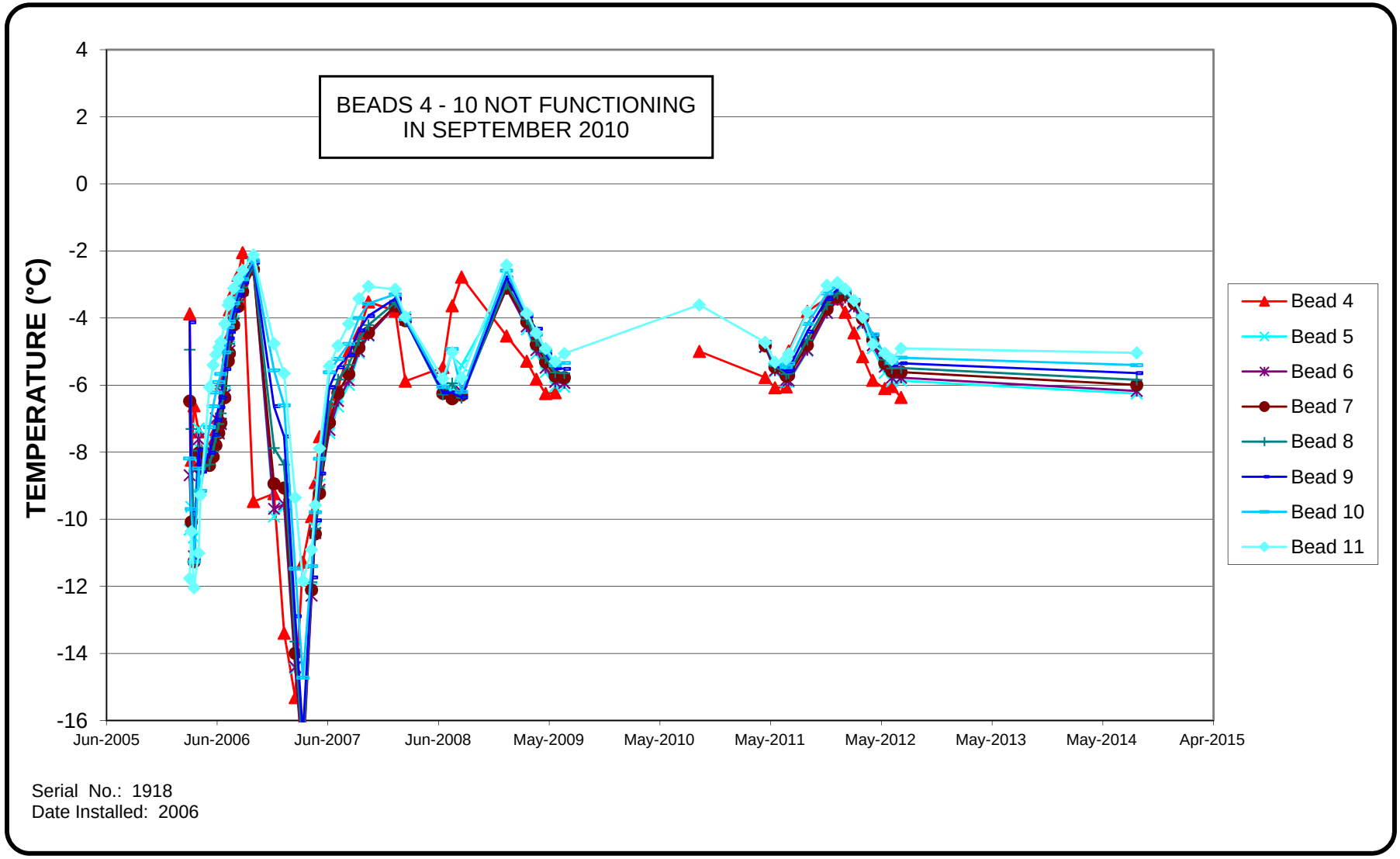
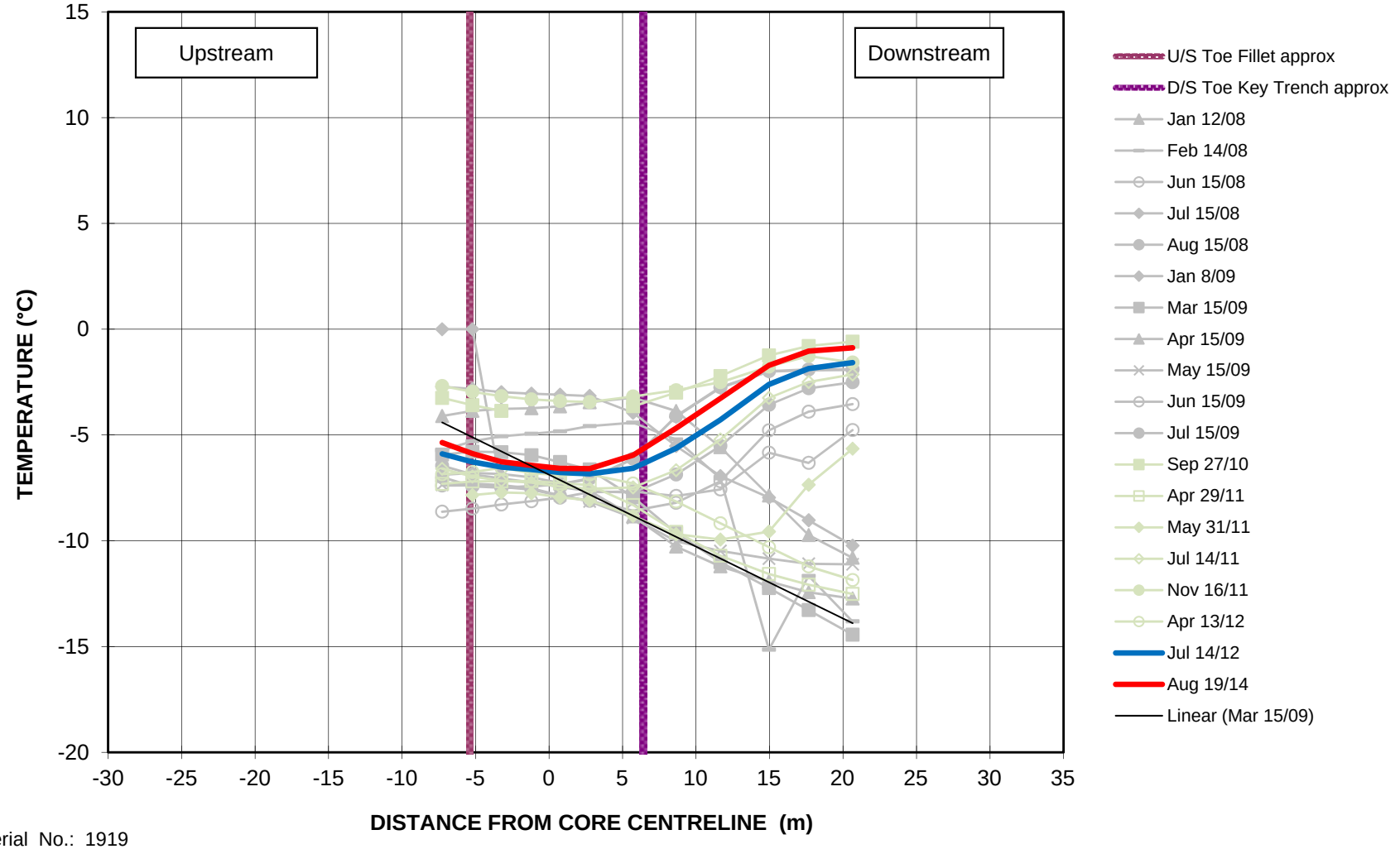


Figure G-27
Horizontal Ground Temperature Distribution
West Dam
Station 0+080, Trench Elevation 518 m

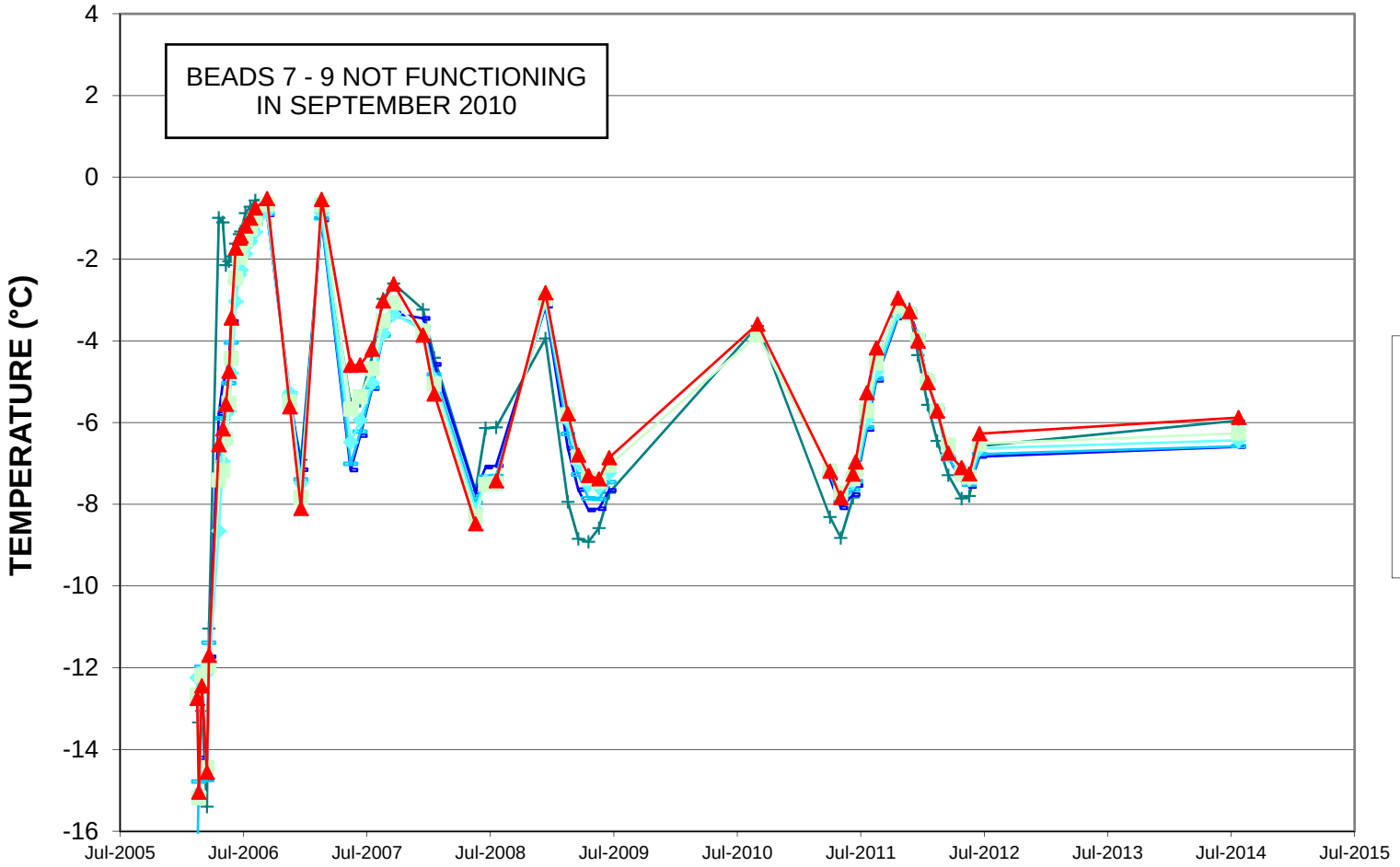
TETRA TECH EBA



Serial No.: 1919
Date Installed: 2006

Figure G-28
Horizontal Ground Temperature Distribution
West Dam
Station 0+120, Trench Elevation 520 m

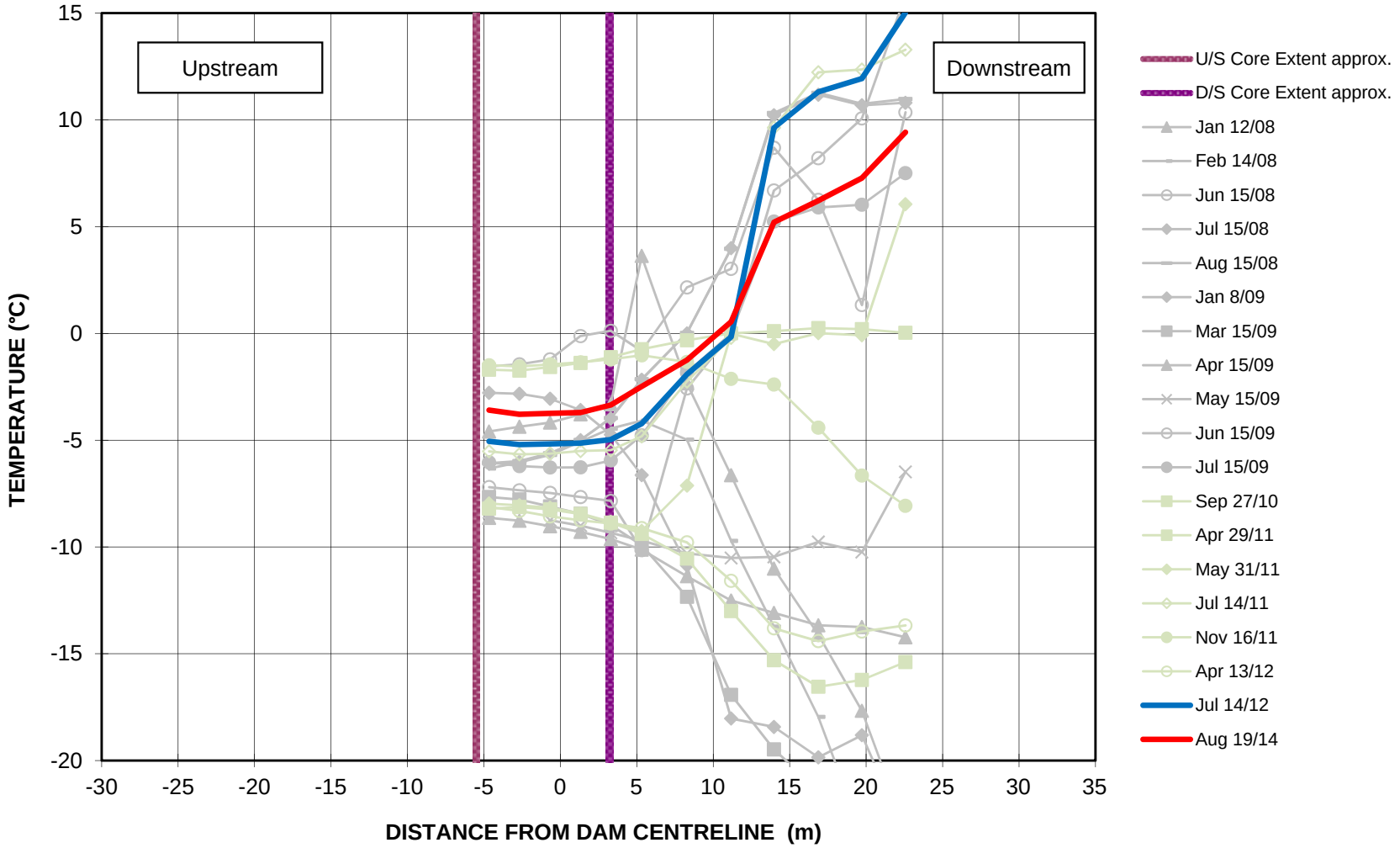
TETRA TECH EBA



Serial No.: 1919
Date Installed: 2006

Figure G-29
Horizontal Ground Temperature Distribution
West Dam
Station 0+120, Trench Elevation 520 m

TETRA TECH EBA

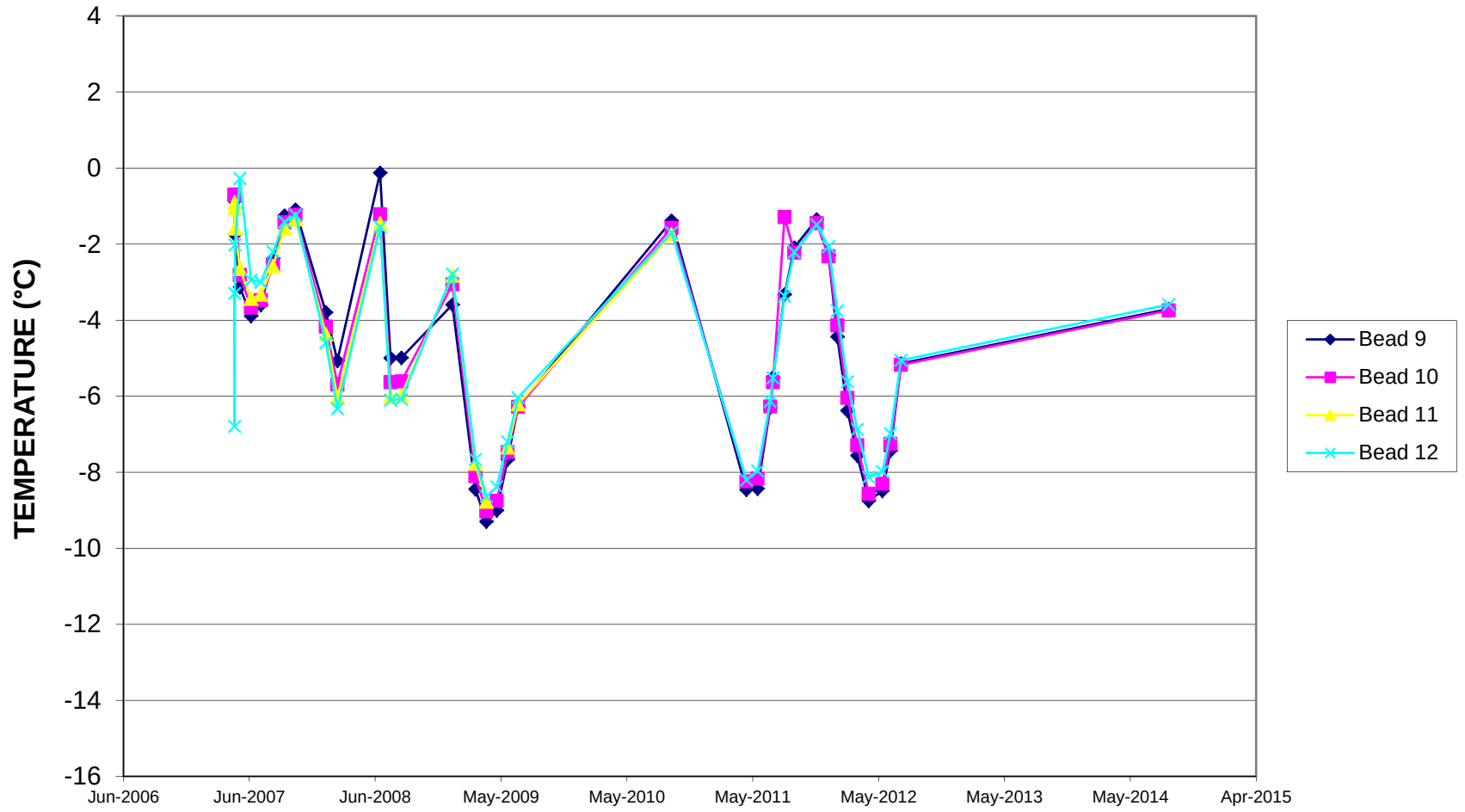


Serial No.: 1921
Date Installed: 04/01/2007

EBA File No: 1100060.007

Figure G-30
Horizontal Ground Temperature Distribution
West Dam
Station 0+080, Average Elevation 522 m

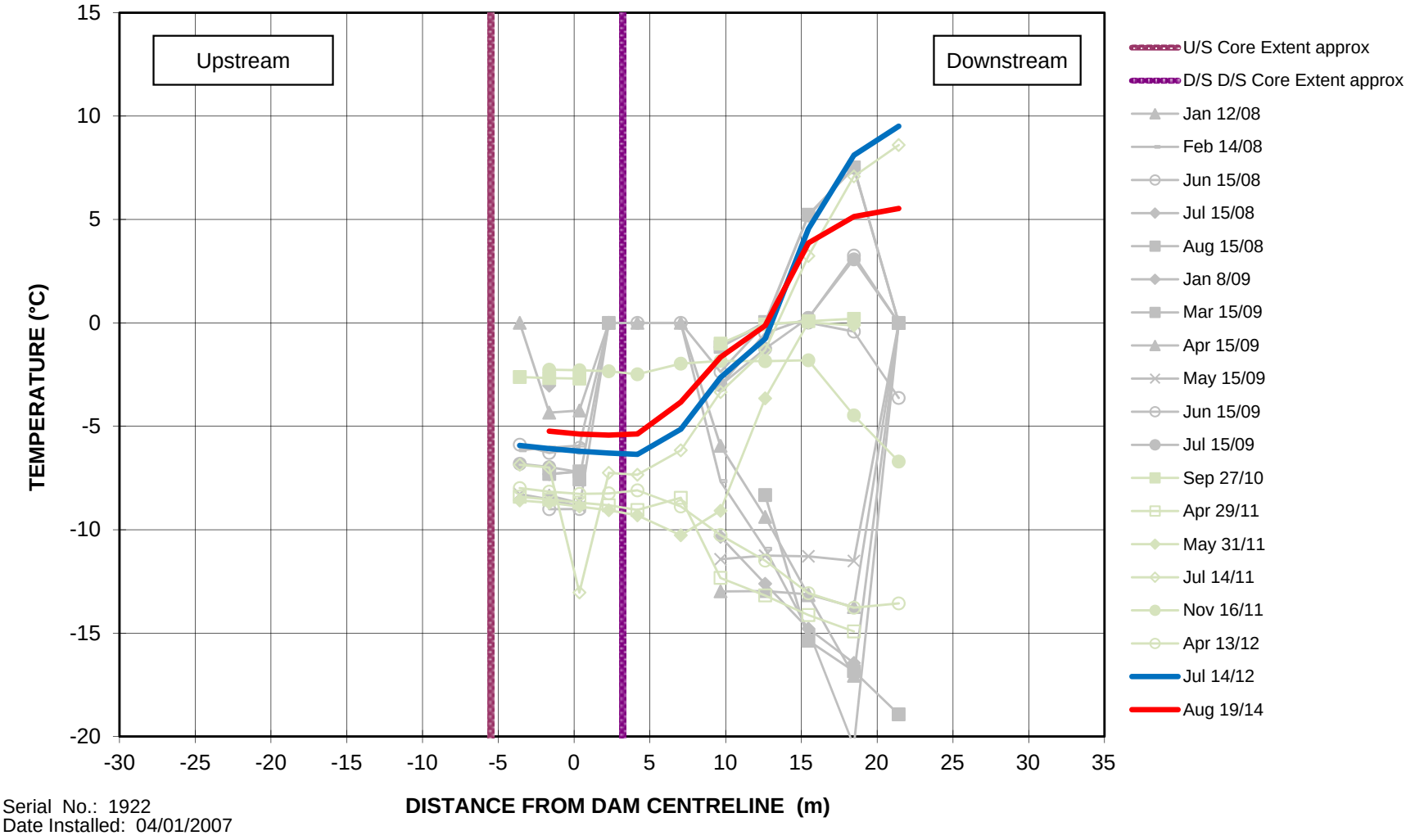
TETRA TECH EBA



Serial No.: 1921
Date Installed: 04/01/2007

Figure G-31
Horizontal Ground Temperature Distribution
West Dam
Station 0+080, Average Elevation 522 m

TETRA TECH EBA



Serial No.: 1922
Date Installed: 04/01/2007

Figure G-32
Horizontal Ground Temperature Distribution
West Dam
Station 0+120, Elevation 522 m

TETRA TECH EBA

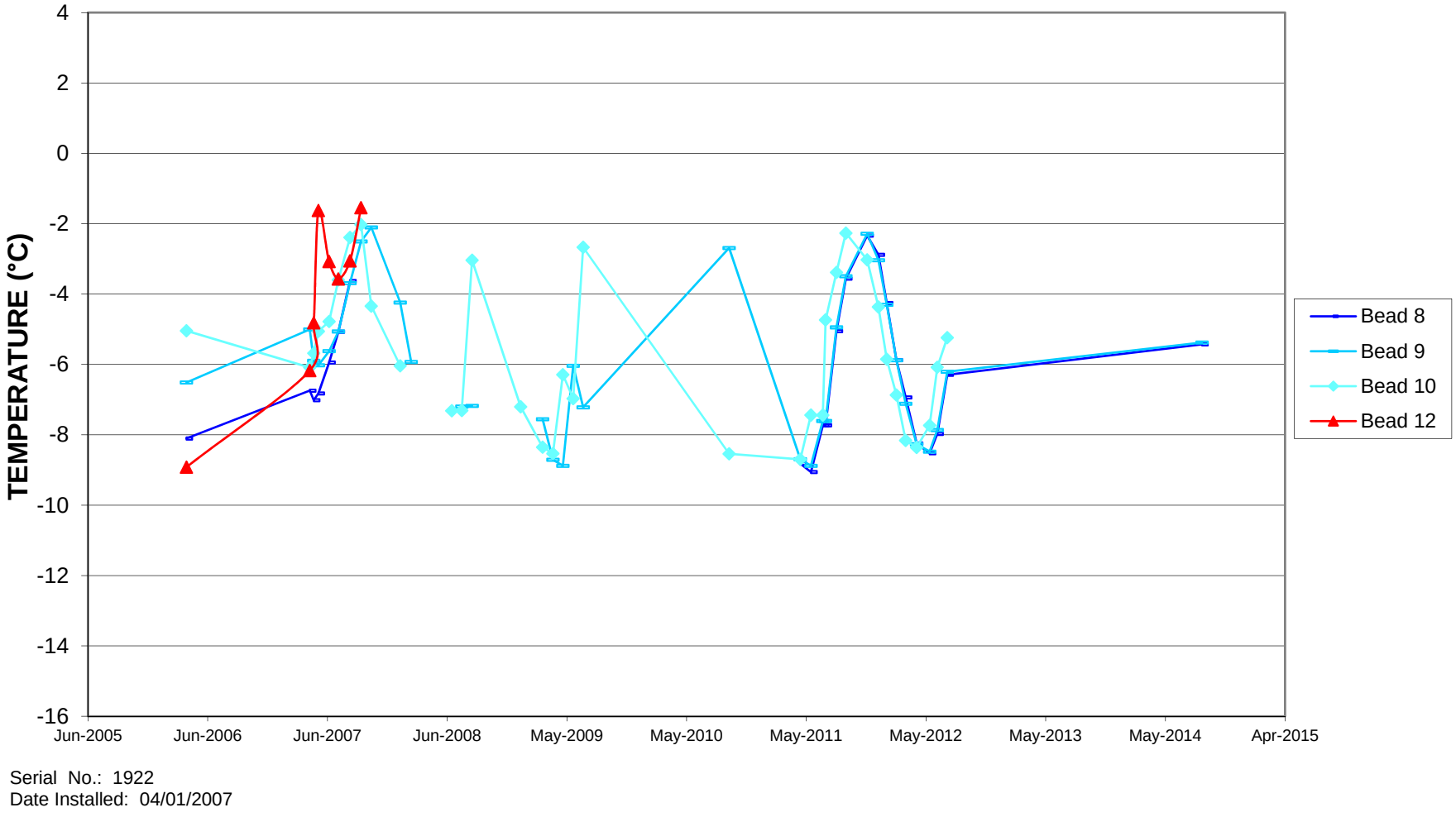
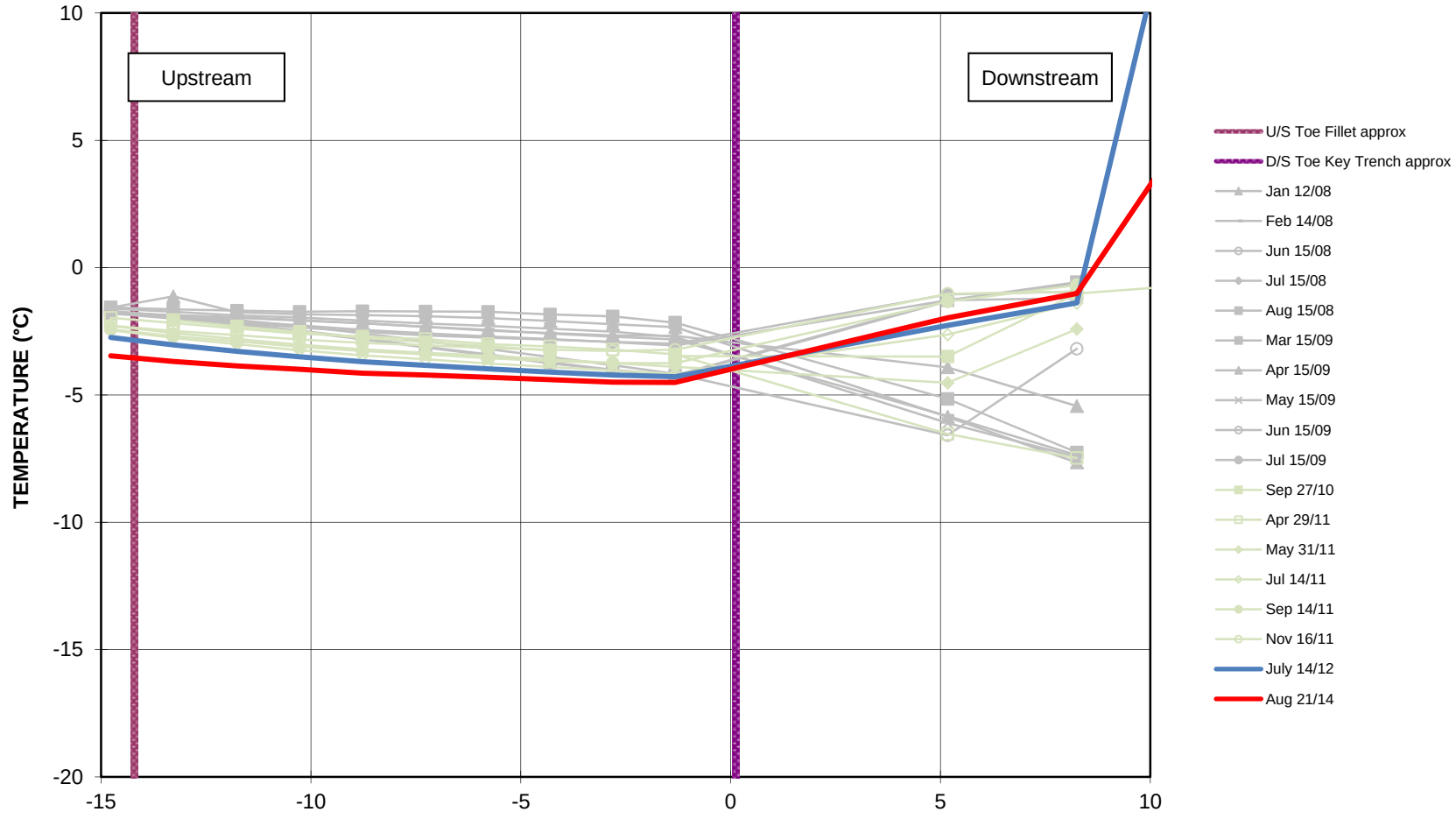


Figure G-33
Horizontal Ground Temperature Distribution
West Dam
Station 0+120, Elevation 522 m

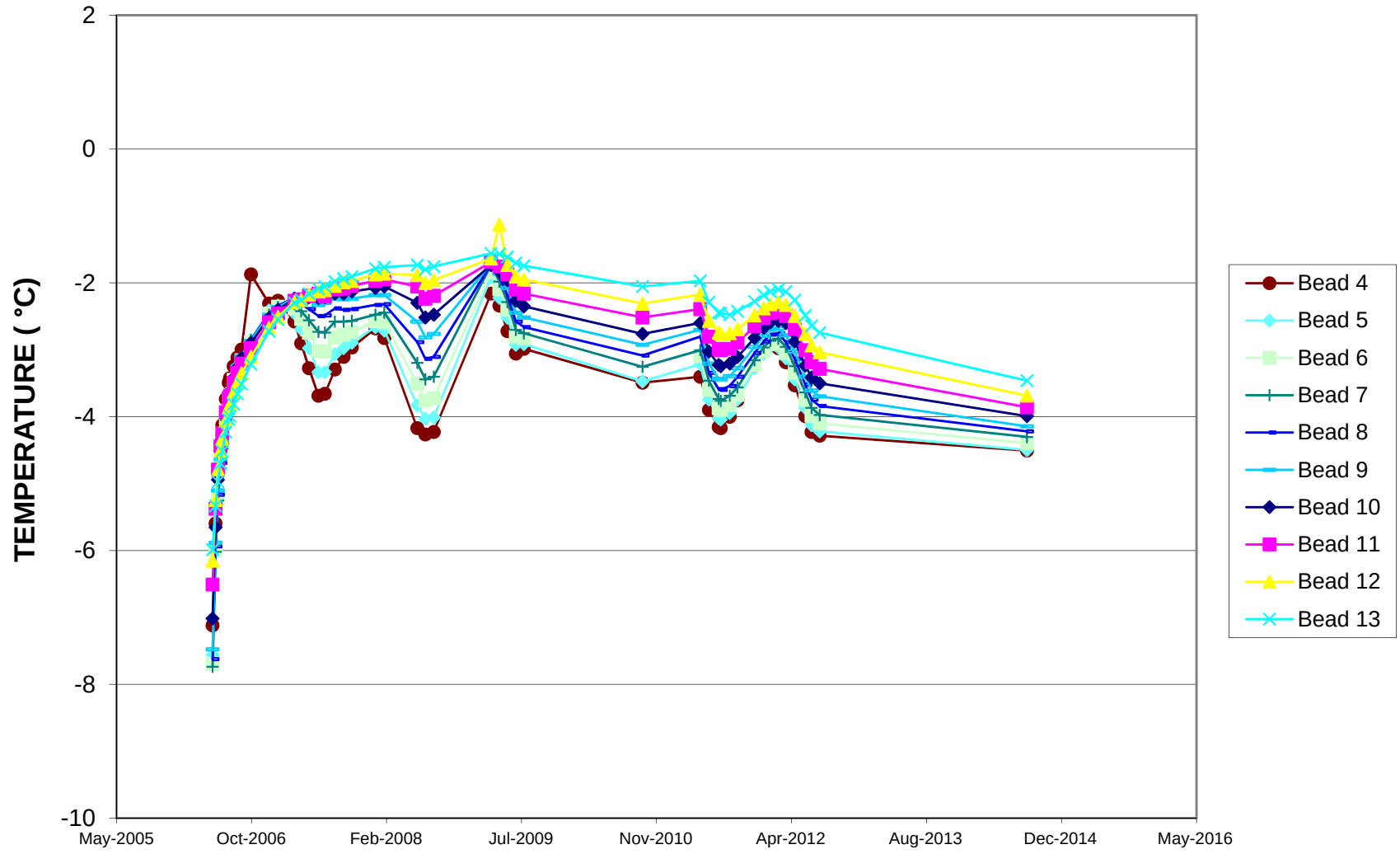
TETRA TECH EBA



Serial No.: 1830
Date Installed: 2005.12.11
EBA File No: 1100060.010

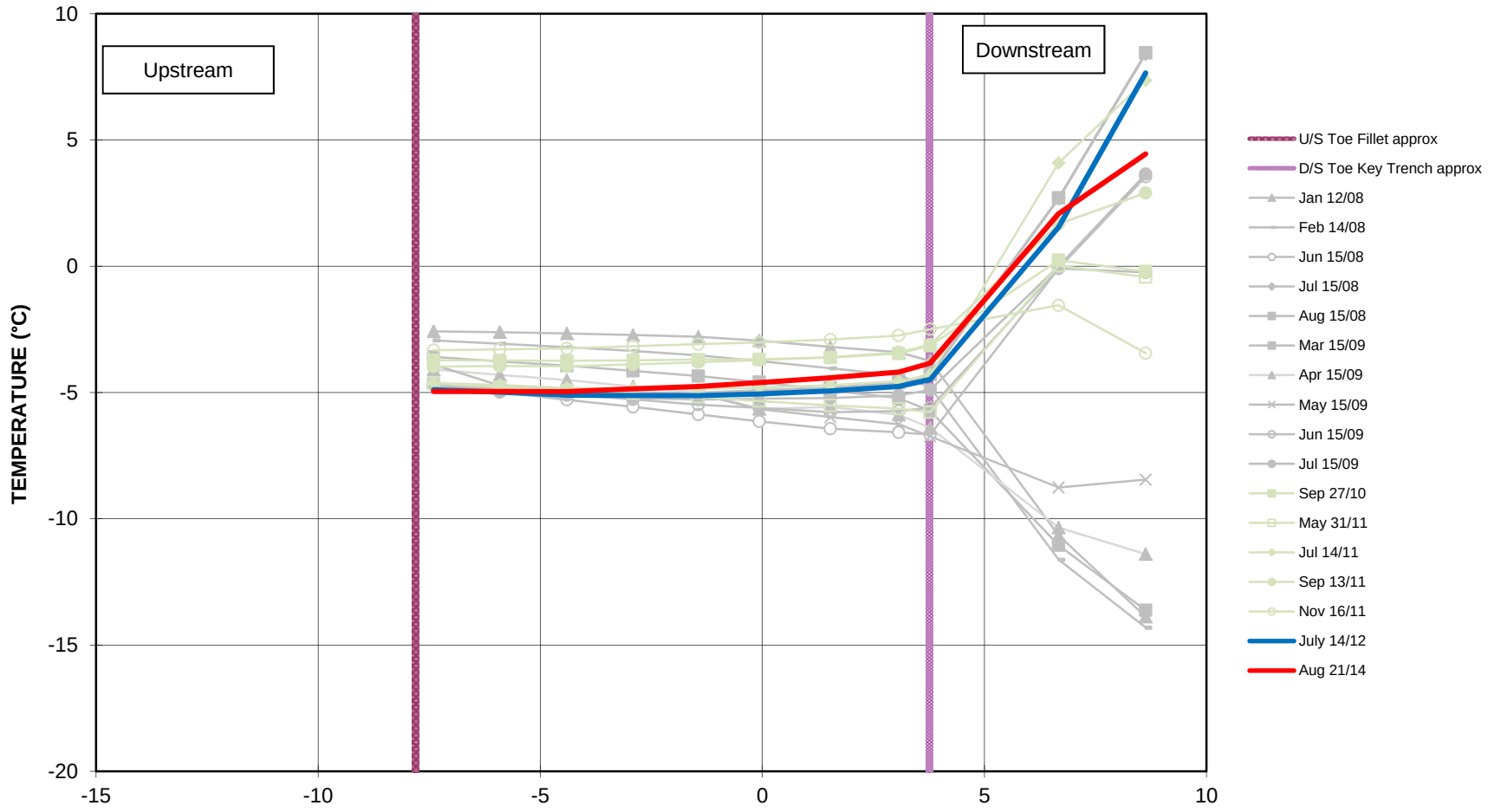
Figure G-34
Horizontal Ground Temperature Distribution
East Dam
Station 0+100, Trench Elevation 517 m

TETRA TECH EBA



Serial No.: 1830
Date Installed: 2005.12.11
EBA File No: 1100060.010

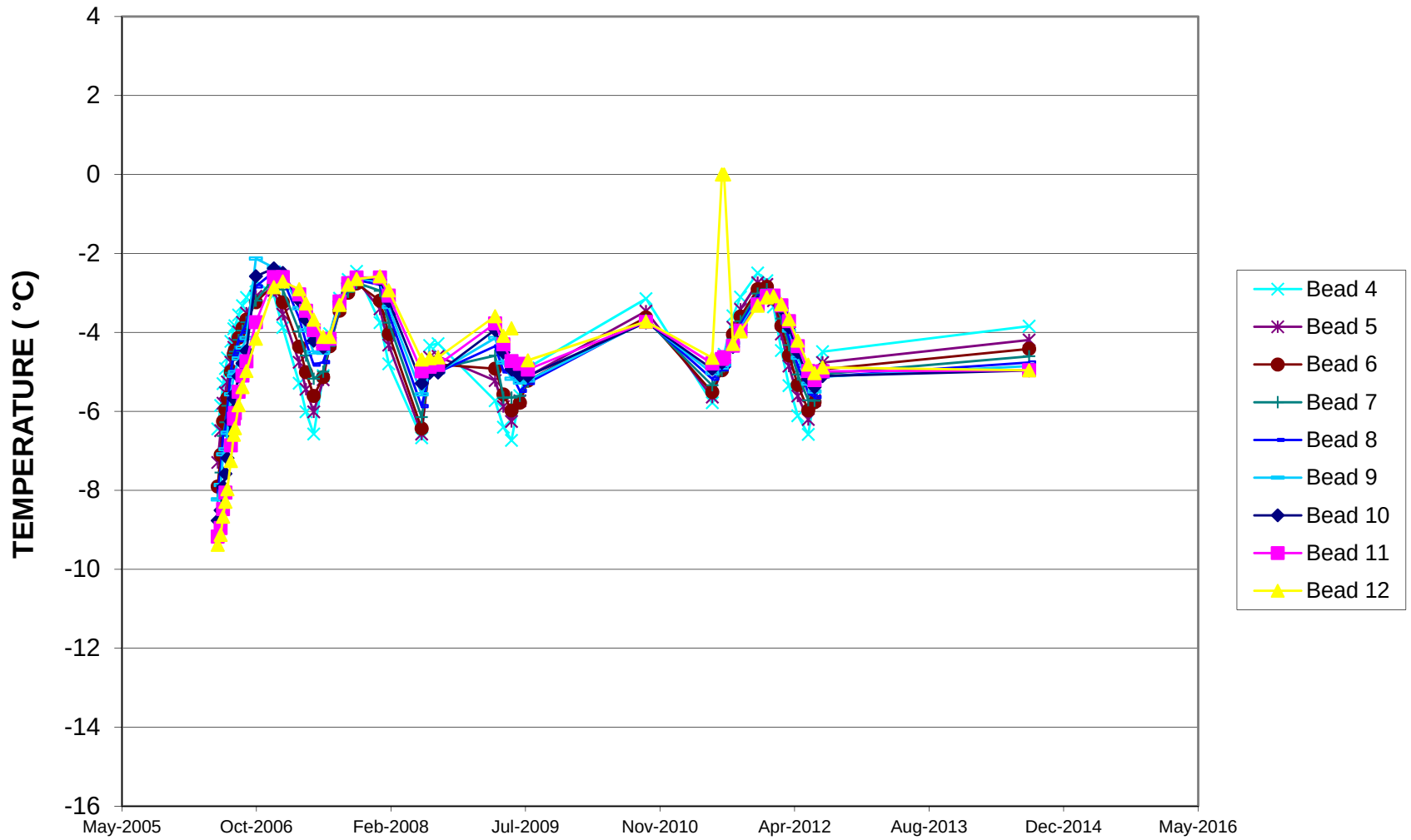
Figure G-35
Horizontal Ground Temperature Distribution
East Dam
Station 0+100, Trench Elevation 517 m



Serial No.: 1831
Date Installed: 2005.11.29
EBA File No: 1100060.010

Figure G-36
Horizontal Ground Temperature Distribution
East Dam
Station 0+150, Trench Elevation 515 m

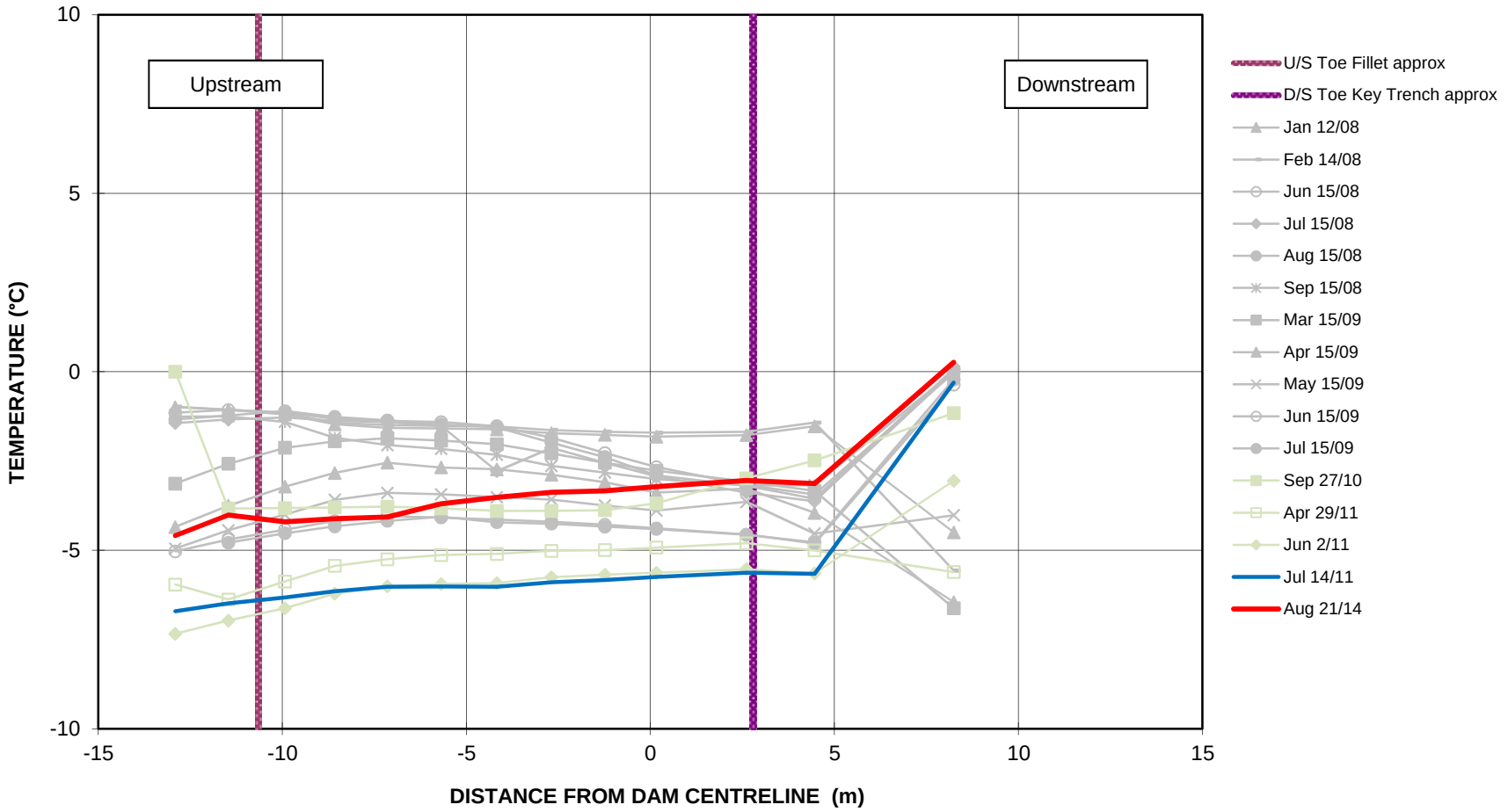
TETRA TECH EBA



Serial No.: 1831
Date Installed: 2005.11.29
EBA File No: 1100060.010

Figure G-37
Horizontal Ground Temperature Distribution
East Dam
Station 0+100, Trench Elevation 517 m

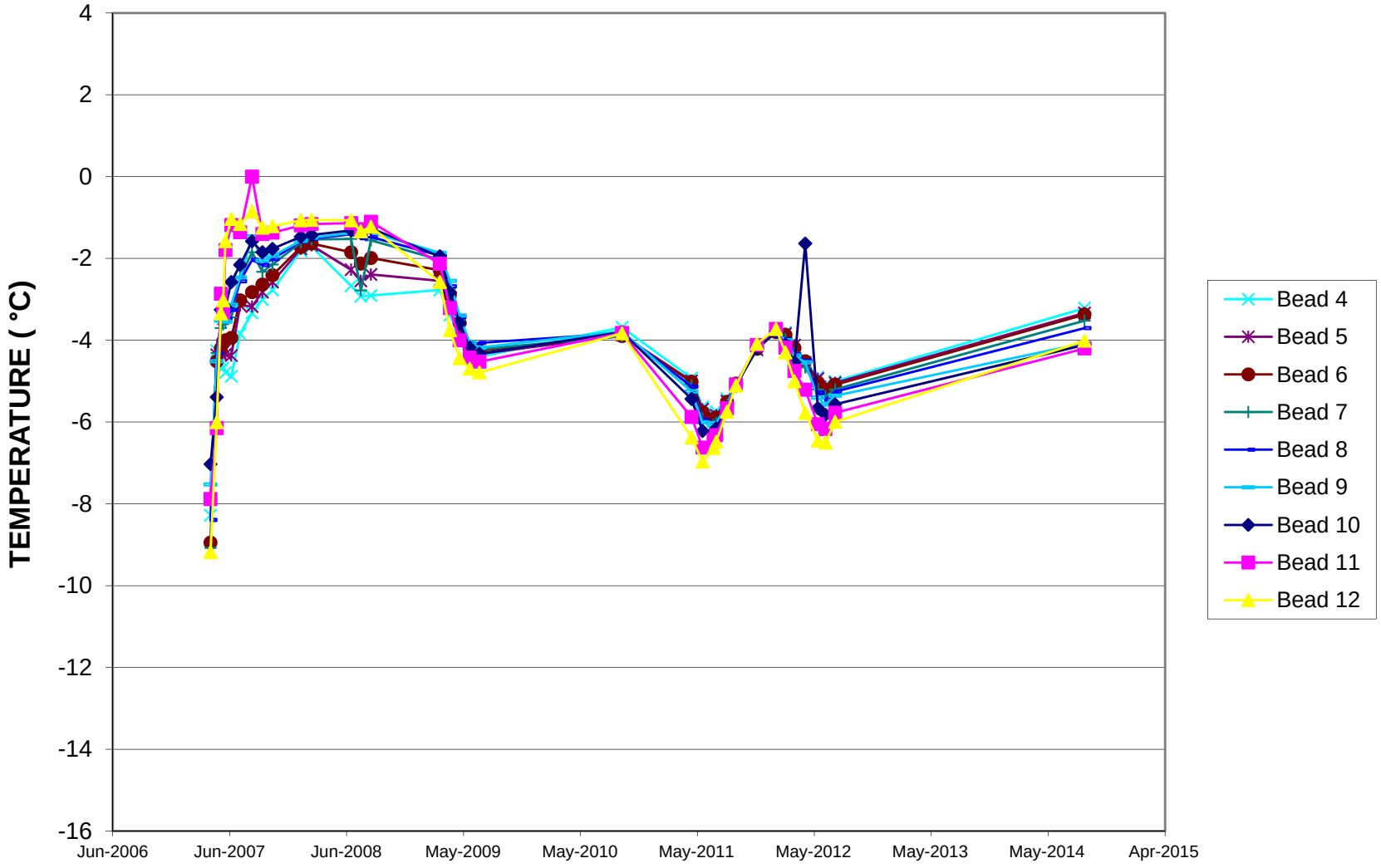
TETRA TECH EBA



Serial No.: 1832
Date Installed: April 5, 2007

Figure G-38
Horizontal Ground Temperature Distribution
Southeast Dam
Station 0+150, Trench Elevation 516 m

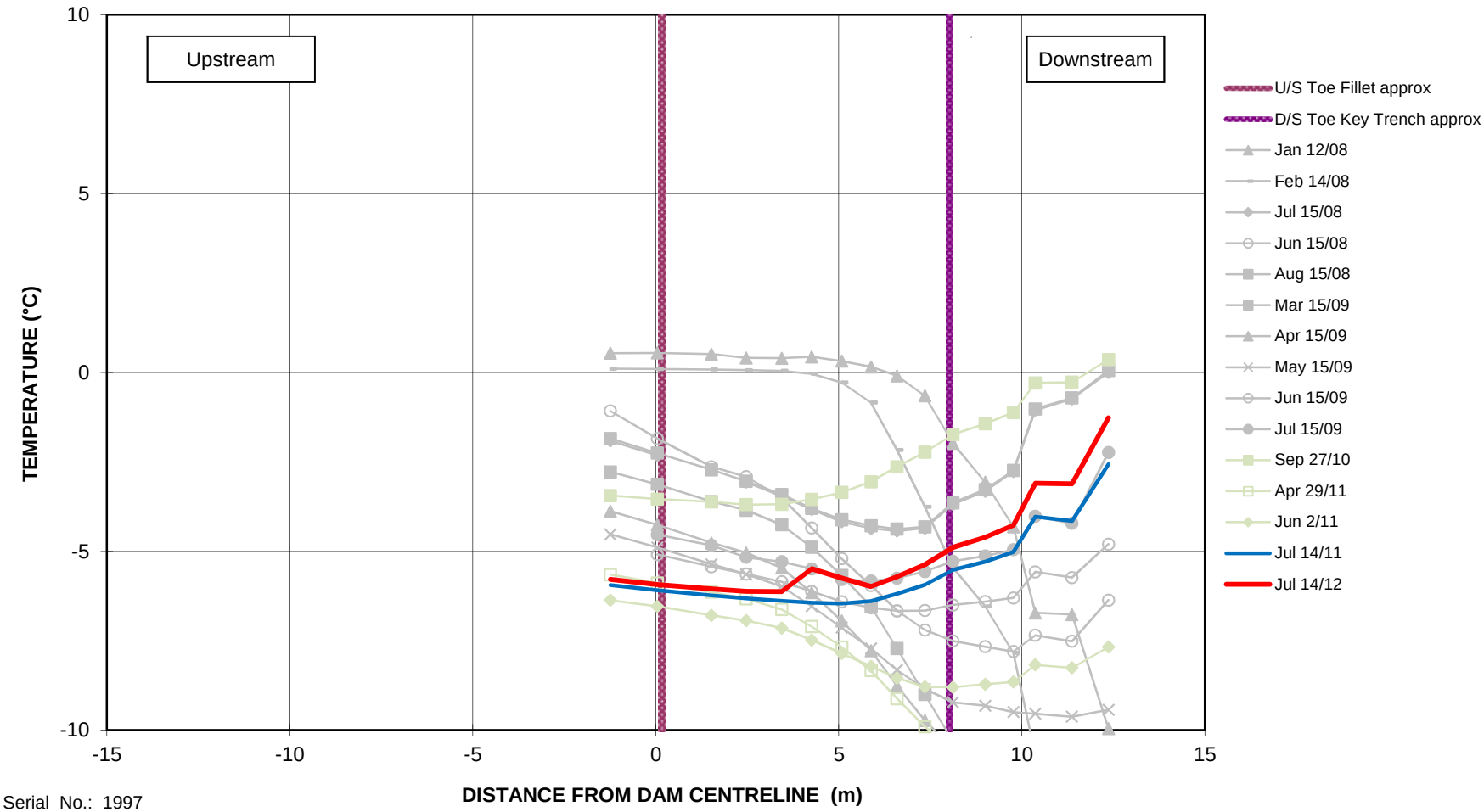
TETRA TECH EBA



Serial No.: 1832
Date Installed: April 5, 2007

Figure G-39
Horizontal Ground Temperature Distribution
Southeast Dam
Station 0+150, Trench Elevation 516 m

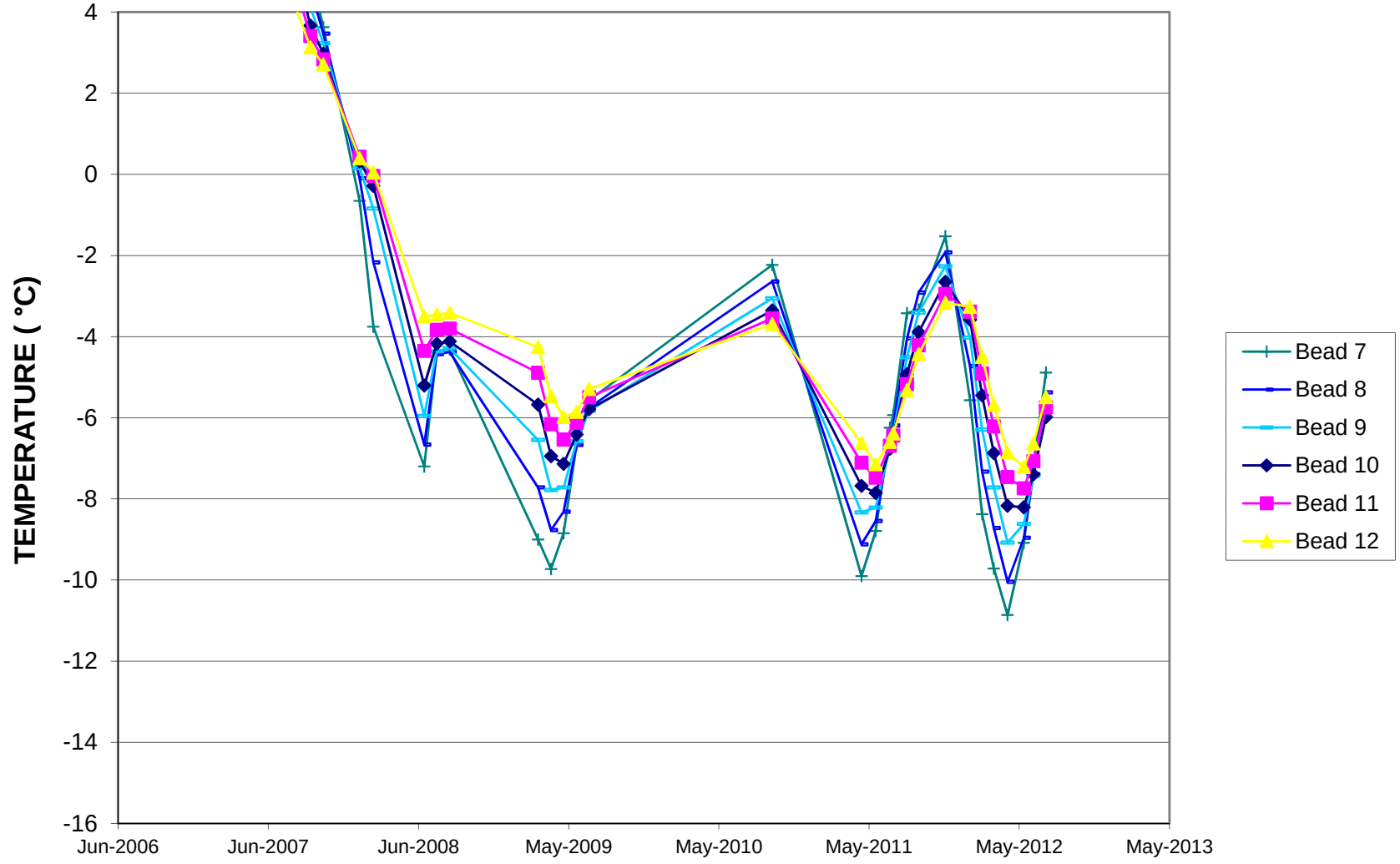
TETRA TECH EBA



Serial No.: 1997
Date Installed: July 6, 2007

Figure G-40
Horizontal Ground Temperature Distribution
Southeast Dam
Station 0+240, Trench Elevation 520 m

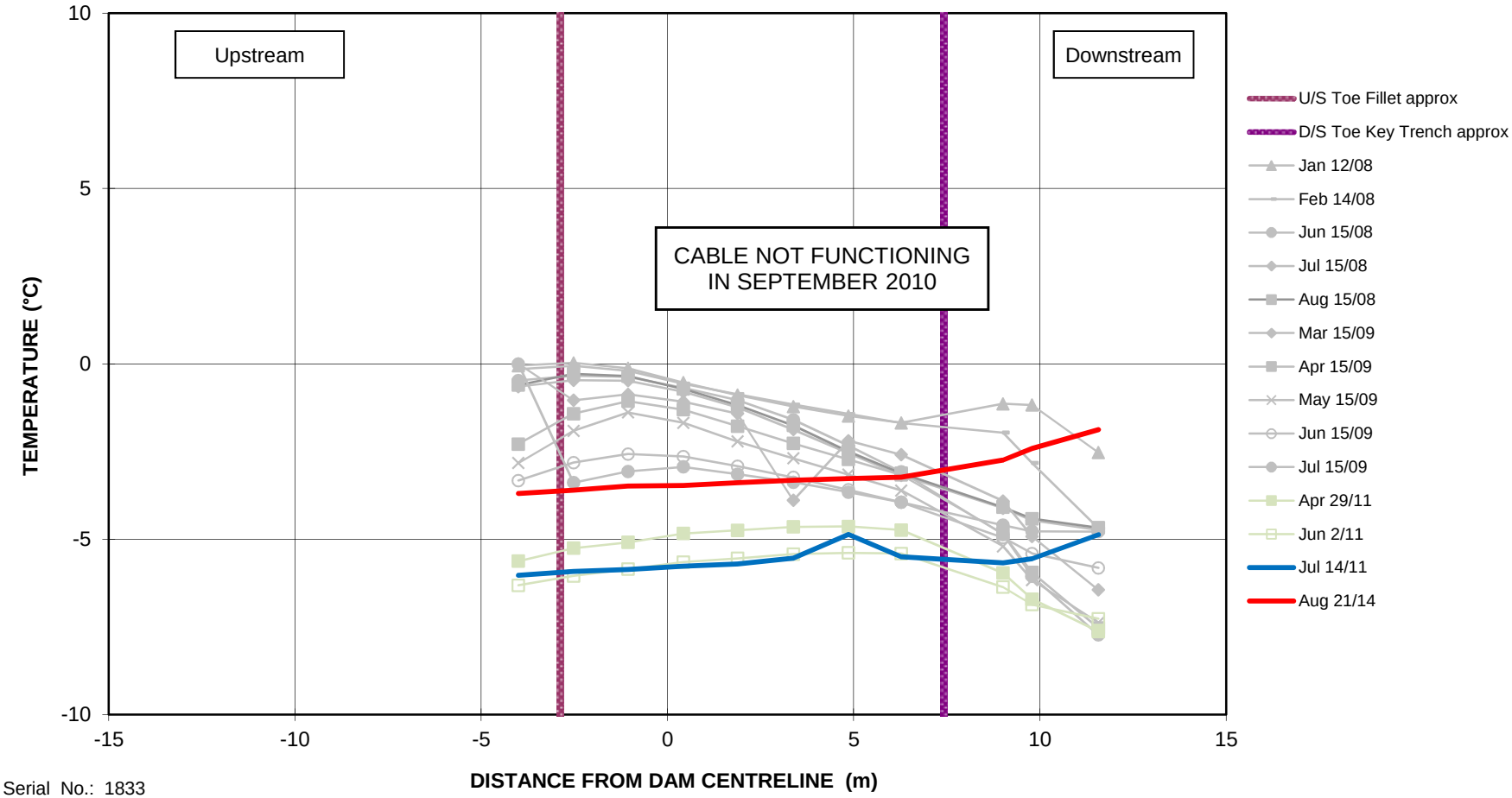
TETRA TECH EBA



Serial No.: 1997
Date Installed: July 6, 2007

Figure G-41
Horizontal Ground Temperature Distribution
Southeast Dam
Station 0+150, Trench Elevation 516 m

TETRA TECH EBA



Serial No.: 1833
Date Installed: April 5, 2007

Figure G-42
Horizontal Ground Temperature Distribution
Southeast Dam
Station 0+200, Trench Elevation 516 m

TETRA TECH EBA

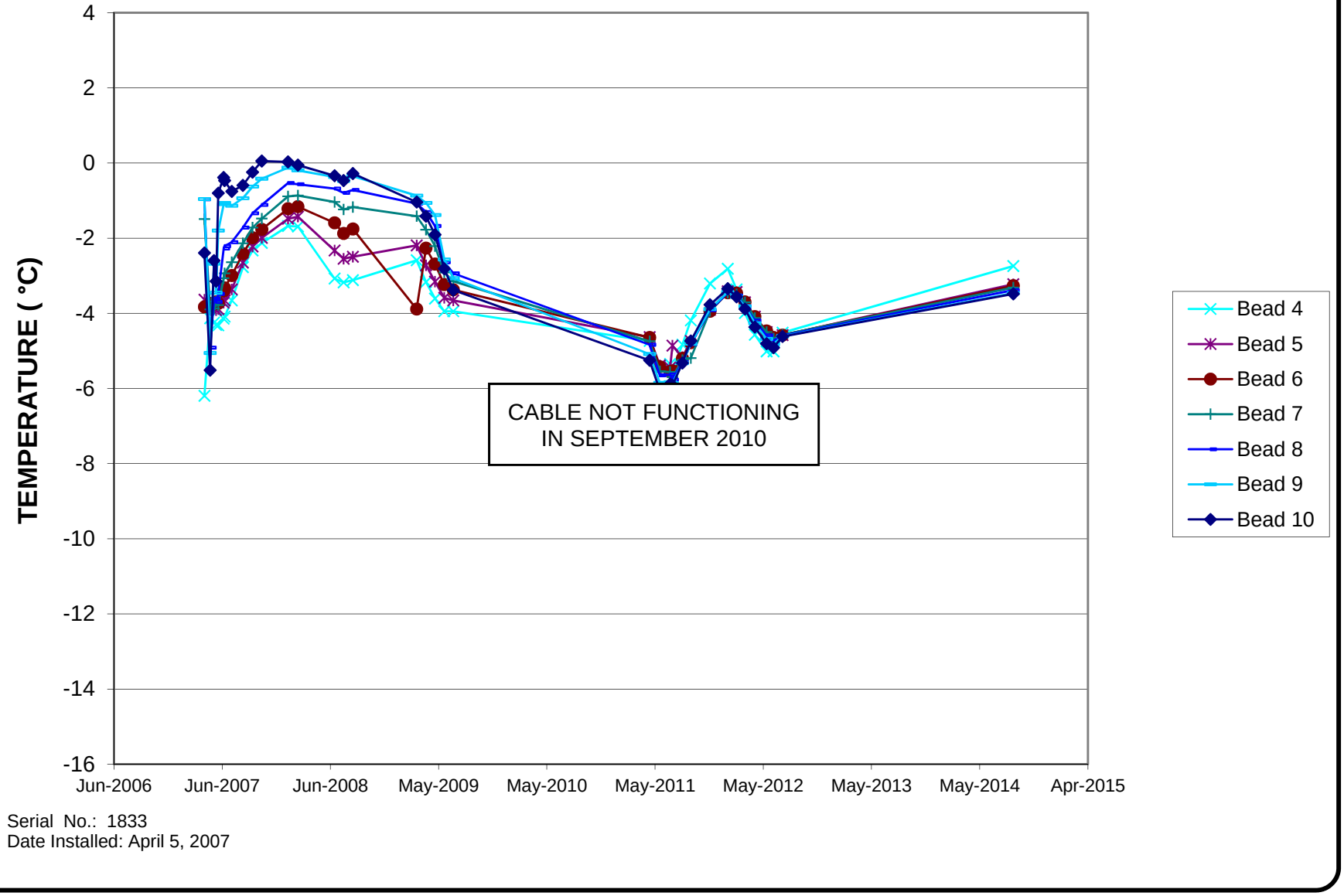


Figure G-43
Horizontal Ground Temperature Distribution
Southeast Dam
Station 0+150, Trench Elevation 516 m

TETRA TECH EBA

APPENDIX H
C1 DIVERSION

Photo H.1: Reach A inlet structure. Water conveyed into diversion with no issues noted

Photo H.2: Reach A west berm. No issues noted

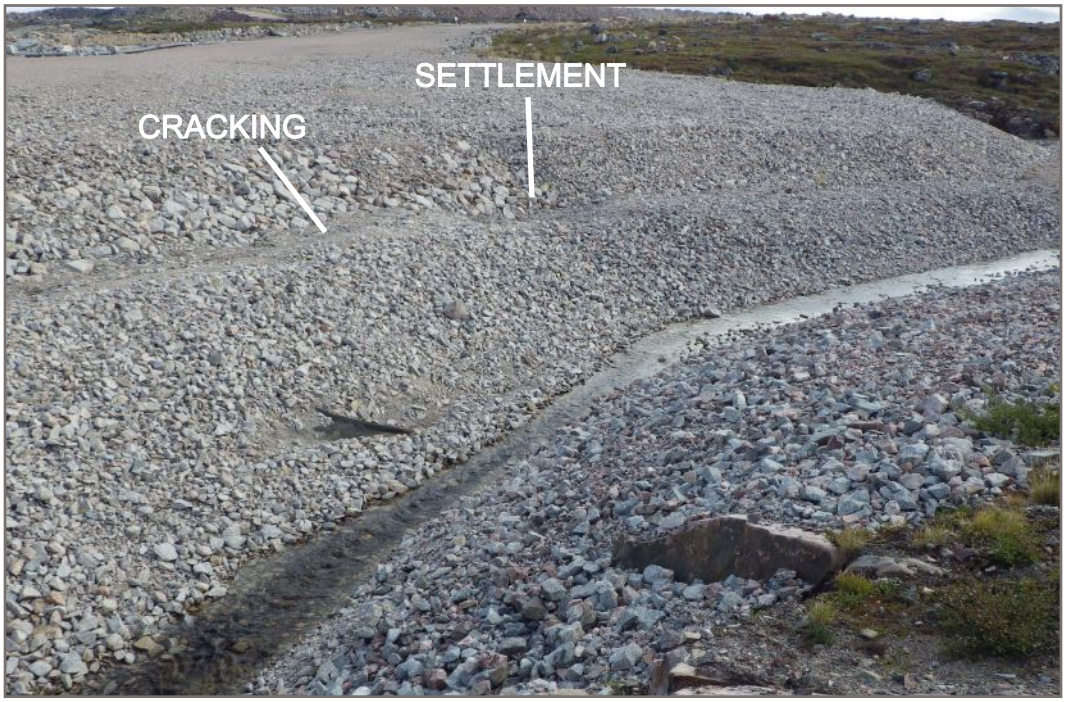


Photo H.3: Reach A east berm and fill pad. Exposed geotextile near water line. Settlement and cracking observed in berm. Condition does not appear to have worsened from 2011 inspection. Does not impact diversion performance

Photo H.4: Longitudinal cracking on Reach A east berm. Does not impact diversion performance

Photo H.5: Reach A looking north

Photo H.6: North end of Reach A. Culvert passing under pipeline road visible in background

Photo H.7: Some rock fall in Reach B causing localized constriction of flow. Does not impede overall flow through the reach.

Photo H.8: Barrier constructed near north end of Reach B. Does not impact water flow movement through the reach.

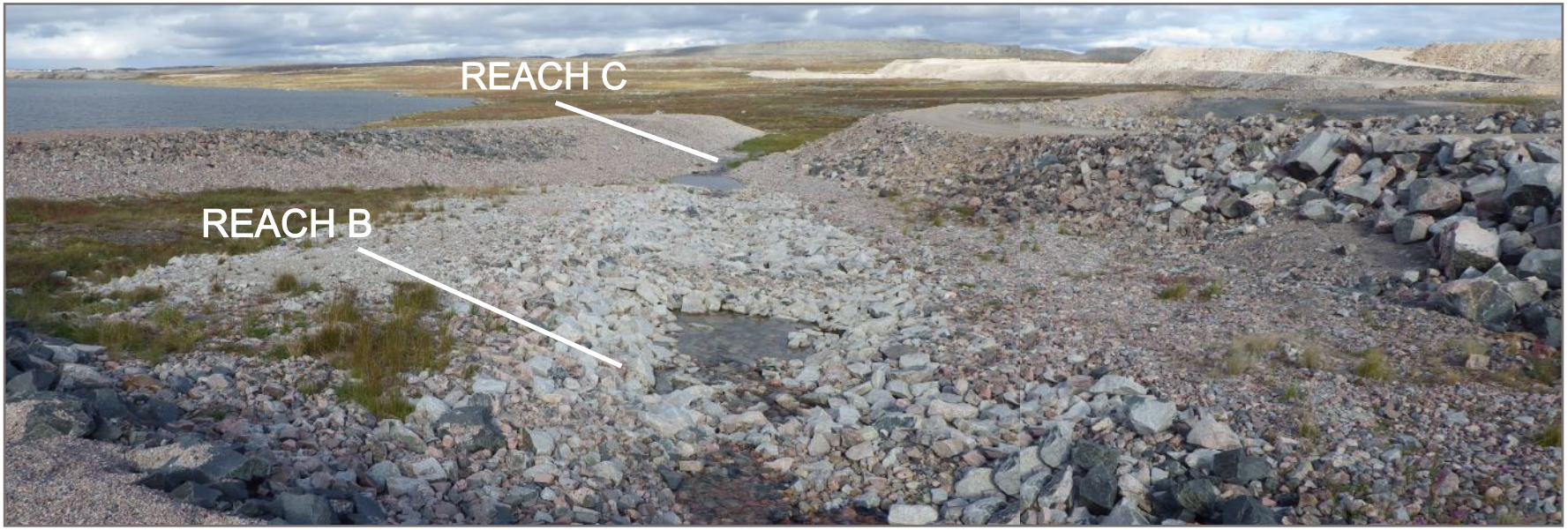


Photo H.9: Reach B looking east from road crossing. Reach C visible in background.

Photo H.10: Lower portion of Reach C. Note vegetation growth in upper right portion of the photo

Photo H.11: Vegetation growth in Reach C

Photo H.12: Geotextile exposed on final spur in Reach C

Photo H.13: Scour pool developed at end of spur

Photo H.14: Downstream slope of north berm in good condition

Photo H.15: Longitudinal cracking noted on crest of north berm. Does not appear to have worsened from previous inspection

Photo H.16: Culvert inlet damaged from snow clearing

Photo H.17: Culvert outlet damaged. Does not appear to be any piping adjacent to culvert

NOTES
DRAWING BASED ON 2006 AS BUILD

STATUS
ISSUED FOR USE

0 100m

Scale: 1:2,000 @ 8.5"x11"

CLIENT

Aboriginal Affairs and Northern Development Canada

Closure Assessment
Jericho Diamond Mine, Nunavut

C1 DIVERSION

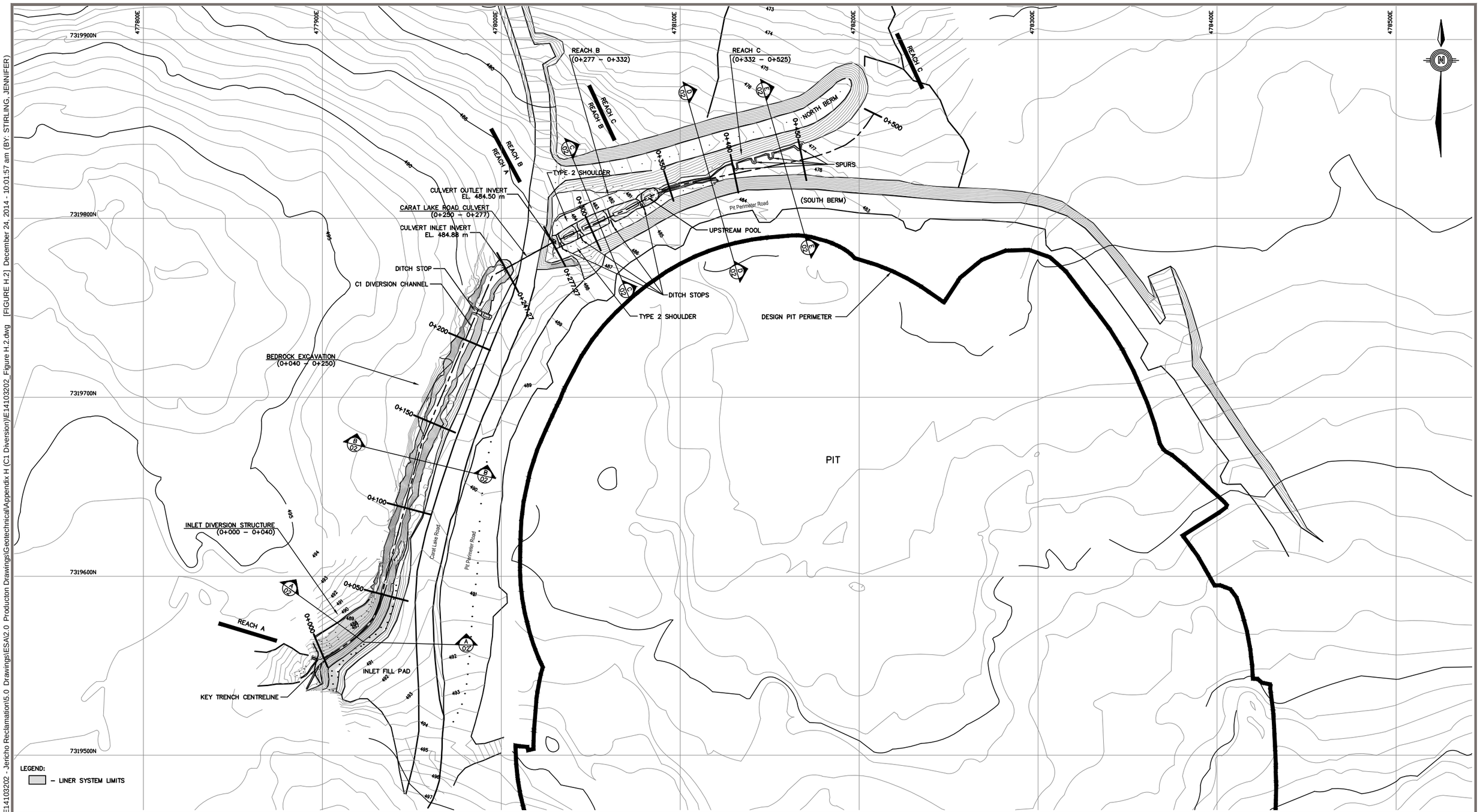
TETRA TECH EBA

PROJECT NO.	DWN	CKD	REV
E14103202	EP/DBD	GDK	0

OFFICE	DATE
EDM	November, 2014

Figure H.1

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\GeotechnicalAppendix H (C1 Diversion)\E14103202_Figure H.1.dwg [FIGURE H.1] December 24, 2014 - 10:01:06 am (BY: STIRLING, JENNIFER)



NOTES

1. SURVEY DATA PROVIDED BY SUB-ARCTIC SURVEYS LTD.
2. DRAWINGS REPRODUCED FROM EBA 2011 CONSTRUCTION RECORD REPORT.

STATUS
ISSUED FOR USE

0 100
Scale: 1: 2 000 (metres)

CLIENT
Aboriginal Affairs and Northern Development Canada

TETRA TECH EBA

Closure Assessment
Jericho Diamond Mine, Nunavut

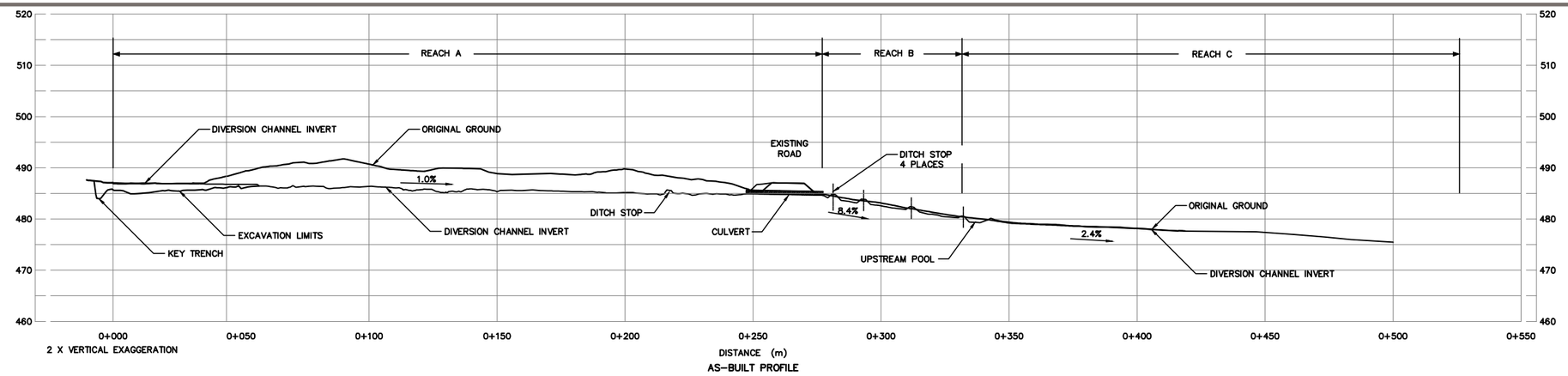
SITE PLAN
CONSTRUCTION RECORD

PROJECT NO.	DWN	CKD	REV
E14003202	BR/DBD	GDK	0

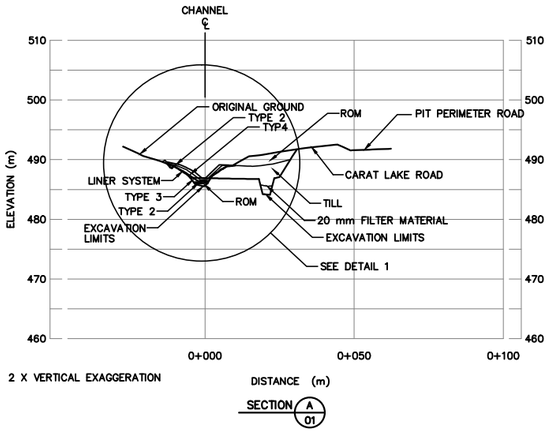
OFFICE: EDM
DATE: November, 2014

Figure H.2

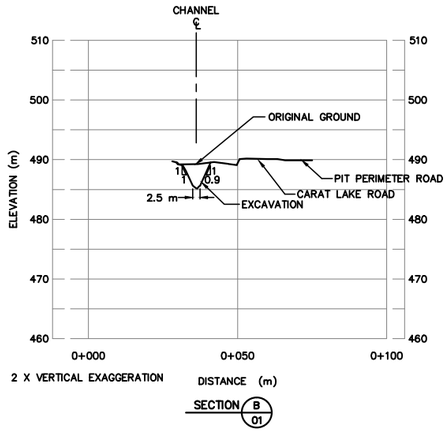
Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA2.0 Producton Drawings\Geotechnical\Appendix H (C1 Diversion)\E14103202_Figure H.2.dwg [FIGURE H.2] December 24, 2014 - 10:01:57 am (BY: STIRLING, JENNIFER)



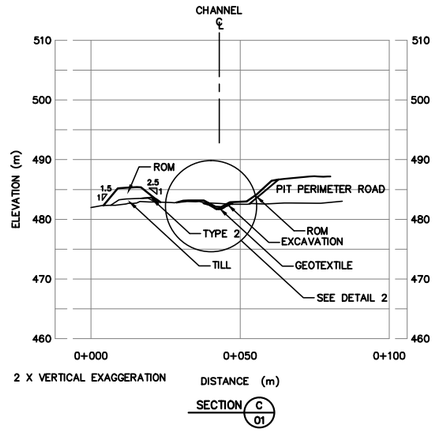
AS-BUILT PROFILE



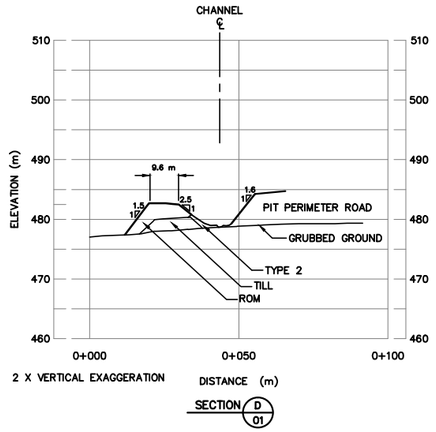
FILL PAD – AS-BUILT



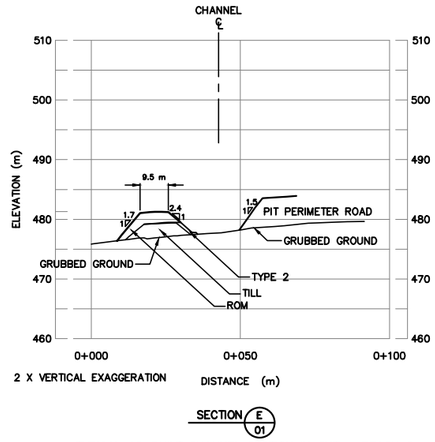
TYPICAL AS-BUILT CHANNEL SECTION – REACH A



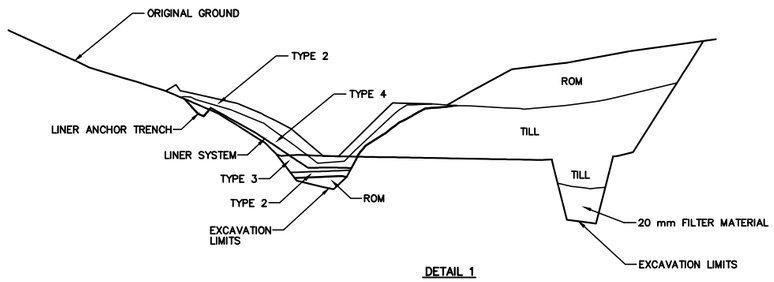
TYPICAL AS-BUILT CHANNEL SECTION – REACH B – UPPER PORTION



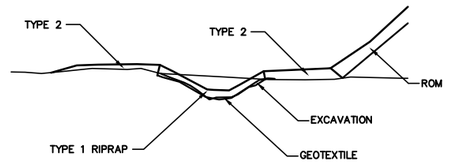
TYPICAL AS-BUILT CHANNEL SECTION – REACH C – LOWER PORTION



TYPICAL AS-BUILT CHANNEL SECTION IN CUT – REACH C



DETAIL 1



DETAIL 2

NOTES

1. SURVEY DATA PROVIDED BY SUB-ARCTIC SURVEYS LTD.
2. DRAWINGS REPRODUCED FROM EBA 2011 CONSTRUCTION RECORD REPORT

STATUS
ISSUED FOR USE

0 100
Scale: 1: 2 000 (metres)

CLIENT
Aboriginal Affairs and Northern Development Canada

TETRA TECH EBA

Closure Assessment
Jericho Diamond Mine, Nunavut

PROFILE AND CROSS-SECTIONS CONSTRUCTION RECORD

PROJECT NO.	DWN	CKD	REV
E14003202	BR/DBD	GDK	0

OFFICE: EDM
DATE: November, 2014

Figure H.3

Q:\Edmonton\Engineering\E141\Projects\E141103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Geotechnical\Appendix H (C1 Diversion)\E141103202_Figure H.3.dwg [FIGURE H.3] December 24, 2014 - 10:02:48 am (BY: STIRLING, JENNIFER)

APPENDIX I
WASTE MATERIAL STORAGE

Photo I.1: Coarse processed kimberlite pile looking southwest. East sump in foreground of photo

Photo I.2: Coarse processed kimberlite pile looking northeast from south side of pile

Photo I.3: Coarse processed kimberlite pile looking northwest from south side of pile. Process plant in background of photo

Photo I.4: Coarse processed kimberlite pile looking west from east end of pile. Note granite pad on base of pile

Photo I.5: Sloughing of coarse process kimberlite slopes at contact point in East sump

Photo I.6: Waste rock pile looking northeast from Low Grade Stockpile Area

Photo I.7: Waste rock slopes near pit. Slopes appear stable with no sign of distress

Photo I.8: Waste rock pad north of main waste rock pile

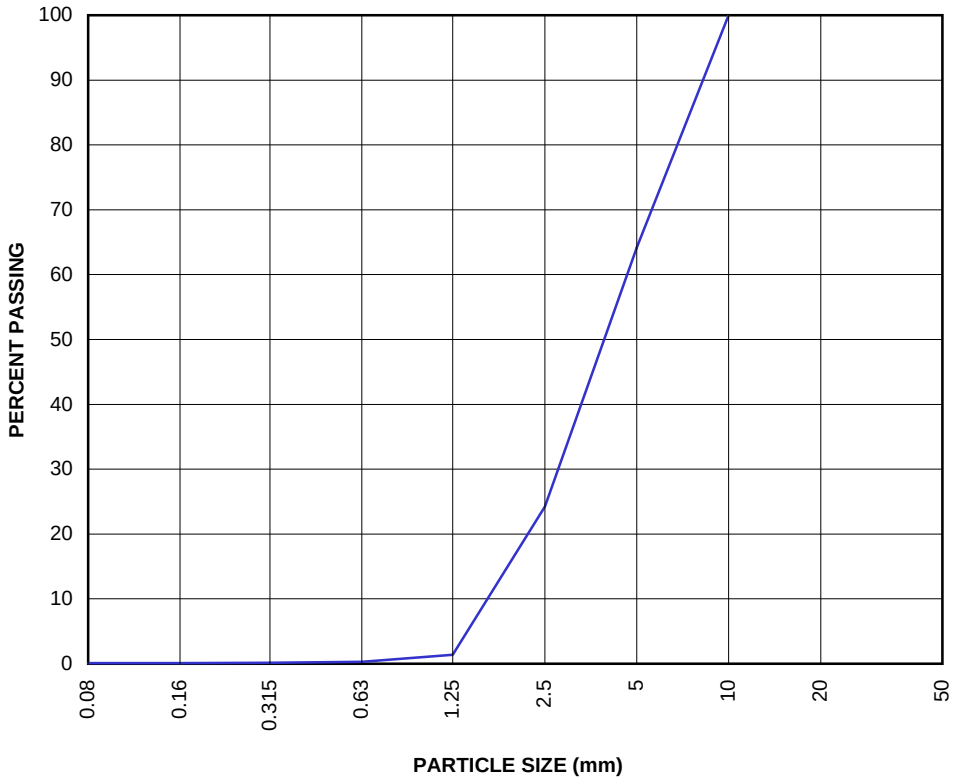
Photo I.9: Waste rock slope on west side of pile. No sign of distress

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

PROJECT:	PKCA Dams	**SAMPLE NO:**	Tailings_Coarse_007
ADDRESS:	Jericho Diamond Project	**SAMPLE DESCRIPTION:**	
PROJECT NO:	0101-04-1100060.007		Coarse Tailings from PP without HPGR
DATE TESTED:	Feb 13/06 By: MM		
CLIENT:	Tahera Diamond Corp.	**NAT. MOISTURE CONT.:**	13.7%
		COLOUR PLATE #:	n/a
		BULK REL DENSITY:	n/a
ATTENTION:	Roland Jones/Harold Gates	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
10	100
5	64
2.5	24
1.25	1
0.630	0
0.315	0
0.160	0.1
0.080	0.1



Remarks: Coarse tailings sample without HPGR running was produced by the Process Plant.

Reviewed by:

Data presented hereon is for the sole use of the stipulated client. EBA is not responsible, nor can be held liable, for use made of this report by any other party, with or without the knowledge of EBA.

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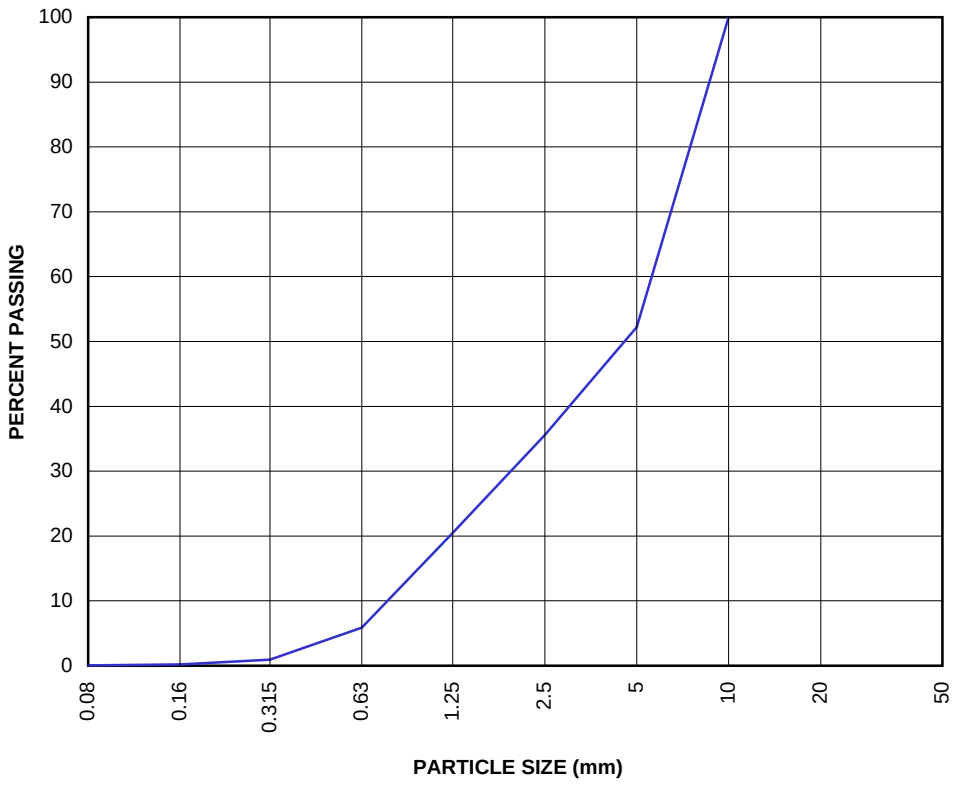
EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

PROJECT:	PKCA Dams	**SAMPLE NO:**	Tailings_Coarse_006
ADDRESS:	Jericho Diamond Project	**SAMPLE DESCRIPTION:**	
PROJECT NO:	0101-04-1100060.007		Coarse Tailings from PP with HPGR
DATE TESTED:	Feb 13/06 By: MM		
CLIENT:	Tahera Diamond Corp.	**NAT. MOISTURE CONT.:**	10.9%
		COLOUR PLATE #:	n/a
		BULK REL DENSITY:	n/a
ATTENTION:	Roland Jones/Harold Gates	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
10	100
5	52
2.5	36
1.25	20
0.630	6
0.315	1
0.160	0.2
0.080	0.1



Remarks: Coarse tailings sample with HPGR running was produced by the Process Plant.

Reviewed by:

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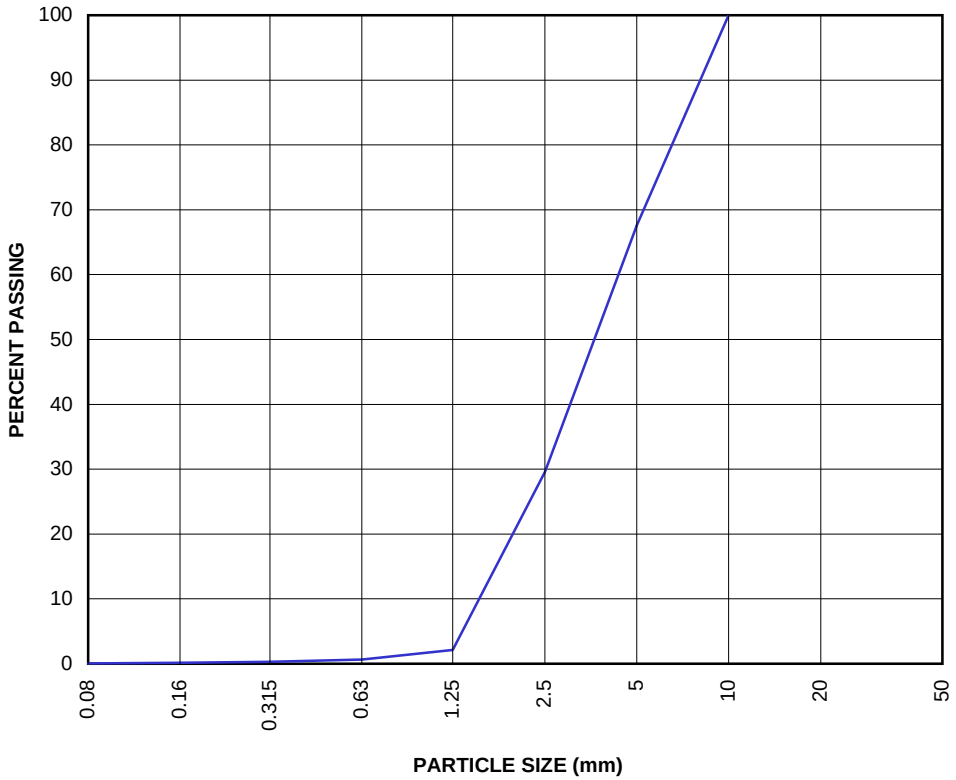
EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

PROJECT:	PKCA Dams	**SAMPLE NO:**	Tailings_Coarse_005
ADDRESS:	Jericho Diamond Project	**SAMPLE DESCRIPTION:**	
PROJECT NO:	0101-04-1100060.007		Coarse Tailings from PP without HPGR
DATE TESTED:	Feb 13/06 By: MM		
CLIENT:	Tahera Diamond Corp.	**NAT. MOISTURE CONT.:**	8.1%
		COLOUR PLATE #:	n/a
		BULK REL DENSITY:	n/a
ATTENTION:	Roland Jones/Harold Gates	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
10	100
5	68
2.5	30
1.25	2
0.630	1
0.315	0
0.160	0.2
0.080	0.1



Remarks: Coarse tailings sample without HPGR running was produced by the Process Plant.

Reviewed by:

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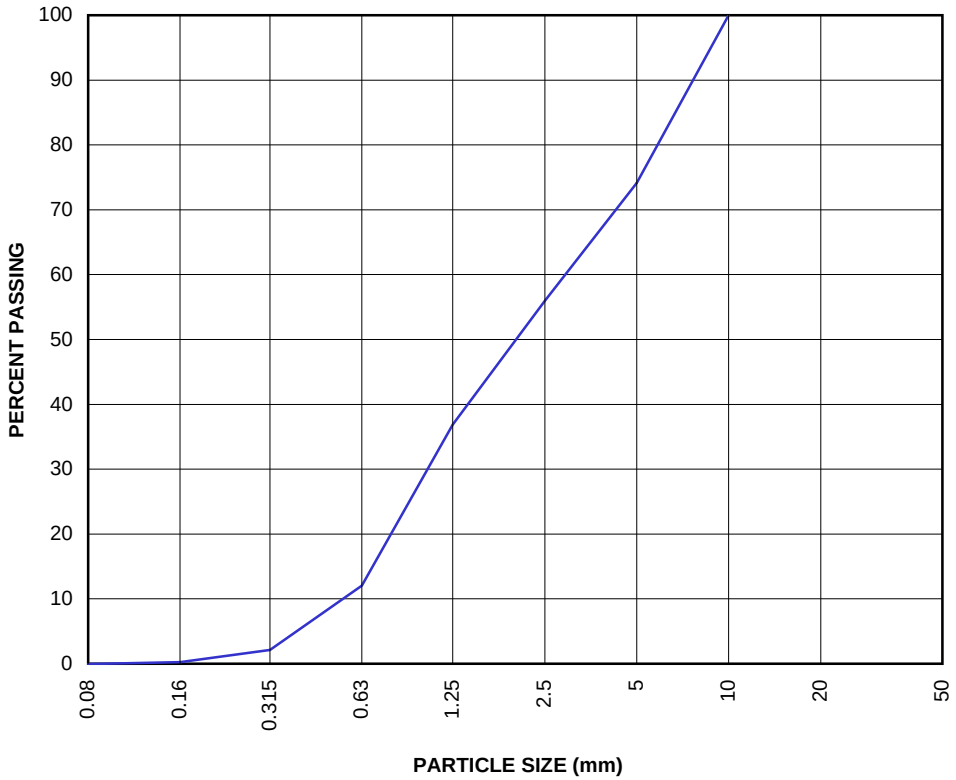
The testing services reported herein have been performed by an EBA technician to recognized industry standards, unless otherwise noted. No other warranty is made. These data do not include or represent any interpretation or opinion of specification compliance or material suitability. Should engineering interpretation be required, EBA will provide it upon written request.

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

PROJECT:	PKCA Dams	**SAMPLE NO:**	Tailings_Coarse_008
ADDRESS:	Jericho Diamond Project	**SAMPLE DESCRIPTION:**	
PROJECT NO:	0101-04-1100060.007		Coarse Tailings from PP with HPGR
DATE TESTED:	Feb 13/06 By: PEP		
CLIENT:	Tahera Diamond Corp.	**NAT. MOISTURE CONT.:**	14.9%
		COLOUR PLATE #:	n/a
		BULK REL DENSITY:	n/a
ATTENTION:	Roland Jones/Harold Gates	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
10	100
5	74
2.5	56
1.25	37
0.630	12
0.315	2
0.160	0.2
0.080	0.0



Remarks: Coarse tailings sample with HPGR running was produced by the Process Plant.

Reviewed by:

Data presented hereon is for the sole use of the stipulated client. EBA is not responsible, nor can be held liable, for use made of this report by any other party, with or without the knowledge of EBA.

The testing services reported herein have been performed by an EBA technician to recognized industry standards, unless otherwise noted. No other warranty is made. These data do not include or represent any interpretation or opinion of specification compliance or material suitability. Should engineering interpretation be required, EBA will provide it upon written request.

EBA Engineering Consultants Ltd.

Relative Density and Absorption of Fine Aggregate

(CSA Designation A23.2-6A)

Project: Jericho Project
EBA Project No.: 0101-1100060.004
Sample No.: 739

Test Date: 8-Feb-06
Technician: RR
Office: Edmonton

SPECIFIC GRAVITY (-5000 mm)

TRIAL NO.		1		2
Pychnometer		6		7
Mass of Pychnometer, g		167.1		165.9
Mass of Pychnometer filled with Water, g	B	664.2		663.2
Mass of Pychnometer, SSD Fine Aggregate, g		669.7		665.5
Mass of Saturated Surface-Dry Fine Aggregate, g	M_f	502.6		499.6
Mass of Pychnometer, Aggregate and Water, g	C	972.7		970.5
Tare I.D.		e		a
Mass of Oven Dry Aggregate & Tare, g		1773.8		1386.3
Tare, g		1286.9		902.7
Mass of Oven Dry Aggregate, g	A	486.9		483.6

		Trial 1	Trial 2	Average
BULK RELATIVE DENSITY	$A/(B+M_f-C)$	2.509	2.515	**2.51**
BULK RELATIVE DENSITY S.S.D.	Mf/(B+Mf-C)	2.589	2.598	**2.59**
APPARENT RELATIVE DENSITY	A/(B+A-C)	2.729	2.743	**2.74**
ABSORPTION	(B-A)/A*100	3.22	3.31	**3.3**

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EBA Engineering

Micro-Deval Abrasion of Fine Aggregate
CAN/CSA A23.2 - 23A

Project No: 1100060.004
Project: Jericho Project
Client : Tahera Diamond Corporation

Attention: Harold Gates Fax:

Date Sampled: 31-Jan-06
Sampled By: JP
Date Tested: 8-Feb-06
Tested By: RR

Sample:
Sample Description: 12.5 mm crushed aggregate
Source: Coarse PK #1
Sample Location:

Initial Weight (g):	501.8
Final Weight (g):	427.4
Weight Loss (g):	74.4
Loss (%):	14.8%

Comments: CSA A23.2, Table 12: Maximum Abrasion Loss 20%

Reviewed By: _____ P. Eng.

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EBA Engineering Consultants Ltd.

Micro-Deval Abrasion of Coarse Aggregate
CAN/CSA A23.2 - 29A

Project No: 1100060.004
Project: Jericho Project
Client : Tahera Diamond Corporation

Attention: Harold Gates Fax:

Date Sampled: 31-Jan-06
Sampled By: JP
Date Tested: 8-Feb-06
Tested By: RR

Sample: # 739
Sample Description: 12.5 mm crushed aggrgate
Source: Coarse PK # 1
Sample Location:

Initial Weight (g):	1504.6
Final Weight (g):	1340
Weight Loss (g):	164.6
Loss (%):	10.9%

Comments: CSA A23.2-04, Table 12: Maximum Abrasion Loss 17%

Reviewed By: _____ P. Eng.

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EBA Engineering Consultants Ltd.

CONSTANT HEAD PERMEABILITY TEST **JERICHO DIAMOND MINE**

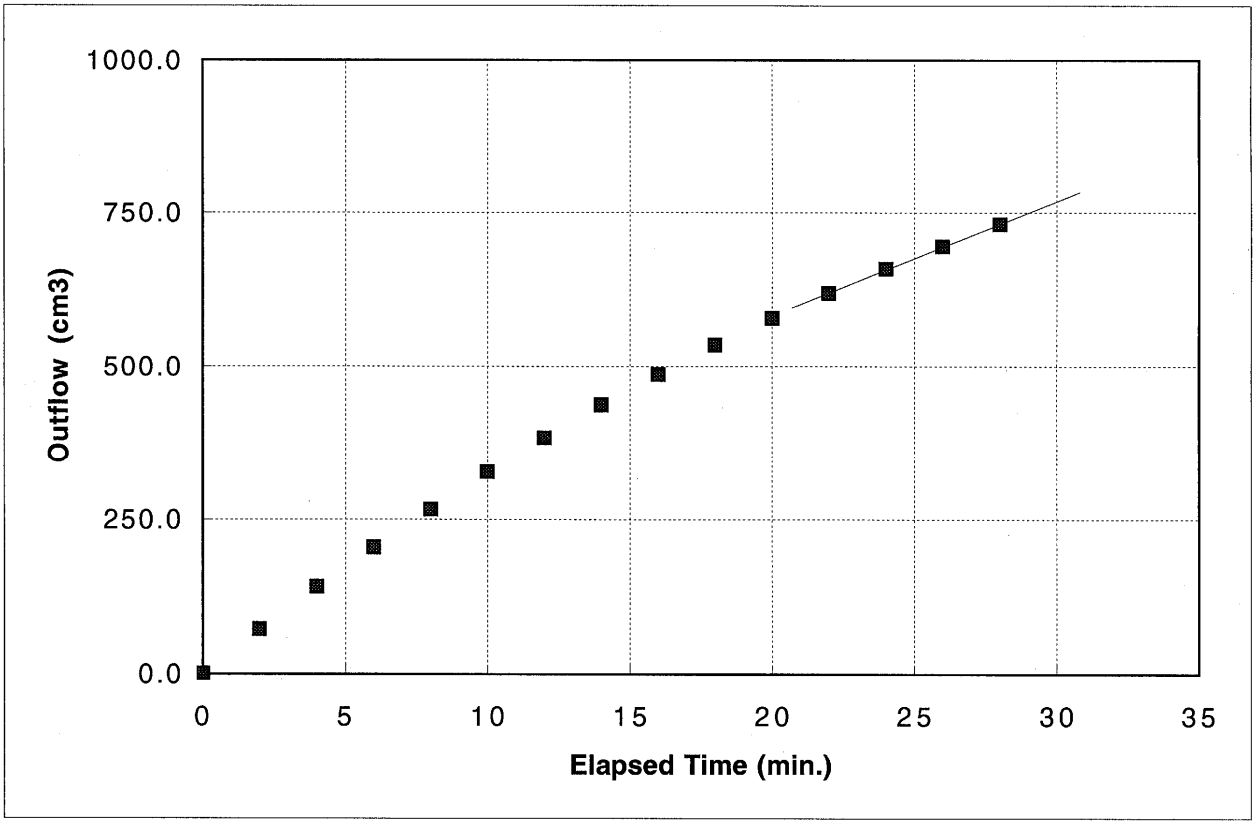
Job Number: 1100060.004
Sample No.: 739 Coarse PK #1

Date: 06-02-20
Test No: P-1

Time	Buret (cc)	Elap. (min)	Outflow (cc)
9:22	0.0	0	0.0
9:24	71.5	2	71.5
9:26	140.7	4	140.7
9:28	204.1	6	204.1
9:30	266.3	8	266.3
9:32	326.6	10	326.6
9:34	383.7	12	383.7
9:36	437.4	14	437.4
9:38	487.3	16	487.3
9:40	534.3	18	534.3
9:42	578.1	20	578.1
9:44	618.8	22	618.8
9:46	657.5	24	657.5
9:48	694.6	26	694.6
9:50	730.5	28	730.5

Diameter=	88.9	mm
Height=	88.6	mm
Volume=	549.95	cm^3
Head Diff.=	0.044	psi
Q=	0.31	cm^3/sec
i=	0.35	
A=	62.07	cm^2

K= 1.43E-02 cm/sec



EBA Engineering Consultants Ltd.

MOISTURE - DENSITY RELATIONSHIP

ASTM D698, D1557, or D2049

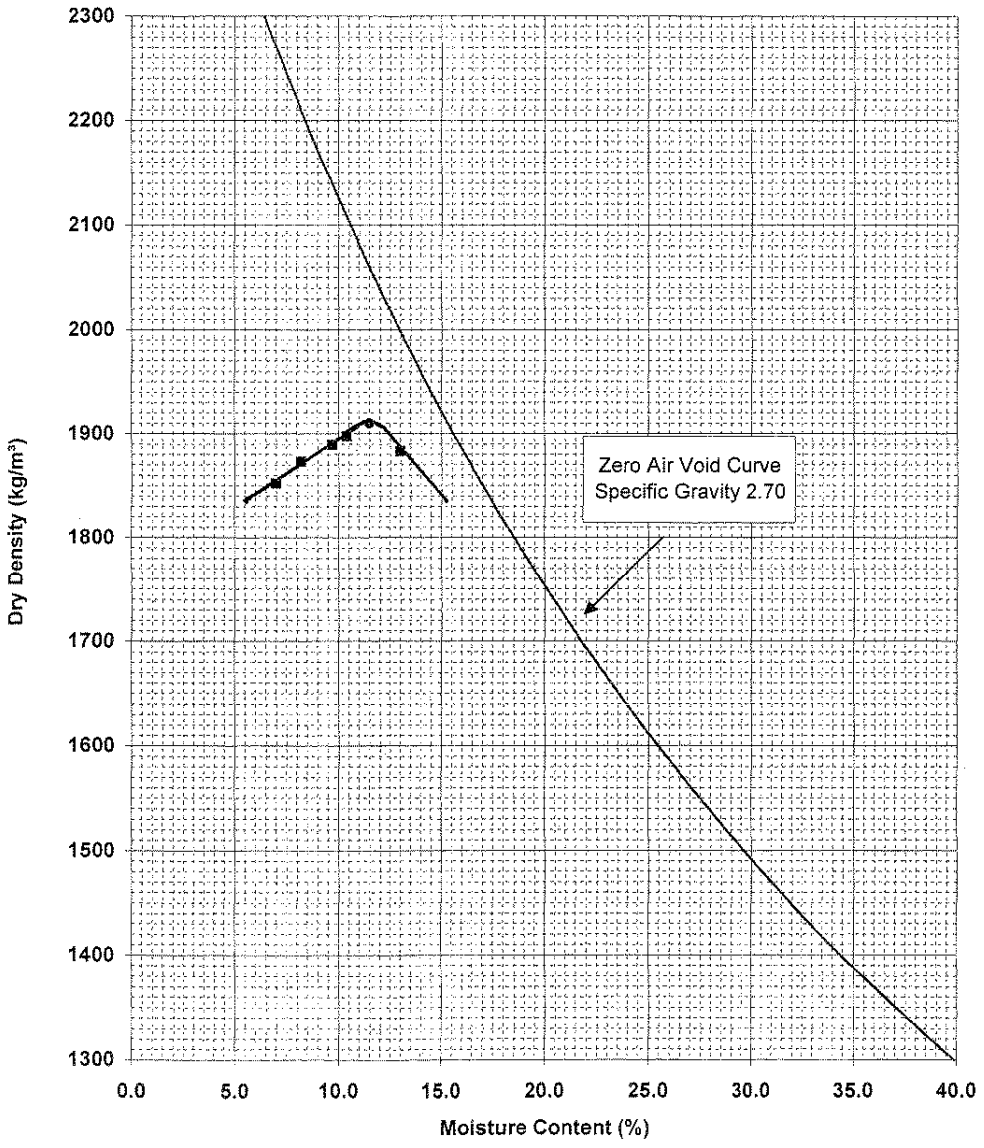
Project: Dam and Diversion Earthworks Monitoring Service - Jericho Project Site, NWT **Sample Number:** 739

Project No.: 0101-1100060.007 **Date Tested:** 06/02/13

Client: Tahera Diamond Corporation c/o Nuna Logistics **Moisture Content (as received):** N/A

Soil Description: SAND, gravelly (12.5mm max.), tr. silt - grey **Maximum Dry Density:** 1910 kg/m³

Sample Location: Coarse Pk #1 **Optimum Moisture Content:** 11.5%



STANDARD PROCTOR

ASTM D698

Hammer Mass: 2.494 kg

Hammer Drop: 304.8 mm

Number of Layers: 3

Number of Blows/Layer: 56

Diameter of Mould: 152.3 mm

Height of Mould: 116.5 mm

Mould Volume: 0.00212 m³

Compactive Effort: 590.3 kJ/m³

REVIEWED BY:

REMARKS:

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APPENDIX J
ROADS AND PADS

Photo J.1: West dam road from North Cofferdam

Photo J.2: Ring Road at confluence with Carat Lake road. Note waste rock base with capping material

Photo J.3: Carat Lake Road from low grade stockpile area

Photo J.4: Airstrip Road. Road constructed of esker material

Photo J.5: Low grade stockpile area at north end

Photo J.6: South end of low grade stockpile area. Jaw crusher in background of photo

Photo J.7: Reclaimed carat camp

Photo J.8: Core box laydown

Photo J.9: Carat Lake laydown

APPENDIX K
BERMS AND CONTAINMENT

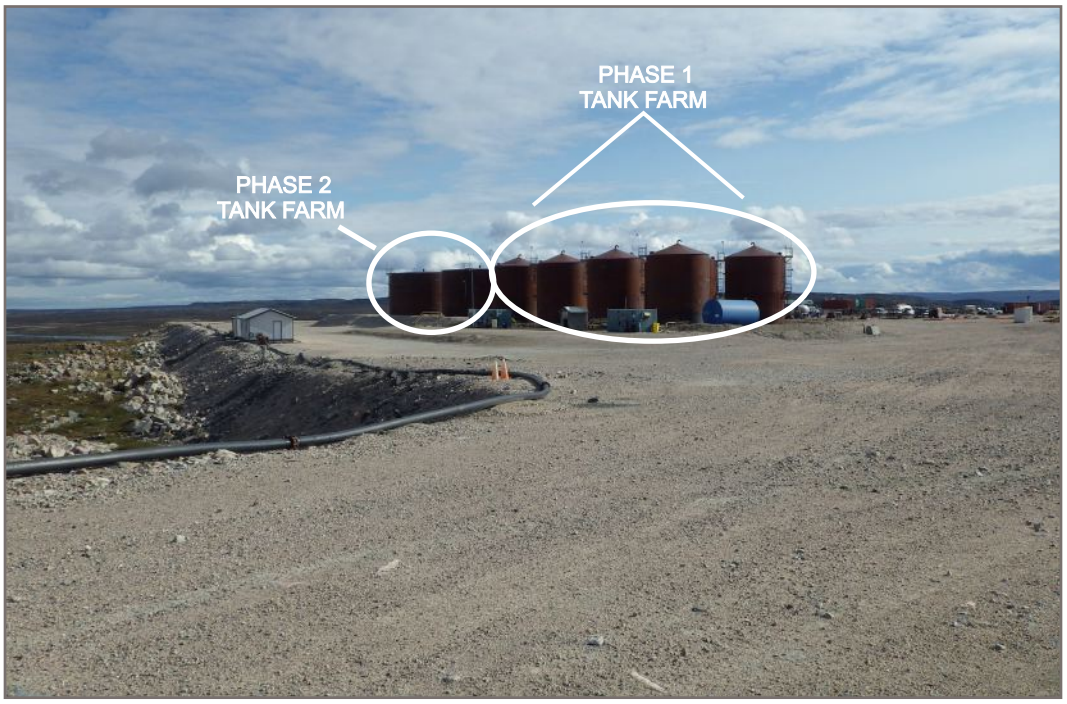


Photo K.1 (tank farm): Jericho tank farm. Phase 1 tank farm in foreground of picture. Phase 2 in background

Photo K.2 (tank farm): Ponding water observed in Phase 1 tank farm

Photo K.3 (tank farm): Staining in south portion of Phase 1 tank farm area. Fuel line to generator visible in background. Also note small depression in berm.

Photo K.4 (tank farm): Settlement in Phase 1 area berm. Sideslopes in good condition

Photo K.5 (tank farm): Exposed liner in Phase 1 area berm (west side). Does not impact performance

Photo K.6 (tank farm): Phase 2 tank farm area. Berms in good condition. Ponded water in majority of cell

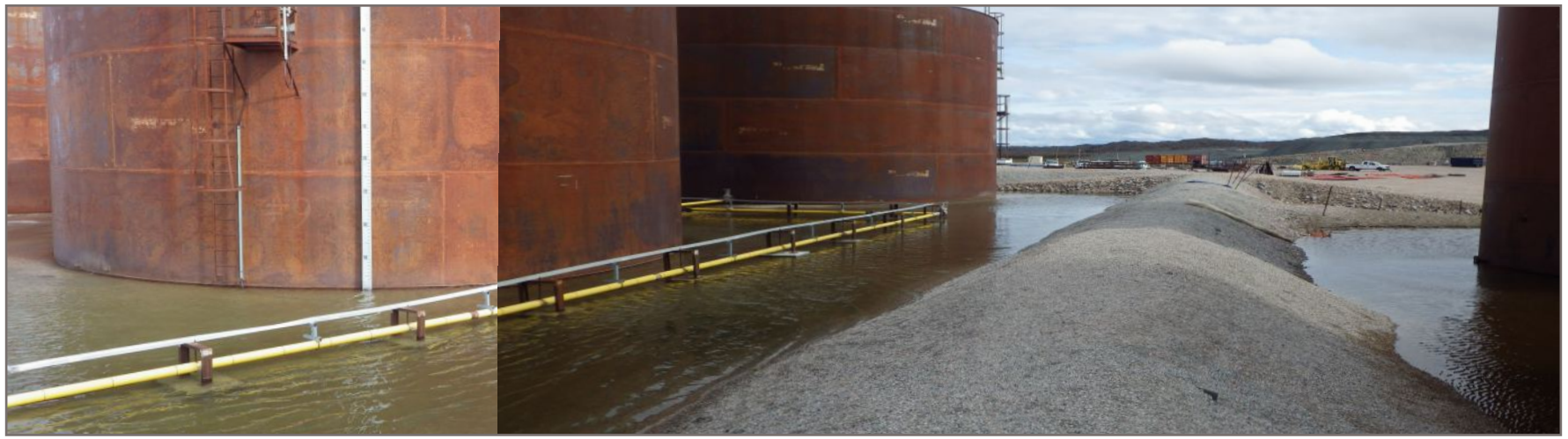


Photo K.7 (tank farm): Phase 2 tank farm area. Berms in good condition. Ponded water in majority of cell

Photo K.8 (tank farm): Drums stored in Phase 2 tank farm area

Photo K.9 (generator tank): Generator day tank

Photo K.10 (generator tank): Settlement in tank berm. Sideslopes in good condition

Photo K.11 (generator tank): Tank berm generally in good condition. Exposed liner on outside slope does not affect performance

Photo K.12 (airstrip tank): Two cylindrical tanks at airstrip. Staining visible in floor of containment area

Photo K.13 (airstrip tank): Berm in good condition. Staining visible on interior side slope

Photo K.14 (airstrip tank): Berm in good condition. Staining visible on interior side slope. Start of fuel transfer area visible to left of photo

Photo K.15 (airstrip tank): Construction of fuel transfer area north of airstrip tanks started in 2012

Photo K.16 (HWTA): East cell of HWTA. Berms were built up and additional base material placed in 2012 in preparation for relining the facility. All materials stored in the cell have been moved to west cell

Photo K.17 (HWTA): West Cell of HWTA. Contains former contents of west cell

Photo K.18 (HWTA): Liner damage in west cell of HWTA

Photo K.19 (HWTA): Liner damage in west cell of HWTA

LEGEND

NOTES
1. BASE IMAGE FROM 2014 DRONE SURVEY
2. WATER IN BOTH TANK FARM AREAS DURING INSPECTION

STATUS
ISSUED FOR USE

0 25m
Scale: 1:750 @ 11"x17"

CLIENT
Aboriginal Affairs and Northern Development Canada

TETRA TECH EBA

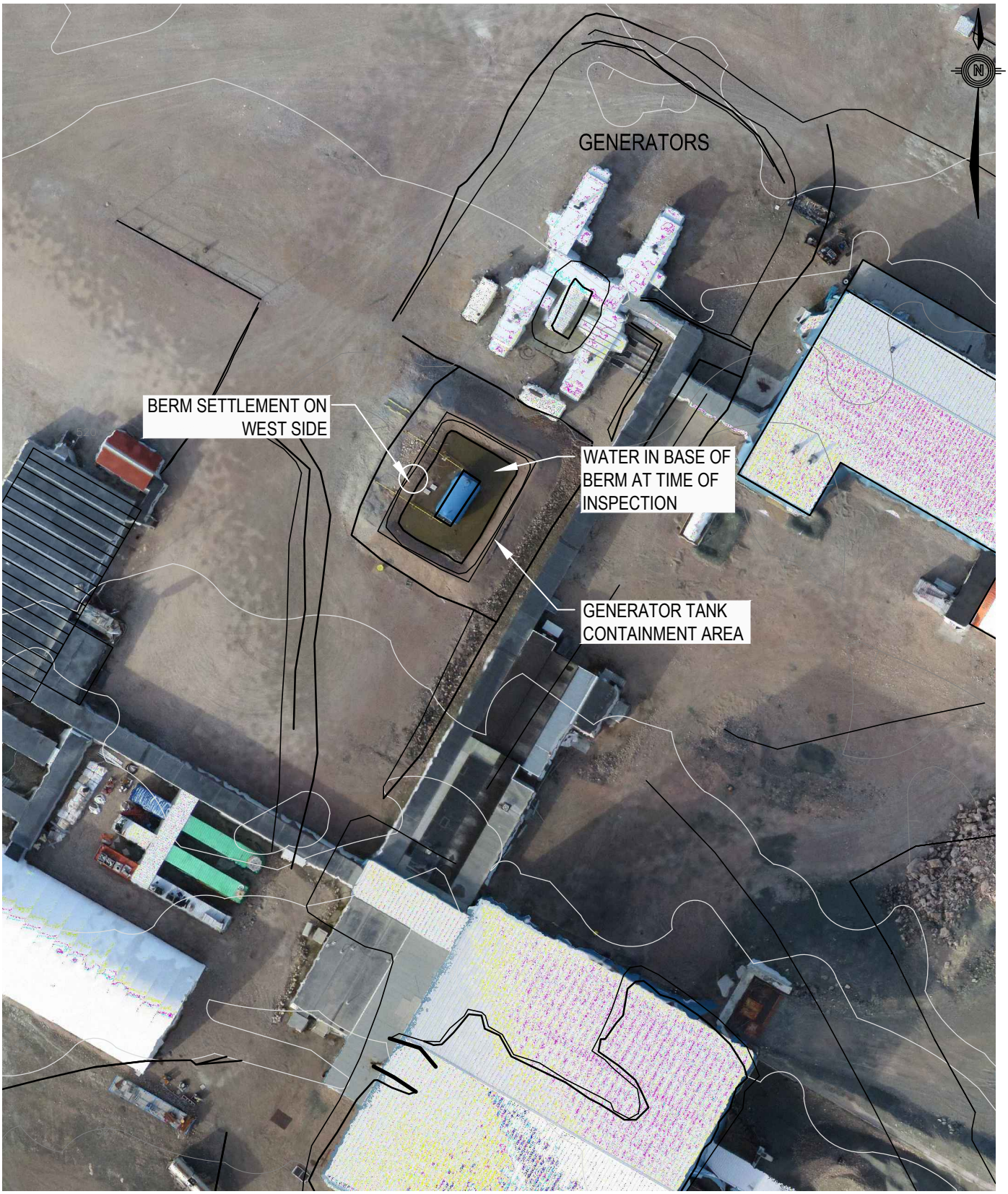
Closure Assessment
Jericho Diamond Mine, Nunavut

TANK FARM

PROJECT NO.	DWN	CKD	REV
E14103202	EP	GDK	0
OFFICE: EDM	DATE: November, 2014		

Figure K.1

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Geotechnical\Appendix K (Berms and Containment)\E14101117_FIG G-1 -K-1.dwg [FIGURE K.1] December 24, 2014 - 10:32:35 am (BY: STIRLING, JENNIFER)



NOTES
1. BASE IMAGE FROM 2014 DRONE SURVEY

STATUS
ISSUED FOR USE

0 25
Scale: 1: 750 (metres)

CLIENT
Aboriginal Affairs and Northern Development Canada

TETRA TECH EBA

Closure Assessment
Jericho Diamond Mine, Nunavut

GENERATOR TANK

PROJECT NO.	DWN	CKD	REV
E14103202	EP	GDK	0

OFFICE	DATE
EDM	November, 2014

Figure K.2

Q:\Edmonton\Engineering\E14\Projects\E14103202 - Jericho Redamation\5.0 Drawings\ESA\2.0 Production Drawings\Geotechnical\Appendix K (Berms and Containment)\E14101117_FIG G-1 -K-1.dwg [FIGURE K.2] December 24, 2014 - 10:32:51 am (BY: STIRLING, JENNIFER)

NOTES
1. BASE IMAGE FROM 2014 DRONE SURVEY

STATUS
ISSUED FOR USE

0 10
Scale: 1: 200 (metres)

CLIENT
Aboriginal Affairs and Northern Development Canada

TETRA TECH EBA

Closure Assessment
Jericho Diamond Mine, Nunavut

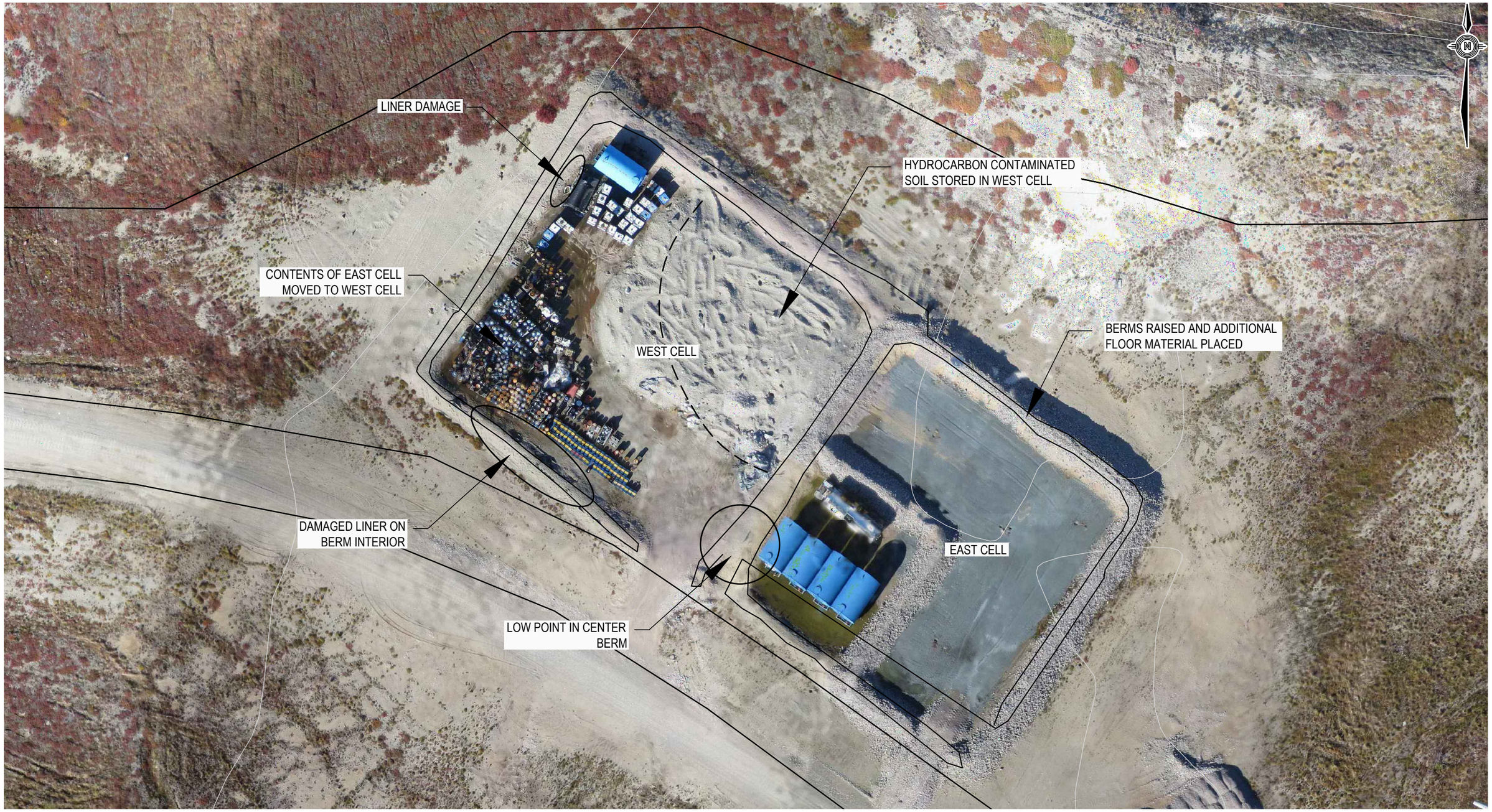
AIRSTRIP TANKS

PROJECT NO.	DWN	CKD	REV
E14103202	EP	GDK	0

OFFICE	DATE
EDM	November, 2014

Figure K.3

Q:\Edmonton\Engineering\E14\Projects\E14103202 - Jericho Redamation\5.0 Drawings\ESA\2.0 Producton Drawings\Geotechnical\Appendix K (Berms and Containment)\E14101117_FIG G-1 -K-1.dwg [FIGURE K.3] December 24, 2014 - 10:33:08 am (BY: STIRLING, JENNIFER)



LEGEND

0 25m

Scale: 1:500 @ 11"x17"

NOTES
1. BASE IMAGE FROM 2014 DRONE SURVEY

STATUS
ISSUED FOR USE

CLIENT

Aboriginal Affairs and Northern Development Canada

Closure Assessment
Jericho Diamond Mine, Nunavut

HAZARD WASTE TRANSFER AREA

TETRA TECH EBA

PROJECT NO.	DWN	CKD	REV
E14103202	EP	GDK	0
OFFICE: EDM	DATE: November, 2014		

Figure K.4

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Geotechnical\Appendix K (Berms and Containment)\E14101117_FIG G-1 -K-1.dwg [FIGURE K.4] December 24, 2014 - 10:33:29 am (BY: STIRLING, JENNIFER)

APPENDIX L
OPEN PIT

Photo L.1: South side of pit

Photo L.2: North side of pit from Carat Lake Road

Photo L.3: Pit ramp on east side of pit

Photo L.4: West pit wall. Sloughing of overburden soil in upper benches

Photo L.5: South pit wall. Some localized sloughing mid bench

Photo L.6: Ramp condition. Some small rock fall adjacent to pit wall

C1 DIVERSION

STREAM C1

RING ROAD

SLOUGHING OVERBURDEN IN UPPER BENCHES

PIT LAKE
ELEVATION 435.4 m
(Est. August 2014)

LOCALIZED SLOUGHING MID-BENCH

CROWN LAND
INUIT LAND

WASTE ROCK PILE

0+000
0+050
0+100
0+150
0+200
0+250
0+300
0+350
0+400
0+450
0+500
0+547

A
L2

N

ISSUED FOR USE

LEGEND

0 150m

Scale: 1:3,000 @ 11"x17"

NOTES
BASE AIRPHOTOS PROVIDED BY OLLERHEAD & ASSOCIATED LTD., AUGUST 2014

CLIENT
Aboriginal Affairs and Northern Development Canada

TETRA TECH EBA

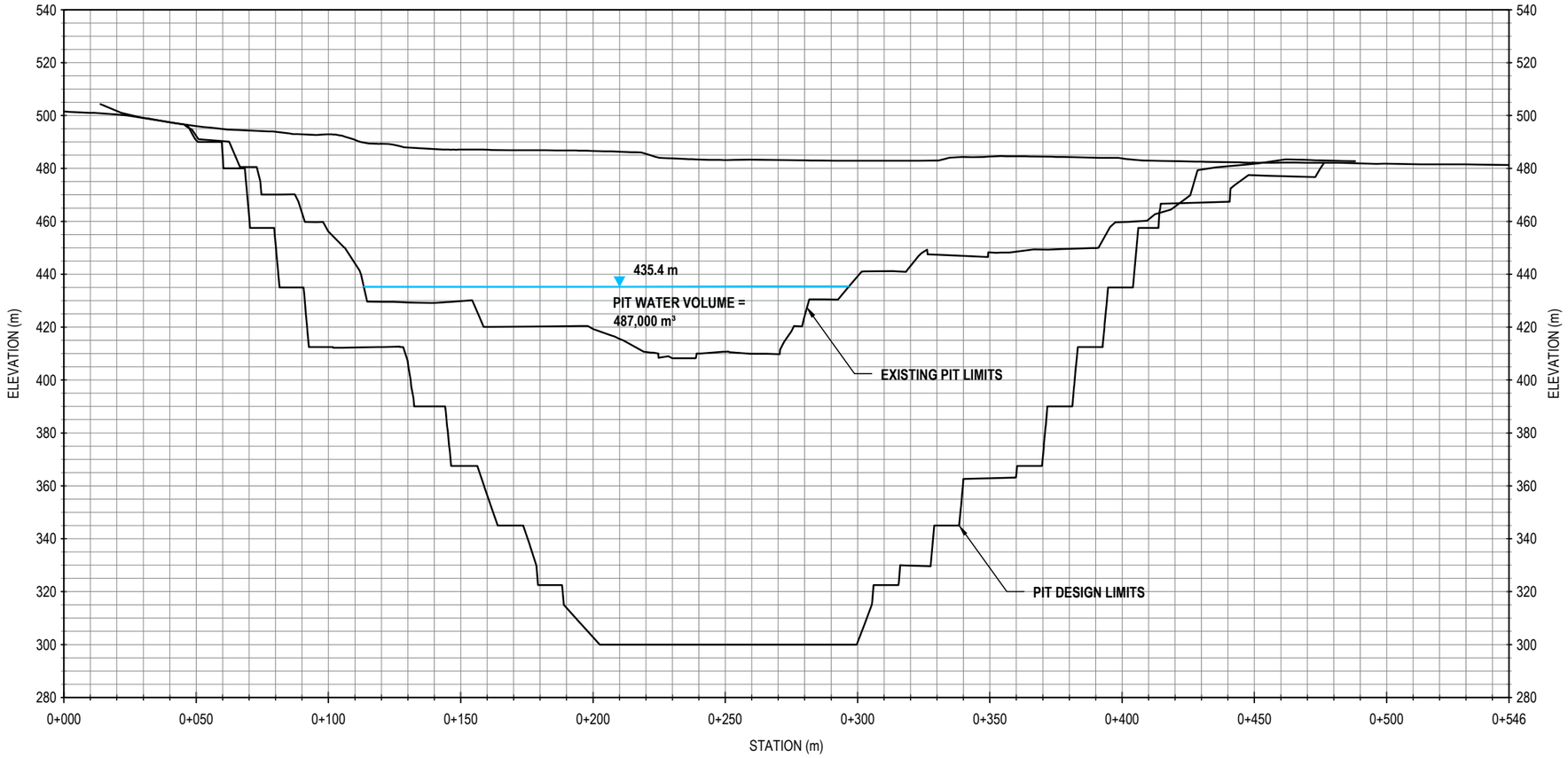
Closure Assessment
Jericho Diamond Mine, NU

OPEN PIT
INSPECTION SUMMARY

PROJECT NO.	DWN	CKD	REV
E14103202	GDK	WTH	0
OFFICE: EDM	DATE: November 2014		

Figure L.1

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Geotechnical\Appendix L (Open Pit)\Apendix L - open pit.dwg [FIGURE L.1] December 24, 2014 - 11:44:30 am (BY: STIRLING, JENNIFER)



Alignment A

ISSUED FOR USE

NOTES
BASE AIRPHOTOS PROVIDED BY OLLERHEAD & ASSOCIATED LTD., AUGUST 2014

100m
Scale: 1:2,000 @ 11"x17"

CLIENT
Aboriginal Affairs and Northern Development Canada

TETRA TECH EBA

Closure Assessment
Jericho Diamond Mine, NU

OPEN PIT
PIT SECTION

PROJECT NO.	DWN	CKD	REV
E14103202	GDK	WTH	0

OFFICE	DATE
EDM	November 2014

Figure L.2

APPENDIX M
BORROW AREAS

Photo M.1: Borrow A.1. Thermokarst feature at north end of borrow area.

Photo M.2: Borrow A.1. Ice wedge features visible in base of borrow area. Remaining material predominantly comprises sand with little to no gravel

Photo M.3: Borrow A.1 looking east. Laydown area visible in background of photo

Photo M.4: Borrow A.1. Some surficial gravel and cobbles in southeast portion of borrow; however, the material is underlain by sand, consistent with the remainder of the borrow area

Photo M.5: Borrow A.2 from north end of borrow, looking southeast. Pond developed in central portion of borrow

Photo M.6: Borrow A.2 from north end of borrow, looking northeast

Photo M.7: Till stockpile on waste rock pile. Looking east from west side of pile.

Photo M.8: East portion of till stockpile. Some codisposal with waste rock

Photo M.9: Aerial view of till stockpile. Photo taken in 2012

PARTICLE SIZE ANALYSIS REPORT

ASTM C136 & C117

Project: Consulting Services, Jericho Mine, NU

Project Number: E14103202-01

Date Tested: October 27, 2014

Borehole Number: Till 01

Depth: N/A

Soil Description: SAND, gravely, some fines (silt/clay)

Cu:

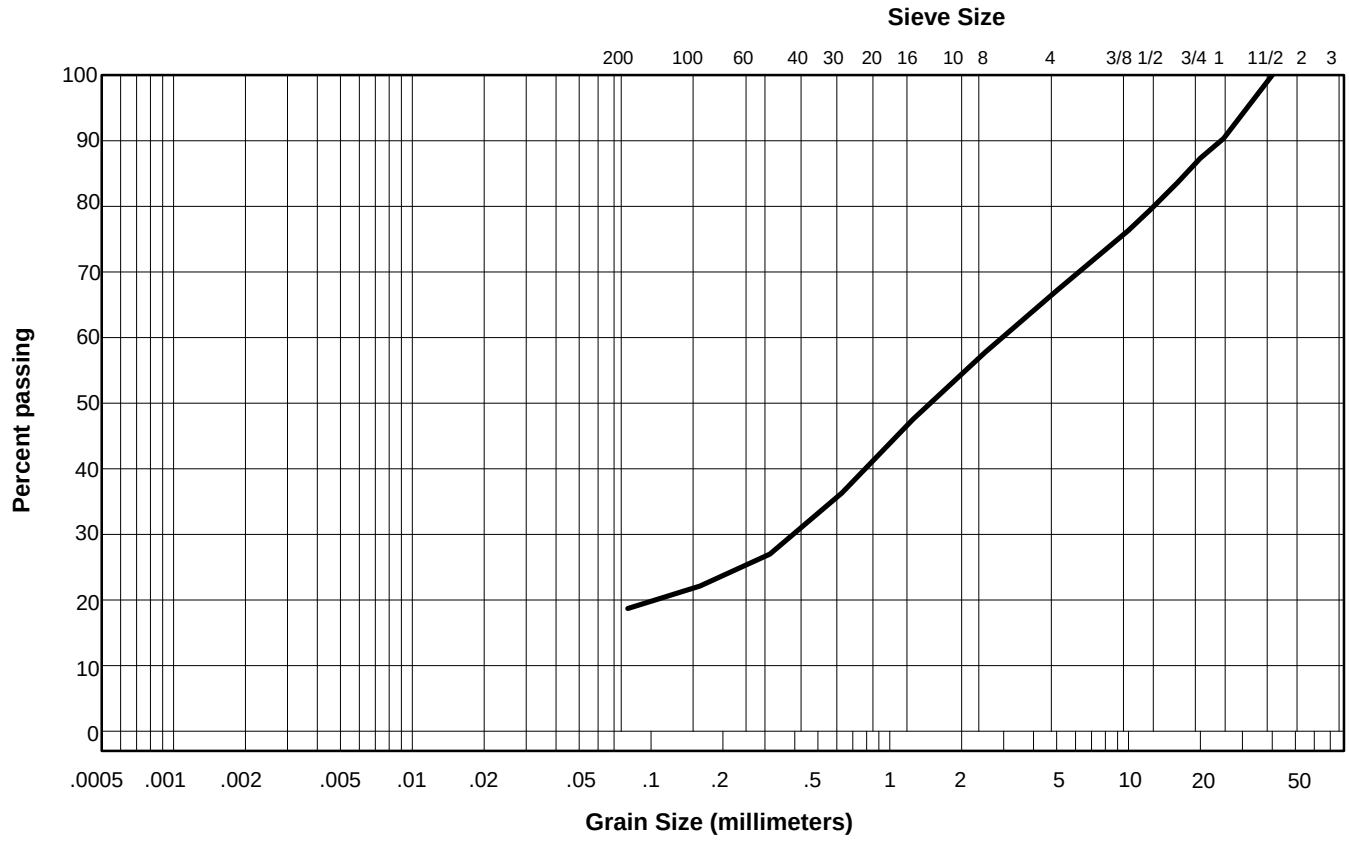
Cc:

Natural Moisture Content: 6.3%

Remarks:

Sieve Size (mm)	Percent Passing
40	100
25	90
20	87
16	84
12.5	80
10	76
5	67
2.5	58
1.25	48
0.63	36
0.315	27
0.160	22
0.080	18.7

Clay	Silt	Sand			Gravel	
		Fine	Medium	Coarse	Fine	Coarse



Reviewed By: _____ P.Eng.

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TETRA TECH

PARTICLE SIZE ANALYSIS REPORT

ASTM C136 & C117

Project: Consulting Services, Jericho Mine, NU

Project Number: E14103202-01

Date Tested: October 27, 2014

Borehole Number: Till 02

Depth: N/A

Soil Description: GRAVEL, sandy, silty/clayey

Cu:

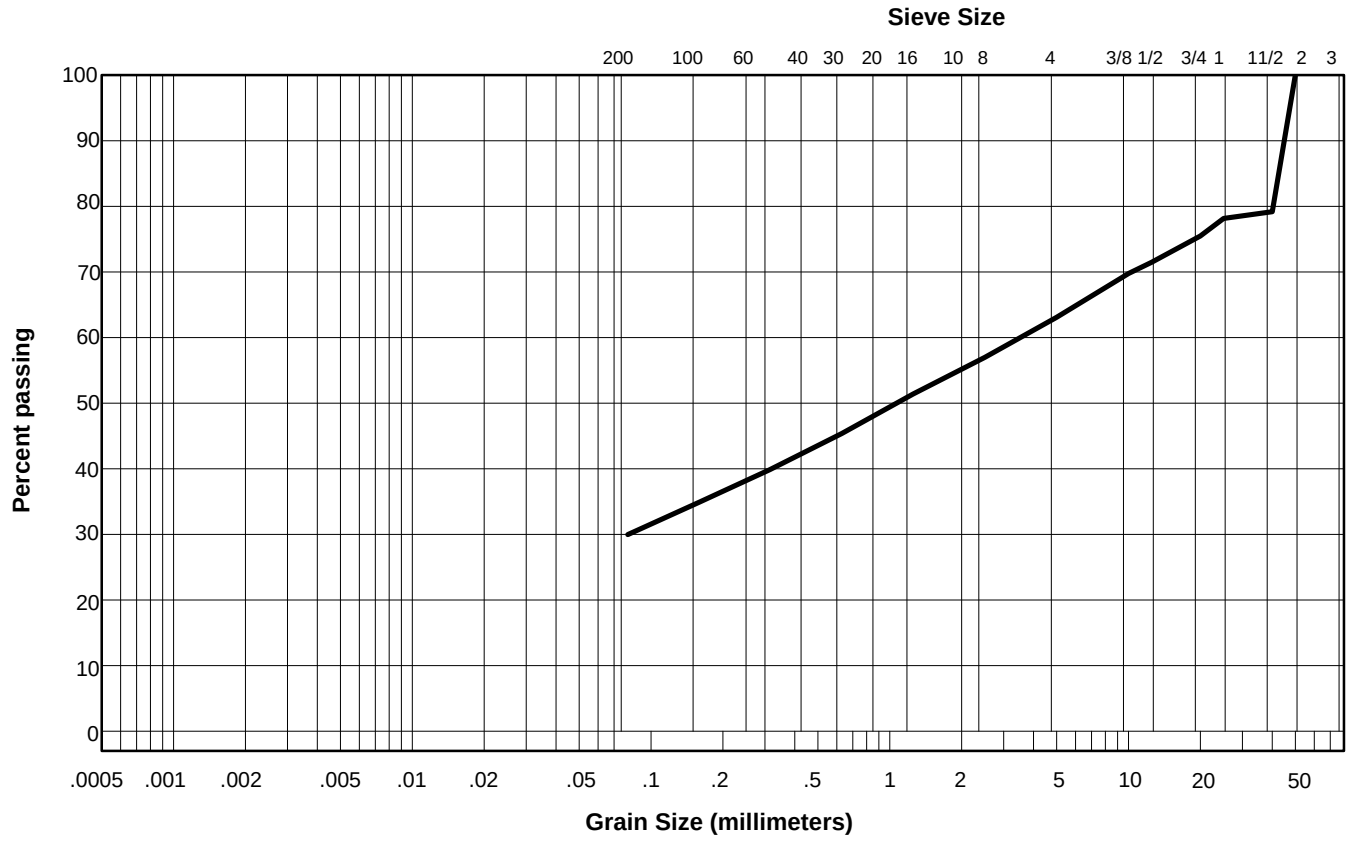
Cc:

Natural Moisture Content: 5.5%

Remarks:

Sieve Size (mm)	Percent Passing
50	100
40	79
25	78
20	75
12.5	71
10	70
5	63
2.5	57
1.25	51
0.63	45
0.315	40
0.160	35
0.080	30.0

Clay	Silt	Sand			Gravel	
		Fine	Medium	Coarse	Fine	Coarse



Reviewed By: _____ P.Eng.

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TETRA TECH

EBA ENGINEERING CONSULTANTS LTD.

FIGURE B6: PARTICLE SIZE SUMMARY REPORT - TILL

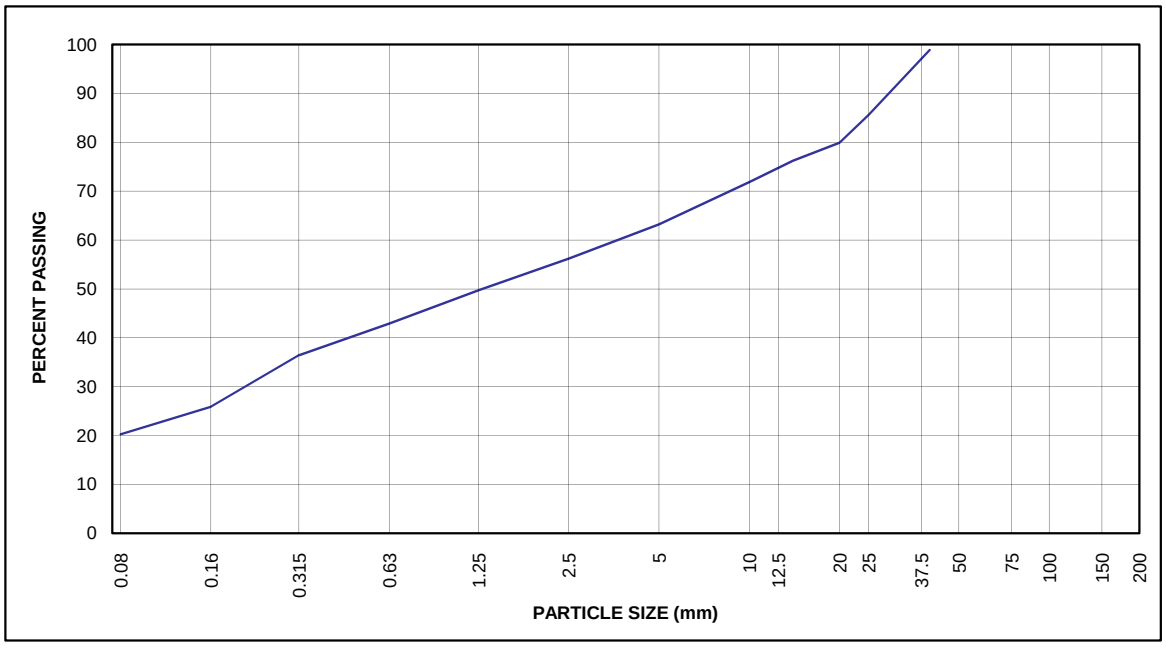
PROJECT: Jericho Diamond Mine
SITE: Jericho, NU
PROJECT NO: 1100060.007
CLIENT: Tahera Attention: H.Gates/R.Jones/T.Loschiavo

SAMPLE DESCRIPTION:
Native Till; West Dam
AVERAGE OF ALL TESTS

SAMPLE NO'S: Till_W Dam_001 to Till_W Dam_005
NATURAL MOISTURE CONTENT: 11.7% average
SPECIFICATION BAND PLOTTED: Specification band not defined
REMARKS: Portion of material +50 mm not plotted

PARTICLE SIZE	AVERAGE % PASSING
40.0	98.9
25.00	85.6
20.00	79.9
14.000	76.2
10.00	71.9
5.00	63.2
2.5	56.2
1.25	49.7
0.63	42.9
0.315	36.4
0.16	25.9
0.08	20.2

SAND			GRAVEL		COBBLES
FINE	MEDIUM	COARSE	FINE	COARSE	



EBA Engineering Consultants Ltd.

TILL PARTICLE SIZE SUMMARY

Project: PKCA Dam Construction
Project No: 1100060.007
Address: Jericho Diamond Mine
Client: Tahera Diamond Corporation
Attention: Mr. Tony Loschiavo

Sample Description: Native Till; West Dam
Summary of ALL gradation samples

OVERALL SUMMARY:

Sieve Size (mm)	40	25	20	14	10	5	2.5	1.25	0.63	0.315	0.16	0.08	M.C. (%)
Specified Maximum													
Average of ALL Tests	**98.9**	**85.6**	**79.9**	**76.2**	**71.9**	**63.2**	**56.2**	**49.7**	**42.9**	**36.4**	**25.9**	**20.2**	**11.7**
Specified Minimum													

DETAILED SUMMARY:

Sample Number	Date Produced	Percent Passing Sieve Sizes (mm)												M.C. (%)
		40	25	20	14	10	5	2.5	1.25	0.63	0.315	0.16	0.08	
Till_W Dam_001		94.5	85.4	82.5	80.3	76.9	69.6	63.2	56.0	47.6	40.1	29.2	20.5	9.2
Till_W Dam_002		100.0	81.9	76.1	71.4	67.8	59.9	54.3	49.5	44.5	39.6	29.7	26.1	13.0
Till_W Dam_003		100.0	93.8	88.6	84.3	79.8	70.0	61.5	53.1	46.0	38.4	28.8	21.7	11.7
Till_W Dam_004		100.0	87.9	77.9	73.2	67.9	57.6	51.3	44.4	37.1	30.1	19.2	13.6	11.1
Till_W Dam_005		100.0	79.0	74.4	72.1	66.9	58.9	50.8	45.5	39.2	33.7	22.5	19.1	13.6
Specified Maximum														
Average of ALL Tests		**98.9**	**85.6**	**79.9**	**76.2**	**71.9**	**63.2**	**56.2**	**49.7**	**42.9**	**36.4**	**25.9**	**20.2**	**11.7**
Specified Minimum														

APPENDIX N
LANDFILL AND LANDFARM

Photo N.1 (Site 1): Site 1 looking northwest from the camp pad. Note outcropping bedrock at several locations

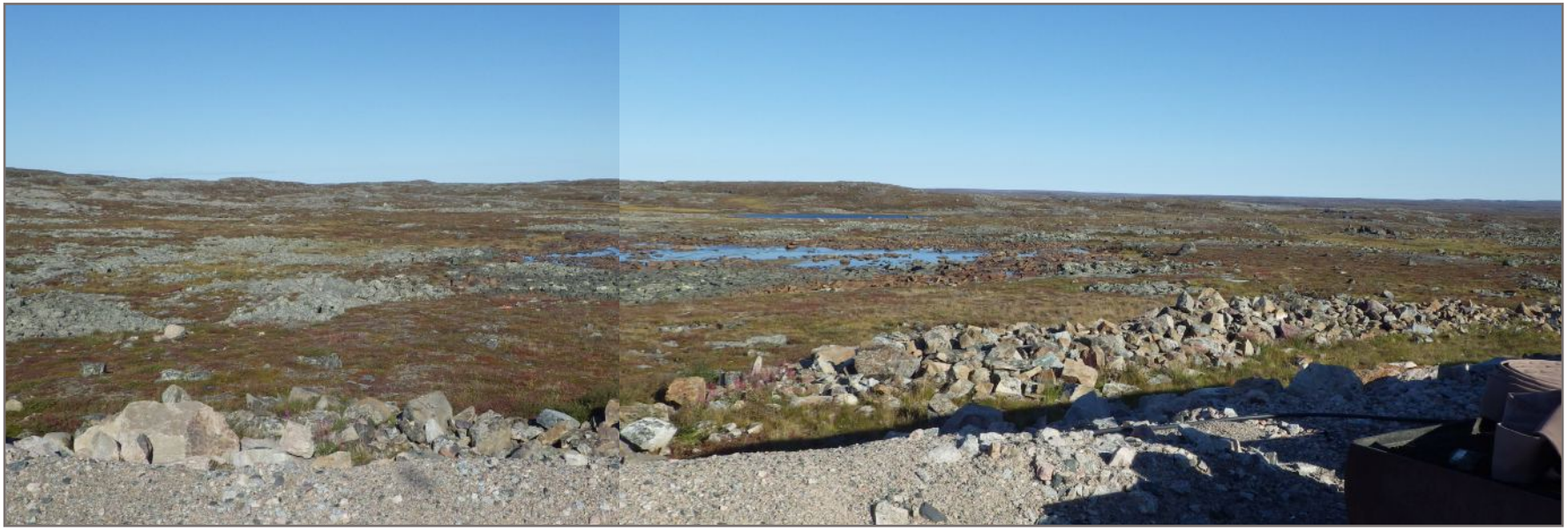


Photo N.2 (Site 1): Eastern portion of Site 1. Ephemeral pond visible mid-photo

Photo N.3 (Site 1): Site 1 looking south towards an ephemeral pond

Photo N.4 (Site 1): Discharge area from the ephemeral pond at the east end of Site 1

Photo N.5 (Site 1)
TP-01

0.0 m ORGANICS

0.04 m SAND and SILT (till) - some gravel, brown, damp

0.5 m END OF HOLE - at desired depth

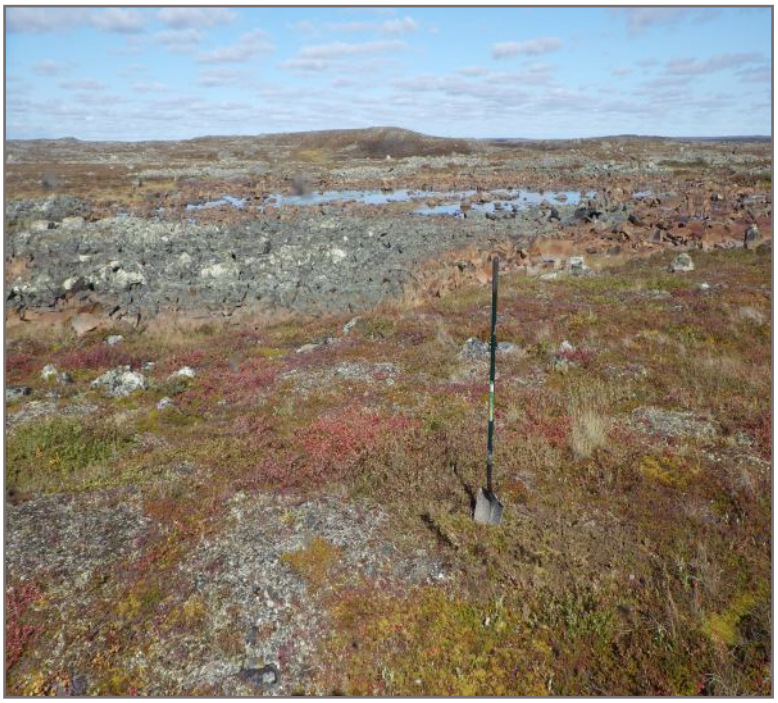


Photo N.6 (Site 1)
TP-02

0.0 m ORGANICS

0.1 m GRAVEL (till) - sandy, silty, brown, increasing moisture with depth

0.4 m END OF HOLE - at refusal on cobbles

Photo N.7 (Site 2): Coarse pk pile , looking east towards the East Sump

Photo N.8 (Site 2): Site 2 looking south from the low grade of stockpile

Photo N.9 (Site 3): Low grade stockpile area from tank farm

Photo N.10 (Site 3): Site 3 looking northwest

Photo N.11 (Site 4): Site 4 looking north. Pit visible in the background

Photo N.12 (Site 4): Site 4 looking northwest

Photo N.13: Site 4 looking southeast towards the low grade stockpile area

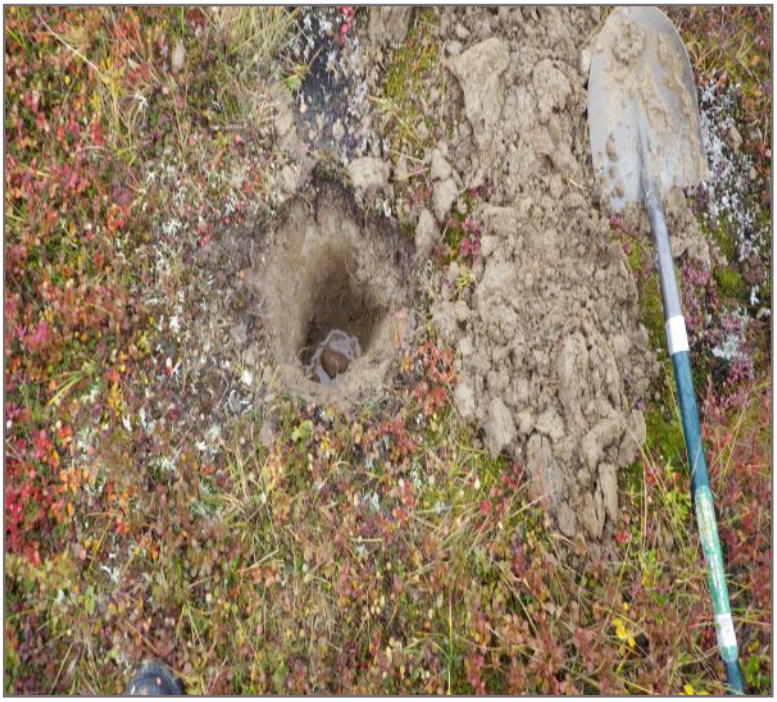


Photo N.14 (Site 4)
TP-03

0.0 m ORGANICS

0.03 m SAND and SILT (till) - some gravel, brown, moist

0.4 m END OF HOLE - seepage in bottom of testpit

LEGEND:

- TESTPIT LOCATION

0 150m

Scale: 1:3,000 @ 11"x17"

NOTE:
BASE AIRPHOTOS PROVIDED BY OLLERHEAD & ASSOCIATES LTD., AUGUST 2014

STATUS
ISSUED FOR USE

CLIENT

Aboriginal Affairs and Northern Development Canada

Closure Assessment
Jericho Diamond Mine, Nunavut

PROPOSED LANDFILL / LANDFARM LOCATIONS

TETRA TECH EBA

PROJECT NO.	DWN	CKD	REV
E14103202	GDK/DBD	WTH	0

OFFICE: EDM

DATE: November 2014

Figure N.1

Y:\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Geotechnical\Appendix N (Landfill)\Appendix N landfill.dwg [FIGURE N.1] November 04, 2014 - 4:06:33 pm (BY: KOOP, GARY)

LEGEND:

- TESTPIT LOCATION
- CATCHMENT BOUNDARY

0 150m

Scale: 1:3,000 @ 11"x17"

NOTE:
BASE AIRPHOTOS PROVIDED BY
OLLERHEAD & ASSOCIATES LTD., AUGUST 2014

STATUS
ISSUED FOR USE

CLIENT

Aboriginal Affairs and Northern Development Canada

Closure Assessment
Jericho Diamond Mine, Nunavut
PROPOSED LANDFARM / LANDFILL LOCATIONS

TETRA TECH EBA

PROJECT NO.	DWN	CKD	REV
E14103202	GDK.DBD	WTH	0

OFFICE: EDM

DATE: November 2014

Figure N.2

Y:\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Geotechnical\Appendix N (Landfill)\Appendix N landfill.dwg [FIGURE N.2] November 04, 2014 - 4:08:05 pm (BY: KOOP, GARY)

PARTICLE SIZE ANALYSIS REPORT

ASTM C136 & C117

Project: Consulting Services, Jericho Mine, NU

Project Number: E14103202-01

Date Tested: October 27, 2014

Borehole Number: TP-01

Depth: 0.3-0.5 m

Soil Description: FINES (silt/clay) and SAND, some gravel

Cu:

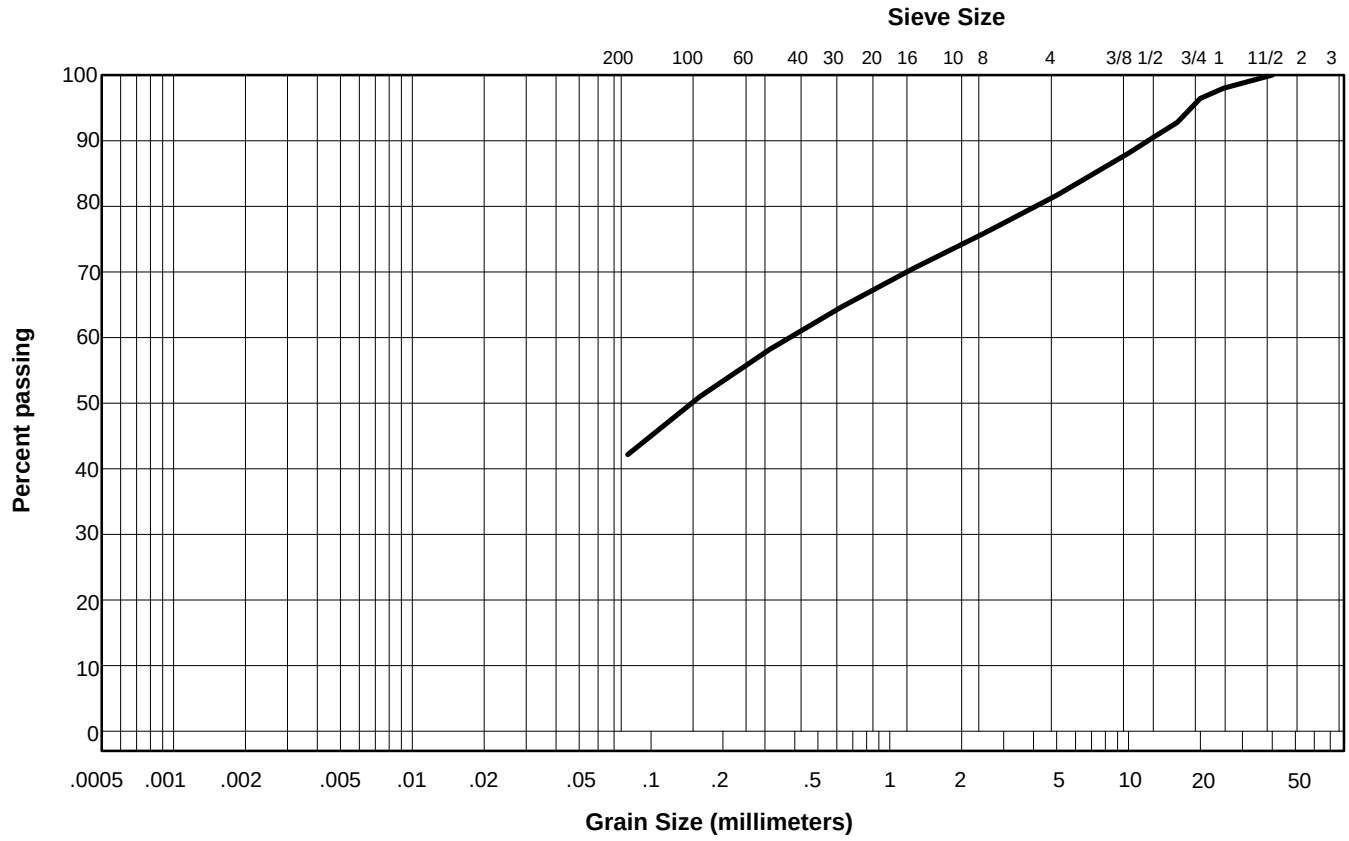
Cc:

Natural Moisture Content: 8.8%

Remarks:

Sieve Size (mm)	Percent Passing
40	100
25	98
20	96
16	93
12.5	90
10	88
5	82
2.5	76
1.25	70
0.63	65
0.315	58
0.160	51
0.080	42.2

Clay	Silt	Sand			Gravel	
		Fine	Medium	Coarse	Fine	Coarse



Reviewed By: _____ P.Eng.

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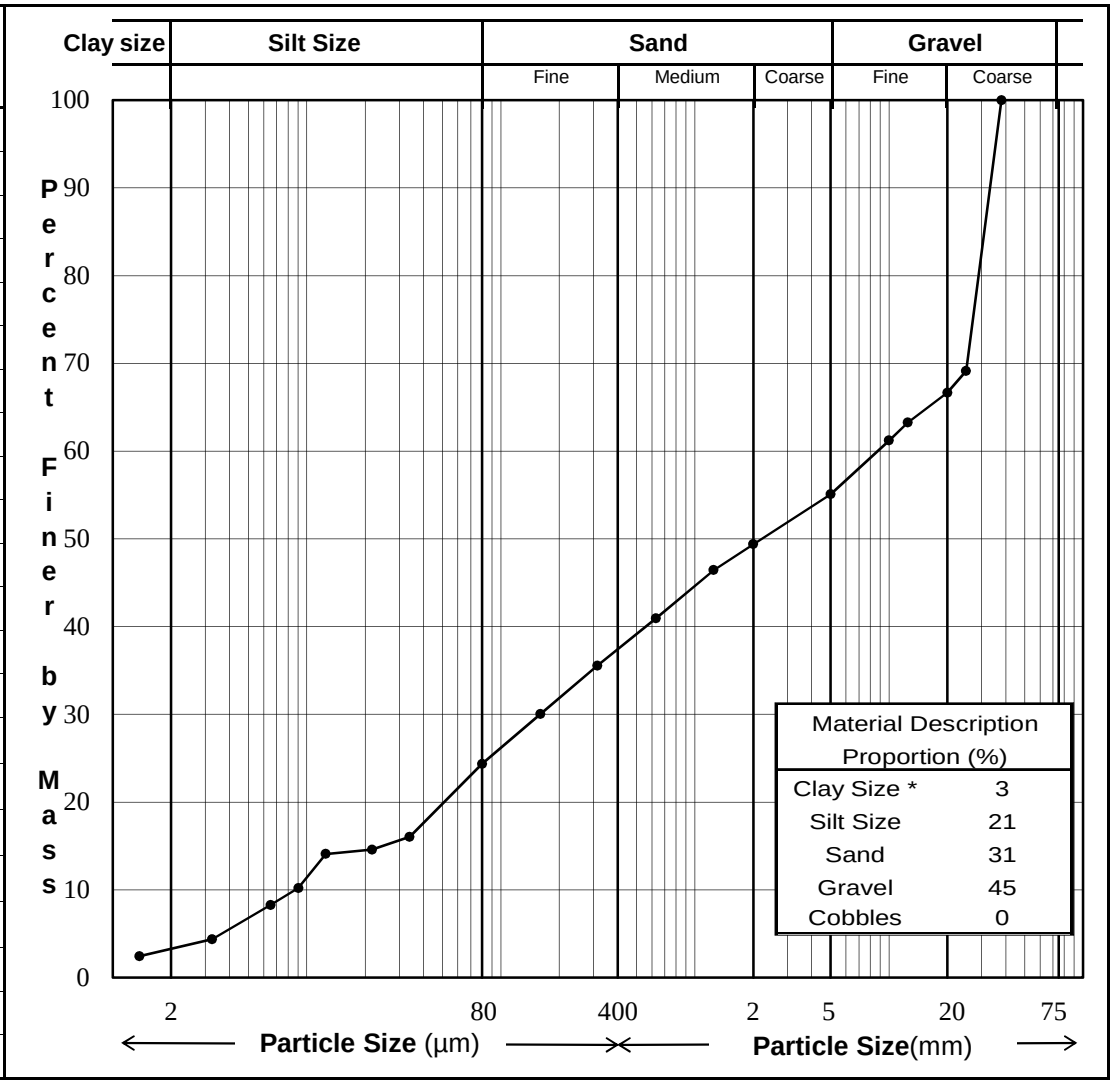
TETRA TECH

PARTICLE SIZE ANALYSIS (Hydrometer) TEST REPORT

ASTM D422

Project:	Closure Assessment	Sample No.:	6102
Client:	AANDC	Borehole/ TP:	TP-02
Project No.:	E14103202-01	Depth:	0.3-0.4 m
Location:	Jericho Mine, NU	Date Tested	October 27-31, 2014
Description **:	GRAVEL, sandy, silty, trace clay	Tested By:	DY/AD

Particle Size	Percent Passing
100 mm	
75 mm	
50 mm	
38 mm	100
25 mm	69
20 mm	67
13 mm	63
10 mm	61
5 mm	55
2 mm	49
1.3 mm	46
630 µm	41
315 µm	36
160 µm	30
80 µm	24
34 µm	16
22 µm	15
13 µm	14
9 µm	10
7 µm	8
3 µm	4
1 µm	2



Remarks: * The upper clay size of 2 µm is as per the Canadian Foundation Manual.

** The description is behaviour based & subject to Tetra Tech EBA description protocols.

Reviewed By: _____ P.Eng.

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TETRA TECH

PARTICLE SIZE ANALYSIS REPORT

ASTM C136 & C117

Project: Consulting Services, Jericho Mine, NU

Project Number: E14103202-01

Date Tested: October 27, 2014

Borehole Number: TP-03

Depth: 0.2-0.3 m

Soil Description: SAND and FINES (silt/clay), some gravel

Cu:

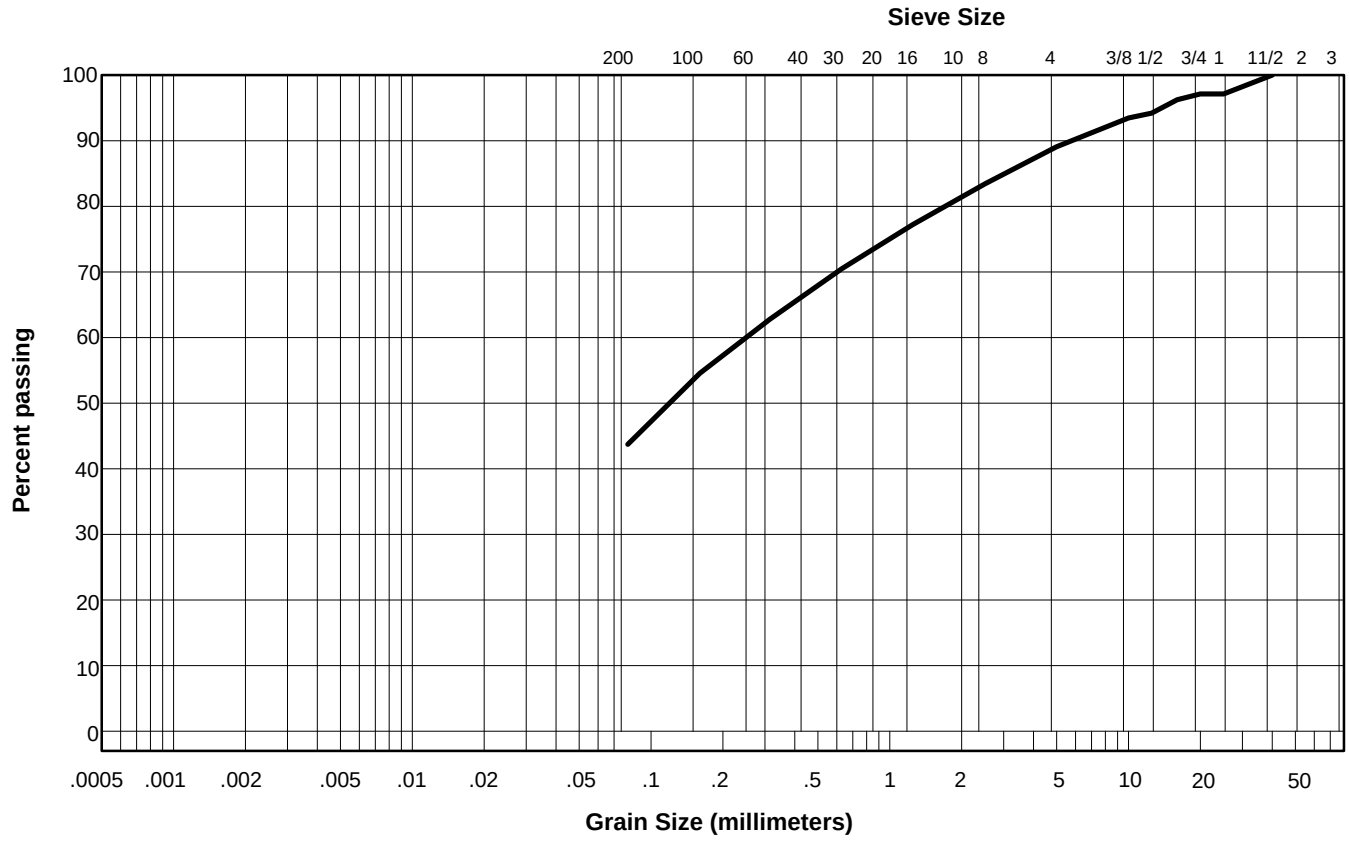
Cc:

Natural Moisture Content: 13.0%

Remarks:

Sieve Size (mm)	Percent Passing
40	100
25	97
20	97
16	96
12.5	94
10	93
5	89
2.5	83
1.25	77
0.63	71
0.315	63
0.160	55
0.080	43.7

Clay	Silt	Sand			Gravel	
		Fine	Medium	Coarse	Fine	Coarse



Reviewed By: _____ P.Eng.

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TETRA TECH

APPENDIX O
LABORATORY RESULTS

Your Project #: E14103202-01
Site Location: JERICHO MINE

Attention:ROBERT ZSCHUPPE

TETRA TECH EBA INC.
14940-123 AVENUE
EDMONTON, AB
CANADA T5V 1B4

Your C.O.C. #: A159194, A158068, A159195, A159198, A159199, A159201, A159202, A159203, A159186, A159196, A159197, A159180, A159181

Report Date: 2014/09/03
Report #: R1635226
Version: 1

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B474838
Received: 2014/08/25, 16:10

Sample Matrix: Soil
Samples Received: 60

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Boron (Hot Water Soluble)	1	2014/08/30	2014/08/30	AB SOP-00034 / AB SOP-00042	EPA 200.7 CFR 2012 m
Boron (Hot Water Soluble)	2	2014/08/31	2014/08/31	AB SOP-00034 / AB SOP-00042	EPA 200.7 CFR 2012 m
Boron (Hot Water Soluble)	1	2014/09/02	2014/09/02	AB SOP-00034 / AB SOP-00042	EPA 200.7 CFR 2012 m
Boron (Hot Water Soluble)	3	2014/09/03	2014/09/03	AB SOP-00034 / AB SOP-00042	EPA 200.7 CFR 2012 m
BTEX/F1 by HS GC/MS (MeOH extract)	31	2014/08/27	2014/08/29	AB SOP-00039	CCME CWS/EPA 5260C m
BTEX/F1 by HS GC/MS (MeOH extract)	25	2014/08/27	2014/08/30	AB SOP-00039	CCME CWS/EPA 5260C m
Hexavalent Chromium	7	2014/08/30	2014/08/30	AB SOP-00063	SM 22 3500-Cr B m
CCME Hydrocarbons (F2-F4 in soil)	5	2014/08/27	2014/08/28	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS
CCME Hydrocarbons (F2-F4 in soil)	19	2014/08/27	2014/08/29	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS
CCME Hydrocarbons (F2-F4 in soil)	23	2014/08/27	2014/08/30	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS
CCME Hydrocarbons (F2-F4 in soil)	9	2014/08/27	2014/08/31	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS
CCME Hydrocarbons (F4G in soil)	2	2014/08/27	2014/09/02	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS
Glycol in Soil by GC/FID (1)	1	2014/08/29	2014/08/29	CAL SOP-00093	SSMA, EPA 8015 D
Elements by ICPMS - Soils	1	2014/08/30	2014/08/30	AB SOP-00001 / AB SOP-00043	EPA 200.8 R5.4 m
Elements by ICPMS - Soils	2	2014/08/31	2014/09/01	AB SOP-00001 / AB SOP-00043	EPA 200.8 R5.4 m
Elements by ICPMS - Soils	1	2014/09/02	2014/09/02	AB SOP-00001 / AB SOP-00043	EPA 200.8 R5.4 m

Your Project #: E14103202-01
Site Location: JERICHO MINE

Attention:ROBERT ZSCHUPPE

TETRA TECH EBA INC.
14940-123 AVENUE
EDMONTON, AB
CANADA T5V 1B4

Your C.O.C. #: A159194, A158068, A159195, A159198, A159199, A159201, A159202, A159203, A159186, A159196, A159197, A159180, A159181

Report Date: 2014/09/03
Report #: R1635226
Version: 1

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B474838
Received: 2014/08/25, 16:10

Sample Matrix: Soil
Samples Received: 60

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Elements by ICPMS - Soils	3	2014/09/03	2014/09/03	AB SOP-00001 / AB SOP-00043	EPA 200.8 R5.4 m
Moisture	58	N/A	2014/08/28	AB SOP-00002	CCME PHC-CWS
Moisture	1	N/A	2014/09/02	AB SOP-00002	CCME PHC-CWS
Moisture	1	N/A	2014/09/03	AB SOP-00002	CCME PHC-CWS
Benzo[a]pyrene Equivalency	2	N/A	2014/08/31	AB SOP-00003	Auto Calc
PAH in Soil by GC/MS	2	2014/08/27	2014/08/31	AB SOP-00036 / AB SOP-00003	EPA 8270D m
Particle Size by Sieve (75 micron)	1	N/A	2014/09/02	EENVSOP-00077	Carter 2nd ed 55.4 m
Particle Size by Sieve (75 micron)	3	N/A	2014/09/03	EENVSOP-00077	Carter 2nd ed 55.4 m

Sample Matrix: Water
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	5	N/A	2014/08/28	AB SOP-00005	SM 22 2320 B m
BTEX/F1 in Water by HS GC/MS	5	N/A	2014/08/27	AB SOP-00039	CCME CWS/EPA 5260C m
BTEX/F1 in Water by HS GC/MS	2	N/A	2014/08/28	AB SOP-00039	CCME CWS/EPA 5260C m
Cadmium - low level CCME - Dissolved	5	N/A	2014/09/01	AB SOP-00043	EPA 200.8 R5.4 m
Cadmium - low level CCME (Total)	5	2014/08/26	2014/09/01	AB SOP-00014 / AB SOP-00043	EPA 200.8 R5.4m
Chloride by Automated Colourimetry	5	N/A	2014/08/30	AB SOP-00020	SM 22 4500-Cl G m
Conductivity @25C	5	N/A	2014/08/28	AB SOP-00005	SM 22 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16)	7	2014/08/28	2014/08/30	AB SOP-00040 AB SOP-00037	EPA3510/CCME PHCCWS
Glycols in Water by GC/FID (1)	1	N/A	2014/08/30	CAL SOP-00093	EPA 8015 D
Hardness	5	N/A	2014/09/01	AB WI-00065	SM 2340B

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Your Project #: E14103202-01
Site Location: JERICHO MINE

Attention:ROBERT ZSCHUPPE

TETRA TECH EBA INC.
14940-123 AVENUE
EDMONTON, AB
CANADA T5V 1B4

Your C.O.C. #: A159194, A158068, A159195, A159198, A159199, A159201, A159202, A159203, A159186, A159196, A159197, A159180, A159181

Report Date: 2014/09/03
Report #: R1635226
Version: 1

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B474838
Received: 2014/08/25, 16:10

Sample Matrix: Water
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Elements by ICP - Dissolved	5	N/A	2014/08/31	AB SOP-00042	EPA 200.7 CFR 2012 m
Elements by ICP - Total	5	2014/08/31	2014/08/31	AB SOP-00014 / AB SOP-00042	EPA 200.7 CFR 2012 m
Elements by ICPMS - Dissolved	5	N/A	2014/08/31	AB SOP-00043	EPA 200.8 R5.4 m
Elements by ICPMS - Total	5	2014/08/31	2014/08/31	AB SOP-00014 / AB SOP-00043	EPA 200.8 R5.4 m
Ion Balance	5	N/A	2014/09/01	AB WI-00065	SM 1030E
Sum of cations, anions	5	N/A	2014/09/01	AB WI-00065	SM 1030E
Nitrate and Nitrite	5	N/A	2014/08/29	AB SOP-00023	Auto Calc
Nitrate + Nitrite-N (calculated)	5	N/A	2014/08/29	AB SOP-00023	SM 4110-B
Nitrogen, (Nitrite, Nitrate) by IC	5	N/A	2014/08/27	AB SOP-00023	SM 22 4110 B m
Benzo[a]pyrene Equivalency (2)	2	N/A	2014/08/28	AB SOP-00003	Auto Calc
PAH in Water by GC/MS	2	2014/08/27	2014/08/28	AB SOP-00037 / AB SOP-00003	EPA 8270D m
pH @25°C (Alkalinity titrator)	5	N/A	2014/08/27	AB SOP-00005	SM 22 4500-H B m
Sulphate by Automated Colourimetry	5	N/A	2014/08/30	AB SOP-00018	SM 22 4500-SO4 E m
Total Dissolved Solids (Calculated)	5	N/A	2014/09/01	AB WI-00065	SM 1030E

(1) This test was performed by Maxxam Calgary Environmental
(2) B[a]P TPE is calculated using 1/2 of the RDL for non detect results as per Alberta Environment instructions. This protocol may not apply in other jurisdictions.

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Your Project #: E14103202-01
Site Location: JERICHO MINE

Attention:ROBERT ZSCHUPPE

TETRA TECH EBA INC.
14940-123 AVENUE
EDMONTON, AB
CANADA T5V 1B4

Your C.O.C. #: A159194, A158068, A159195, A159198, A159199, A159201, A159202, A159203, A159186, A159196, A159197, A159180, A159181

Report Date: 2014/09/03
Report #: R1635226
Version: 1

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B474838
Received: 2014/08/25, 16:10

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Sherlyne Sim, B.Eng, Project Manager
Email: SSim@maxxam.ca
Phone# (780)577-7113
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Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F2 (WATER)

Maxxam ID		KL1989	KL1990	KL1991	KL1992	KL1993	KL1994		
Sampling Date		2014/08/24 18:00	2014/08/24 18:10	2014/08/24 18:20	2014/08/25 09:00	2014/08/25 09:20	2014/08/25 09:40		
COC Number		A159181	A159181	A159181	A159181	A159181	A159181		
	Units	SW 9-1	SW 8-1	SW 7-1	SW 3-1	SW 2-1	SW 1-1	RDL	QC Batch
Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	4.5	0.51	0.10	7616062
Volatiles									
Benzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7616020
Toluene	mg/L	0.00053	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7616020
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7616020
m & p-Xylene	mg/L	0.00088	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	7616020
o-Xylene	mg/L	0.00052	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7616020
Xylenes (Total)	mg/L	0.0014	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	7616020
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7616020
(C6-C10)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7616020
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	103	106	105	102	112	108	N/A	7616020
4-Bromofluorobenzene (sur.)	%	85	85	88	88	82	91	N/A	7616020
D4-1,2-Dichloroethane (sur.)	%	104	104	104	109	129	113	N/A	7616020
O-TERPHENYL (sur.)	%	99	106	105	99	107	103	N/A	7616062

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F2 (WATER)

Maxxam ID		KL1995		
Sampling Date		2014/08/25		
COC Number		A159181		
	Units	SW DUP 1	RDL	QC Batch
Hydrocarbons				
F2 (C10-C16 Hydrocarbons)	mg/L	5.2	0.10	7616062
Volatiles				
Benzene	mg/L	<0.00040	0.00040	7616020
Toluene	mg/L	<0.00040	0.00040	7616020
Ethylbenzene	mg/L	<0.00040	0.00040	7616020
m & p-Xylene	mg/L	<0.00080	0.00080	7616020
o-Xylene	mg/L	<0.00040	0.00040	7616020
Xylenes (Total)	mg/L	<0.00080	0.00080	7616020
F1 (C6-C10) - BTEX	mg/L	<0.10	0.10	7616020
(C6-C10)	mg/L	<0.10	0.10	7616020
Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	101	N/A	7616020
4-Bromofluorobenzene (sur.)	%	87	N/A	7616020
D4-1,2-Dichloroethane (sur.)	%	109	N/A	7616020
O-TERPHENYL (sur.)	%	103	N/A	7616062

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KL1510	KL1511		KL1512	KL1513	KL1514		
Sampling Date		2014/08/24	2014/08/24		2014/08/24	2014/08/24	2014/08/24		
COC Number		A159198	A159198		A159198	A159198	A159198		
	Units	SS1A-2 10-30	SS1A-4 10-30	QC Batch	SS1B-4 0-10	SS1B-1 0-10	SS1B-8 0-10	RDL	QC Batch
Physical Properties									
Moisture	%	4.5	3.9	7616683	11	5.6	12	0.30	7616970
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	7616969	3500	3300	2800	10	7616972
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	<50	7616969	400	1100	1000	50	7616972
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	7616969	<50	<50	<50	50	7616972
Reached Baseline at C50	mg/kg	Yes	Yes	7616969	Yes	Yes	Yes	N/A	7616972
Volatiles									
Benzene	mg/kg	<0.0050	<0.0050	7618018	<0.0050	<0.0050	<0.0050	0.0050	7618039
Toluene	mg/kg	<0.020	<0.020	7618018	0.034	0.11	<0.020	0.020	7618039
Ethylbenzene	mg/kg	<0.010	<0.010	7618018	0.13	0.13	0.018	0.010	7618039
Xylenes (Total)	mg/kg	<0.040	<0.040	7618018	1.0	4.3	1.2	0.040	7618039
m & p-Xylene	mg/kg	<0.040	<0.040	7618018	0.57	2.0	0.45	0.040	7618039
o-Xylene	mg/kg	<0.020	<0.020	7618018	0.47	2.3	0.77	0.020	7618039
F1 (C6-C10) - BTEX	mg/kg	<12	<12	7618018	150	90	79	12	7618039
(C6-C10)	mg/kg	<12	<12	7618018	150	95	81	12	7618039
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	112	109	7618018	119	112	113	N/A	7618039
4-Bromofluorobenzene (sur.)	%	84	82	7618018	76	90	87	N/A	7618039
D10-ETHYLBENZENE (sur.)	%	113	108	7618018	129	121	123	N/A	7618039
D4-1,2-Dichloroethane (sur.)	%	100	103	7618018	120	97	95	N/A	7618039
O-TERPHENYL (sur.)	%	104	118	7616969	100	108	95	N/A	7616972

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KL1515		KL1516	KL1517		KL1518		
Sampling Date		2014/08/24		2014/08/24	2014/08/24		2014/08/24		
COC Number		A159198		A159198	A159198		A159198		
	Units	SS1B-6 90-110	QC Batch	SS1B-7 90-110	SS1C-1 0-10	QC Batch	SS1C-2 0-20	RDL	QC Batch
Physical Properties									
Moisture	%	11	7616970	5.6	1.9	7616683	4.0	0.30	7616970
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	7616972	<10	4200	7616969	2400	10	7616972
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	7616972	<50	3500	7616969	2900	50	7616972
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	7616972	<50	970	7616969	68	50	7616972
Reached Baseline at C50	mg/kg	Yes	7616972	Yes	Yes	7616969	Yes	N/A	7616972
Volatiles									
Benzene	mg/kg	<0.0050	7618039	<0.0050	<0.0050	7618018	<0.0050	0.0050	7618039
Toluene	mg/kg	<0.020	7618039	<0.020	<0.020	7618018	<0.020	0.020	7618039
Ethylbenzene	mg/kg	<0.010	7618039	<0.010	<0.010	7618018	<0.010	0.010	7618039
Xylenes (Total)	mg/kg	<0.040	7618039	<0.040	<0.040	7618018	<0.040	0.040	7618039
m & p-Xylene	mg/kg	<0.040	7618039	<0.040	<0.040	7618018	<0.040	0.040	7618039
o-Xylene	mg/kg	<0.020	7618039	<0.020	<0.020	7618018	<0.020	0.020	7618039
F1 (C6-C10) - BTEX	mg/kg	<12	7618039	<12	<12	7618018	<12	12	7618039
(C6-C10)	mg/kg	<12	7618039	<12	<12	7618018	<12	12	7618039
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	118	7618039	110	111	7618018	106	N/A	7618039
4-Bromofluorobenzene (sur.)	%	93	7618039	87	83	7618018	87	N/A	7618039
D10-ETHYLBENZENE (sur.)	%	122	7618039	115	108	7618018	109	N/A	7618039
D4-1,2-Dichloroethane (sur.)	%	98	7618039	107	109	7618018	101	N/A	7618039
O-TERPHENYL (sur.)	%	101	7616972	96	85	7616969	105	N/A	7616972

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KL1519		KL1520		KL1521	KL1569		
Sampling Date		2014/08/24		2014/08/24		2014/08/24	2014/08/24		
COC Number		A159198		A159198		A159198	A159199		
	Units	SS1C-3 0-20	QC Batch	DUP1	QC Batch	SS1D-1 0-20	SS1D-3 0-20	RDL	QC Batch
Physical Properties									
Moisture	%	2.9	7616970	5.8	7617356	5.6	12	0.30	7616970
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	7616972	2600	7616969	<10	15	10	7616972
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	7616972	3500	7616969	<50	1300	50	7616972
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	7616972	140	7616969	<50	720	50	7616972
Reached Baseline at C50	mg/kg	Yes	7616972	Yes	7616969	Yes	Yes	N/A	7616972
Volatiles									
Benzene	mg/kg	0.0079	7618039	<0.0050	7618018	<0.0050	0.0099	0.0050	7618039
Toluene	mg/kg	<0.020	7618039	<0.020	7618018	<0.020	<0.020	0.020	7618039
Ethylbenzene	mg/kg	<0.010	7618039	<0.010	7618018	<0.010	<0.010	0.010	7618039
Xylenes (Total)	mg/kg	<0.040	7618039	<0.040	7618018	<0.040	<0.040	0.040	7618039
m & p-Xylene	mg/kg	<0.040	7618039	<0.040	7618018	<0.040	<0.040	0.040	7618039
o-Xylene	mg/kg	<0.020	7618039	<0.020	7618018	<0.020	<0.020	0.020	7618039
F1 (C6-C10) - BTEX	mg/kg	<12	7618039	<12	7618018	<12	<12	12	7618039
(C6-C10)	mg/kg	<12	7618039	<12	7618018	<12	<12	12	7618039
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	108	7618039	111	7618018	110	104	N/A	7618039
4-Bromofluorobenzene (sur.)	%	85	7618039	83	7618018	90	79	N/A	7618039
D10-ETHYLBENZENE (sur.)	%	116	7618039	117	7618018	113	111	N/A	7618039
D4-1,2-Dichloroethane (sur.)	%	100	7618039	98	7618018	107	94	N/A	7618039
O-TERPHENYL (sur.)	%	103	7616972	106	7616969	101	112	N/A	7616972

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KL1570		KL1571	KL1572		KL1573		
Sampling Date		2014/08/24		2014/08/24	2014/08/24		2014/08/24		
COC Number		A159199		A159199	A159199		A159199		
	Units	SS1D-4 20-40	QC Batch	SS1D-5 0-20	SS1E-1 0-20	QC Batch	SS1E-2 0-20	RDL	QC Batch
Physical Properties									
Moisture	%	8.1	7616913	6.5	4.6	7616970	7.1	0.30	7617356
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	190	7616969	<10	54	7616972	<10	10	7616969
F3 (C16-C34 Hydrocarbons)	mg/kg	150	7616969	<50	3600	7616972	<50	50	7616969
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	7616969	<50	13000	7616972	<50	50	7616969
Reached Baseline at C50	mg/kg	Yes	7616969	Yes	No	7616972	Yes	N/A	7616969
F4G-SG (Heavy Hydrocarbons-Grav.)	mg/kg	N/A	N/A	N/A	19000	7622036	N/A	500	N/A
Volatiles									
Benzene	mg/kg	<0.0050	7618018	0.0090	<0.0050	7618039	<0.0050	0.0050	7618018
Toluene	mg/kg	<0.020	7618018	<0.020	<0.020	7618039	<0.020	0.020	7618018
Ethylbenzene	mg/kg	<0.010	7618018	<0.010	<0.010	7618039	<0.010	0.010	7618018
Xylenes (Total)	mg/kg	<0.040	7618018	<0.040	<0.040	7618039	<0.040	0.040	7618018
m & p-Xylene	mg/kg	<0.040	7618018	<0.040	<0.040	7618039	<0.040	0.040	7618018
o-Xylene	mg/kg	<0.020	7618018	<0.020	<0.020	7618039	<0.020	0.020	7618018
F1 (C6-C10) - BTEX	mg/kg	<12	7618018	<12	<12	7618039	<12	12	7618018
(C6-C10)	mg/kg	<12	7618018	<12	<12	7618039	<12	12	7618018
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	108	7618018	111	114	7618039	102	N/A	7618018
4-Bromofluorobenzene (sur.)	%	90	7618018	88	86	7618039	106	N/A	7618018
D10-ETHYLBENZENE (sur.)	%	115	7618018	116	114	7618039	100	N/A	7618018
D4-1,2-Dichloroethane (sur.)	%	102	7618018	103	113	7618039	142 (1)	N/A	7618018
O-TERPHENYL (sur.)	%	105	7616969	111	116	7616972	107	N/A	7616969

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KL1574		KL1575		KL1636	KL1638		
Sampling Date		2014/08/24		2014/08/24		2014/08/24	2014/08/24		
COC Number		A159199		A159199		A159201	A159201		
	Units	SS1E-5 0-20	QC Batch	SS1E-9 0-20	QC Batch	SS2-6 90-100	SS2-8 0-10	RDL	QC Batch
Physical Properties									
Moisture	%	6.7	7616683	7.6	7616970	5.9	N/A	0.30	7616683
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	770	7616969	410	7616972	<10	360	10	7616969
F3 (C16-C34 Hydrocarbons)	mg/kg	400	7616969	1100	7616972	<50	14000	50	7616969
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	7616969	1600	7616972	<50	7000	50	7616969
Reached Baseline at C50	mg/kg	Yes	7616969	No	7616972	Yes	Yes	N/A	7616969
F4G-SG (Heavy Hydrocarbons-Grav.)	mg/kg	N/A	N/A	2600	7622036	N/A	N/A	500	N/A
Volatiles									
Benzene	mg/kg	<0.0050	7618018	<0.0050	7618039	<0.0050	<0.0050	0.0050	7618018
Toluene	mg/kg	<0.020	7618018	<0.020	7618039	<0.020	<0.020	0.020	7618018
Ethylbenzene	mg/kg	0.014	7618018	<0.010	7618039	<0.010	<0.010	0.010	7618018
Xylenes (Total)	mg/kg	1.1	7618018	<0.040	7618039	<0.040	<0.040	0.040	7618018
m & p-Xylene	mg/kg	0.39	7618018	<0.040	7618039	<0.040	<0.040	0.040	7618018
o-Xylene	mg/kg	0.72	7618018	<0.020	7618039	<0.020	<0.020	0.020	7618018
F1 (C6-C10) - BTEX	mg/kg	63	7618018	<12	7618039	<12	<12	12	7618018
(C6-C10)	mg/kg	64	7618018	<12	7618039	<12	<12	12	7618018
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	110	7618018	113	7618039	112	109	N/A	7618018
4-Bromofluorobenzene (sur.)	%	92	7618018	87	7618039	90	91	N/A	7618018
D10-ETHYLBENZENE (sur.)	%	112	7618018	113	7618039	115	117	N/A	7618018
D4-1,2-Dichloroethane (sur.)	%	103	7618018	110	7618039	101	97	N/A	7618018
O-TERPHENYL (sur.)	%	110	7616969	115	7616972	108	94	N/A	7616969

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KL1639		KL1640		KL1644		
Sampling Date		2014/08/24		2014/08/24		2014/08/24		
COC Number		A159201		A159201		A159201		
	Units	SS2-9 0-10	QC Batch	SS2-10 0-10	QC Batch	SS2-14 0-10	RDL	QC Batch
Physical Properties								
Moisture	%	13	7617394	5.5	7616970	11	0.30	7616683
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	130	7616673	1400	7617665	2500	10	7616969
F3 (C16-C34 Hydrocarbons)	mg/kg	3600	7616673	16000	7617665	8700	50	7616969
F4 (C34-C50 Hydrocarbons)	mg/kg	660	7616673	3300	7617665	80	50	7616969
Reached Baseline at C50	mg/kg	Yes	7616673	Yes	7617665	Yes	N/A	7616969
Volatiles								
Benzene	mg/kg	<0.0050	7616627	0.0070	7618039	<0.0050	0.0050	7618018
Toluene	mg/kg	<0.020	7616627	<0.020	7618039	<0.020	0.020	7618018
Ethylbenzene	mg/kg	<0.010	7616627	<0.010	7618039	<0.010	0.010	7618018
Xylenes (Total)	mg/kg	<0.040	7616627	<0.040	7618039	<0.040	0.040	7618018
m & p-Xylene	mg/kg	<0.040	7616627	<0.040	7618039	<0.040	0.040	7618018
o-Xylene	mg/kg	<0.020	7616627	<0.020	7618039	<0.020	0.020	7618018
F1 (C6-C10) - BTEX	mg/kg	<12	7616627	<12	7618039	<12	12	7618018
(C6-C10)	mg/kg	<12	7616627	<12	7618039	<12	12	7618018
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	104	7616627	119	7618039	113	N/A	7618018
4-Bromofluorobenzene (sur.)	%	97	7616627	84	7618039	90	N/A	7618018
D10-ETHYLBENZENE (sur.)	%	101	7616627	113	7618039	108	N/A	7618018
D4-1,2-Dichloroethane (sur.)	%	104	7616627	111	7618039	108	N/A	7618018
O-TERPHENYL (sur.)	%	89	7616673	75	7617665	106	N/A	7616969

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KL1750		KL1752	KL1756		KL1757		
Sampling Date		2014/08/22		2014/08/22	2014/08/22		2014/08/22		
COC Number		A159202		A159202	A159202		A159202		
	Units	SS2-16 90-100	QC Batch	SS2-17 90-100	SS2-19 90-100	QC Batch	SS2-20 0-20	RDL	QC Batch
Physical Properties									
Moisture	%	5.0	7616913	5.3	5.7	7616683	3.9	0.30	7616913
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	1200	7616969	510	2100	7616969	420	10	7616969
F3 (C16-C34 Hydrocarbons)	mg/kg	520	7616969	280	720	7616969	340	50	7616969
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	7616969	<50	<50	7616969	<50	50	7616969
Reached Baseline at C50	mg/kg	Yes	7616969	Yes	Yes	7616969	Yes	N/A	7616969
Volatiles									
Benzene	mg/kg	<0.0050	7618018	<0.0050	<0.0050	7618018	<0.0050	0.0050	7618018
Toluene	mg/kg	<0.020	7618018	<0.020	<0.020	7618018	<0.020	0.020	7618018
Ethylbenzene	mg/kg	<0.010	7618018	<0.010	<0.010	7618018	<0.010	0.010	7618018
Xylenes (Total)	mg/kg	<0.040	7618018	<0.040	<0.040	7618018	<0.040	0.040	7618018
m & p-Xylene	mg/kg	<0.040	7618018	<0.040	<0.040	7618018	<0.040	0.040	7618018
o-Xylene	mg/kg	<0.020	7618018	<0.020	<0.020	7618018	<0.020	0.020	7618018
F1 (C6-C10) - BTEX	mg/kg	25	7618018	<12	60	7618018	<12	12	7618018
(C6-C10)	mg/kg	25	7618018	<12	60	7618018	<12	12	7618018
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	111	7618018	112	107	7618018	111	N/A	7618018
4-Bromofluorobenzene (sur.)	%	91	7618018	95	91	7618018	92	N/A	7618018
D10-ETHYLBENZENE (sur.)	%	116	7618018	116	107	7618018	119	N/A	7618018
D4-1,2-Dichloroethane (sur.)	%	100	7618018	104	106	7618018	98	N/A	7618018
O-TERPHENYL (sur.)	%	107	7616969	116	110	7616969	105	N/A	7616969

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KL1780		KL1782	KL1791		KL1851		
Sampling Date		2014/08/23		2014/08/23	2014/08/23		2014/08/23		
COC Number		A159203		A159203	A159203		A159186		
	Units	SS3-1 0-20	QC Batch	SS3-1 90-110	SS3-4 80-98	QC Batch	SS3-6 20-40	RDL	QC Batch
Physical Properties									
Moisture	%	4.7	7617394	8.7	7.9	7616683	5.9	0.30	7617356
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	460	7616673	<10	<10	7616969	350	10	7616673
F3 (C16-C34 Hydrocarbons)	mg/kg	9700	7616673	<50	<50	7616969	260	50	7616673
F4 (C34-C50 Hydrocarbons)	mg/kg	2300	7616673	<50	<50	7616969	<50	50	7616673
Reached Baseline at C50	mg/kg	Yes	7616673	Yes	Yes	7616969	Yes	N/A	7616673
Volatiles									
Benzene	mg/kg	<0.0050	7616627	<0.0050	<0.0050	7618018	<0.0050	0.0050	7616627
Toluene	mg/kg	<0.020	7616627	<0.020	<0.020	7618018	<0.020	0.020	7616627
Ethylbenzene	mg/kg	<0.010	7616627	<0.010	<0.010	7618018	<0.010	0.010	7616627
Xylenes (Total)	mg/kg	<0.040	7616627	<0.040	<0.040	7618018	<0.040	0.040	7616627
m & p-Xylene	mg/kg	<0.040	7616627	<0.040	<0.040	7618018	<0.040	0.040	7616627
o-Xylene	mg/kg	<0.020	7616627	<0.020	<0.020	7618018	<0.020	0.020	7616627
F1 (C6-C10) - BTEX	mg/kg	<12	7616627	<12	<12	7618018	<12	12	7616627
(C6-C10)	mg/kg	<12	7616627	<12	<12	7618018	<12	12	7616627
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	100	7616627	111	113	7618018	101	N/A	7616627
4-Bromofluorobenzene (sur.)	%	100	7616627	91	91	7618018	102	N/A	7616627
D10-ETHYLBENZENE (sur.)	%	100	7616627	110	114	7618018	100	N/A	7616627
D4-1,2-Dichloroethane (sur.)	%	108	7616627	104	109	7618018	104	N/A	7616627
O-TERPHENYL (sur.)	%	88	7616673	113	101	7616969	95	N/A	7616673

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KL1852		KL1853		KL1854		
Sampling Date		2014/08/23		2014/08/23		2014/08/23		
COC Number		A159186		A159186		A159186		
	Units	SS3-7 20-40	QC Batch	SS3-8 20-40	QC Batch	SS3-9 0-10	RDL	QC Batch
Physical Properties								
Moisture	%	15	7616683	8.1	7617394	15	0.30	7617356
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	7616969	<10	7616673	460	10	7616673
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	7616969	<50	7616673	560	50	7616673
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	7616969	<50	7616673	<50	50	7616673
Reached Baseline at C50	mg/kg	Yes	7616969	Yes	7616673	Yes	N/A	7616673
Volatiles								
Benzene	mg/kg	<0.0050	7618018	<0.0050	7616627	<0.0050	0.0050	7616627
Toluene	mg/kg	<0.020	7618018	<0.020	7616627	<0.020	0.020	7616627
Ethylbenzene	mg/kg	<0.010	7618018	<0.010	7616627	<0.010	0.010	7616627
Xylenes (Total)	mg/kg	<0.040	7618018	<0.040	7616627	<0.040	0.040	7616627
m & p-Xylene	mg/kg	<0.040	7618018	<0.040	7616627	<0.040	0.040	7616627
o-Xylene	mg/kg	<0.020	7618018	<0.020	7616627	<0.020	0.020	7616627
F1 (C6-C10) - BTEX	mg/kg	<12	7618018	<12	7616627	<12	12	7616627
(C6-C10)	mg/kg	<12	7618018	<12	7616627	<12	12	7616627
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	120	7618018	101	7616627	104	N/A	7616627
4-Bromofluorobenzene (sur.)	%	88	7618018	100	7616627	98	N/A	7616627
D10-ETHYLBENZENE (sur.)	%	116	7618018	100	7616627	104	N/A	7616627
D4-1,2-Dichloroethane (sur.)	%	106	7618018	104	7616627	103	N/A	7616627
O-TERPHENYL (sur.)	%	105	7616969	96	7616673	99	N/A	7616673

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KL1856		KL1857		KL1860	KL1897		
Sampling Date		2014/08/23		2014/08/23		2014/08/23	2014/08/21		
COC Number		A159186		A159186		A159186	A159196		
	Units	SS3-11 0-20	QC Batch	SS3-12 20-40	QC Batch	DUP 3	SS13-1 0-10	RDL	QC Batch
Physical Properties									
Moisture	%	14	7617394	9.3	7617356	11	5.0	0.30	7616913
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	330	7616673	<10	7616673	360	<10	10	7616673
F3 (C16-C34 Hydrocarbons)	mg/kg	8100	7616673	63	7616673	240	10000	50	7616673
F4 (C34-C50 Hydrocarbons)	mg/kg	1800	7616673	<50	7616673	<50	2700	50	7616673
Reached Baseline at C50	mg/kg	Yes	7616673	Yes	7616673	Yes	Yes	N/A	7616673
Volatiles									
Benzene	mg/kg	<0.0050	7616627	0.0066	7616627	<0.0050	<0.0050	0.0050	7616627
Toluene	mg/kg	<0.020	7616627	<0.020	7616627	<0.020	<0.020	0.020	7616627
Ethylbenzene	mg/kg	<0.010	7616627	0.016	7616627	<0.010	<0.010	0.010	7616627
Xylenes (Total)	mg/kg	<0.040	7616627	<0.040	7616627	<0.040	<0.040	0.040	7616627
m & p-Xylene	mg/kg	<0.040	7616627	<0.040	7616627	<0.040	<0.040	0.040	7616627
o-Xylene	mg/kg	<0.020	7616627	<0.020	7616627	<0.020	<0.020	0.020	7616627
F1 (C6-C10) - BTEX	mg/kg	<12	7616627	<12	7616627	<12	<12	12	7616627
(C6-C10)	mg/kg	<12	7616627	<12	7616627	<12	<12	12	7616627
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	106	7616627	101	7616627	103	101	N/A	7616627
4-Bromofluorobenzene (sur.)	%	98	7616627	97	7616627	99	99	N/A	7616627
D10-ETHYLBENZENE (sur.)	%	101	7616627	100	7616627	105	100	N/A	7616627
D4-1,2-Dichloroethane (sur.)	%	106	7616627	102	7616627	106	107	N/A	7616627
O-TERPHENYL (sur.)	%	86	7616673	96	7616673	100	89	N/A	7616673

RDL = Reportable Detection Limit
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Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KL1898		KL1902	KL1906	KL1907	KL1908		
Sampling Date		2014/08/21		2014/08/21	2014/08/21	2014/08/21	2014/08/21		
COC Number		A159196		A159196	A159196	A159196	A159196		
	Units	SS13-2 0-10	QC Batch	SS13-6 0-20	SS13-10 0-20	SS13-11 0-15	SS13-11 30-50	RDL	QC Batch
Physical Properties									
Moisture	%	5.1	7616913	6.3	8.3	N/A	N/A	0.30	7617356
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	430	7616673	180	<10	<10	170	10	7616673
F3 (C16-C34 Hydrocarbons)	mg/kg	9800	7616673	500	<50	28000	8800	50	7616673
F4 (C34-C50 Hydrocarbons)	mg/kg	2000	7616673	<50	<50	10000	2700	50	7616673
Reached Baseline at C50	mg/kg	Yes	7616673	Yes	Yes	Yes	Yes	N/A	7616673
Volatiles									
Benzene	mg/kg	<0.0050	7616627	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	7616627
Toluene	mg/kg	<0.020	7616627	<0.020	<0.020	<0.020	<0.020	0.020	7616627
Ethylbenzene	mg/kg	<0.010	7616627	<0.010	<0.010	<0.010	<0.010	0.010	7616627
Xylenes (Total)	mg/kg	<0.040	7616627	<0.040	<0.040	<0.040	<0.040	0.040	7616627
m & p-Xylene	mg/kg	<0.040	7616627	<0.040	<0.040	<0.040	<0.040	0.040	7616627
o-Xylene	mg/kg	<0.020	7616627	<0.020	<0.020	<0.020	<0.020	0.020	7616627
F1 (C6-C10) - BTEX	mg/kg	<12	7616627	<12	<12	<12	<12	12	7616627
(C6-C10)	mg/kg	<12	7616627	<12	<12	<12	<12	12	7616627
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	102	7616627	101	102	104	99	N/A	7616627
4-Bromofluorobenzene (sur.)	%	94	7616627	101	96	99	97	N/A	7616627
D10-ETHYLBENZENE (sur.)	%	95	7616627	98	105	93	99	N/A	7616627
D4-1,2-Dichloroethane (sur.)	%	106	7616627	106	107	106	103	N/A	7616627
O-TERPHENYL (sur.)	%	89	7616673	94	107	89	91	N/A	7616673

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Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KL1947		KL1948		KL1951		
Sampling Date		2014/08/21		2014/08/21		2014/08/21		
COC Number		A159197		A159197		A159197		
	Units	SS13-15 0-20	QC Batch	SS13-16 0-20	QC Batch	SS13-19 0-20	RDL	QC Batch
Physical Properties								
Moisture	%	N/A	7617356	9.0	7616913	13	0.30	7617356
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	7616673	<10	7616673	<10	10	7616983
F3 (C16-C34 Hydrocarbons)	mg/kg	59	7616673	57	7616673	71	50	7616983
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	7616673	<50	7616673	<50	50	7616983
Reached Baseline at C50	mg/kg	Yes	7616673	Yes	7616673	Yes	N/A	7616983
Volatiles								
Benzene	mg/kg	<0.0050	7616627	<0.0050	7616627	<0.0050	0.0050	7618934
Toluene	mg/kg	<0.020	7616627	<0.020	7616627	<0.020	0.020	7618934
Ethylbenzene	mg/kg	<0.010	7616627	<0.010	7616627	<0.010	0.010	7618934
Xylenes (Total)	mg/kg	<0.040	7616627	<0.040	7616627	<0.040	0.040	7618934
m & p-Xylene	mg/kg	<0.040	7616627	<0.040	7616627	<0.040	0.040	7618934
o-Xylene	mg/kg	<0.020	7616627	<0.020	7616627	<0.020	0.020	7618934
F1 (C6-C10) - BTEX	mg/kg	<12	7616627	<12	7616627	<12	12	7618934
(C6-C10)	mg/kg	<12	7616627	<12	7616627	<12	12	7618934
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	103	7616627	101	7616627	104	N/A	7618934
4-Bromofluorobenzene (sur.)	%	97	7616627	95	7616627	99	N/A	7618934
D10-ETHYLBENZENE (sur.)	%	100	7616627	95	7616627	110	N/A	7618934
D4-1,2-Dichloroethane (sur.)	%	104	7616627	105	7616627	108	N/A	7618934
O-TERPHENYL (sur.)	%	104	7616673	105	7616673	96	N/A	7616983

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Maxxam Job #: B474838
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TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KL1953	KL1955		KL1957		KL1960		
Sampling Date		2014/08/21	2014/08/21		2014/08/24		2014/08/24		
COC Number		A159197	A159197		A159180		A159180		
	Units	SS13-21 0-10	DUP 2	QC Batch	RCC-1 0-10	QC Batch	RCC-2 0-20	RDL	QC Batch
Physical Properties									
Moisture	%	4.8	8.4	7617394	N/A	7617394	N/A	0.30	7617394
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	590	340	7616673	320	7616983	<10	10	7616983
F3 (C16-C34 Hydrocarbons)	mg/kg	29000	27000	7616673	21000	7616983	<50	50	7616983
F4 (C34-C50 Hydrocarbons)	mg/kg	8100	9400	7616673	5100	7616983	<50	50	7616983
Reached Baseline at C50	mg/kg	Yes	Yes	7616673	Yes	7616983	Yes	N/A	7616983
Volatiles									
Benzene	mg/kg	<0.0050	<0.0050	7616627	<0.0050	7618931	<0.0050	0.0050	7618934
Toluene	mg/kg	<0.020	<0.020	7616627	<0.020	7618931	<0.020	0.020	7618934
Ethylbenzene	mg/kg	<0.010	<0.010	7616627	<0.010	7618931	<0.010	0.010	7618934
Xylenes (Total)	mg/kg	<0.040	<0.040	7616627	<0.040	7618931	<0.040	0.040	7618934
m & p-Xylene	mg/kg	<0.040	<0.040	7616627	<0.040	7618931	<0.040	0.040	7618934
o-Xylene	mg/kg	<0.020	<0.020	7616627	<0.020	7618931	<0.020	0.020	7618934
F1 (C6-C10) - BTEX	mg/kg	<12	<12	7616627	<12	7618931	<12	12	7618934
(C6-C10)	mg/kg	<12	<12	7616627	<12	7618931	<12	12	7618934
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	101	103	7616627	104	7618931	102	N/A	7618934
4-Bromofluorobenzene (sur.)	%	97	97	7616627	96	7618931	99	N/A	7618934
D10-ETHYLBENZENE (sur.)	%	96	98	7616627	81	7618931	110	N/A	7618934
D4-1,2-Dichloroethane (sur.)	%	106	109	7616627	96	7618931	106	N/A	7618934
O-TERPHENYL (sur.)	%	81	97	7616673	89	7616983	100	N/A	7616983

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KL1961		KL1963		KL2221		
Sampling Date		2014/08/24		2014/08/22		2014/08/22		
COC Number		A159180		A159180		A159201		
	Units	RCC-2 90-100	QC Batch	14MW01 50-70	QC Batch	SS2-1 90-102	RDL	QC Batch
Physical Properties								
Moisture	%	2.9	7617356	16	7616913	8.0	0.30	7616683
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	7616983	<10	7616673	<10	10	7616969
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	7616983	<50	7616673	<50	50	7616969
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	7616983	<50	7616673	<50	50	7616969
Reached Baseline at C50	mg/kg	Yes	7616983	Yes	7616673	Yes	N/A	7616969
Volatiles								
Benzene	mg/kg	<0.0050	7618934	<0.0050	7616627	<0.0050	0.0050	7618018
Toluene	mg/kg	<0.020	7618934	<0.020	7616627	<0.020	0.020	7618018
Ethylbenzene	mg/kg	<0.010	7618934	<0.010	7616627	<0.010	0.010	7618018
Xylenes (Total)	mg/kg	<0.040	7618934	<0.040	7616627	<0.040	0.040	7618018
m & p-Xylene	mg/kg	<0.040	7618934	<0.040	7616627	<0.040	0.040	7618018
o-Xylene	mg/kg	<0.020	7618934	<0.020	7616627	<0.020	0.020	7618018
F1 (C6-C10) - BTEX	mg/kg	<12	7618934	<12	7616627	<12	12	7618018
(C6-C10)	mg/kg	<12	7618934	<12	7616627	<12	12	7618018
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	100	7618934	107	7616627	108	N/A	7618018
4-Bromofluorobenzene (sur.)	%	100	7618934	97	7616627	85	N/A	7618018
D10-ETHYLBENZENE (sur.)	%	115	7618934	99	7616627	108	N/A	7618018
D4-1,2-Dichloroethane (sur.)	%	105	7618934	106	7616627	104	N/A	7618018
O-TERPHENYL (sur.)	%	96	7616983	97	7616673	92	N/A	7616969

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KL2223	KL2228		
Sampling Date		2014/08/22	2014/08/22		
COC Number		A159201	A159201		
	Units	SS2-2 50-70	SS2-4 90-110	RDL	QC Batch
Physical Properties					
Moisture	%	6.1	6.0	0.30	7616970
Ext. Pet. Hydrocarbon					
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	10	7616972
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	<50	50	7616972
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	50	7616972
Reached Baseline at C50	mg/kg	Yes	Yes	N/A	7616972
Volatiles					
Benzene	mg/kg	<0.0050	0.0064	0.0050	7618039
Toluene	mg/kg	<0.020	<0.020	0.020	7618039
Ethylbenzene	mg/kg	<0.010	<0.010	0.010	7618039
Xylenes (Total)	mg/kg	<0.040	<0.040	0.040	7618039
m & p-Xylene	mg/kg	<0.040	<0.040	0.040	7618039
o-Xylene	mg/kg	<0.020	<0.020	0.020	7618039
F1 (C6-C10) - BTEX	mg/kg	<12	<12	12	7618039
(C6-C10)	mg/kg	<12	<12	12	7618039
Surrogate Recovery (%)					
1,4-Difluorobenzene (sur.)	%	115	115	N/A	7618039
4-Bromofluorobenzene (sur.)	%	84	84	N/A	7618039
D10-ETHYLBENZENE (sur.)	%	120	116	N/A	7618039
D4-1,2-Dichloroethane (sur.)	%	113	109	N/A	7618039
O-TERPHENYL (sur.)	%	104	112	N/A	7616972

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Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		KL1986			KL1987	KL1988	KL1990		
Sampling Date		2014/08/20 20:30			2014/08/24 18:50	2014/08/24 19:00	2014/08/24 18:10		
COC Number		A159181			A159181	A159181	A159181		
	Units	SEEP 1	RDL	QC Batch	SEEP 2	SEEP 3	SW 8-1	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	4.1	N/A	7615594	1.2	2.0	0.59	N/A	7615594
Cation Sum	meq/L	4.4	N/A	7615594	1.3	2.1	0.76	N/A	7615594
Hardness (CaCO3)	mg/L	200	0.50	7615198	52	88	33	0.50	7615198
Ion Balance	N/A	1.1	0.010	7615593	1.1	1.1	1.3	0.010	7615593
Dissolved Nitrate (NO3)	mg/L	50	0.089	7615595	8.8	24	0.35	0.044	7615803
Nitrate plus Nitrite (N)	mg/L	11	0.020	7615596	2.0	5.3	0.080	0.010	7615804
Dissolved Nitrite (NO2)	mg/L	<0.033	0.033	7615595	<0.033	0.043	<0.033	0.033	7615803
Total Dissolved Solids	mg/L	250	10	7614774	66	120	33	10	7614774
Misc. Inorganics									
Conductivity	uS/cm	410	1.0	7616645	120	200	66	1.0	7616645
pH	pH	7.86	N/A	7616642	7.67	7.40	7.45	N/A	7616642
Low Level Elements									
Dissolved Cadmium (Cd)	ug/L	0.021	0.020	7614764	<0.020	<0.020	0.051	0.020	7614764
Anions									
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	7616644	<0.50	<0.50	<0.50	0.50	7616644
Alkalinity (Total as CaCO3)	mg/L	110	0.50	7616644	42	49	29	0.50	7616644
Bicarbonate (HCO3)	mg/L	130	0.50	7616644	52	59	36	0.50	7616644
Carbonate (CO3)	mg/L	<0.50	0.50	7616644	<0.50	<0.50	<0.50	0.50	7616644
Hydroxide (OH)	mg/L	<0.50	0.50	7616644	<0.50	<0.50	<0.50	0.50	7616644
Dissolved Sulphate (SO4)	mg/L	52	1.0	7618388	7.3	25	<1.0	1.0	7618388
Dissolved Chloride (Cl)	mg/L	2.4	1.0	7618378	1.1	4.6	<1.0	1.0	7618378
Nutrients									
Dissolved Nitrite (N)	mg/L	<0.010	0.010	7617296	<0.010	0.013	<0.010	0.010	7617296
Dissolved Nitrate (N)	mg/L	11 (1)	0.020	7617296	2.0	5.3	0.080	0.010	7617296
Elements									
Dissolved Aluminum (Al)	mg/L	0.0084	0.0030	7621619	0.066	0.059	0.036	0.0030	7621619
Dissolved Antimony (Sb)	mg/L	<0.00060	0.00060	7621619	<0.00060	<0.00060	<0.00060	0.00060	7621619
Dissolved Arsenic (As)	mg/L	0.00083	0.00020	7621619	0.00045	0.00028	0.0040	0.00020	7621619
Dissolved Barium (Ba)	mg/L	0.037	0.010	7621644	0.012	0.022	<0.010	0.010	7621644
Dissolved Beryllium (Be)	mg/L	<0.0010	0.0010	7621619	<0.0010	<0.0010	<0.0010	0.0010	7621619
Dissolved Boron (B)	mg/L	0.046	0.020	7621644	0.041 (2)	0.070 (2)	<0.020	0.020	7621644

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.
(2) Dissolved greater than total. Results are within limits of uncertainty(MU).

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		KL1986			KL1987	KL1988	KL1990		
Sampling Date		2014/08/20 20:30			2014/08/24 18:50	2014/08/24 19:00	2014/08/24 18:10		
COC Number		A159181			A159181	A159181	A159181		
	Units	SEEP 1	RDL	QC Batch	SEEP 2	SEEP 3	SW 8-1	RDL	QC Batch
Dissolved Calcium (Ca)	mg/L	47 (1)	0.30	7621644	11	17	8.6 (1)	0.30	7621644
Dissolved Chromium (Cr)	mg/L	<0.0010	0.0010	7621619	<0.0010	<0.0010	<0.0010	0.0010	7621619
Dissolved Cobalt (Co)	mg/L	<0.00030	0.00030	7621619	<0.00030	0.00049	0.0017	0.00030	7621619
Dissolved Copper (Cu)	mg/L	0.0073	0.00020	7621619	0.0038	0.0038	0.012	0.00020	7621619
Dissolved Iron (Fe)	mg/L	<0.060	0.060	7621644	0.13	0.11	0.39	0.060	7621644
Dissolved Lead (Pb)	mg/L	<0.00020	0.00020	7621619	<0.00020	<0.00020	0.00024	0.00020	7621619
Dissolved Lithium (Li)	mg/L	<0.020	0.020	7621644	<0.020	<0.020	<0.020	0.020	7621644
Dissolved Magnesium (Mg)	mg/L	19	0.20	7621644	5.9 (1)	11	2.7	0.20	7621644
Dissolved Manganese (Mn)	mg/L	0.017	0.0040	7621644	0.025	0.058 (1)	0.40	0.0040	7621644
Dissolved Molybdenum (Mo)	mg/L	0.0057	0.00020	7621619	0.0043	0.0050	0.00058	0.00020	7621619
Dissolved Nickel (Ni)	mg/L	0.0033	0.00050	7621619	0.0027	0.0039 (1)	0.0079	0.00050	7621619
Dissolved Phosphorus (P)	mg/L	<0.10	0.10	7621644	<0.10	<0.10	<0.10	0.10	7621644
Dissolved Potassium (K)	mg/L	5.5	0.30	7621644	1.7	2.0	1.5	0.30	7621644
Dissolved Selenium (Se)	mg/L	0.00026	0.00020	7621619	0.00023	0.00027 (2)	<0.00020	0.00020	7621619
Dissolved Silicon (Si)	mg/L	3.9	0.10	7621644	4.1	5.1 (1)	2.4	0.10	7621644
Dissolved Silver (Ag)	mg/L	<0.00010	0.00010	7621619	<0.00010	<0.00010	<0.00010	0.00010	7621619
Dissolved Sodium (Na)	mg/L	7.1	0.50	7621644	4.3 (1)	7.4	1.0 (2)	0.50	7621644
Dissolved Strontium (Sr)	mg/L	0.19	0.020	7621644	0.057	0.090	0.037	0.020	7621644
Dissolved Sulphur (S)	mg/L	17	0.20	7621644	2.5 (1)	7.8 (1)	0.58	0.20	7621644
Dissolved Thallium (Tl)	mg/L	<0.00020	0.00020	7621619	<0.00020	<0.00020	<0.00020	0.00020	7621619
Dissolved Tin (Sn)	mg/L	<0.0010	0.0010	7621619	<0.0010	<0.0010	<0.0010	0.0010	7621619
Dissolved Titanium (Ti)	mg/L	<0.0010	0.0010	7621619	0.0015	0.0022 (2)	<0.0010	0.0010	7621619
Dissolved Uranium (U)	mg/L	0.063	0.00010	7621619	0.089	0.032	0.00059	0.00010	7621619
Dissolved Vanadium (V)	mg/L	<0.0010	0.0010	7621619	<0.0010	<0.0010	<0.0010	0.0010	7621619
Dissolved Zinc (Zn)	mg/L	0.0044	0.0030	7621619	0.0092	<0.0030	0.0067	0.0030	7621619

RDL = Reportable Detection Limit
(1) Dissolved greater than total. Results within acceptable limits of precision.
(2) Dissolved greater than total. Results are within limits of uncertainty(MU).

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		KL1991		
Sampling Date		2014/08/24 18:20		
COC Number		A159181		
	Units	SW 7-1	RDL	QC Batch
Calculated Parameters				
Anion Sum	meq/L	1.4	N/A	7615594
Cation Sum	meq/L	1.5	N/A	7615594
Hardness (CaCO3)	mg/L	61	0.50	7615198
Ion Balance	N/A	1.1	0.010	7615593
Dissolved Nitrate (NO3)	mg/L	0.051	0.044	7615803
Nitrate plus Nitrite (N)	mg/L	0.011	0.010	7615804
Dissolved Nitrite (NO2)	mg/L	<0.033	0.033	7615803
Total Dissolved Solids	mg/L	72	10	7614774
Misc. Inorganics				
Conductivity	uS/cm	130	1.0	7616645
pH	pH	7.89	N/A	7616642
Low Level Elements				
Dissolved Cadmium (Cd)	ug/L	<0.020	0.020	7614764
Anions				
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	7616644
Alkalinity (Total as CaCO3)	mg/L	63	0.50	7616644
Bicarbonate (HCO3)	mg/L	77	0.50	7616644
Carbonate (CO3)	mg/L	<0.50	0.50	7616644
Hydroxide (OH)	mg/L	<0.50	0.50	7616644
Dissolved Sulphate (SO4)	mg/L	3.7	1.0	7618388
Dissolved Chloride (Cl)	mg/L	1.3	1.0	7618378
Nutrients				
Dissolved Nitrite (N)	mg/L	<0.010	0.010	7617296
Dissolved Nitrate (N)	mg/L	0.011	0.010	7617296
Elements				
Dissolved Aluminum (Al)	mg/L	0.010	0.0030	7621619
Dissolved Antimony (Sb)	mg/L	<0.00060	0.00060	7621619
Dissolved Arsenic (As)	mg/L	0.00056	0.00020	7621619
Dissolved Barium (Ba)	mg/L	<0.010	0.010	7621644
Dissolved Beryllium (Be)	mg/L	<0.0010	0.0010	7621619
Dissolved Boron (B)	mg/L	<0.020	0.020	7621644
Dissolved Calcium (Ca)	mg/L	16	0.30	7621644
Dissolved Chromium (Cr)	mg/L	<0.0010	0.0010	7621619

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		KL1991		
Sampling Date		2014/08/24 18:20		
COC Number		A159181		
	Units	SW 7-1	RDL	QC Batch
Dissolved Cobalt (Co)	mg/L	<0.00030	0.00030	7621619
Dissolved Copper (Cu)	mg/L	0.0039	0.00020	7621619
Dissolved Iron (Fe)	mg/L	<0.060	0.060	7621644
Dissolved Lead (Pb)	mg/L	<0.00020	0.00020	7621619
Dissolved Lithium (Li)	mg/L	<0.020	0.020	7621644
Dissolved Magnesium (Mg)	mg/L	4.9 (1)	0.20	7621644
Dissolved Manganese (Mn)	mg/L	<0.0040	0.0040	7621644
Dissolved Molybdenum (Mo)	mg/L	0.0043	0.00020	7621619
Dissolved Nickel (Ni)	mg/L	0.0018	0.00050	7621619
Dissolved Phosphorus (P)	mg/L	<0.10	0.10	7621644
Dissolved Potassium (K)	mg/L	4.0 (1)	0.30	7621644
Dissolved Selenium (Se)	mg/L	<0.00020	0.00020	7621619
Dissolved Silicon (Si)	mg/L	2.2	0.10	7621644
Dissolved Silver (Ag)	mg/L	<0.00010	0.00010	7621619
Dissolved Sodium (Na)	mg/L	3.8 (1)	0.50	7621644
Dissolved Strontium (Sr)	mg/L	0.045	0.020	7621644
Dissolved Sulphur (S)	mg/L	0.94 (2)	0.20	7621644
Dissolved Thallium (Tl)	mg/L	<0.00020	0.00020	7621619
Dissolved Tin (Sn)	mg/L	<0.0010	0.0010	7621619
Dissolved Titanium (Ti)	mg/L	<0.0010	0.0010	7621619
Dissolved Uranium (U)	mg/L	0.036	0.00010	7621619
Dissolved Vanadium (V)	mg/L	<0.0010	0.0010	7621619
Dissolved Zinc (Zn)	mg/L	0.0032	0.0030	7621619

RDL = Reportable Detection Limit

(1) Dissolved greater than total. Results within acceptable limits of precision.

(2) Dissolved greater than total. Results are within limits of uncertainty(MU).

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Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

REGULATED METALS (CCME/AT1) - SOILS

Maxxam ID		KL1518		KL1638		KL1907	KL1908		
Sampling Date		2014/08/24		2014/08/24		2014/08/21	2014/08/21		
COC Number		A159198		A159201		A159196	A159196		
	Units	SS1C-2 0-20	QC Batch	SS2-8 0-10	QC Batch	SS13-11 0-15	SS13-11 30-50	RDL	QC Batch
Elements									
Soluble (Hot water) Boron (B)	mg/kg	0.38	7622202	0.18	7621554	0.39	0.12	0.10	7623776
Hex. Chromium (Cr 6+)	mg/kg	<0.15	7620738	<0.15	7620738	<0.15	<0.15	0.15	7620738
Total Antimony (Sb)	mg/kg	<1.0	7622543	<1.0	7621533	<1.0	<1.0	1.0	7623749
Total Arsenic (As)	mg/kg	<1.0	7622543	<1.0	7621533	4.1	3.8	1.0	7623749
Total Barium (Ba)	mg/kg	47	7622543	43	7621533	18	21	10	7623749
Total Beryllium (Be)	mg/kg	<0.40	7622543	<0.40	7621533	<0.40	<0.40	0.40	7623749
Total Cadmium (Cd)	mg/kg	<0.10	7622543	<0.10	7621533	0.72	<0.10	0.10	7623749
Total Chromium (Cr)	mg/kg	48	7622543	110	7621533	13	14	1.0	7623749
Total Cobalt (Co)	mg/kg	7.8	7622543	6.4	7621533	3.0	4.1	1.0	7623749
Total Copper (Cu)	mg/kg	6.6	7622543	13	7621533	7.7	6.2	5.0	7623749
Total Lead (Pb)	mg/kg	3.0	7622543	3.8	7621533	2.0	1.9	1.0	7623749
Total Mercury (Hg)	mg/kg	<0.050	7622543	<0.050	7621533	<0.050	<0.050	0.050	7623749
Total Molybdenum (Mo)	mg/kg	2.3	7622543	3.5	7621533	<0.40	<0.40	0.40	7623749
Total Nickel (Ni)	mg/kg	63	7622543	94	7621533	8.8	9.6	1.0	7623749
Total Selenium (Se)	mg/kg	<0.50	7622543	<0.50	7621533	<0.50	<0.50	0.50	7623749
Total Silver (Ag)	mg/kg	<1.0	7622543	<1.0	7621533	<1.0	<1.0	1.0	7623749
Total Thallium (Tl)	mg/kg	<0.30	7622543	<0.30	7621533	<0.30	<0.30	0.30	7623749
Total Tin (Sn)	mg/kg	<1.0	7622543	1.2	7621533	<1.0	<1.0	1.0	7623749
Total Uranium (U)	mg/kg	4.3	7622543	5.4	7621533	<1.0	<1.0	1.0	7623749
Total Vanadium (V)	mg/kg	17	7622543	11	7621533	14	16	1.0	7623749
Total Zinc (Zn)	mg/kg	27	7622543	210	7621533	490	20	10	7623749

RDL = Reportable Detection Limit

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

REGULATED METALS (CCME/AT1) - SOILS

Maxxam ID		KL1947		KL1957		KL1960		
Sampling Date		2014/08/21		2014/08/24		2014/08/24		
COC Number		A159197		A159180		A159180		
	Units	SS13-15 0-20	QC Batch	RCC-1 0-10	QC Batch	RCC-2 0-20	RDL	QC Batch
Elements								
Soluble (Hot water) Boron (B)	mg/kg	<0.10	7621554	0.25	7623776	<0.10	0.10	7621091
Hex. Chromium (Cr 6+)	mg/kg	<0.15	7620738	<0.15	7620738	<0.15	0.15	7620738
Total Antimony (Sb)	mg/kg	<1.0	7621533	2.3	7623749	<1.0	1.0	7621054
Total Arsenic (As)	mg/kg	2.9	7621533	4.4	7623749	2.8	1.0	7621054
Total Barium (Ba)	mg/kg	13	7621533	28	7623749	15	10	7621054
Total Beryllium (Be)	mg/kg	<0.40	7621533	<0.40	7623749	<0.40	0.40	7621054
Total Cadmium (Cd)	mg/kg	<0.10	7621533	<0.10	7623749	<0.10	0.10	7621054
Total Chromium (Cr)	mg/kg	12	7621533	22	7623749	15	1.0	7621054
Total Cobalt (Co)	mg/kg	1.8	7621533	4.2	7623749	3.5	1.0	7621054
Total Copper (Cu)	mg/kg	<5.0	7621533	26	7623749	5.2	5.0	7621054
Total Lead (Pb)	mg/kg	1.8	7621533	6.6	7623749	2.1	1.0	7621054
Total Mercury (Hg)	mg/kg	<0.050	7621533	<0.050	7623749	<0.050	0.050	7621054
Total Molybdenum (Mo)	mg/kg	<0.40	7621533	2.1	7623749	<0.40	0.40	7621054
Total Nickel (Ni)	mg/kg	5.5	7621533	24	7623749	8.6	1.0	7621054
Total Selenium (Se)	mg/kg	<0.50	7621533	<0.50	7623749	<0.50	0.50	7621054
Total Silver (Ag)	mg/kg	<1.0	7621533	<1.0	7623749	<1.0	1.0	7621054
Total Thallium (Tl)	mg/kg	<0.30	7621533	<0.30	7623749	<0.30	0.30	7621054
Total Tin (Sn)	mg/kg	<1.0	7621533	3.1	7623749	<1.0	1.0	7621054
Total Uranium (U)	mg/kg	<1.0	7621533	<1.0	7623749	<1.0	1.0	7621054
Total Vanadium (V)	mg/kg	14	7621533	15	7623749	22	1.0	7621054
Total Zinc (Zn)	mg/kg	13	7621533	190	7623749	17	10	7621054
RDL = Reportable Detection Limit								

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Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		KL1986	KL1987	KL1988	KL1990	KL1991		
Sampling Date		2014/08/20 20:30	2014/08/24 18:50	2014/08/24 19:00	2014/08/24 18:10	2014/08/24 18:20		
COC Number		A159181	A159181	A159181	A159181	A159181		
	Units	SEEP 1	SEEP 2	SEEP 3	SW 8-1	SW 7-1	RDL	QC Batch
Low Level Elements								
Total Cadmium (Cd)	ug/L	<0.020	<0.020	<0.020	0.055	<0.020	0.020	7614765
Elements								
Total Aluminum (Al)	mg/L	1.3	0.19	0.091	0.11	0.032	0.0030	7621571
Total Antimony (Sb)	mg/L	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00060	7621571
Total Arsenic (As)	mg/L	0.0010	0.00057	0.00039	0.0047	0.00057	0.00020	7621571
Total Barium (Ba)	mg/L	0.052	0.017	0.027	<0.010	0.013	0.010	7621574
Total Beryllium (Be)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7621571
Total Boron (B)	mg/L	0.048	0.039	0.069	<0.020	<0.020	0.020	7621574
Total Calcium (Ca)	mg/L	46	11	17	8.4	16	0.30	7621574
Total Chromium (Cr)	mg/L	0.0027	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7621571
Total Cobalt (Co)	mg/L	0.0012	<0.00030	0.00057	0.0020	<0.00030	0.00030	7621571
Total Copper (Cu)	mg/L	0.012	0.0045	0.0039	0.014	0.0043	0.00020	7621571
Total Iron (Fe)	mg/L	1.9	0.28	0.14	0.79	<0.060	0.060	7621574
Total Lead (Pb)	mg/L	0.00072	0.00020	<0.00020	0.00055	<0.00020	0.00020	7621571
Total Lithium (Li)	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	7621574
Total Magnesium (Mg)	mg/L	20	5.8	11	2.8	4.8	0.20	7621574
Total Manganese (Mn)	mg/L	0.061	0.028	0.057	0.41	0.0079	0.0040	7621574
Total Molybdenum (Mo)	mg/L	0.0061	0.0046	0.0051	0.00060	0.0044	0.00020	7621571
Total Nickel (Ni)	mg/L	0.0072	0.0030	0.0036	0.0088	0.0021	0.00050	7621571
Total Phosphorus (P)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7621574
Total Potassium (K)	mg/L	5.8	1.7	2.0	1.5	3.9	0.30	7621574
Total Selenium (Se)	mg/L	0.00038	0.00027	0.00026	<0.00020	<0.00020	0.00020	7621571
Total Silicon (Si)	mg/L	6.2	4.3	5.0	2.6	2.2	0.10	7621574
Total Silver (Ag)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	7621571
Total Sodium (Na)	mg/L	7.1	4.2	7.4	0.95	3.7	0.50	7621574
Total Strontium (Sr)	mg/L	0.20	0.057	0.090	0.038	0.045	0.020	7621574
Total Sulphur (S)	mg/L	17	2.3	7.5	0.60	0.90	0.20	7621574
Total Thallium (Tl)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	7621571
Total Tin (Sn)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7621571
Total Titanium (Ti)	mg/L	0.054	0.0037	0.0011	0.0059	<0.0010	0.0010	7621571
Total Uranium (U)	mg/L	0.069	0.093	0.034	0.00068	0.038	0.00010	7621571
Total Vanadium (V)	mg/L	0.0039	0.0012	<0.0010	<0.0010	<0.0010	0.0010	7621571
Total Zinc (Zn)	mg/L	0.012	0.012	<0.0030	0.0098	0.0053	0.0030	7621571
RDL = Reportable Detection Limit								

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

RESULTS OF CHEMICAL ANALYSES OF SOIL

Maxxam ID		KL1388		KL1423		KL1638	KL1850		
Sampling Date		2014/08/20		2014/08/20		2014/08/24	2014/08/23		
COC Number		A159194		A158068		A159201	A159186		
	Units	SS1B-4 0-10	QC Batch	SS1D-4 20-40	QC Batch	SS2-8 0-10	SS3-5 25-38	RDL	QC Batch
Physical Properties									
Moisture	%	4.1	7621694	5.9	7623070	7.1	14	0.30	7616683
Sieve - Pan	%	5.1	7622058	9.0	7619702	N/A	N/A	0.20	N/A
Sieve - #200 (>0.075mm)	%	95	7622058	91	7619702	N/A	N/A	0.20	N/A
Grain Size	%	COARSE	7622058	COARSE	7619702	N/A	N/A	0.20	N/A

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam ID		KL1855		KL1907		KL1908	KL1947	KL1953		
Sampling Date		2014/08/23		2014/08/21		2014/08/21	2014/08/21	2014/08/21		
COC Number		A159186		A159196		A159196	A159197	A159197		
	Units	SS3-10 0-10	QC Batch	SS13-11 0-15	QC Batch	SS13-11 30-50	SS13-15 0-20	SS13-21 0-10	RDL	QC Batch
Physical Properties										
Moisture	%	12	7617356	7.8	7617394	2.1	11	N/A	0.30	7617356
Sieve - Pan	%	N/A	N/A	N/A	N/A	N/A	N/A	17	0.20	7619702
Sieve - #200 (>0.075mm)	%	N/A	N/A	N/A	N/A	N/A	N/A	83	0.20	7619702
Grain Size	%	N/A	N/A	N/A	N/A	N/A	N/A	COARSE	0.20	7619702

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam ID		KL1957		KL1960	KL1963		
Sampling Date		2014/08/24		2014/08/24	2014/08/22		
COC Number		A159180		A159180	A159180		
	Units	RCC-1 0-10	QC Batch	RCC-2 0-20	14MW01 50-70	RDL	QC Batch
Physical Properties							
Moisture	%	3.1	7616913	8.1	N/A	0.30	7617394
Sieve - Pan	%	N/A	N/A	N/A	12	0.20	7619702
Sieve - #200 (>0.075mm)	%	N/A	N/A	N/A	88	0.20	7619702
Grain Size	%	N/A	N/A	N/A	COARSE	0.20	7619702

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

GLYCOLS BY GC-FID (SOIL)

Maxxam ID		KL1639		
Sampling Date		2014/08/24		
COC Number		A159201		
	Units	**SS2-9 0-10**	**RDL**	**QC Batch**
Glycols				
Extractable (Water) Ethylene Glycol	mg/kg	<10	10	7620217
Extractable (Water) Diethylene Glycol	mg/kg	<10	10	7620217
Extractable (Water) Triethylene Glycol	mg/kg	<10	10	7620217
Extractable (Water) Tetraethylene Glycol	mg/kg	<10	10	7620217
Extractable (Water) Propylene Glycol	mg/kg	<10	10	7620217
Surrogate Recovery (%)				
Extractable (Water) Methyl Sulfone (sur.)	%	85	N/A	7620217

RDL = Reportable Detection Limit
N/A = Not Applicable

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TETRA TECH EBA INC.
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SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		KL1640		KL1644		
Sampling Date		2014/08/24		2014/08/24		
COC Number		A159201		A159201		
	Units	SS2-10 0-10	RDL	SS2-14 0-10	RDL	QC Batch
Polycyclic Aromatics						
Acenaphthene	mg/kg	0.20	0.050	0.10	0.050	7620934
Benzo[a]pyrene equivalency	mg/kg	<0.10	0.10	<0.10	0.10	7615697
Acenaphthylene	mg/kg	0.15	0.050	<0.050	0.050	7620934
Acridine	mg/kg	0.66 (1)	0.63	<0.31 (1)	0.31	7620934
Anthracene	mg/kg	<0.63 (1)	0.63	<0.33 (1)	0.33	7620934
Benzo(a)anthracene	mg/kg	<0.050	0.050	<0.050	0.050	7620934
Benzo(b&j)fluoranthene	mg/kg	0.15	0.050	<0.050	0.050	7620934
Benzo(k)fluoranthene	mg/kg	0.26	0.050	<0.050	0.050	7620934
Benzo(g,h,i)perylene	mg/kg	<0.050	0.050	<0.050	0.050	7620934
Benzo(c)phenanthrene	mg/kg	<0.050	0.050	<0.050	0.050	7620934
Benzo(a)pyrene	mg/kg	<0.050	0.050	<0.050	0.050	7620934
Benzo[e]pyrene	mg/kg	<0.050	0.050	<0.050	0.050	7620934
Chrysene	mg/kg	<0.050	0.050	<0.050	0.050	7620934
Dibenz(a,h)anthracene	mg/kg	<0.050	0.050	<0.050	0.050	7620934
Fluoranthene	mg/kg	0.21	0.050	0.11	0.050	7620934
Fluorene	mg/kg	0.88	0.050	0.059	0.050	7620934
Indeno(1,2,3-cd)pyrene	mg/kg	<0.050	0.050	<0.050	0.050	7620934
2-Methylnaphthalene	mg/kg	0.052	0.050	<0.050	0.050	7620934
Naphthalene	mg/kg	<0.050	0.050	<0.050	0.050	7620934
Phenanthrene	mg/kg	3.7	0.050	0.11	0.050	7620934
Perylene	mg/kg	<0.050	0.050	<0.050	0.050	7620934
Pyrene	mg/kg	0.66	0.050	0.78	0.050	7620934
Quinoline	mg/kg	NC (2)	0.10	NC (2)	0.10	7620934
Surrogate Recovery (%)						
D10-ANTHRACENE (sur.)	%	123	N/A	128	N/A	7620934
D12-BENZO(A)PYRENE (sur.)	%	117	N/A	127	N/A	7620934
D8-ACENAPHTHYLENE (sur.)	%	115	N/A	121	N/A	7620934
TERPHENYL-D14 (sur.)	%	120	N/A	130	N/A	7620934

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to matrix interference.
(2) Parameter non-calcuable with required dilution for matrix interference.

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Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
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GLYCOLS BY GC-FID (WATER)

Maxxam ID		KL1993		
Sampling Date		2014/08/25 09:20		
COC Number		A159181		
	Units	SW 2-1	RDL	QC Batch
Glycols				
Ethylene Glycol	mg/L	<10	10	7614688
Diethylene Glycol	mg/L	<5.0	5.0	7614688
Triethylene Glycol	mg/L	<10	10	7614688
Tetraethylene Glycol	mg/L	<10	10	7614688
Propylene Glycol	mg/L	<10	10	7614688
Surrogate Recovery (%)				
Methyl Sulfone (sur.)	%	72	N/A	7614688

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
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SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		KL1993		KL1995		
Sampling Date		2014/08/25 09:20		2014/08/25		
COC Number		A159181		A159181		
	Units	SW 2-1	RDL	SW DUP 1	RDL	QC Batch
Polycyclic Aromatics						
Benzo[a]pyrene equivalency	ug/L	0.093	0.010	0.094	0.010	7615054
Acenaphthene	ug/L	<1.0	1.0	<1.0	1.0	7603748
Acenaphthylene	ug/L	<1.0	1.0	<1.0	1.0	7603748
Acridine	ug/L	<2.0	2.0	<2.0	2.0	7603748
Anthracene	ug/L	<2.0 (1)	2.0	<1.4 (1)	1.4	7603748
Benzo(a)anthracene	ug/L	<0.085	0.085	<0.085	0.085	7603748
Benzo(b&j)fluoranthene	ug/L	<0.085	0.085	<0.085	0.085	7603748
Benzo(k)fluoranthene	ug/L	<0.085	0.085	<0.085	0.085	7603748
Benzo(g,h,i)perylene	ug/L	<0.085	0.085	0.17	0.085	7603748
Benzo(c)phenanthrene	ug/L	<0.50	0.50	<0.50	0.50	7603748
Benzo(a)pyrene	ug/L	<0.075	0.075	<0.075	0.075	7603748
Benzo[e]pyrene	ug/L	<0.50	0.50	<0.50	0.50	7603748
Chrysene	ug/L	<0.085	0.085	<0.085	0.085	7603748
Dibenz(a,h)anthracene	ug/L	<0.075	0.075	<0.075	0.075	7603748
Fluoranthene	ug/L	0.82	0.10	0.24	0.10	7603748
Fluorene	ug/L	4.7	0.50	<4.8 (1)	4.8	7603748
Indeno(1,2,3-cd)pyrene	ug/L	<0.085	0.085	<0.085	0.085	7603748
2-Methylnaphthalene	ug/L	<1.0	1.0	<1.0	1.0	7603748
Naphthalene	ug/L	<1.0	1.0	<1.0	1.0	7603748
Phenanthrene	ug/L	14	0.50	11	0.50	7603748
Perylene	ug/L	<0.56 (1)	0.56	<0.50	0.50	7603748
Pyrene	ug/L	3.3	0.20	2.4	0.20	7603748
Quinoline	ug/L	<2.0	2.0	<2.0	2.0	7603748
Surrogate Recovery (%)						
D10-ANTHRACENE (sur.)	%	129	N/A	150 (2)	N/A	7603748
D12-BENZO(A)PYRENE (sur.)	%	109	N/A	105	N/A	7603748
D8-ACENAPHTHYLENE (sur.)	%	123	N/A	125	N/A	7603748
TERPHENYL-D14 (sur.)	%	100	N/A	96	N/A	7603748

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to matrix interference.
(2) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	4.0°C
Package 2	3.7°C
Package 3	4.3°C
Package 4	6.0°C
Package 5	3.0°C
Package 6	3.0°C
Package 7	3.7°C

Sample KL1640-01 : PAH - Detection limits raised due to matrix interference.

Sample KL1644-01 : PAH - Detection limits raised due to matrix interference.

Sample KL1986-01 : Dissolved greater than total for Cd. Results are within limits of uncertainty(MU).

Sample KL1990-01 : Cation anion balance exceeds normal acceptance limits, due to the low concentrations of ions being measured.

Sample KL1993-01 : PAH - Detection limits raised due to matrix interference.

Sample KL1995-01 : PAH - Detection limits raised due to matrix interference.

Results relate only to the items tested.

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Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
7603748	BC5	Matrix Spike	D10-ANTHRACENE (sur.)	2014/08/18		69	%	50 - 130
			D12-BENZO(A)PYRENE (sur.)	2014/08/18		36 (1)	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2014/08/18		106	%	50 - 130
			TERPHENYL-D14 (sur.)	2014/08/18		37 (1)	%	50 - 130
			Acenaphthene	2014/08/18		87	%	50 - 130
			Acenaphthylene	2014/08/18		94	%	50 - 130
			Acridine	2014/08/18		68	%	50 - 130
			Anthracene	2014/08/18		69	%	50 - 130
			Benzo(a)anthracene	2014/08/18		40 (2)	%	50 - 130
			Benzo(b&j)fluoranthene	2014/08/18		32 (2)	%	50 - 130
			Benzo(k)fluoranthene	2014/08/18		33 (2)	%	50 - 130
			Benzo(g,h,i)perylene	2014/08/18		35 (2)	%	50 - 130
			Benzo(c)phenanthrene	2014/08/18		47 (2)	%	50 - 130
			Benzo(a)pyrene	2014/08/18		38 (2)	%	50 - 130
			Benzo[e]pyrene	2014/08/18		36 (2)	%	50 - 130
			Chrysene	2014/08/18		36 (2)	%	50 - 130
			Dibenz(a,h)anthracene	2014/08/18		30 (2)	%	50 - 130
			Fluoranthene	2014/08/18		46 (2)	%	50 - 130
			Fluorene	2014/08/18		89	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2014/08/18		29 (2)	%	50 - 130
			2-Methylnaphthalene	2014/08/18		91	%	50 - 130
			Naphthalene	2014/08/18		91	%	50 - 130
			Phenanthrene	2014/08/18		77	%	50 - 130
			Perylene	2014/08/18		37 (2)	%	50 - 130
			Pyrene	2014/08/18		45 (2)	%	50 - 130
			Quinoline	2014/08/18		91	%	50 - 130
7603748	BC5	Spiked Blank	D10-ANTHRACENE (sur.)	2014/08/18		104	%	50 - 130
			D12-BENZO(A)PYRENE (sur.)	2014/08/18		133 (1)	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2014/08/18		113	%	50 - 130
			TERPHENYL-D14 (sur.)	2014/08/18		124	%	50 - 130
			Acenaphthene	2014/08/18		88	%	50 - 130
			Acenaphthylene	2014/08/18		92	%	50 - 130
			Acridine	2014/08/18		103	%	50 - 130
			Anthracene	2014/08/18		97	%	50 - 130
			Benzo(a)anthracene	2014/08/18		123	%	50 - 130
			Benzo(b&j)fluoranthene	2014/08/18		109	%	50 - 130
			Benzo(k)fluoranthene	2014/08/18		105	%	50 - 130
			Benzo(g,h,i)perylene	2014/08/18		108	%	50 - 130
			Benzo(c)phenanthrene	2014/08/18		109	%	50 - 130
			Benzo(a)pyrene	2014/08/18		118	%	50 - 130
			Benzo[e]pyrene	2014/08/18		113	%	50 - 130
			Chrysene	2014/08/18		110	%	50 - 130
			Dibenz(a,h)anthracene	2014/08/18		104	%	50 - 130
			Fluoranthene	2014/08/18		105	%	50 - 130
			Fluorene	2014/08/18		94	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2014/08/18		93	%	50 - 130
			2-Methylnaphthalene	2014/08/18		85	%	50 - 130
			Naphthalene	2014/08/18		86	%	50 - 130
			Phenanthrene	2014/08/18		93	%	50 - 130
			Perylene	2014/08/18		111	%	50 - 130
			Pyrene	2014/08/18		106	%	50 - 130
			Quinoline	2014/08/18		86	%	50 - 130

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Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
7603748	BC5	Method Blank	D10-ANTHRACENE (sur.)	2014/08/18		111	%	50 - 130
			D12-BENZO(A)PYRENE (sur.)	2014/08/18		136 (1)		50 - 130
			D8-ACENAPHTHYLENE (sur.)	2014/08/18		116	%	50 - 130
			TERPHENYL-D14 (sur.)	2014/08/18		128	%	50 - 130
			Acenaphthene	2014/08/18	<0.10		ug/L	
			Acenaphthylene	2014/08/18	<0.10		ug/L	
			Acridine	2014/08/18	<0.20		ug/L	
			Anthracene	2014/08/18	<0.010		ug/L	
			Benzo(a)anthracene	2014/08/18	<0.0085		ug/L	
			Benzo(b&j)fluoranthene	2014/08/18	<0.0085		ug/L	
			Benzo(k)fluoranthene	2014/08/18	<0.0085		ug/L	
			Benzo(g,h,i)perylene	2014/08/18	<0.0085		ug/L	
			Benzo(c)phenanthrene	2014/08/18	<0.050		ug/L	
			Benzo(a)pyrene	2014/08/18	<0.0075		ug/L	
			Benzo[e]pyrene	2014/08/18	<0.050		ug/L	
			Chrysene	2014/08/18	<0.0085		ug/L	
			Dibenz(a,h)anthracene	2014/08/18	<0.0075		ug/L	
			Fluoranthene	2014/08/18	<0.010		ug/L	
			Fluorene	2014/08/18	<0.050		ug/L	
			Indeno(1,2,3-cd)pyrene	2014/08/18	<0.0085		ug/L	
			2-Methylnaphthalene	2014/08/18	<0.10		ug/L	
			Naphthalene	2014/08/18	<0.10		ug/L	
			Phenanthrene	2014/08/18	<0.050		ug/L	
			Perylene	2014/08/18	<0.050		ug/L	
			Pyrene	2014/08/18	<0.020		ug/L	
			Quinoline	2014/08/18	<0.20		ug/L	
7603748	BC5	RPD	Acenaphthene	2014/08/18	NC		%	40
			Acenaphthylene	2014/08/18	NC		%	40
			Acridine	2014/08/18	NC		%	40
			Anthracene	2014/08/18	NC		%	40
			Benzo(a)anthracene	2014/08/18	NC		%	40
			Benzo(b&j)fluoranthene	2014/08/18	NC		%	40
			Benzo(k)fluoranthene	2014/08/18	NC		%	40
			Benzo(g,h,i)perylene	2014/08/18	NC		%	40
			Benzo(c)phenanthrene	2014/08/18	NC		%	40
			Benzo(a)pyrene	2014/08/18	NC		%	40
			Benzo[e]pyrene	2014/08/18	NC		%	40
			Chrysene	2014/08/18	NC		%	40
			Dibenz(a,h)anthracene	2014/08/18	NC		%	40
			Fluoranthene	2014/08/18	NC		%	40
			Fluorene	2014/08/18	NC		%	40
			Indeno(1,2,3-cd)pyrene	2014/08/18	NC		%	40
			2-Methylnaphthalene	2014/08/18	NC		%	40
			Naphthalene	2014/08/18	NC		%	40
			Phenanthrene	2014/08/18	NC		%	40
			Perylene	2014/08/18	NC		%	40
			Pyrene	2014/08/18	NC		%	40
			Quinoline	2014/08/18	NC		%	40
7614688	DO1	Matrix Spike	Methyl Sulfone (sur.)	2014/08/29		91	%	70 - 130
			Ethylene Glycol	2014/08/29		92	%	70 - 130
			Diethylene Glycol	2014/08/29		92	%	70 - 130
			Triethylene Glycol	2014/08/29		98	%	70 - 130

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Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
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Sampler Initials: TH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Tetraethylene Glycol	2014/08/29		118	%	70 - 130
			Propylene Glycol	2014/08/29		101	%	70 - 130
7614688	DO1	Spiked Blank	Methyl Sulfone (sur.)	2014/08/29		94	%	70 - 130
			Ethylene Glycol	2014/08/29		90	%	70 - 130
			Diethylene Glycol	2014/08/29		90	%	70 - 130
			Triethylene Glycol	2014/08/29		98	%	70 - 130
			Tetraethylene Glycol	2014/08/29		109	%	70 - 130
			Propylene Glycol	2014/08/29		101	%	70 - 130
7614688	DO1	Method Blank	Methyl Sulfone (sur.)	2014/08/29		104	%	70 - 130
			Ethylene Glycol	2014/08/29	<10		mg/L	
			Diethylene Glycol	2014/08/29	<5.0		mg/L	
			Triethylene Glycol	2014/08/29	<10		mg/L	
			Tetraethylene Glycol	2014/08/29	<10		mg/L	
			Propylene Glycol	2014/08/29	<10		mg/L	
7614688	DO1	RPD	Ethylene Glycol	2014/08/30	NC		%	40
			Propylene Glycol	2014/08/30	NC		%	40
7616020	RC6	Matrix Spike	1,4-Difluorobenzene (sur.)	2014/08/28		107	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/08/28		93	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/08/28		113	%	70 - 130
			Benzene	2014/08/28		91	%	70 - 130
			Toluene	2014/08/28		79	%	70 - 130
			Ethylbenzene	2014/08/28		77	%	70 - 130
			m & p-Xylene	2014/08/28		77	%	70 - 130
			o-Xylene	2014/08/28		85	%	70 - 130
			(C6-C10)	2014/08/28		90	%	70 - 130
7616020	RC6	Spiked Blank	1,4-Difluorobenzene (sur.)	2014/08/27		105	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/08/27		88	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/08/27		109	%	70 - 130
			Benzene	2014/08/27		94	%	70 - 130
			Toluene	2014/08/27		90	%	70 - 130
			Ethylbenzene	2014/08/27		91	%	70 - 130
			m & p-Xylene	2014/08/27		87	%	70 - 130
			o-Xylene	2014/08/27		90	%	70 - 130
			(C6-C10)	2014/08/27		109	%	70 - 130
7616020	RC6	Method Blank	1,4-Difluorobenzene (sur.)	2014/08/27		108	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/08/27		90	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/08/27		107	%	70 - 130
			Benzene	2014/08/27	<0.00040		mg/L	
			Toluene	2014/08/27	<0.00040		mg/L	
			Ethylbenzene	2014/08/27	<0.00040		mg/L	
			m & p-Xylene	2014/08/27	<0.00080		mg/L	
			o-Xylene	2014/08/27	<0.00040		mg/L	
			Xylenes (Total)	2014/08/27	<0.00080		mg/L	
			F1 (C6-C10) - BTEX	2014/08/27	<0.10		mg/L	
			(C6-C10)	2014/08/27	<0.10		mg/L	
7616020	RC6	RPD	Benzene	2014/08/27	NC		%	40
			Toluene	2014/08/27	NC		%	40
			Ethylbenzene	2014/08/27	NC		%	40
			m & p-Xylene	2014/08/27	NC		%	40
			o-Xylene	2014/08/27	NC		%	40
			Xylenes (Total)	2014/08/27	NC		%	40
			F1 (C6-C10) - BTEX	2014/08/27	NC		%	40

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			(C6-C10)	2014/08/27	NC		%	40
7616062	KK5	Matrix Spike [KL1990-04]	O-TERPHENYL (sur.)	2014/08/30		102	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/08/30		109	%	50 - 130
7616062	KK5	Spiked Blank	O-TERPHENYL (sur.)	2014/08/30		99	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/08/30		100	%	70 - 130
7616062	KK5	Method Blank	O-TERPHENYL (sur.)	2014/08/30		104	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/08/30	<0.10		mg/L	
7616062	KK5	RPD [KL1989-01]	F2 (C10-C16 Hydrocarbons)	2014/08/30	NC		%	40
7616627	NP2	Matrix Spike [KL1907-02]	1,4-Difluorobenzene (sur.)	2014/08/29		103	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/08/29		98	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/08/29		101	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/08/29		109	%	60 - 140
			Benzene	2014/08/29		96	%	60 - 140
			Toluene	2014/08/29		94	%	60 - 140
			Ethylbenzene	2014/08/29		90	%	60 - 140
			m & p-Xylene	2014/08/29		91	%	60 - 140
			o-Xylene	2014/08/29		93	%	60 - 140
			(C6-C10)	2014/08/29		81	%	60 - 140
7616627	NP2	Spiked Blank	1,4-Difluorobenzene (sur.)	2014/08/29		97	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/08/29		98	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/08/29		98	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/08/29		103	%	60 - 140
			Benzene	2014/08/29		89	%	60 - 140
			Toluene	2014/08/29		89	%	60 - 140
			Ethylbenzene	2014/08/29		87	%	60 - 140
			m & p-Xylene	2014/08/29		89	%	60 - 140
			o-Xylene	2014/08/29		92	%	60 - 140
			(C6-C10)	2014/08/29		114	%	60 - 140
7616627	NP2	Method Blank	1,4-Difluorobenzene (sur.)	2014/08/29		97	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/08/29		100	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/08/29		95	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/08/29		104	%	60 - 140
			Benzene	2014/08/29	<0.0050		mg/kg	
			Toluene	2014/08/29	<0.020		mg/kg	
			Ethylbenzene	2014/08/29	<0.010		mg/kg	
			Xylenes (Total)	2014/08/29	<0.040		mg/kg	
			m & p-Xylene	2014/08/29	<0.040		mg/kg	
			o-Xylene	2014/08/29	<0.020		mg/kg	
			F1 (C6-C10) - BTEX	2014/08/29	<12		mg/kg	
			(C6-C10)	2014/08/29	<12		mg/kg	
7616627	NP2	RPD [KL1907-02]	Benzene	2014/08/29	NC		%	50
			Toluene	2014/08/29	NC		%	50
			Ethylbenzene	2014/08/29	NC		%	50
			Xylenes (Total)	2014/08/29	NC		%	50
			m & p-Xylene	2014/08/29	NC		%	50
			o-Xylene	2014/08/29	NC		%	50
			F1 (C6-C10) - BTEX	2014/08/29	NC		%	50
			(C6-C10)	2014/08/29	NC		%	50
7616642	MA4	Spiked Blank	pH	2014/08/27		100	%	97 - 103
7616642	MA4	RPD	pH	2014/08/27	2.5		%	N/A
7616644	MA4	Spiked Blank	Alkalinity (Total as CaCO3)	2014/08/28		100	%	80 - 120
7616644	MA4	Method Blank	Alkalinity (PP as CaCO3)	2014/08/28	<0.50		mg/L	

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Alkalinity (Total as CaCO3)	2014/08/28	<0.50		mg/L	
			Bicarbonate (HCO3)	2014/08/28	<0.50		mg/L	
			Carbonate (CO3)	2014/08/28	<0.50		mg/L	
			Hydroxide (OH)	2014/08/28	<0.50		mg/L	
7616644	MA4	RPD	Alkalinity (PP as CaCO3)	2014/08/28	NC		%	20
			Alkalinity (Total as CaCO3)	2014/08/28	4.6		%	20
			Bicarbonate (HCO3)	2014/08/28	4.6		%	20
			Carbonate (CO3)	2014/08/28	NC		%	20
			Hydroxide (OH)	2014/08/28	NC		%	20
7616645	MA4	Spiked Blank	Conductivity	2014/08/28		100	%	90 - 110
7616645	MA4	Method Blank	Conductivity	2014/08/28	<1.0		uS/cm	
7616645	MA4	RPD	Conductivity	2014/08/28	3.8		%	20
7616673	SHM	Matrix Spike [KL1907-02]	O-TERPHENYL (sur.)	2014/09/01		82	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/01		137 (3)	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2014/09/01		NC	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2014/09/01		NC	%	50 - 130
7616673	SHM	Spiked Blank	O-TERPHENYL (sur.)	2014/08/30		88	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/08/30		105	%	70 - 130
			F3 (C16-C34 Hydrocarbons)	2014/08/30		98	%	70 - 130
			F4 (C34-C50 Hydrocarbons)	2014/08/30		87	%	70 - 130
7616673	SHM	Method Blank	O-TERPHENYL (sur.)	2014/08/30		94	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/08/30	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2014/08/30	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2014/08/30	<50		mg/kg	
7616673	SHM	RPD [KL1907-02]	F2 (C10-C16 Hydrocarbons)	2014/08/30	NC		%	50
			F3 (C16-C34 Hydrocarbons)	2014/08/30	1.3		%	50
			F4 (C34-C50 Hydrocarbons)	2014/08/30	0.76		%	50
7616683	ZZ	Method Blank	Moisture	2014/08/28	<0.30		%	
7616683	ZZ	RPD [KL1791-02]	Moisture	2014/08/28	3.7		%	20
7616913	ZZ	Method Blank	Moisture	2014/08/28	<0.30		%	
7616913	ZZ	RPD	Moisture	2014/08/28	1.7		%	20
7616969	KK5	Matrix Spike [KL1791-02]	O-TERPHENYL (sur.)	2014/08/29		99	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/08/29		90	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2014/08/29		90	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2014/08/29		83	%	50 - 130
7616969	KK5	Spiked Blank	O-TERPHENYL (sur.)	2014/08/29		105	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/08/29		110	%	70 - 130
			F3 (C16-C34 Hydrocarbons)	2014/08/29		113	%	70 - 130
			F4 (C34-C50 Hydrocarbons)	2014/08/29		104	%	70 - 130
7616969	KK5	Method Blank	O-TERPHENYL (sur.)	2014/08/29		103	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/08/29	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2014/08/29	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2014/08/29	<50		mg/kg	
7616969	KK5	RPD [KL1791-02]	F2 (C10-C16 Hydrocarbons)	2014/08/29	NC		%	50
			F3 (C16-C34 Hydrocarbons)	2014/08/29	NC		%	50
			F4 (C34-C50 Hydrocarbons)	2014/08/29	NC		%	50
7616970	ZZ	Method Blank	Moisture	2014/08/28	<0.30		%	
7616970	ZZ	RPD	Moisture	2014/08/28	2.2		%	20
7616972	JR1	Matrix Spike	O-TERPHENYL (sur.)	2014/08/30		97	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/08/30		95	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2014/08/30		95	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2014/08/30		89	%	50 - 130

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
7616972	JR1	Spiked Blank	O-TERPHENYL (sur.)	2014/08/30		94	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/08/30		100	%	70 - 130
			F3 (C16-C34 Hydrocarbons)	2014/08/30		101	%	70 - 130
			F4 (C34-C50 Hydrocarbons)	2014/08/30		93	%	70 - 130
7616972	JR1	Method Blank	O-TERPHENYL (sur.)	2014/08/30		88	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/08/30	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2014/08/30	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2014/08/30	<50		mg/kg	
7616972	JR1	RPD	F2 (C10-C16 Hydrocarbons)	2014/08/30	NC		%	50
			F3 (C16-C34 Hydrocarbons)	2014/08/30	NC		%	50
			F4 (C34-C50 Hydrocarbons)	2014/08/30	NC		%	50
7616983	RPA	Matrix Spike	O-TERPHENYL (sur.)	2014/08/28		77	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/08/28		82	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2014/08/28		82	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2014/08/28		76	%	50 - 130
7616983	RPA	Spiked Blank	O-TERPHENYL (sur.)	2014/08/28		71	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/08/28		105	%	70 - 130
			F3 (C16-C34 Hydrocarbons)	2014/08/28		105	%	70 - 130
			F4 (C34-C50 Hydrocarbons)	2014/08/28		97	%	70 - 130
7616983	RPA	Method Blank	O-TERPHENYL (sur.)	2014/08/28		69	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/08/28	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2014/08/28	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2014/08/28	<50		mg/kg	
7616983	RPA	RPD	F2 (C10-C16 Hydrocarbons)	2014/08/28	NC		%	50
			F3 (C16-C34 Hydrocarbons)	2014/08/28	NC		%	50
			F4 (C34-C50 Hydrocarbons)	2014/08/28	NC		%	50
7617296	MPH	Matrix Spike	Dissolved Nitrite (N)	2014/08/27		98	%	80 - 120
			Dissolved Nitrate (N)	2014/08/27		100	%	80 - 120
7617296	MPH	Spiked Blank	Dissolved Nitrite (N)	2014/08/27		97	%	80 - 120
			Dissolved Nitrate (N)	2014/08/27		98	%	80 - 120
7617296	MPH	Method Blank	Dissolved Nitrite (N)	2014/08/27	<0.010		mg/L	
			Dissolved Nitrate (N)	2014/08/27	<0.010		mg/L	
7617296	MPH	RPD	Dissolved Nitrite (N)	2014/08/27	NC		%	20
			Dissolved Nitrate (N)	2014/08/27	NC		%	20
7617356	ZZ	Method Blank	Moisture	2014/08/28	<0.30		%	
7617356	ZZ	RPD	Moisture	2014/08/28	2.4		%	20
7617394	ZZ	Method Blank	Moisture	2014/08/28	<0.30		%	
7617394	ZZ	RPD	Moisture	2014/08/28	9.4		%	20
7617665	KO	Matrix Spike	O-TERPHENYL (sur.)	2014/08/28		86	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/08/28		88	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2014/08/28		90	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2014/08/28		82	%	50 - 130
7617665	KO	Spiked Blank	O-TERPHENYL (sur.)	2014/08/28		91	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/08/28		101	%	70 - 130
			F3 (C16-C34 Hydrocarbons)	2014/08/28		103	%	70 - 130
			F4 (C34-C50 Hydrocarbons)	2014/08/28		93	%	70 - 130
7617665	KO	Method Blank	O-TERPHENYL (sur.)	2014/08/28		107	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/08/28	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2014/08/28	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2014/08/28	<50		mg/kg	
7617665	KO	RPD	F2 (C10-C16 Hydrocarbons)	2014/08/28	NC		%	50
			F3 (C16-C34 Hydrocarbons)	2014/08/28	NC		%	50

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			F4 (C34-C50 Hydrocarbons)	2014/08/28	NC		%	50
7618018	PS7	Matrix Spike [KL1791-02]	1,4-Difluorobenzene (sur.)	2014/08/29		109	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/08/29		86	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/08/29		108	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/08/29		107	%	60 - 140
			Benzene	2014/08/29		108	%	60 - 140
			Toluene	2014/08/29		98	%	60 - 140
			Ethylbenzene	2014/08/29		98	%	60 - 140
			m & p-Xylene	2014/08/29		102	%	60 - 140
			o-Xylene	2014/08/29		92	%	60 - 140
			(C6-C10)	2014/08/29		109	%	60 - 140
7618018	PS7	Spiked Blank	1,4-Difluorobenzene (sur.)	2014/08/29		107	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/08/29		91	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/08/29		107	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/08/29		108	%	60 - 140
			Benzene	2014/08/29		107	%	60 - 140
			Toluene	2014/08/29		96	%	60 - 140
			Ethylbenzene	2014/08/29		97	%	60 - 140
			m & p-Xylene	2014/08/29		99	%	60 - 140
			o-Xylene	2014/08/29		93	%	60 - 140
			(C6-C10)	2014/08/29		109	%	60 - 140
7618018	PS7	Method Blank	1,4-Difluorobenzene (sur.)	2014/08/30		107	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/08/30		85	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/08/30		130	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/08/30		103	%	60 - 140
			Benzene	2014/08/30	<0.0050		mg/kg	
			Toluene	2014/08/30	<0.020		mg/kg	
			Ethylbenzene	2014/08/30	<0.010		mg/kg	
			Xylenes (Total)	2014/08/30	<0.040		mg/kg	
			m & p-Xylene	2014/08/30	<0.040		mg/kg	
			o-Xylene	2014/08/30	<0.020		mg/kg	
			F1 (C6-C10) - BTEX	2014/08/30	<12		mg/kg	
			(C6-C10)	2014/08/30	<12		mg/kg	
7618018	PS7	RPD [KL1791-02]	Benzene	2014/08/29	NC		%	50
			Toluene	2014/08/29	NC		%	50
			Ethylbenzene	2014/08/29	NC		%	50
			Xylenes (Total)	2014/08/29	NC		%	50
			m & p-Xylene	2014/08/29	NC		%	50
			o-Xylene	2014/08/29	NC		%	50
			F1 (C6-C10) - BTEX	2014/08/29	NC		%	50
			(C6-C10)	2014/08/29	NC		%	50
7618039	PS7	Matrix Spike	1,4-Difluorobenzene (sur.)	2014/08/30		113	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/08/30		80	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/08/30		119	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/08/30		109	%	60 - 140
			Benzene	2014/08/30		112	%	60 - 140
			Toluene	2014/08/30		94	%	60 - 140
			Ethylbenzene	2014/08/30		103	%	60 - 140
			m & p-Xylene	2014/08/30		102	%	60 - 140
			o-Xylene	2014/08/30		100	%	60 - 140
			(C6-C10)	2014/08/30		102	%	60 - 140
7618039	PS7	Spiked Blank	1,4-Difluorobenzene (sur.)	2014/08/30		108	%	60 - 140

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			4-Bromofluorobenzene (sur.)	2014/08/30		84	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/08/30		119	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/08/30		105	%	60 - 140
			Benzene	2014/08/30		112	%	60 - 140
			Toluene	2014/08/30		100	%	60 - 140
			Ethylbenzene	2014/08/30		104	%	60 - 140
			m & p-Xylene	2014/08/30		103	%	60 - 140
			o-Xylene	2014/08/30		96	%	60 - 140
			(C6-C10)	2014/08/30		84	%	60 - 140
7618039	PS7	Method Blank	1,4-Difluorobenzene (sur.)	2014/08/30		103	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/08/30		81	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/08/30		110	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/08/30		106	%	60 - 140
			Benzene	2014/08/30	<0.0050		mg/kg	
			Toluene	2014/08/30	<0.020		mg/kg	
			Ethylbenzene	2014/08/30	<0.010		mg/kg	
			Xylenes (Total)	2014/08/30	<0.040		mg/kg	
			m & p-Xylene	2014/08/30	<0.040		mg/kg	
			o-Xylene	2014/08/30	<0.020		mg/kg	
			F1 (C6-C10) - BTEX	2014/08/30	<12		mg/kg	
			(C6-C10)	2014/08/30	<12		mg/kg	
7618039	PS7	RPD	Benzene	2014/08/30	NC		%	50
			Toluene	2014/08/30	NC		%	50
			Ethylbenzene	2014/08/30	NC		%	50
			Xylenes (Total)	2014/08/30	NC		%	50
			m & p-Xylene	2014/08/30	NC		%	50
			o-Xylene	2014/08/30	NC		%	50
			F1 (C6-C10) - BTEX	2014/08/30	NC		%	50
			(C6-C10)	2014/08/30	NC		%	50
7618378	ARD	Matrix Spike	Dissolved Chloride (Cl)	2014/08/30		108	%	80 - 120
7618378	ARD	Spiked Blank	Dissolved Chloride (Cl)	2014/08/30		102	%	80 - 120
7618378	ARD	Method Blank	Dissolved Chloride (Cl)	2014/08/30	<1.0		mg/L	
7618378	ARD	RPD	Dissolved Chloride (Cl)	2014/08/30	1.3		%	20
7618388	ARD	Matrix Spike	Dissolved Sulphate (SO4)	2014/08/30		NC	%	80 - 120
7618388	ARD	Spiked Blank	Dissolved Sulphate (SO4)	2014/08/30		104	%	80 - 120
7618388	ARD	Method Blank	Dissolved Sulphate (SO4)	2014/08/30	<1.0		mg/L	
7618388	ARD	RPD	Dissolved Sulphate (SO4)	2014/08/30	0.50		%	20
7618931	NP2	Matrix Spike	1,4-Difluorobenzene (sur.)	2014/08/29		107	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/08/29		98	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/08/29		94	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/08/29		102	%	60 - 140
			Benzene	2014/08/29		90	%	60 - 140
			Toluene	2014/08/29		97	%	60 - 140
			Ethylbenzene	2014/08/29		84	%	60 - 140
			m & p-Xylene	2014/08/29		93	%	60 - 140
			o-Xylene	2014/08/29		92	%	60 - 140
			(C6-C10)	2014/08/29		135	%	60 - 140
7618931	NP2	Spiked Blank	1,4-Difluorobenzene (sur.)	2014/08/29		106	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/08/29		98	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/08/29		90	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/08/29		96	%	60 - 140
			Benzene	2014/08/29		89	%	60 - 140

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Toluene	2014/08/29		95	%	60 - 140
			Ethylbenzene	2014/08/29		84	%	60 - 140
			m & p-Xylene	2014/08/29		92	%	60 - 140
			o-Xylene	2014/08/29		91	%	60 - 140
			(C6-C10)	2014/08/29		133	%	60 - 140
7618931	NP2	Method Blank	1,4-Difluorobenzene (sur.)	2014/08/29		100	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/08/29		99	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/08/29		86	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/08/29		94	%	60 - 140
			Benzene	2014/08/29	<0.0050		mg/kg	
			Toluene	2014/08/29	<0.020		mg/kg	
			Ethylbenzene	2014/08/29	<0.010		mg/kg	
			Xylenes (Total)	2014/08/29	<0.040		mg/kg	
			m & p-Xylene	2014/08/29	<0.040		mg/kg	
			o-Xylene	2014/08/29	<0.020		mg/kg	
			F1 (C6-C10) - BTEX	2014/08/29	<12		mg/kg	
			(C6-C10)	2014/08/29	<12		mg/kg	
7618931	NP2	RPD	Benzene	2014/08/29	NC		%	50
			Toluene	2014/08/29	NC		%	50
			Ethylbenzene	2014/08/29	NC		%	50
			Xylenes (Total)	2014/08/29	NC		%	50
			m & p-Xylene	2014/08/29	NC		%	50
			o-Xylene	2014/08/29	NC		%	50
			F1 (C6-C10) - BTEX	2014/08/29	NC		%	50
			(C6-C10)	2014/08/29	NC		%	50
7618934	RC6	Matrix Spike	1,4-Difluorobenzene (sur.)	2014/08/30		104	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/08/30		102	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/08/30		106	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/08/30		97	%	60 - 140
			Benzene	2014/08/30		102	%	60 - 140
			Toluene	2014/08/30		103	%	60 - 140
			Ethylbenzene	2014/08/30		101	%	60 - 140
			m & p-Xylene	2014/08/30		103	%	60 - 140
			o-Xylene	2014/08/30		104	%	60 - 140
			(C6-C10)	2014/08/30		84	%	60 - 140
7618934	RC6	Spiked Blank	1,4-Difluorobenzene (sur.)	2014/08/30		96	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/08/30		99	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/08/30		119	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/08/30		104	%	60 - 140
			Benzene	2014/08/30		111	%	60 - 140
			Toluene	2014/08/30		113	%	60 - 140
			Ethylbenzene	2014/08/30		111	%	60 - 140
			m & p-Xylene	2014/08/30		114	%	60 - 140
			o-Xylene	2014/08/30		112	%	60 - 140
			(C6-C10)	2014/08/30		124	%	60 - 140
7618934	RC6	Method Blank	1,4-Difluorobenzene (sur.)	2014/08/30		96	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/08/30		100	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/08/30		111	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/08/30		99	%	60 - 140
			Benzene	2014/08/30	<0.0050		mg/kg	
			Toluene	2014/08/30	<0.020		mg/kg	
			Ethylbenzene	2014/08/30	<0.010		mg/kg	

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Xylenes (Total)	2014/08/30	<0.040		mg/kg	
			m & p-Xylene	2014/08/30	<0.040		mg/kg	
			o-Xylene	2014/08/30	<0.020		mg/kg	
			F1 (C6-C10) - BTEX	2014/08/30	<12		mg/kg	
			(C6-C10)	2014/08/30	<12		mg/kg	
7618934	RC6	RPD	Benzene	2014/08/30	NC		%	50
			Toluene	2014/08/30	NC		%	50
			Ethylbenzene	2014/08/30	NC		%	50
			Xylenes (Total)	2014/08/30	NC		%	50
			m & p-Xylene	2014/08/30	NC		%	50
			o-Xylene	2014/08/30	NC		%	50
			F1 (C6-C10) - BTEX	2014/08/30	NC		%	50
			(C6-C10)	2014/08/30	NC		%	50
7619702	EI2	QC Standard	Sieve - Pan	2014/09/03		100	%	91 - 109
			Sieve - #200 (>0.075mm)	2014/09/03		100	%	84 - 116
7619702	EI2	RPD	Sieve - Pan	2014/09/03	5.3		%	35
			Sieve - #200 (>0.075mm)	2014/09/03	10		%	35
7620217	DO1	Matrix Spike	Extractable (Water) Methyl Sulfone (sur.)	2014/08/29		76	%	50 - 130
			Extractable (Water) Ethylene Glycol	2014/08/29		82	%	30 - 130
			Extractable (Water) Diethylene Glycol	2014/08/29		76	%	30 - 130
			Extractable (Water) Triethylene Glycol	2014/08/29		68	%	30 - 130
			Extractable (Water) Tetraethylene Glycol	2014/08/29		66	%	30 - 130
			Extractable (Water) Propylene Glycol	2014/08/29		92	%	30 - 130
7620217	DO1	Spiked Blank	Extractable (Water) Methyl Sulfone (sur.)	2014/08/29		99	%	50 - 130
			Extractable (Water) Ethylene Glycol	2014/08/29		95	%	30 - 130
			Extractable (Water) Diethylene Glycol	2014/08/29		94	%	30 - 130
			Extractable (Water) Triethylene Glycol	2014/08/29		102	%	30 - 130
			Extractable (Water) Tetraethylene Glycol	2014/08/29		119	%	30 - 130
			Extractable (Water) Propylene Glycol	2014/08/29		107	%	30 - 130
7620217	DO1	Method Blank	Extractable (Water) Methyl Sulfone (sur.)	2014/08/29		107	%	50 - 130
			Extractable (Water) Ethylene Glycol	2014/08/29	<10		mg/kg	
			Extractable (Water) Diethylene Glycol	2014/08/29	<10		mg/kg	
			Extractable (Water) Triethylene Glycol	2014/08/29	<10		mg/kg	
			Extractable (Water) Tetraethylene Glycol	2014/08/29	<10		mg/kg	
			Extractable (Water) Propylene Glycol	2014/08/29	<10		mg/kg	
7620217	DO1	RPD	Extractable (Water) Ethylene Glycol	2014/08/30	NC		%	50
			Extractable (Water) Diethylene Glycol	2014/08/30	NC		%	50
			Extractable (Water) Triethylene Glycol	2014/08/30	NC		%	50
			Extractable (Water) Tetraethylene Glycol	2014/08/30	NC		%	50
			Extractable (Water) Propylene Glycol	2014/08/30	NC		%	50
7620738	ARD	Matrix Spike	Hex. Chromium (Cr 6+)	2014/08/30		91	%	75 - 125
7620738	ARD	Spiked Blank	Hex. Chromium (Cr 6+)	2014/08/30		101	%	80 - 120
7620738	ARD	Method Blank	Hex. Chromium (Cr 6+)	2014/08/30	<0.15		mg/kg	
7620738	ARD	RPD	Hex. Chromium (Cr 6+)	2014/08/30	NC		%	35
7620934	NM6	Matrix Spike	D10-ANTHRACENE (sur.)	2014/08/30		87	%	50 - 130
			D12-BENZO(A)PYRENE (sur.)	2014/08/30		106	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2014/08/30		97	%	50 - 130
			TERPHENYL-D14 (sur.)	2014/08/30		103	%	50 - 130
			Acenaphthene	2014/08/30		75	%	50 - 130
			Acenaphthylene	2014/08/30		79	%	50 - 130
			Acridine	2014/08/30		65	%	50 - 130
			Anthracene	2014/08/30		78	%	50 - 130

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Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Benzo(a)anthracene	2014/08/30		102	%	50 - 130
			Benzo(b&j)fluoranthene	2014/08/30		103	%	50 - 130
			Benzo(k)fluoranthene	2014/08/30		95	%	50 - 130
			Benzo(g,h,i)perylene	2014/08/30		98	%	50 - 130
			Benzo(c)phenanthrene	2014/08/30		87	%	50 - 130
			Benzo(a)pyrene	2014/08/30		93	%	50 - 130
			Benzo[e]pyrene	2014/08/30		100	%	50 - 130
			Chrysene	2014/08/30		88	%	50 - 130
			Dibenz(a,h)anthracene	2014/08/30		108	%	50 - 130
			Fluoranthene	2014/08/30		89	%	50 - 130
			Fluorene	2014/08/30		80	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2014/08/30		118	%	50 - 130
			2-Methylnaphthalene	2014/08/30		78	%	50 - 130
			Naphthalene	2014/08/30		73	%	50 - 130
			Phenanthrene	2014/08/30		73	%	50 - 130
			Perylene	2014/08/30		89	%	50 - 130
			Pyrene	2014/08/30		89	%	50 - 130
			Quinoline	2014/08/30		77	%	50 - 130
7620934	NM6	Spiked Blank	D10-ANTHRACENE (sur.)	2014/08/30		91	%	50 - 130
			D12-BENZO(A)PYRENE (sur.)	2014/08/30		114	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2014/08/30		103	%	50 - 130
			TERPHENYL-D14 (sur.)	2014/08/30		107	%	50 - 130
			Acenaphthene	2014/08/30		81	%	50 - 130
			Acenaphthylene	2014/08/30		84	%	50 - 130
			Acridine	2014/08/30		75	%	50 - 130
			Anthracene	2014/08/30		82	%	50 - 130
			Benzo(a)anthracene	2014/08/30		110	%	50 - 130
			Benzo(b&j)fluoranthene	2014/08/30		112	%	50 - 130
			Benzo(k)fluoranthene	2014/08/30		101	%	50 - 130
			Benzo(g,h,i)perylene	2014/08/30		106	%	50 - 130
			Benzo(c)phenanthrene	2014/08/30		94	%	50 - 130
			Benzo(a)pyrene	2014/08/30		101	%	50 - 130
			Benzo[e]pyrene	2014/08/30		110	%	50 - 130
			Chrysene	2014/08/30		95	%	50 - 130
			Dibenz(a,h)anthracene	2014/08/30		108	%	50 - 130
			Fluoranthene	2014/08/30		94	%	50 - 130
			Fluorene	2014/08/30		85	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2014/08/30		122	%	50 - 130
			2-Methylnaphthalene	2014/08/30		81	%	50 - 130
			Naphthalene	2014/08/30		77	%	50 - 130
			Phenanthrene	2014/08/30		77	%	50 - 130
			Perylene	2014/08/30		97	%	50 - 130
			Pyrene	2014/08/30		95	%	50 - 130
			Quinoline	2014/08/30		78	%	50 - 130
7620934	NM6	Method Blank	D10-ANTHRACENE (sur.)	2014/08/31		85	%	50 - 130
			D12-BENZO(A)PYRENE (sur.)	2014/08/31		108	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2014/08/31		84	%	50 - 130
			TERPHENYL-D14 (sur.)	2014/08/31		100	%	50 - 130
			Acenaphthene	2014/08/31	<0.0050		mg/kg	
			Acenaphthylene	2014/08/31	<0.0050		mg/kg	
			Acridine	2014/08/31	<0.010		mg/kg	
			Anthracene	2014/08/31	<0.0040		mg/kg	

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Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Benzo(a)anthracene	2014/08/31	<0.0050		mg/kg	
			Benzo(b&j)fluoranthene	2014/08/31	<0.0050		mg/kg	
			Benzo(k)fluoranthene	2014/08/31	<0.0050		mg/kg	
			Benzo(g,h,i)perylene	2014/08/31	<0.0050		mg/kg	
			Benzo(c)phenanthrene	2014/08/31	<0.0050		mg/kg	
			Benzo(a)pyrene	2014/08/31	<0.0050		mg/kg	
			Benzo[e]pyrene	2014/08/31	<0.0050		mg/kg	
			Chrysene	2014/08/31	<0.0050		mg/kg	
			Dibenz(a,h)anthracene	2014/08/31	<0.0050		mg/kg	
			Fluoranthene	2014/08/31	<0.0050		mg/kg	
			Fluorene	2014/08/31	<0.0050		mg/kg	
			Indeno(1,2,3-cd)pyrene	2014/08/31	<0.0050		mg/kg	
			2-Methylnaphthalene	2014/08/31	<0.0050		mg/kg	
			Naphthalene	2014/08/31	<0.0050		mg/kg	
			Phenanthrene	2014/08/31	<0.0050		mg/kg	
			Perylene	2014/08/31	<0.0050		mg/kg	
			Pyrene	2014/08/31	<0.0050		mg/kg	
			Quinoline	2014/08/31	<0.010		mg/kg	
7620934	NM6	RPD	Acenaphthene	2014/08/31	NC		%	50
			Acenaphthylene	2014/08/31	NC		%	50
			Acridine	2014/08/31	NC		%	50
			Anthracene	2014/08/31	NC		%	50
			Benzo(a)anthracene	2014/08/31	NC		%	50
			Benzo(b&j)fluoranthene	2014/08/31	NC		%	50
			Benzo(k)fluoranthene	2014/08/31	NC		%	50
			Benzo(g,h,i)perylene	2014/08/31	NC		%	50
			Benzo(c)phenanthrene	2014/08/31	NC		%	50
			Benzo(a)pyrene	2014/08/31	NC		%	50
			Benzo[e]pyrene	2014/08/31	NC		%	50
			Chrysene	2014/08/31	NC		%	50
			Dibenz(a,h)anthracene	2014/08/31	NC		%	50
			Fluoranthene	2014/08/31	NC		%	50
			Fluorene	2014/08/31	NC		%	50
			Indeno(1,2,3-cd)pyrene	2014/08/31	NC		%	50
			2-Methylnaphthalene	2014/08/31	NC		%	50
			Naphthalene	2014/08/31	NC		%	50
			Phenanthrene	2014/08/31	NC		%	50
			Perylene	2014/08/31	NC		%	50
			Pyrene	2014/08/31	NC		%	50
			Quinoline	2014/08/31	NC		%	50
7621054	SF3	Matrix Spike	Total Antimony (Sb)	2014/08/30		89	%	75 - 125
			Total Arsenic (As)	2014/08/30		96	%	75 - 125
			Total Barium (Ba)	2014/08/30		NC	%	75 - 125
			Total Beryllium (Be)	2014/08/30		100	%	75 - 125
			Total Cadmium (Cd)	2014/08/30		97	%	75 - 125
			Total Chromium (Cr)	2014/08/30		91	%	75 - 125
			Total Cobalt (Co)	2014/08/30		95	%	75 - 125
			Total Copper (Cu)	2014/08/30		91	%	75 - 125
			Total Lead (Pb)	2014/08/30		99	%	75 - 125
			Total Mercury (Hg)	2014/08/30		103	%	75 - 125
			Total Molybdenum (Mo)	2014/08/30		101	%	75 - 125
			Total Nickel (Ni)	2014/08/30		NC	%	75 - 125

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Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Total Selenium (Se)	2014/08/30		98	%	75 - 125
			Total Silver (Ag)	2014/08/30		99	%	75 - 125
			Total Thallium (Tl)	2014/08/30		96	%	75 - 125
			Total Tin (Sn)	2014/08/30		102	%	75 - 125
			Total Uranium (U)	2014/08/30		96	%	75 - 125
			Total Vanadium (V)	2014/08/30		NC	%	75 - 125
			Total Zinc (Zn)	2014/08/30		NC	%	75 - 125
7621054	SF3	QC Standard	Total Arsenic (As)	2014/08/30		116	%	75 - 125
			Total Barium (Ba)	2014/08/30		110	%	75 - 125
			Total Chromium (Cr)	2014/08/30		105	%	75 - 125
			Total Cobalt (Co)	2014/08/30		104	%	75 - 125
			Total Copper (Cu)	2014/08/30		102	%	75 - 125
			Total Lead (Pb)	2014/08/30		105	%	75 - 125
			Total Mercury (Hg)	2014/08/30		117	%	75 - 125
			Total Nickel (Ni)	2014/08/30		110	%	75 - 125
			Total Vanadium (V)	2014/08/30		122	%	75 - 125
			Total Zinc (Zn)	2014/08/30		110	%	75 - 125
7621054	SF3	Spiked Blank	Total Antimony (Sb)	2014/08/30		95	%	75 - 125
			Total Arsenic (As)	2014/08/30		96	%	75 - 125
			Total Barium (Ba)	2014/08/30		96	%	75 - 125
			Total Beryllium (Be)	2014/08/30		94	%	75 - 125
			Total Cadmium (Cd)	2014/08/30		95	%	75 - 125
			Total Chromium (Cr)	2014/08/30		97	%	75 - 125
			Total Cobalt (Co)	2014/08/30		97	%	75 - 125
			Total Copper (Cu)	2014/08/30		97	%	75 - 125
			Total Lead (Pb)	2014/08/30		100	%	75 - 125
			Total Mercury (Hg)	2014/08/30		101	%	75 - 125
			Total Molybdenum (Mo)	2014/08/30		99	%	75 - 125
			Total Nickel (Ni)	2014/08/30		95	%	75 - 125
			Total Selenium (Se)	2014/08/30		98	%	75 - 125
			Total Silver (Ag)	2014/08/30		97	%	75 - 125
			Total Thallium (Tl)	2014/08/30		102	%	75 - 125
			Total Tin (Sn)	2014/08/30		98	%	75 - 125
			Total Uranium (U)	2014/08/30		99	%	75 - 125
			Total Vanadium (V)	2014/08/30		99	%	75 - 125
			Total Zinc (Zn)	2014/08/30		100	%	75 - 125
7621054	SF3	Method Blank	Total Antimony (Sb)	2014/08/30	<1.0		mg/kg	
			Total Arsenic (As)	2014/08/30	<1.0		mg/kg	
			Total Barium (Ba)	2014/08/30	<10		mg/kg	
			Total Beryllium (Be)	2014/08/30	<0.40		mg/kg	
			Total Cadmium (Cd)	2014/08/30	<0.10		mg/kg	
			Total Chromium (Cr)	2014/08/30	<1.0		mg/kg	
			Total Cobalt (Co)	2014/08/30	<1.0		mg/kg	
			Total Copper (Cu)	2014/08/30	<5.0		mg/kg	
			Total Lead (Pb)	2014/08/30	<1.0		mg/kg	
			Total Mercury (Hg)	2014/08/30	<0.050		mg/kg	
			Total Molybdenum (Mo)	2014/08/30	<0.40		mg/kg	
			Total Nickel (Ni)	2014/08/30	<1.0		mg/kg	
			Total Selenium (Se)	2014/08/30	<0.50		mg/kg	
			Total Silver (Ag)	2014/08/30	<1.0		mg/kg	
			Total Thallium (Tl)	2014/08/30	<0.30		mg/kg	
			Total Tin (Sn)	2014/08/30	<1.0		mg/kg	

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Total Uranium (U)	2014/08/30	<1.0		mg/kg	
			Total Vanadium (V)	2014/08/30	<1.0		mg/kg	
			Total Zinc (Zn)	2014/08/30	<10		mg/kg	
7621054	SF3	RPD	Total Antimony (Sb)	2014/08/30	NC		%	35
			Total Arsenic (As)	2014/08/30	4.7		%	35
			Total Barium (Ba)	2014/08/30	1.4		%	35
			Total Beryllium (Be)	2014/08/30	NC		%	35
			Total Cadmium (Cd)	2014/08/30	1.9		%	35
			Total Chromium (Cr)	2014/08/30	23		%	35
			Total Cobalt (Co)	2014/08/30	3.4		%	35
			Total Copper (Cu)	2014/08/30	NC		%	35
			Total Lead (Pb)	2014/08/30	2.4		%	35
			Total Mercury (Hg)	2014/08/30	NC		%	35
			Total Molybdenum (Mo)	2014/08/30	39 (1)		%	35
			Total Nickel (Ni)	2014/08/30	12		%	35
			Total Selenium (Se)	2014/08/30	NC		%	35
			Total Silver (Ag)	2014/08/30	NC		%	35
			Total Thallium (Tl)	2014/08/30	NC		%	35
			Total Tin (Sn)	2014/08/30	NC		%	35
			Total Uranium (U)	2014/08/30	NC		%	35
			Total Vanadium (V)	2014/08/30	4.5		%	35
			Total Zinc (Zn)	2014/08/30	6.3		%	35
7621091	SDH	Matrix Spike	Soluble (Hot water) Boron (B)	2014/08/30		102	%	75 - 125
7621091	SDH	Spiked Blank	Soluble (Hot water) Boron (B)	2014/08/30		105	%	75 - 125
7621091	SDH	Method Blank	Soluble (Hot water) Boron (B)	2014/08/30	<0.10		mg/kg	
7621091	SDH	RPD	Soluble (Hot water) Boron (B)	2014/08/30	NC		%	35
7621533	SF3	Matrix Spike	Total Antimony (Sb)	2014/09/01		89	%	75 - 125
			Total Arsenic (As)	2014/09/01		93	%	75 - 125
			Total Barium (Ba)	2014/09/01		NC	%	75 - 125
			Total Beryllium (Be)	2014/09/01		97	%	75 - 125
			Total Cadmium (Cd)	2014/09/01		93	%	75 - 125
			Total Chromium (Cr)	2014/09/01		89	%	75 - 125
			Total Cobalt (Co)	2014/09/01		90	%	75 - 125
			Total Copper (Cu)	2014/09/01		91	%	75 - 125
			Total Lead (Pb)	2014/09/01		95	%	75 - 125
			Total Mercury (Hg)	2014/09/01		95	%	75 - 125
			Total Molybdenum (Mo)	2014/09/01		96	%	75 - 125
			Total Nickel (Ni)	2014/09/01		91	%	75 - 125
			Total Selenium (Se)	2014/09/01		93	%	75 - 125
			Total Silver (Ag)	2014/09/01		93	%	75 - 125
			Total Thallium (Tl)	2014/09/01		95	%	75 - 125
			Total Tin (Sn)	2014/09/01		96	%	75 - 125
			Total Uranium (U)	2014/09/01		92	%	75 - 125
			Total Vanadium (V)	2014/09/01		101	%	75 - 125
			Total Zinc (Zn)	2014/09/01		NC	%	75 - 125
7621533	SF3	QC Standard	Total Arsenic (As)	2014/09/01		113	%	50 - 150
			Total Barium (Ba)	2014/09/01		108	%	69 - 131
			Total Chromium (Cr)	2014/09/01		101	%	41 - 159
			Total Cobalt (Co)	2014/09/01		100	%	75 - 125
			Total Copper (Cu)	2014/09/01		106	%	73 - 127
			Total Lead (Pb)	2014/09/01		105	%	54 - 146
			Total Nickel (Ni)	2014/09/01		107	%	61 - 139

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Total Vanadium (V)	2014/09/01		118	%	50 - 150
			Total Zinc (Zn)	2014/09/01		109	%	72 - 128
7621533	SF3	Spiked Blank	Total Antimony (Sb)	2014/09/01		95	%	75 - 125
			Total Arsenic (As)	2014/09/01		94	%	75 - 125
			Total Barium (Ba)	2014/09/01		95	%	75 - 125
			Total Beryllium (Be)	2014/09/01		95	%	75 - 125
			Total Cadmium (Cd)	2014/09/01		95	%	75 - 125
			Total Chromium (Cr)	2014/09/01		94	%	75 - 125
			Total Cobalt (Co)	2014/09/01		93	%	75 - 125
			Total Copper (Cu)	2014/09/01		95	%	75 - 125
			Total Lead (Pb)	2014/09/01		96	%	75 - 125
			Total Mercury (Hg)	2014/09/01		100	%	75 - 125
			Total Molybdenum (Mo)	2014/09/01		98	%	75 - 125
			Total Nickel (Ni)	2014/09/01		95	%	75 - 125
			Total Selenium (Se)	2014/09/01		96	%	75 - 125
			Total Silver (Ag)	2014/09/01		95	%	75 - 125
			Total Thallium (Tl)	2014/09/01		97	%	75 - 125
			Total Tin (Sn)	2014/09/01		99	%	75 - 125
			Total Uranium (U)	2014/09/01		96	%	75 - 125
			Total Vanadium (V)	2014/09/01		98	%	75 - 125
			Total Zinc (Zn)	2014/09/01		98	%	75 - 125
7621533	SF3	Method Blank	Total Antimony (Sb)	2014/09/01	<1.0		mg/kg	
			Total Arsenic (As)	2014/09/01	<1.0		mg/kg	
			Total Barium (Ba)	2014/09/01	<10		mg/kg	
			Total Beryllium (Be)	2014/09/01	<0.40		mg/kg	
			Total Cadmium (Cd)	2014/09/01	<0.10		mg/kg	
			Total Chromium (Cr)	2014/09/01	<1.0		mg/kg	
			Total Cobalt (Co)	2014/09/01	<1.0		mg/kg	
			Total Copper (Cu)	2014/09/01	<5.0		mg/kg	
			Total Lead (Pb)	2014/09/01	<1.0		mg/kg	
			Total Mercury (Hg)	2014/09/01	<0.050		mg/kg	
			Total Molybdenum (Mo)	2014/09/01	<0.40		mg/kg	
			Total Nickel (Ni)	2014/09/01	<1.0		mg/kg	
			Total Selenium (Se)	2014/09/01	<0.50		mg/kg	
			Total Silver (Ag)	2014/09/01	<1.0		mg/kg	
			Total Thallium (Tl)	2014/09/01	<0.30		mg/kg	
			Total Tin (Sn)	2014/09/01	<1.0		mg/kg	
			Total Uranium (U)	2014/09/01	<1.0		mg/kg	
			Total Vanadium (V)	2014/09/01	<1.0		mg/kg	
			Total Zinc (Zn)	2014/09/01	<10		mg/kg	
7621533	SF3	RPD	Total Arsenic (As)	2014/09/01	10		%	35
			Total Barium (Ba)	2014/09/01	14		%	35
			Total Cadmium (Cd)	2014/09/01	NC		%	35
			Total Chromium (Cr)	2014/09/01	13		%	35
			Total Cobalt (Co)	2014/09/01	NC		%	35
			Total Copper (Cu)	2014/09/01	NC		%	35
			Total Lead (Pb)	2014/09/01	5.5		%	35
			Total Mercury (Hg)	2014/09/01	NC		%	35
			Total Nickel (Ni)	2014/09/01	14		%	35
			Total Zinc (Zn)	2014/09/01	NC		%	35
7621554	LT4	Matrix Spike	Soluble (Hot water) Boron (B)	2014/08/31		102	%	75 - 125
7621554	LT4	Spiked Blank	Soluble (Hot water) Boron (B)	2014/08/31		102	%	75 - 125

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
7621554	LT4	Method Blank	Soluble (Hot water) Boron (B)	2014/08/31	0.13 , RDL=0.10		mg/kg	
7621554	LT4	RPD	Soluble (Hot water) Boron (B)	2014/08/31	NC		%	35
7621571	SF3	Matrix Spike	Total Aluminum (Al)	2014/08/31		94	%	80 - 120
			Total Antimony (Sb)	2014/08/31		107	%	80 - 120
			Total Arsenic (As)	2014/08/31		99	%	80 - 120
			Total Beryllium (Be)	2014/08/31		104	%	80 - 120
			Total Chromium (Cr)	2014/08/31		96	%	80 - 120
			Total Cobalt (Co)	2014/08/31		93	%	80 - 120
			Total Copper (Cu)	2014/08/31		93	%	80 - 120
			Total Lead (Pb)	2014/08/31		91	%	80 - 120
			Total Molybdenum (Mo)	2014/08/31		111	%	80 - 120
			Total Nickel (Ni)	2014/08/31		93	%	80 - 120
			Total Selenium (Se)	2014/08/31		98	%	80 - 120
			Total Silver (Ag)	2014/08/31		98	%	80 - 120
			Total Thallium (Tl)	2014/08/31		92	%	80 - 120
			Total Tin (Sn)	2014/08/31		109	%	80 - 120
			Total Titanium (Ti)	2014/08/31		104	%	80 - 120
			Total Uranium (U)	2014/08/31		98	%	80 - 120
			Total Vanadium (V)	2014/08/31		104	%	80 - 120
			Total Zinc (Zn)	2014/08/31		97	%	80 - 120
7621571	SF3	Spiked Blank	Total Aluminum (Al)	2014/08/31		102	%	80 - 120
			Total Antimony (Sb)	2014/08/31		101	%	80 - 120
			Total Arsenic (As)	2014/08/31		98	%	80 - 120
			Total Beryllium (Be)	2014/08/31		103	%	80 - 120
			Total Chromium (Cr)	2014/08/31		97	%	80 - 120
			Total Cobalt (Co)	2014/08/31		96	%	80 - 120
			Total Copper (Cu)	2014/08/31		96	%	80 - 120
			Total Lead (Pb)	2014/08/31		103	%	80 - 120
			Total Molybdenum (Mo)	2014/08/31		104	%	80 - 120
			Total Nickel (Ni)	2014/08/31		98	%	80 - 120
			Total Selenium (Se)	2014/08/31		99	%	80 - 120
			Total Silver (Ag)	2014/08/31		100	%	80 - 120
			Total Thallium (Tl)	2014/08/31		102	%	80 - 120
			Total Tin (Sn)	2014/08/31		104	%	80 - 120
			Total Titanium (Ti)	2014/08/31		100	%	80 - 120
			Total Uranium (U)	2014/08/31		100	%	80 - 120
			Total Vanadium (V)	2014/08/31		102	%	80 - 120
			Total Zinc (Zn)	2014/08/31		99	%	80 - 120
7621571	SF3	Method Blank	Total Aluminum (Al)	2014/08/31	<0.0030		mg/L	
			Total Antimony (Sb)	2014/08/31	<0.00060		mg/L	
			Total Arsenic (As)	2014/08/31	<0.00020		mg/L	
			Total Beryllium (Be)	2014/08/31	<0.0010		mg/L	
			Total Chromium (Cr)	2014/08/31	<0.0010		mg/L	
			Total Cobalt (Co)	2014/08/31	<0.00030		mg/L	
			Total Copper (Cu)	2014/08/31	<0.00020		mg/L	
			Total Lead (Pb)	2014/08/31	<0.00020		mg/L	
			Total Molybdenum (Mo)	2014/08/31	<0.00020		mg/L	
			Total Nickel (Ni)	2014/08/31	<0.00050		mg/L	
			Total Selenium (Se)	2014/08/31	<0.00020		mg/L	
			Total Silver (Ag)	2014/08/31	<0.00010		mg/L	
			Total Thallium (Tl)	2014/08/31	<0.00020		mg/L	

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Total Tin (Sn)	2014/08/31	<0.0010		mg/L	
			Total Titanium (Ti)	2014/08/31	<0.0010		mg/L	
			Total Uranium (U)	2014/08/31	<0.00010		mg/L	
			Total Vanadium (V)	2014/08/31	<0.0010		mg/L	
			Total Zinc (Zn)	2014/08/31	<0.0030		mg/L	
7621571	SF3	RPD	Total Aluminum (Al)	2014/08/31	NC		%	20
			Total Antimony (Sb)	2014/08/31	NC		%	20
			Total Arsenic (As)	2014/08/31	7.6		%	20
			Total Beryllium (Be)	2014/08/31	NC		%	20
			Total Chromium (Cr)	2014/08/31	NC		%	20
			Total Cobalt (Co)	2014/08/31	NC		%	20
			Total Copper (Cu)	2014/08/31	NC		%	20
			Total Lead (Pb)	2014/08/31	NC		%	20
			Total Molybdenum (Mo)	2014/08/31	NC		%	20
			Total Nickel (Ni)	2014/08/31	NC		%	20
			Total Selenium (Se)	2014/08/31	NC		%	20
			Total Silver (Ag)	2014/08/31	NC		%	20
			Total Thallium (Tl)	2014/08/31	NC		%	20
			Total Tin (Sn)	2014/08/31	NC		%	20
			Total Titanium (Ti)	2014/08/31	NC		%	20
			Total Uranium (U)	2014/08/31	6.9		%	20
			Total Vanadium (V)	2014/08/31	NC		%	20
			Total Zinc (Zn)	2014/08/31	NC		%	20
7621574	LT4	Matrix Spike [KL1990-02]	Total Barium (Ba)	2014/08/31		100	%	80 - 120
			Total Boron (B)	2014/08/31		101	%	80 - 120
			Total Calcium (Ca)	2014/08/31		96	%	80 - 120
			Total Iron (Fe)	2014/08/31		NC	%	80 - 120
			Total Lithium (Li)	2014/08/31		102	%	80 - 120
			Total Magnesium (Mg)	2014/08/31		104	%	80 - 120
			Total Manganese (Mn)	2014/08/31		98	%	80 - 120
			Total Phosphorus (P)	2014/08/31		98	%	80 - 120
			Total Potassium (K)	2014/08/31		104	%	80 - 120
			Total Silicon (Si)	2014/08/31		101	%	80 - 120
			Total Sodium (Na)	2014/08/31		104	%	80 - 120
			Total Strontium (Sr)	2014/08/31		99	%	80 - 120
7621574	LT4	Spiked Blank	Total Barium (Ba)	2014/08/31		98	%	80 - 120
			Total Boron (B)	2014/08/31		99	%	80 - 120
			Total Calcium (Ca)	2014/08/31		95	%	80 - 120
			Total Iron (Fe)	2014/08/31		99	%	80 - 120
			Total Lithium (Li)	2014/08/31		99	%	80 - 120
			Total Magnesium (Mg)	2014/08/31		102	%	80 - 120
			Total Manganese (Mn)	2014/08/31		98	%	80 - 120
			Total Phosphorus (P)	2014/08/31		96	%	80 - 120
			Total Potassium (K)	2014/08/31		102	%	80 - 120
			Total Silicon (Si)	2014/08/31		100	%	80 - 120
			Total Sodium (Na)	2014/08/31		102	%	80 - 120
			Total Strontium (Sr)	2014/08/31		97	%	80 - 120
			Total Sulphur (S)	2014/08/31		102	%	80 - 120
7621574	LT4	Method Blank	Total Barium (Ba)	2014/08/31	<0.010		mg/L	
			Total Boron (B)	2014/08/31	<0.020		mg/L	
			Total Calcium (Ca)	2014/08/31	<0.30		mg/L	
			Total Iron (Fe)	2014/08/31	<0.060		mg/L	

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Total Lithium (Li)	2014/08/31	<0.020		mg/L	
			Total Magnesium (Mg)	2014/08/31	<0.20		mg/L	
			Total Manganese (Mn)	2014/08/31	<0.0040		mg/L	
			Total Phosphorus (P)	2014/08/31	<0.10		mg/L	
			Total Potassium (K)	2014/08/31	<0.30		mg/L	
			Total Silicon (Si)	2014/08/31	<0.10		mg/L	
			Total Sodium (Na)	2014/08/31	<0.50		mg/L	
			Total Strontium (Sr)	2014/08/31	<0.020		mg/L	
			Total Sulphur (S)	2014/08/31	<0.20		mg/L	
7621574	LT4	RPD [KL1990-02]	Total Barium (Ba)	2014/08/31	NC		%	20
			Total Boron (B)	2014/08/31	NC		%	20
			Total Calcium (Ca)	2014/08/31	1.2		%	20
			Total Iron (Fe)	2014/08/31	1.5		%	20
			Total Lithium (Li)	2014/08/31	NC		%	20
			Total Magnesium (Mg)	2014/08/31	1.5		%	20
			Total Manganese (Mn)	2014/08/31	0.27		%	20
			Total Phosphorus (P)	2014/08/31	NC		%	20
			Total Potassium (K)	2014/08/31	NC		%	20
			Total Silicon (Si)	2014/08/31	0.68		%	20
			Total Sodium (Na)	2014/08/31	NC		%	20
			Total Strontium (Sr)	2014/08/31	NC		%	20
			Total Sulphur (S)	2014/08/31	NC		%	20
7621619	SF3	Matrix Spike	Dissolved Aluminum (Al)	2014/08/31		102	%	80 - 120
			Dissolved Antimony (Sb)	2014/08/31		96	%	80 - 120
			Dissolved Arsenic (As)	2014/08/31		99	%	80 - 120
			Dissolved Beryllium (Be)	2014/08/31		106	%	80 - 120
			Dissolved Chromium (Cr)	2014/08/31		98	%	80 - 120
			Dissolved Cobalt (Co)	2014/08/31		96	%	80 - 120
			Dissolved Copper (Cu)	2014/08/31		99	%	80 - 120
			Dissolved Lead (Pb)	2014/08/31		97	%	80 - 120
			Dissolved Molybdenum (Mo)	2014/08/31		108	%	80 - 120
			Dissolved Nickel (Ni)	2014/08/31		100	%	80 - 120
			Dissolved Selenium (Se)	2014/08/31		102	%	80 - 120
			Dissolved Silver (Ag)	2014/08/31		93	%	80 - 120
			Dissolved Thallium (Tl)	2014/08/31		98	%	80 - 120
			Dissolved Tin (Sn)	2014/08/31		106	%	80 - 120
			Dissolved Titanium (Ti)	2014/08/31		110	%	80 - 120
			Dissolved Uranium (U)	2014/08/31		100	%	80 - 120
			Dissolved Vanadium (V)	2014/08/31		106	%	80 - 120
			Dissolved Zinc (Zn)	2014/08/31		98	%	80 - 120
7621619	SF3	Spiked Blank	Dissolved Aluminum (Al)	2014/08/31		100	%	80 - 120
			Dissolved Antimony (Sb)	2014/08/31		92	%	80 - 120
			Dissolved Arsenic (As)	2014/08/31		99	%	80 - 120
			Dissolved Beryllium (Be)	2014/08/31		101	%	80 - 120
			Dissolved Chromium (Cr)	2014/08/31		99	%	80 - 120
			Dissolved Cobalt (Co)	2014/08/31		96	%	80 - 120
			Dissolved Copper (Cu)	2014/08/31		100	%	80 - 120
			Dissolved Lead (Pb)	2014/08/31		101	%	80 - 120
			Dissolved Molybdenum (Mo)	2014/08/31		104	%	80 - 120
			Dissolved Nickel (Ni)	2014/08/31		99	%	80 - 120
			Dissolved Selenium (Se)	2014/08/31		101	%	80 - 120
			Dissolved Silver (Ag)	2014/08/31		93	%	80 - 120

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Dissolved Thallium (Tl)	2014/08/31		100	%	80 - 120
			Dissolved Tin (Sn)	2014/08/31		103	%	80 - 120
			Dissolved Titanium (Ti)	2014/08/31		102	%	80 - 120
			Dissolved Uranium (U)	2014/08/31		99	%	80 - 120
			Dissolved Vanadium (V)	2014/08/31		102	%	80 - 120
			Dissolved Zinc (Zn)	2014/08/31		98	%	80 - 120
7621619	SF3	Method Blank	Dissolved Aluminum (Al)	2014/08/31	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2014/08/31	<0.00060		mg/L	
			Dissolved Arsenic (As)	2014/08/31	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2014/08/31	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2014/08/31	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2014/08/31	<0.00030		mg/L	
			Dissolved Copper (Cu)	2014/08/31	<0.00020		mg/L	
			Dissolved Lead (Pb)	2014/08/31	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2014/08/31	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2014/08/31	<0.00050		mg/L	
			Dissolved Selenium (Se)	2014/08/31	<0.00020		mg/L	
			Dissolved Silver (Ag)	2014/08/31	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2014/08/31	<0.00020		mg/L	
			Dissolved Tin (Sn)	2014/08/31	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2014/08/31	<0.0010		mg/L	
			Dissolved Uranium (U)	2014/08/31	<0.00010		mg/L	
			Dissolved Vanadium (V)	2014/08/31	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2014/08/31	<0.0030		mg/L	
7621619	SF3	RPD	Dissolved Aluminum (Al)	2014/08/31	3.6		%	20
			Dissolved Antimony (Sb)	2014/08/31	NC		%	20
			Dissolved Arsenic (As)	2014/08/31	NC		%	20
			Dissolved Beryllium (Be)	2014/08/31	NC		%	20
			Dissolved Chromium (Cr)	2014/08/31	NC		%	20
			Dissolved Cobalt (Co)	2014/08/31	NC		%	20
			Dissolved Copper (Cu)	2014/08/31	1.3		%	20
			Dissolved Lead (Pb)	2014/08/31	NC		%	20
			Dissolved Molybdenum (Mo)	2014/08/31	NC		%	20
			Dissolved Nickel (Ni)	2014/08/31	NC		%	20
			Dissolved Selenium (Se)	2014/08/31	NC		%	20
			Dissolved Silver (Ag)	2014/08/31	NC		%	20
			Dissolved Thallium (Tl)	2014/08/31	NC		%	20
			Dissolved Tin (Sn)	2014/08/31	NC		%	20
			Dissolved Titanium (Ti)	2014/08/31	NC		%	20
			Dissolved Uranium (U)	2014/08/31	0.59		%	20
			Dissolved Vanadium (V)	2014/08/31	NC		%	20
			Dissolved Zinc (Zn)	2014/08/31	NC		%	20
7621644	LT4	Matrix Spike [KL1991-03]	Dissolved Barium (Ba)	2014/08/31		97	%	80 - 120
			Dissolved Boron (B)	2014/08/31		102	%	80 - 120
			Dissolved Calcium (Ca)	2014/08/31		98	%	80 - 120
			Dissolved Iron (Fe)	2014/08/31		100	%	80 - 120
			Dissolved Lithium (Li)	2014/08/31		100	%	80 - 120
			Dissolved Magnesium (Mg)	2014/08/31		105	%	80 - 120
			Dissolved Manganese (Mn)	2014/08/31		100	%	80 - 120
			Dissolved Phosphorus (P)	2014/08/31		101	%	80 - 120
			Dissolved Potassium (K)	2014/08/31		104	%	80 - 120
			Dissolved Silicon (Si)	2014/08/31		103	%	80 - 120

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Dissolved Sodium (Na)	2014/08/31		100	%	80 - 120
			Dissolved Strontium (Sr)	2014/08/31		96	%	80 - 120
7621644	LT4	Spiked Blank	Dissolved Barium (Ba)	2014/08/31		96	%	80 - 120
			Dissolved Boron (B)	2014/08/31		101	%	80 - 120
			Dissolved Calcium (Ca)	2014/08/31		99	%	80 - 120
			Dissolved Iron (Fe)	2014/08/31		99	%	80 - 120
			Dissolved Lithium (Li)	2014/08/31		98	%	80 - 120
			Dissolved Magnesium (Mg)	2014/08/31		104	%	80 - 120
			Dissolved Manganese (Mn)	2014/08/31		99	%	80 - 120
			Dissolved Phosphorus (P)	2014/08/31		100	%	80 - 120
			Dissolved Potassium (K)	2014/08/31		103	%	80 - 120
			Dissolved Silicon (Si)	2014/08/31		102	%	80 - 120
			Dissolved Sodium (Na)	2014/08/31		99	%	80 - 120
			Dissolved Strontium (Sr)	2014/08/31		95	%	80 - 120
			Dissolved Sulphur (S)	2014/08/31		101	%	80 - 120
7621644	LT4	Method Blank	Dissolved Barium (Ba)	2014/08/31	<0.010		mg/L	
			Dissolved Boron (B)	2014/08/31	<0.020		mg/L	
			Dissolved Calcium (Ca)	2014/08/31	<0.30		mg/L	
			Dissolved Iron (Fe)	2014/08/31	<0.060		mg/L	
			Dissolved Lithium (Li)	2014/08/31	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2014/08/31	<0.20		mg/L	
			Dissolved Manganese (Mn)	2014/08/31	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2014/08/31	<0.10		mg/L	
			Dissolved Potassium (K)	2014/08/31	<0.30		mg/L	
			Dissolved Silicon (Si)	2014/08/31	<0.10		mg/L	
			Dissolved Sodium (Na)	2014/08/31	<0.50		mg/L	
			Dissolved Strontium (Sr)	2014/08/31	<0.020		mg/L	
			Dissolved Sulphur (S)	2014/08/31	<0.20		mg/L	
7621644	LT4	RPD [KL1991-03]	Dissolved Barium (Ba)	2014/08/31	NC		%	20
			Dissolved Boron (B)	2014/08/31	NC		%	20
			Dissolved Calcium (Ca)	2014/08/31	0.072		%	20
			Dissolved Iron (Fe)	2014/08/31	NC		%	20
			Dissolved Lithium (Li)	2014/08/31	NC		%	20
			Dissolved Magnesium (Mg)	2014/08/31	0.53		%	20
			Dissolved Manganese (Mn)	2014/08/31	NC		%	20
			Dissolved Phosphorus (P)	2014/08/31	NC		%	20
			Dissolved Potassium (K)	2014/08/31	1.0		%	20
			Dissolved Silicon (Si)	2014/08/31	1.1		%	20
			Dissolved Sodium (Na)	2014/08/31	0.57		%	20
			Dissolved Strontium (Sr)	2014/08/31	NC		%	20
			Dissolved Sulphur (S)	2014/08/31	NC		%	20
7621694	ZZ	Method Blank	Moisture	2014/09/02	<0.30		%	
7621694	ZZ	RPD	Moisture	2014/09/02	1.0		%	20
7622036	OO1	Spiked Blank	F4G-SG (Heavy Hydrocarbons-Grav.)	2014/09/02		83	%	70 - 130
7622036	OO1	Method Blank	F4G-SG (Heavy Hydrocarbons-Grav.)	2014/09/02	<500		mg/kg	
7622058	JB9	QC Standard	Sieve - Pan	2014/09/02		99	%	91 - 109
			Sieve - #200 (>0.075mm)	2014/09/02		101	%	84 - 116
7622058	JB9	RPD	Sieve - Pan	2014/09/02	0.11		%	35
			Sieve - #200 (>0.075mm)	2014/09/02	8.1		%	35
7622202	LT4	Matrix Spike	Soluble (Hot water) Boron (B)	2014/09/02		102	%	75 - 125
7622202	LT4	Spiked Blank	Soluble (Hot water) Boron (B)	2014/09/02		105	%	75 - 125

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
7622202	LT4	Method Blank	Soluble (Hot water) Boron (B)	2014/09/02	0.14 , RDL=0.10		mg/kg	
7622202	LT4	RPD	Soluble (Hot water) Boron (B)	2014/09/02	NC		%	35
7622543	SF3	Matrix Spike	Total Antimony (Sb)	2014/09/02		80	%	75 - 125
			Total Arsenic (As)	2014/09/02		97	%	75 - 125
			Total Barium (Ba)	2014/09/02		NC	%	75 - 125
			Total Beryllium (Be)	2014/09/02		99	%	75 - 125
			Total Cadmium (Cd)	2014/09/02		97	%	75 - 125
			Total Chromium (Cr)	2014/09/02		NC	%	75 - 125
			Total Cobalt (Co)	2014/09/02		93	%	75 - 125
			Total Copper (Cu)	2014/09/02		91	%	75 - 125
			Total Lead (Pb)	2014/09/02		96	%	75 - 125
			Total Mercury (Hg)	2014/09/02		97	%	75 - 125
			Total Molybdenum (Mo)	2014/09/02		102	%	75 - 125
			Total Nickel (Ni)	2014/09/02		92	%	75 - 125
			Total Selenium (Se)	2014/09/02		93	%	75 - 125
			Total Silver (Ag)	2014/09/02		97	%	75 - 125
			Total Thallium (Tl)	2014/09/02		97	%	75 - 125
			Total Tin (Sn)	2014/09/02		103	%	75 - 125
			Total Uranium (U)	2014/09/02		92	%	75 - 125
			Total Vanadium (V)	2014/09/02		NC	%	75 - 125
			Total Zinc (Zn)	2014/09/02		NC	%	75 - 125
7622543	SF3	QC Standard	Total Arsenic (As)	2014/09/02		114	%	50 - 150
			Total Barium (Ba)	2014/09/02		106	%	69 - 131
			Total Chromium (Cr)	2014/09/02		97	%	41 - 159
			Total Cobalt (Co)	2014/09/02		100	%	75 - 125
			Total Copper (Cu)	2014/09/02		98	%	73 - 127
			Total Lead (Pb)	2014/09/02		97	%	54 - 146
			Total Nickel (Ni)	2014/09/02		104	%	61 - 139
			Total Vanadium (V)	2014/09/02		111	%	50 - 150
			Total Zinc (Zn)	2014/09/02		106	%	72 - 128
7622543	SF3	Spiked Blank	Total Antimony (Sb)	2014/09/02		97	%	75 - 125
			Total Arsenic (As)	2014/09/02		99	%	75 - 125
			Total Barium (Ba)	2014/09/02		99	%	75 - 125
			Total Beryllium (Be)	2014/09/02		98	%	75 - 125
			Total Cadmium (Cd)	2014/09/02		96	%	75 - 125
			Total Chromium (Cr)	2014/09/02		99	%	75 - 125
			Total Cobalt (Co)	2014/09/02		98	%	75 - 125
			Total Copper (Cu)	2014/09/02		99	%	75 - 125
			Total Lead (Pb)	2014/09/02		100	%	75 - 125
			Total Mercury (Hg)	2014/09/02		102	%	75 - 125
			Total Molybdenum (Mo)	2014/09/02		100	%	75 - 125
			Total Nickel (Ni)	2014/09/02		99	%	75 - 125
			Total Selenium (Se)	2014/09/02		100	%	75 - 125
			Total Silver (Ag)	2014/09/02		98	%	75 - 125
			Total Thallium (Tl)	2014/09/02		102	%	75 - 125
			Total Tin (Sn)	2014/09/02		99	%	75 - 125
			Total Uranium (U)	2014/09/02		99	%	75 - 125
			Total Vanadium (V)	2014/09/02		102	%	75 - 125
			Total Zinc (Zn)	2014/09/02		102	%	75 - 125
7622543	SF3	Method Blank	Total Antimony (Sb)	2014/09/02	<1.0		mg/kg	
			Total Arsenic (As)	2014/09/02	<1.0		mg/kg	

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Total Barium (Ba)	2014/09/02	<10		mg/kg	
			Total Beryllium (Be)	2014/09/02	<0.40		mg/kg	
			Total Cadmium (Cd)	2014/09/02	<0.10		mg/kg	
			Total Chromium (Cr)	2014/09/02	<1.0		mg/kg	
			Total Cobalt (Co)	2014/09/02	<1.0		mg/kg	
			Total Copper (Cu)	2014/09/02	<5.0		mg/kg	
			Total Lead (Pb)	2014/09/02	<1.0		mg/kg	
			Total Mercury (Hg)	2014/09/02	<0.050		mg/kg	
			Total Molybdenum (Mo)	2014/09/02	<0.40		mg/kg	
			Total Nickel (Ni)	2014/09/02	<1.0		mg/kg	
			Total Selenium (Se)	2014/09/02	<0.50		mg/kg	
			Total Silver (Ag)	2014/09/02	<1.0		mg/kg	
			Total Thallium (Tl)	2014/09/02	<0.30		mg/kg	
			Total Tin (Sn)	2014/09/02	<1.0		mg/kg	
			Total Uranium (U)	2014/09/02	<1.0		mg/kg	
			Total Vanadium (V)	2014/09/02	<1.0		mg/kg	
			Total Zinc (Zn)	2014/09/02	<10		mg/kg	
7622543	SF3	RPD	Total Arsenic (As)	2014/09/02	NC		%	35
			Total Barium (Ba)	2014/09/02	9.9		%	35
			Total Chromium (Cr)	2014/09/02	12		%	35
			Total Copper (Cu)	2014/09/02	NC		%	35
			Total Lead (Pb)	2014/09/02	11		%	35
			Total Zinc (Zn)	2014/09/02	NC		%	35
7623070	ZZ	Method Blank	Moisture	2014/09/03	<0.30		%	
7623070	ZZ	RPD	Moisture	2014/09/03	2.0		%	20
7623749	SF3	Matrix Spike	Total Antimony (Sb)	2014/09/03		86	%	75 - 125
			Total Arsenic (As)	2014/09/03		97	%	75 - 125
			Total Barium (Ba)	2014/09/03		NC	%	75 - 125
			Total Beryllium (Be)	2014/09/03		99	%	75 - 125
			Total Cadmium (Cd)	2014/09/03		94	%	75 - 125
			Total Chromium (Cr)	2014/09/03		100	%	75 - 125
			Total Cobalt (Co)	2014/09/03		93	%	75 - 125
			Total Copper (Cu)	2014/09/03		92	%	75 - 125
			Total Lead (Pb)	2014/09/03		97	%	75 - 125
			Total Mercury (Hg)	2014/09/03		99	%	75 - 125
			Total Molybdenum (Mo)	2014/09/03		98	%	75 - 125
			Total Nickel (Ni)	2014/09/03		98	%	75 - 125
			Total Selenium (Se)	2014/09/03		96	%	75 - 125
			Total Silver (Ag)	2014/09/03		95	%	75 - 125
			Total Thallium (Tl)	2014/09/03		98	%	75 - 125
			Total Tin (Sn)	2014/09/03		98	%	75 - 125
			Total Uranium (U)	2014/09/03		93	%	75 - 125
			Total Vanadium (V)	2014/09/03		103	%	75 - 125
			Total Zinc (Zn)	2014/09/03		NC	%	75 - 125
7623749	SF3	QC Standard	Total Arsenic (As)	2014/09/03		117	%	50 - 150
			Total Barium (Ba)	2014/09/03		107	%	69 - 131
			Total Chromium (Cr)	2014/09/03		98	%	41 - 159
			Total Cobalt (Co)	2014/09/03		102	%	75 - 125
			Total Copper (Cu)	2014/09/03		106	%	73 - 127
			Total Lead (Pb)	2014/09/03		104	%	54 - 146
			Total Nickel (Ni)	2014/09/03		110	%	61 - 139
			Total Vanadium (V)	2014/09/03		115	%	50 - 150

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Total Zinc (Zn)	2014/09/03		110	%	72 - 128
7623749	SF3	Spiked Blank	Total Antimony (Sb)	2014/09/03		98	%	75 - 125
			Total Arsenic (As)	2014/09/03		102	%	75 - 125
			Total Barium (Ba)	2014/09/03		101	%	75 - 125
			Total Beryllium (Be)	2014/09/03		102	%	75 - 125
			Total Cadmium (Cd)	2014/09/03		98	%	75 - 125
			Total Chromium (Cr)	2014/09/03		100	%	75 - 125
			Total Cobalt (Co)	2014/09/03		100	%	75 - 125
			Total Copper (Cu)	2014/09/03		102	%	75 - 125
			Total Lead (Pb)	2014/09/03		104	%	75 - 125
			Total Mercury (Hg)	2014/09/03		104	%	75 - 125
			Total Molybdenum (Mo)	2014/09/03		103	%	75 - 125
			Total Nickel (Ni)	2014/09/03		102	%	75 - 125
			Total Selenium (Se)	2014/09/03		101	%	75 - 125
			Total Silver (Ag)	2014/09/03		99	%	75 - 125
			Total Thallium (Tl)	2014/09/03		104	%	75 - 125
			Total Tin (Sn)	2014/09/03		100	%	75 - 125
			Total Uranium (U)	2014/09/03		102	%	75 - 125
			Total Vanadium (V)	2014/09/03		104	%	75 - 125
			Total Zinc (Zn)	2014/09/03		104	%	75 - 125
7623749	SF3	Method Blank	Total Antimony (Sb)	2014/09/03	<1.0		mg/kg	
			Total Arsenic (As)	2014/09/03	<1.0		mg/kg	
			Total Barium (Ba)	2014/09/03	<10		mg/kg	
			Total Beryllium (Be)	2014/09/03	<0.40		mg/kg	
			Total Cadmium (Cd)	2014/09/03	<0.10		mg/kg	
			Total Chromium (Cr)	2014/09/03	<1.0		mg/kg	
			Total Cobalt (Co)	2014/09/03	<1.0		mg/kg	
			Total Copper (Cu)	2014/09/03	<5.0		mg/kg	
			Total Lead (Pb)	2014/09/03	<1.0		mg/kg	
			Total Mercury (Hg)	2014/09/03	<0.050		mg/kg	
			Total Molybdenum (Mo)	2014/09/03	<0.40		mg/kg	
			Total Nickel (Ni)	2014/09/03	<1.0		mg/kg	
			Total Selenium (Se)	2014/09/03	<0.50		mg/kg	
			Total Silver (Ag)	2014/09/03	<1.0		mg/kg	
			Total Thallium (Tl)	2014/09/03	<0.30		mg/kg	
			Total Tin (Sn)	2014/09/03	<1.0		mg/kg	
			Total Uranium (U)	2014/09/03	<1.0		mg/kg	
			Total Vanadium (V)	2014/09/03	<1.0		mg/kg	
			Total Zinc (Zn)	2014/09/03	<10		mg/kg	
7623749	SF3	RPD	Total Antimony (Sb)	2014/09/03	NC		%	35
			Total Arsenic (As)	2014/09/03	NC		%	35
			Total Barium (Ba)	2014/09/03	10		%	35
			Total Beryllium (Be)	2014/09/03	NC		%	35
			Total Cadmium (Cd)	2014/09/03	NC		%	35
			Total Chromium (Cr)	2014/09/03	2.6		%	35
			Total Cobalt (Co)	2014/09/03	NC		%	35
			Total Copper (Cu)	2014/09/03	NC		%	35
			Total Lead (Pb)	2014/09/03	NC		%	35
			Total Mercury (Hg)	2014/09/03	NC		%	35
			Total Molybdenum (Mo)	2014/09/03	NC		%	35
			Total Nickel (Ni)	2014/09/03	2.5		%	35
			Total Selenium (Se)	2014/09/03	NC		%	35

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Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Total Silver (Ag)	2014/09/03	NC		%	35
			Total Thallium (Tl)	2014/09/03	NC		%	35
			Total Tin (Sn)	2014/09/03	NC		%	35
			Total Uranium (U)	2014/09/03	NC		%	35
			Total Vanadium (V)	2014/09/03	5.2		%	35
			Total Zinc (Zn)	2014/09/03	NC		%	35
7623776	JHC	Matrix Spike	Soluble (Hot water) Boron (B)	2014/09/03		101	%	75 - 125
7623776	JHC	Spiked Blank	Soluble (Hot water) Boron (B)	2014/09/03		107	%	75 - 125
7623776	JHC	Method Blank	Soluble (Hot water) Boron (B)	2014/09/03	<0.10		mg/kg	
7623776	JHC	RPD	Soluble (Hot water) Boron (B)	2014/09/03	NC		%	35

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.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

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 (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

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 (one or both samples < 5x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

(2) Matrix spike below acceptance limits due to matrix interference. Reanalysis yeilds similar results.

(3) Matrix Spike exceeds acceptance limits due to matrix interference. Reanalysis yields similar results.

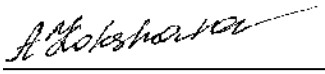
Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B474838
Report Date: 2014/09/03

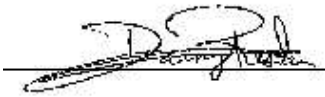
TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

VALIDATION SIGNATURE PAGE

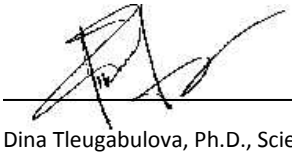
The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Anna Koksharova, M.Sc., Senior Analyst



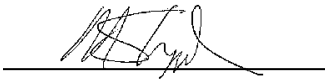
Daniel Reslan, Chem. Tech., Volatiles Supervisor



Dina Tleugabulova, Ph.D., Scientific Specialist, Inorganics Department

Karla Offord, B.Sc., Supervisor, Extractable Hydrocarbons

Luba Shymushovska, Senior Analyst, Organic Department



Michael Sheppard, Organics Supervisor

Pamela Kimmerly, Chem. Tech., Team Lead

Maxxam Job #: B474838
Report Date: 2014/09/03

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICHO MINE
Sampler Initials: TH

VALIDATION SIGNATURE PAGE(CONT'D)

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Yashu Mohan, B.Sc. B.Tech., 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.

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Your Project #: E14103202-01
Site Location: JERICO MINE

Attention: ROBERT ZSCHUPPE
TETRA TECH EBA INC.
14940-123 AVENUE
EDMONTON, AB
CANADA T5V 1B4

Your C.O.C. #: A159187, A159188, A131760, A131761, A131762, A131763, A131764, A131766, A131765

Report Date: 2014/09/09
Report #: R1638643
Version: 1

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B476653
Received: 2014/08/29, 10:25

Sample Matrix: Soil
Samples Received: 72

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Boron (Hot Water Soluble)	6	2014/09/08	2014/09/08	AB SOP-00034 / AB SOP-00042	EPA 200.7 CFR 2012 m
Boron (Hot Water Soluble)	1	2014/09/09	2014/09/09	AB SOP-00034 / AB SOP-00042	EPA 200.7 CFR 2012 m
BTEX/F1 by HS GC/MS (MeOH extract)	25	2014/08/31	2014/09/04	AB SOP-00039	CCME CWS/EPA 8260C m
BTEX/F1 by HS GC/MS (MeOH extract)	18	2014/08/31	2014/09/05	AB SOP-00039	CCME CWS/EPA 8260C m
BTEX/F1 by HS GC/MS (MeOH extract)	2	2014/09/01	2014/09/04	AB SOP-00039	CCME CWS/EPA 8260C m
BTEX/F1 by HS GC/MS (MeOH extract)	14	2014/09/01	2014/09/05	AB SOP-00039	CCME CWS/EPA 8260C m
BTEX/F1 by HS GC/MS (MeOH extract)	1	2014/09/02	2014/09/05	AB SOP-00039	CCME CWS/EPA 8260C m
Hexavalent Chromium	6	2014/09/07	2014/09/07	AB SOP-00063	SM 22 3500-Cr B m
Hexavalent Chromium	1	2014/09/09	2014/09/09	AB SOP-00063	SM 22 3500-Cr B m
CCME Hydrocarbons (F2-F4 in soil)	16	2014/08/31	2014/09/04	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS
CCME Hydrocarbons (F2-F4 in soil)	25	2014/08/31	2014/09/05	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS
CCME Hydrocarbons (F2-F4 in soil)	2	2014/08/31	2014/09/08	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS
CCME Hydrocarbons (F2-F4 in soil)	16	2014/09/01	2014/09/05	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS
CCME Hydrocarbons (F2-F4 in soil)	1	2014/09/02	2014/09/03	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS
Elements by ICPMS - Soils	6	2014/09/08	2014/09/08	AB SOP-00001 / AB SOP-00043	EPA 200.8 R5.4 m
Elements by ICPMS - Soils	1	2014/09/09	2014/09/09	AB SOP-00001 / AB SOP-00043	EPA 200.8 R5.4 m
Moisture	71	N/A	2014/09/02	AB SOP-00002	CCME PHC-CWS
Moisture	1	N/A	2014/09/03	AB SOP-00002	CCME PHC-CWS
Benzo[a]pyrene Equivalency	1	N/A	2014/09/05	AB SOP-00003	Auto Calc
Benzo[a]pyrene Equivalency	2	N/A	2014/09/07	AB SOP-00003	Auto Calc

Your Project #: E14103202-01
Site Location: JERICO MINE

Attention: ROBERT ZSCHUPPE
TETRA TECH EBA INC.
14940-123 AVENUE
EDMONTON, AB
CANADA T5V 1B4

Your C.O.C. #: A159187, A159188, A131760, A131761, A131762, A131763, A131764, A131766, A131765

Report Date: 2014/09/09
Report #: R1638643
Version: 1

CERTIFICATE OF ANALYSIS

Sample Matrix: Soil
Samples Received: 72

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
PAH in Soil by GC/MS	3	2014/08/31	2014/09/05	AB SOP-00036 / AB SOP-00003	EPA 8270D m
Particle Size by Sieve (75 micron)	1	N/A	2014/09/04	EENVSOP-00077	Carter 2nd ed 55.4 m

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Sherlyne Sim, B.Eng, Project Manager
Email: SSim@maxxam.ca
Phone# (780) 577-7113

==========

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 #: B476653
Report Date: 2014/09/09

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KM2690		KM2691		KM2692	KM2693		
Sampling Date		2014/08/26		2014/08/26		2014/08/26	2014/08/26		
COC Number		A159187		A159187		A159187	A159187		
	UNITS	**SS6-1**	**QC Batch**	**SS6-2**	**QC Batch**	**SS6-3**	**SS4-1**	**RDL**	**QC Batch**
Physical Properties									
Moisture	%	4.5	7621639	0.90	7621693	2.9	3.8	0.30	7621639
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	7621701	<10	7621958	<10	280	10	7621701
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	7621701	<50	7621958	<50	8300	50	7621701
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	7621701	<50	7621958	<50	1400	50	7621701
Reached Baseline at C50	mg/kg	Yes	7621701	Yes	7621958	Yes	Yes	N/A	7621701
Volatiles									
Benzene	mg/kg	<0.0050	7621780	<0.0050	7621780	<0.0050	<0.0050	0.0050	7621780
Toluene	mg/kg	<0.020	7621780	<0.020	7621780	<0.020	<0.020	0.020	7621780
Ethylbenzene	mg/kg	<0.010	7621780	<0.010	7621780	<0.010	<0.010	0.010	7621780
Xylenes (Total)	mg/kg	<0.040	7621780	<0.040	7621780	<0.040	<0.040	0.040	7621780
m & p-Xylene	mg/kg	<0.040	7621780	<0.040	7621780	<0.040	<0.040	0.040	7621780
o-Xylene	mg/kg	<0.020	7621780	<0.020	7621780	<0.020	<0.020	0.020	7621780
F1 (C6-C10) - BTEX	mg/kg	<12	7621780	<12	7621780	<12	<12	12	7621780
(C6-C10)	mg/kg	<12	7621780	<12	7621780	<12	<12	12	7621780
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	107	7621780	108	7621780	108	113	N/A	7621780
4-Bromofluorobenzene (sur.)	%	101	7621780	96	7621780	89	91	N/A	7621780
D10-ETHYLBENZENE (sur.)	%	97	7621780	102	7621780	102	99	N/A	7621780
D4-1,2-Dichloroethane (sur.)	%	102	7621780	100	7621780	99	102	N/A	7621780
O-TERPHENYL (sur.)	%	114	7621701	92	7621958	112	86	N/A	7621701

N/A = Not Applicable
RDL = Reportable Detection Limit

Maxxam Job #: B476653
Report Date: 2014/09/09

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KM2694		KM2696	KM2709		KM2711		
Sampling Date		2014/08/26		2014/08/26	2014/08/27		2014/08/27		
COC Number		A159187		A159187	A159188		A159188		
	UNITS	**SS9-1**	**QC Batch**	**SS9-3**	**SS9-5 20-30**	**QC Batch**	**SS9-7**	**RDL**	**QC Batch**
Physical Properties									
Moisture	%	14	7621694	19	12	7621693	5.7	0.30	7621639
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	3000	7621952	<10	27	7621952	60	10	7621701
F3 (C16-C34 Hydrocarbons)	mg/kg	1800	7621952	53	<50	7621952	200	50	7621701
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	7621952	<50	<50	7621952	<50	50	7621701
Reached Baseline at C50	mg/kg	Yes	7621952	Yes	Yes	7621952	Yes	N/A	7621701
Volatiles									
Benzene	mg/kg	<0.0050	7621838	<0.0050	<0.0050	7621838	<0.0050	0.0050	7621780
Toluene	mg/kg	0.043	7621838	<0.020	<0.020	7621838	<0.020	0.020	7621780
Ethylbenzene	mg/kg	<0.010	7621838	<0.010	<0.010	7621838	<0.010	0.010	7621780
Xylenes (Total)	mg/kg	6.3	7621838	<0.040	<0.040	7621838	<0.040	0.040	7621780
m & p-Xylene	mg/kg	2.6	7621838	<0.040	<0.040	7621838	<0.040	0.040	7621780
o-Xylene	mg/kg	3.7	7621838	<0.020	<0.020	7621838	<0.020	0.020	7621780
F1 (C6-C10) - BTEX	mg/kg	530	7621838	<12	<12	7621838	<12	12	7621780
(C6-C10)	mg/kg	540	7621838	<12	<12	7621838	<12	12	7621780
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	102	7621838	107	103	7621838	105	N/A	7621780
4-Bromofluorobenzene (sur.)	%	103	7621838	97	98	7621838	83	N/A	7621780
D10-ETHYLBENZENE (sur.)	%	101	7621838	106	102	7621838	95	N/A	7621780
D4-1,2-Dichloroethane (sur.)	%	109	7621838	106	110	7621838	93	N/A	7621780
O-TERPHENYL (sur.)	%	113	7621952	114	104	7621952	102	N/A	7621701

N/A = Not Applicable
RDL = Reportable Detection Limit

Maxxam Job #: B476653
Report Date: 2014/09/09

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KM2712		KM2714		KM2717		
Sampling Date		2014/08/27		2014/08/27		2014/08/27		
COC Number		A159188		A159188		A159188		
	UNITS	**SS9-8**	**QC Batch**	**SS9-10**	**QC Batch**	**SS9-13**	**RDL**	**QC Batch**
Physical Properties								
Moisture	%	6.5	7621693	4.6	7621694	7.9	0.30	7621693
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	1500	7621952	<10	7621952	3500	10	7621958
F3 (C16-C34 Hydrocarbons)	mg/kg	4100	7621952	120	7621952	4500	50	7621958
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	7621952	<50	7621952	<50	50	7621958
Reached Baseline at C50	mg/kg	Yes	7621952	Yes	7621952	Yes	N/A	7621958
Volatiles								
Benzene	mg/kg	<0.0050	7621838	<0.0050	7621838	<0.0050	0.0050	7621838
Toluene	mg/kg	<0.020	7621838	<0.020	7621838	<0.020	0.020	7621838
Ethylbenzene	mg/kg	<0.010	7621838	<0.010	7621838	<0.010	0.010	7621838
Xylenes (Total)	mg/kg	<0.040	7621838	<0.040	7621838	<0.040	0.040	7621838
m & p-Xylene	mg/kg	<0.040	7621838	<0.040	7621838	<0.040	0.040	7621838
o-Xylene	mg/kg	<0.020	7621838	<0.020	7621838	<0.020	0.020	7621838
F1 (C6-C10) - BTEX	mg/kg	<12	7621838	<12	7621838	<12	12	7621838
(C6-C10)	mg/kg	<12	7621838	<12	7621838	<12	12	7621838
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	101	7621838	110	7621838	103	N/A	7621838
4-Bromofluorobenzene (sur.)	%	97	7621838	116	7621838	98	N/A	7621838
D10-ETHYLBENZENE (sur.)	%	100	7621838	96	7621838	98	N/A	7621838
D4-1,2-Dichloroethane (sur.)	%	110	7621838	123	7621838	115	N/A	7621838
O-TERPHENYL (sur.)	%	117	7621952	106	7621952	92	N/A	7621958

N/A = Not Applicable
RDL = Reportable Detection Limit

Maxxam Job #: B476653
Report Date: 2014/09/09

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KM2718		KM2719	KM2721	KM2723		
Sampling Date		2014/08/27		2014/08/27	2014/08/27	2014/08/27		
COC Number		A159188		A131760	A131760	A131760		
	UNITS	**DUP4**	**QC Batch**	**SS9-14**	**SS9-16**	**SS9-18**	**RDL**	**QC Batch**
Physical Properties								
Moisture	%	8.2	7621639	7.7	4.9	5.3	0.30	7621693
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	3500	7621701	4200	22	<10	10	7621958
F3 (C16-C34 Hydrocarbons)	mg/kg	5900	7621701	4800	11000	<50	50	7621958
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	7621701	<50	1900	<50	50	7621958
Reached Baseline at C50	mg/kg	Yes	7621701	Yes	Yes	Yes	N/A	7621958
Volatiles								
Benzene	mg/kg	<0.0050	7621780	<0.0050	<0.0050	<0.0050	0.0050	7621838
Toluene	mg/kg	<0.020	7621780	<0.020	<0.020	<0.020	0.020	7621838
Ethylbenzene	mg/kg	<0.010	7621780	<0.010	<0.010	<0.010	0.010	7621838
Xylenes (Total)	mg/kg	<0.040	7621780	<0.040	<0.040	<0.040	0.040	7621838
m & p-Xylene	mg/kg	<0.040	7621780	<0.040	<0.040	<0.040	0.040	7621838
o-Xylene	mg/kg	<0.020	7621780	<0.020	<0.020	<0.020	0.020	7621838
F1 (C6-C10) - BTEX	mg/kg	<12	7621780	14	<12	<12	12	7621838
(C6-C10)	mg/kg	<12	7621780	14	<12	<12	12	7621838
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	110	7621780	101	99	100	N/A	7621838
4-Bromofluorobenzene (sur.)	%	86	7621780	99	98	98	N/A	7621838
D10-ETHYLBENZENE (sur.)	%	92	7621780	102	101	102	N/A	7621838
D4-1,2-Dichloroethane (sur.)	%	98	7621780	108	108	108	N/A	7621838
O-TERPHENYL (sur.)	%	105	7621701	96	87	93	N/A	7621958

N/A = Not Applicable
RDL = Reportable Detection Limit

Maxxam Job #: B476653
Report Date: 2014/09/09

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KM2725	KM2727	KM2729		KM2730		
Sampling Date		2014/08/27	2014/08/27	2014/08/27		2014/08/27		
COC Number		A131760	A131760	A131760		A131760		
	UNITS	**SS9-20**	**SS7-2**	**SS7-4**	**QC Batch**	**SS7-5**	**RDL**	**QC Batch**
Physical Properties								
Moisture	%	9.9	4.8	3.6	7621639	16	0.30	7621693
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	1500	<10	<10	7621701	2400	10	7621958
F3 (C16-C34 Hydrocarbons)	mg/kg	11000	<50	260	7621701	1400	50	7621958
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	180	7621701	<50	50	7621958
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	7621701	Yes	N/A	7621958
Volatiles								
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	7621780	<0.0050	0.0050	7621838
Toluene	mg/kg	0.083	<0.020	<0.020	7621780	<0.020	0.020	7621838
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	7621780	<0.010	0.010	7621838
Xylenes (Total)	mg/kg	<0.040	<0.040	<0.040	7621780	<0.040	0.040	7621838
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	7621780	<0.040	0.040	7621838
o-Xylene	mg/kg	<0.020	<0.020	<0.020	7621780	<0.020	0.020	7621838
F1 (C6-C10) - BTEX	mg/kg	<12	<12	<12	7621780	91	12	7621838
(C6-C10)	mg/kg	<12	<12	<12	7621780	91	12	7621838
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	108	113	111	7621780	106	N/A	7621838
4-Bromofluorobenzene (sur.)	%	96	96	93	7621780	105	N/A	7621838
D10-ETHYLBENZENE (sur.)	%	98	97	99	7621780	111	N/A	7621838
D4-1,2-Dichloroethane (sur.)	%	106	101	98	7621780	107	N/A	7621838
O-TERPHENYL (sur.)	%	111	102	100	7621701	106	N/A	7621958

N/A = Not Applicable
RDL = Reportable Detection Limit

Maxxam Job #: B476653
Report Date: 2014/09/09

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KM2732		KM2733		KM2735		
Sampling Date		2014/08/27		2014/08/27		2014/08/27		
COC Number		A131761		A131761		A131761		
	UNITS	**SS7-7**	**QC Batch**	**SS7-8**	**QC Batch**	**SS8-2**	**RDL**	**QC Batch**
Physical Properties								
Moisture	%	8.4	7621693	14	7621639	8.7	0.30	7621636
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	160	7621958	16	7621701	820	10	7621702
F3 (C16-C34 Hydrocarbons)	mg/kg	7700	7621958	3300	7621701	180	50	7621702
F4 (C34-C50 Hydrocarbons)	mg/kg	5000	7621958	2400	7621701	<50	50	7621702
Reached Baseline at C50	mg/kg	Yes	7621958	Yes	7621701	Yes	N/A	7621702
Volatiles								
Benzene	mg/kg	<0.0050	7621780	<0.0050	7621780	<0.0050	0.0050	7621777
Toluene	mg/kg	<0.020	7621780	<0.020	7621780	<0.020	0.020	7621777
Ethylbenzene	mg/kg	<0.010	7621780	<0.010	7621780	<0.010	0.010	7621777
Xylenes (Total)	mg/kg	<0.040	7621780	<0.040	7621780	<0.040	0.040	7621777
m & p-Xylene	mg/kg	<0.040	7621780	<0.040	7621780	<0.040	0.040	7621777
o-Xylene	mg/kg	<0.020	7621780	<0.020	7621780	0.027	0.020	7621777
F1 (C6-C10) - BTEX	mg/kg	<12	7621780	<12	7621780	25	12	7621777
(C6-C10)	mg/kg	<12	7621780	<12	7621780	25	12	7621777
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	115	7621780	118	7621780	101	N/A	7621777
4-Bromofluorobenzene (sur.)	%	92	7621780	87	7621780	103	N/A	7621777
D10-ETHYLBENZENE (sur.)	%	98	7621780	101	7621780	111	N/A	7621777
D4-1,2-Dichloroethane (sur.)	%	99	7621780	95	7621780	103	N/A	7621777
O-TERPHENYL (sur.)	%	83	7621958	102	7621701	93	N/A	7621702

N/A = Not Applicable
RDL = Reportable Detection Limit

Maxxam Job #: B476653
Report Date: 2014/09/09

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KM2737		KM2739		KM2741		
Sampling Date		2014/08/27		2014/08/27		2014/08/27		
COC Number		A131761		A131761		A131761		
	UNITS	**SS8-4**	**QC Batch**	**SS8-6**	**QC Batch**	**SS8-8**	**RDL**	**QC Batch**
Physical Properties								
Moisture	%	13	7621639	15	7621694	4.0	0.30	7621639
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	6300	7621932	4500	7621952	<10	10	7621701
F3 (C16-C34 Hydrocarbons)	mg/kg	4200	7621932	2800	7621952	59	50	7621701
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	7621932	<50	7621952	<50	50	7621701
Reached Baseline at C50	mg/kg	Yes	7621932	Yes	7621952	Yes	N/A	7621701
Volatiles								
Benzene	mg/kg	<0.0050	7621780	<0.0050	7621838	<0.0050	0.0050	7621780
Toluene	mg/kg	<0.020	7621780	<0.020	7621838	<0.020	0.020	7621780
Ethylbenzene	mg/kg	<0.010	7621780	<0.010	7621838	<0.010	0.010	7621780
Xylenes (Total)	mg/kg	<0.040	7621780	0.075	7621838	<0.040	0.040	7621780
m & p-Xylene	mg/kg	<0.040	7621780	<0.040	7621838	<0.040	0.040	7621780
o-Xylene	mg/kg	<0.020	7621780	0.075	7621838	<0.020	0.020	7621780
F1 (C6-C10) - BTEX	mg/kg	56	7621780	220	7621838	<12	12	7621780
(C6-C10)	mg/kg	56	7621780	220	7621838	<12	12	7621780
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	113	7621780	104	7621838	103	N/A	7621780
4-Bromofluorobenzene (sur.)	%	85	7621780	115	7621838	107	N/A	7621780
D10-ETHYLBENZENE (sur.)	%	92	7621780	107	7621838	96	N/A	7621780
D4-1,2-Dichloroethane (sur.)	%	96	7621780	107	7621838	99	N/A	7621780
O-TERPHENYL (sur.)	%	83	7621932	115	7621952	103	N/A	7621701

N/A = Not Applicable
RDL = Reportable Detection Limit

Maxxam Job #: B476653
Report Date: 2014/09/09

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KM2742		KM2744		KM2745		
Sampling Date		2014/08/27		2014/08/27		2014/08/27		
COC Number		A131761		A131762		A131762		
	UNITS	**SS8-9 20-40**	**QC Batch**	**SS8-10**	**QC Batch**	**SS8-11**	**RDL**	**QC Batch**
Physical Properties								
Moisture	%	7.9	7621693	13	7621639	7.0	0.30	7621693
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	930	7621958	4300	7621701	16	10	7621952
F3 (C16-C34 Hydrocarbons)	mg/kg	540	7621958	2500	7621701	<50	50	7621952
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	7621958	<50	7621701	<50	50	7621952
Reached Baseline at C50	mg/kg	Yes	7621958	Yes	7621701	Yes	N/A	7621952
Volatiles								
Benzene	mg/kg	<0.0050	7621838	<0.0050	7621780	<0.0050	0.0050	7621838
Toluene	mg/kg	<0.020	7621838	<0.020	7621780	<0.020	0.020	7621838
Ethylbenzene	mg/kg	<0.010	7621838	0.018	7621780	<0.010	0.010	7621838
Xylenes (Total)	mg/kg	<0.040	7621838	0.27	7621780	<0.040	0.040	7621838
m & p-Xylene	mg/kg	<0.040	7621838	0.069	7621780	<0.040	0.040	7621838
o-Xylene	mg/kg	<0.020	7621838	0.21	7621780	<0.020	0.020	7621838
F1 (C6-C10) - BTEX	mg/kg	43	7621838	340	7621780	<12	12	7621838
(C6-C10)	mg/kg	43	7621838	340	7621780	<12	12	7621838
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	100	7621838	111	7621780	102	N/A	7621838
4-Bromofluorobenzene (sur.)	%	102	7621838	83	7621780	98	N/A	7621838
D10-ETHYLBENZENE (sur.)	%	103	7621838	114	7621780	104	N/A	7621838
D4-1,2-Dichloroethane (sur.)	%	106	7621838	99	7621780	106	N/A	7621838
O-TERPHENYL (sur.)	%	94	7621958	110	7621701	105	N/A	7621952

N/A = Not Applicable
RDL = Reportable Detection Limit

Maxxam Job #: B476653
Report Date: 2014/09/09

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KM2746		KM2748		KM2749		
Sampling Date		2014/08/27		2014/08/27		2014/08/27		
COC Number		A131762		A131762		A131762		
	UNITS	**SS8-12**	**QC Batch**	**SS8-14**	**QC Batch**	**SS8-15**	**RDL**	**QC Batch**
Physical Properties								
Moisture	%	4.5	7621639	3.0	7621693	12	0.30	7621636
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	7621701	<10	7621952	4300	10	7621932
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	7621701	<50	7621952	8100	50	7621932
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	7621701	<50	7621952	<50	50	7621932
Reached Baseline at C50	mg/kg	Yes	7621701	Yes	7621952	Yes	N/A	7621932
Volatiles								
Benzene	mg/kg	<0.0050	7621780	<0.0050	7621838	<0.0050	0.0050	7621777
Toluene	mg/kg	<0.020	7621780	<0.020	7621838	<0.020	0.020	7621777
Ethylbenzene	mg/kg	<0.010	7621780	<0.010	7621838	<0.010	0.010	7621777
Xylenes (Total)	mg/kg	<0.040	7621780	<0.040	7621838	<0.040	0.040	7621777
m & p-Xylene	mg/kg	<0.040	7621780	<0.040	7621838	<0.040	0.040	7621777
o-Xylene	mg/kg	<0.020	7621780	<0.020	7621838	0.038	0.020	7621777
F1 (C6-C10) - BTEX	mg/kg	<12	7621780	<12	7621838	93	12	7621777
(C6-C10)	mg/kg	<12	7621780	<12	7621838	93	12	7621777
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	99	7621780	99	7621838	105	N/A	7621777
4-Bromofluorobenzene (sur.)	%	106	7621780	98	7621838	104	N/A	7621777
D10-ETHYLBENZENE (sur.)	%	97	7621780	100	7621838	106	N/A	7621777
D4-1,2-Dichloroethane (sur.)	%	106	7621780	108	7621838	107	N/A	7621777
O-TERPHENYL (sur.)	%	102	7621701	103	7621952	107	N/A	7621932

N/A = Not Applicable
RDL = Reportable Detection Limit

Maxxam Job #: B476653
Report Date: 2014/09/09

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KM2751	KM2753	KM2754		KM2756		
Sampling Date		2014/08/27	2014/08/27	2014/08/27		2014/08/27		
COC Number		A131762	A131762	A131762		A131763		
	UNITS	**SS8-17**	**SS8-19**	**SS8-20**	**QC Batch**	**DUP5**	**RDL**	**QC Batch**
Physical Properties								
Moisture	%	16	16	17	7621636	15	0.30	7621633
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	2300	84	7621702	2000	10	7621701
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	1900	260	7621702	1800	50	7621701
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	<50	7621702	<50	50	7621701
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	7621702	Yes	N/A	7621701
Volatiles								
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	7621777	<0.0050	0.0050	7621836
Toluene	mg/kg	<0.020	<0.020	<0.020	7621777	<0.020	0.020	7621836
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	7621777	<0.010	0.010	7621836
Xylenes (Total)	mg/kg	<0.040	0.056	<0.040	7621777	0.045	0.040	7621836
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	7621777	<0.040	0.040	7621836
o-Xylene	mg/kg	<0.020	0.056	<0.020	7621777	0.045	0.020	7621836
F1 (C6-C10) - BTEX	mg/kg	<12	20	<12	7621777	16	12	7621836
(C6-C10)	mg/kg	<12	20	<12	7621777	16	12	7621836
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	106	105	104	7621777	117	N/A	7621836
4-Bromofluorobenzene (sur.)	%	101	102	100	7621777	91	N/A	7621836
D10-ETHYLBENZENE (sur.)	%	110	106	107	7621777	104	N/A	7621836
D4-1,2-Dichloroethane (sur.)	%	107	104	105	7621777	104	N/A	7621836
O-TERPHENYL (sur.)	%	101	115	97	7621702	107	N/A	7621701

N/A = Not Applicable
RDL = Reportable Detection Limit

Maxxam Job #: B476653
Report Date: 2014/09/09

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KM2757		KM2758		KM2759		
Sampling Date		2014/08/27		2014/08/28		2014/08/28		
COC Number		A131763		A131763		A131763		
	UNITS	**RCC1**	**QC Batch**	**SS10-1**	**QC Batch**	**SS10-2**	**RDL**	**QC Batch**
Physical Properties								
Moisture	%	4.7	7621636	5.8	7621639	5.0	0.30	7621636
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	2400	7621702	11	7621701	<10	10	7621702
F3 (C16-C34 Hydrocarbons)	mg/kg	1300	7621702	270	7621701	91	50	7621702
F4 (C34-C50 Hydrocarbons)	mg/kg	120	7621702	<50	7621701	<50	50	7621702
Reached Baseline at C50	mg/kg	Yes	7621702	Yes	7621701	Yes	N/A	7621702
Volatiles								
Benzene	mg/kg	<0.0050	7621777	<0.0050	7621780	<0.0050	0.0050	7621777
Toluene	mg/kg	<0.020	7621777	<0.020	7621780	<0.020	0.020	7621777
Ethylbenzene	mg/kg	<0.010	7621777	<0.010	7621780	<0.010	0.010	7621777
Xylenes (Total)	mg/kg	<0.040	7621777	<0.040	7621780	<0.040	0.040	7621777
m & p-Xylene	mg/kg	<0.040	7621777	<0.040	7621780	<0.040	0.040	7621777
o-Xylene	mg/kg	<0.020	7621777	<0.020	7621780	<0.020	0.020	7621777
F1 (C6-C10) - BTEX	mg/kg	190	7621777	<12	7621780	<12	12	7621777
(C6-C10)	mg/kg	190	7621777	<12	7621780	<12	12	7621777
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	101	7621777	110	7621780	99	N/A	7621777
4-Bromofluorobenzene (sur.)	%	118	7621777	95	7621780	100	N/A	7621777
D10-ETHYLBENZENE (sur.)	%	109	7621777	104	7621780	113	N/A	7621777
D4-1,2-Dichloroethane (sur.)	%	104	7621777	99	7621780	104	N/A	7621777
O-TERPHENYL (sur.)	%	106	7621702	103	7621701	106	N/A	7621702

N/A = Not Applicable
RDL = Reportable Detection Limit

Maxxam Job #: B476653
Report Date: 2014/09/09

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KM2761		KM2764		KM2765		
Sampling Date		2014/08/28		2014/08/28		2014/08/28		
COC Number		A131763		A131763		A131763		
	UNITS	**SS10-4**	**QC Batch**	**SS10-7**	**QC Batch**	**SS10-8**	**RDL**	**QC Batch**
Physical Properties								
Moisture	%	5.6	7621633	5.9	7621636	3.8	0.30	7621633
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	200	7621932	69	7621702	75	10	7621701
F3 (C16-C34 Hydrocarbons)	mg/kg	680	7621932	1700	7621702	16000	50	7621701
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	7621932	300	7621702	15000	50	7621701
Reached Baseline at C50	mg/kg	Yes	7621932	Yes	7621702	Yes	N/A	7621701
Volatiles								
Benzene	mg/kg	<0.0050	7621836	<0.0050	7621777	<0.0050	0.0050	7621836
Toluene	mg/kg	<0.020	7621836	<0.020	7621777	<0.020	0.020	7621836
Ethylbenzene	mg/kg	<0.010	7621836	<0.010	7621777	<0.010	0.010	7621836
Xylenes (Total)	mg/kg	<0.040	7621836	<0.040	7621777	<0.040	0.040	7621836
m & p-Xylene	mg/kg	<0.040	7621836	<0.040	7621777	<0.040	0.040	7621836
o-Xylene	mg/kg	<0.020	7621836	<0.020	7621777	<0.020	0.020	7621836
F1 (C6-C10) - BTEX	mg/kg	<12	7621836	<12	7621777	<12	12	7621836
(C6-C10)	mg/kg	<12	7621836	<12	7621777	<12	12	7621836
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	105	7621836	101	7621777	104	N/A	7621836
4-Bromofluorobenzene (sur.)	%	100	7621836	99	7621777	106	N/A	7621836
D10-ETHYLBENZENE (sur.)	%	100	7621836	108	7621777	93	N/A	7621836
D4-1,2-Dichloroethane (sur.)	%	101	7621836	104	7621777	106	N/A	7621836
O-TERPHENYL (sur.)	%	72	7621932	96	7621702	91	N/A	7621701

N/A = Not Applicable
RDL = Reportable Detection Limit

Maxxam Job #: B476653
Report Date: 2014/09/09

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KM2766		KM2767		KM2770		
Sampling Date		2014/08/28		2014/08/28		2014/08/28		
COC Number		A131763		A131764		A131764		
	UNITS	**SS10-9**	**QC Batch**	**SS10-10**	**QC Batch**	**SS10-13**	**RDL**	**QC Batch**
Physical Properties								
Moisture	%	4.9	7621633	5.9	7621636	4.0	0.30	7621633
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	21	7621932	2500	7621702	<10	10	7621932
F3 (C16-C34 Hydrocarbons)	mg/kg	730	7621932	2600	7621702	<50	50	7621932
F4 (C34-C50 Hydrocarbons)	mg/kg	170	7621932	<50	7621702	<50	50	7621932
Reached Baseline at C50	mg/kg	Yes	7621932	Yes	7621702	Yes	N/A	7621932
Volatiles								
Benzene	mg/kg	<0.0050	7621836	<0.0050	7621777	<0.0050	0.0050	7621836
Toluene	mg/kg	<0.020	7621836	<0.020	7621777	<0.020	0.020	7621836
Ethylbenzene	mg/kg	<0.010	7621836	<0.010	7621777	<0.010	0.010	7621836
Xylenes (Total)	mg/kg	<0.040	7621836	<0.040	7621777	<0.040	0.040	7621836
m & p-Xylene	mg/kg	<0.040	7621836	<0.040	7621777	<0.040	0.040	7621836
o-Xylene	mg/kg	<0.020	7621836	<0.020	7621777	<0.020	0.020	7621836
F1 (C6-C10) - BTEX	mg/kg	<12	7621836	<12	7621777	<12	12	7621836
(C6-C10)	mg/kg	<12	7621836	<12	7621777	<12	12	7621836
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	109	7621836	103	7621777	108	N/A	7621836
4-Bromofluorobenzene (sur.)	%	102	7621836	101	7621777	92	N/A	7621836
D10-ETHYLBENZENE (sur.)	%	103	7621836	108	7621777	98	N/A	7621836
D4-1,2-Dichloroethane (sur.)	%	105	7621836	107	7621777	103	N/A	7621836
O-TERPHENYL (sur.)	%	89	7621932	103	7621702	83	N/A	7621932

N/A = Not Applicable
RDL = Reportable Detection Limit

Maxxam Job #: B476653
Report Date: 2014/09/09

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KM2771		KM2772		KM2776		
Sampling Date		2014/08/28		2014/08/28		2014/08/28		
COC Number		A131764		A131764		A131764		
	UNITS	**SS10-14**	**QC Batch**	**SS10-15**	**QC Batch**	**SS10-19**	**RDL**	**QC Batch**
Physical Properties								
Moisture	%	8.0	7621633	7.5	7621636	5.8	0.30	7621648
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	870	7621701	1500	7621702	560	10	7621701
F3 (C16-C34 Hydrocarbons)	mg/kg	1000	7621701	1000	7621702	14000	50	7621701
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	7621701	<50	7621702	1700	50	7621701
Reached Baseline at C50	mg/kg	Yes	7621701	Yes	7621702	Yes	N/A	7621701
Volatiles								
Benzene	mg/kg	<0.0050	7621836	<0.0050	7621777	<0.0050	0.0050	7621780
Toluene	mg/kg	<0.020	7621836	<0.020	7621777	<0.020	0.020	7621780
Ethylbenzene	mg/kg	<0.010	7621836	<0.010	7621777	<0.010	0.010	7621780
Xylenes (Total)	mg/kg	<0.040	7621836	<0.040	7621777	<0.040	0.040	7621780
m & p-Xylene	mg/kg	<0.040	7621836	<0.040	7621777	<0.040	0.040	7621780
o-Xylene	mg/kg	<0.020	7621836	<0.020	7621777	<0.020	0.020	7621780
F1 (C6-C10) - BTEX	mg/kg	<12	7621836	22	7621777	<12	12	7621780
(C6-C10)	mg/kg	<12	7621836	22	7621777	<12	12	7621780
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	113	7621836	100	7621777	108	N/A	7621780
4-Bromofluorobenzene (sur.)	%	87	7621836	102	7621777	85	N/A	7621780
D10-ETHYLBENZENE (sur.)	%	102	7621836	108	7621777	97	N/A	7621780
D4-1,2-Dichloroethane (sur.)	%	102	7621836	106	7621777	98	N/A	7621780
O-TERPHENYL (sur.)	%	103	7621701	99	7621702	89	N/A	7621701

N/A = Not Applicable
RDL = Reportable Detection Limit

Maxxam Job #: B476653
Report Date: 2014/09/09

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KM2778		KM2780			KM2781		
Sampling Date		2014/08/28		2014/08/28			2014/08/28		
COC Number		A131764		A131766			A131766		
	UNITS	**SS10-21**	**QC Batch**	**SS10-23**	**RDL**	**QC Batch**	**SS10-24**	**RDL**	**QC Batch**
Physical Properties									
Moisture	%	5.2	7621633	5.0	0.30	7621636	5.4	0.30	7621636
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	7621932	<10	10	7621932	410 (1)	100	7621702
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	7621932	1800	50	7621932	75000 (1)	500	7621702
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	7621932	100	50	7621932	29000 (1)	500	7621702
Reached Baseline at C50	mg/kg	Yes	7621932	Yes	N/A	7621932	Yes	N/A	7621702
Volatiles									
Benzene	mg/kg	<0.0050	7621836	<0.0050	0.0050	7621777	<0.0050	0.0050	7621777
Toluene	mg/kg	<0.020	7621836	<0.020	0.020	7621777	<0.020	0.020	7621777
Ethylbenzene	mg/kg	<0.010	7621836	<0.010	0.010	7621777	<0.010	0.010	7621777
Xylenes (Total)	mg/kg	<0.040	7621836	<0.040	0.040	7621777	<0.040	0.040	7621777
m & p-Xylene	mg/kg	<0.040	7621836	<0.040	0.040	7621777	<0.040	0.040	7621777
o-Xylene	mg/kg	<0.020	7621836	<0.020	0.020	7621777	<0.020	0.020	7621777
F1 (C6-C10) - BTEX	mg/kg	<12	7621836	<12	12	7621777	<12	12	7621777
(C6-C10)	mg/kg	<12	7621836	<12	12	7621777	<12	12	7621777
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	104	7621836	98	N/A	7621777	101	N/A	7621777
4-Bromofluorobenzene (sur.)	%	99	7621836	99	N/A	7621777	98	N/A	7621777
D10-ETHYLBENZENE (sur.)	%	98	7621836	102	N/A	7621777	95	N/A	7621777
D4-1,2-Dichloroethane (sur.)	%	101	7621836	109	N/A	7621777	112	N/A	7621777
O-TERPHENYL (sur.)	%	84	7621932	85	N/A	7621932	104	N/A	7621702

N/A = Not Applicable
RDL = Reportable Detection Limit
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Job #: B476653
Report Date: 2014/09/09

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KM2782		KM2783		KM2785	KM2786		
Sampling Date		2014/08/28		2014/08/28		2014/08/28	2014/08/28		
COC Number		A131766		A131766		A131766	A131766		
	UNITS	**SS14-1**	**RDL**	**SS14-2**	**RDL**	**SS14-4**	**SS14-5**	**RDL**	**QC Batch**
Physical Properties									
Moisture	%	6.1	0.30	3.8	0.30	4.0	6.9	0.30	7621636
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	10	1300 (1)	100	<10	<10	10	7621702
F3 (C16-C34 Hydrocarbons)	mg/kg	140	50	32000 (1)	500	<50	200	50	7621702
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	50	7000 (1)	500	<50	<50	50	7621702
Reached Baseline at C50	mg/kg	Yes	N/A	Yes	N/A	Yes	Yes	N/A	7621702
Volatiles									
Benzene	mg/kg	<0.0050	0.0050	<0.0050	0.0050	<0.0050	<0.0050	0.0050	7621777
Toluene	mg/kg	<0.020	0.020	<0.020	0.020	<0.020	<0.020	0.020	7621777
Ethylbenzene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	<0.010	0.010	7621777
Xylenes (Total)	mg/kg	<0.040	0.040	<0.040	0.040	<0.040	<0.040	0.040	7621777
m & p-Xylene	mg/kg	<0.040	0.040	<0.040	0.040	<0.040	<0.040	0.040	7621777
o-Xylene	mg/kg	<0.020	0.020	<0.020	0.020	<0.020	<0.020	0.020	7621777
F1 (C6-C10) - BTEX	mg/kg	<12	12	<12	12	<12	<12	12	7621777
(C6-C10)	mg/kg	<12	12	<12	12	<12	<12	12	7621777
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	101	N/A	99	N/A	99	101	N/A	7621777
4-Bromofluorobenzene (sur.)	%	99	N/A	99	N/A	99	99	N/A	7621777
D10-ETHYLBENZENE (sur.)	%	110	N/A	101	N/A	105	107	N/A	7621777
D4-1,2-Dichloroethane (sur.)	%	103	N/A	111	N/A	106	107	N/A	7621777
O-TERPHENYL (sur.)	%	87	N/A	101	N/A	101	94	N/A	7621702

N/A = Not Applicable
RDL = Reportable Detection Limit
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Job #: B476653
Report Date: 2014/09/09

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KM2788	KM2789		KM2790		KM2791		
Sampling Date		2014/08/28	2014/08/28		2014/08/28		2014/08/28		
COC Number		A131766	A131766		A131766		A131765		
	UNITS	**SS14-7**	**SS14-8**	**QC Batch**	**SS14-9**	**QC Batch**	**SS14-10**	**RDL**	**QC Batch**
Physical Properties									
Moisture	%	4.2	4.6	7621636	5.0	7621633	6.5	0.30	7621636
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	240	7621702	<10	7621932	<10	10	7621702
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	7500	7621702	<50	7621932	<50	50	7621702
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	3700	7621702	<50	7621932	<50	50	7621702
Reached Baseline at C50	mg/kg	Yes	Yes	7621702	Yes	7621932	Yes	N/A	7621702
Volatiles									
Benzene	mg/kg	<0.0050	<0.0050	7621777	<0.0050	7621836	<0.0050	0.0050	7621777
Toluene	mg/kg	<0.020	<0.020	7621777	<0.020	7621836	<0.020	0.020	7621777
Ethylbenzene	mg/kg	<0.010	<0.010	7621777	<0.010	7621836	<0.010	0.010	7621777
Xylenes (Total)	mg/kg	<0.040	<0.040	7621777	<0.040	7621836	<0.040	0.040	7621777
m & p-Xylene	mg/kg	<0.040	<0.040	7621777	<0.040	7621836	<0.040	0.040	7621777
o-Xylene	mg/kg	<0.020	<0.020	7621777	<0.020	7621836	<0.020	0.020	7621777
F1 (C6-C10) - BTEX	mg/kg	<12	<12	7621777	<12	7621836	<12	12	7621777
(C6-C10)	mg/kg	<12	<12	7621777	<12	7621836	<12	12	7621777
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	98	101	7621777	107	7621836	110	N/A	7621777
4-Bromofluorobenzene (sur.)	%	97	99	7621777	95	7621836	119	N/A	7621777
D10-ETHYLBENZENE (sur.)	%	104	108	7621777	98	7621836	104	N/A	7621777
D4-1,2-Dichloroethane (sur.)	%	105	107	7621777	102	7621836	129	N/A	7621777
O-TERPHENYL (sur.)	%	94	91	7621702	85	7621932	97	N/A	7621702

N/A = Not Applicable
RDL = Reportable Detection Limit

Maxxam Job #: B476653
Report Date: 2014/09/09

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICO MINE
Sampler Initials: TH

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KM2795		KM2796		
Sampling Date		2014/08/29		2014/08/28		
COC Number		A131765		A131765		
	UNITS	**SS10-25**	**QC Batch**	**SS10-11 30-50**	**RDL**	**QC Batch**
Physical Properties						
Moisture	%	4.8	7621636	3.9	0.30	7623070
Ext. Pet. Hydrocarbon						
F2 (C10-C16 Hydrocarbons)	mg/kg	16	7621702	<10	10	7623263
F3 (C16-C34 Hydrocarbons)	mg/kg	87	7621702	<50	50	7623263
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	7621702	<50	50	7623263
Reached Baseline at C50	mg/kg	Yes	7621702	Yes	N/A	7623263
Volatiles						
Benzene	mg/kg	<0.0050	7621777	<0.0050	0.0050	7623251
Toluene	mg/kg	<0.020	7621777	<0.020	0.020	7623251
Ethylbenzene	mg/kg	<0.010	7621777	<0.010	0.010	7623251
Xylenes (Total)	mg/kg	<0.040	7621777	<0.040	0.040	7623251
m & p-Xylene	mg/kg	<0.040	7621777	<0.040	0.040	7623251
o-Xylene	mg/kg	<0.020	7621777	<0.020	0.020	7623251
F1 (C6-C10) - BTEX	mg/kg	<12	7621777	<12	12	7623251
(C6-C10)	mg/kg	<12	7621777	<12	12	7623251
Surrogate Recovery (%)						
1,4-Difluorobenzene (sur.)	%	100	7621777	100	N/A	7623251
4-Bromofluorobenzene (sur.)	%	99	7621777	99	N/A	7623251
D10-ETHYLBENZENE (sur.)	%	115	7621777	95	N/A	7623251
D4-1,2-Dichloroethane (sur.)	%	106	7621777	114	N/A	7623251
O-TERPHENYL (sur.)	%	95	7621702	93	N/A	7623263

N/A = Not Applicable
RDL = Reportable Detection Limit

Maxxam Job #: B476653
Report Date: 2014/09/09

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICO MINE
Sampler Initials: TH

REGULATED METALS (CCME/AT1) - SOILS

Maxxam ID		KM2689		KM2737		KM2749	KM2759		
Sampling Date		2014/08/26		2014/08/27		2014/08/27	2014/08/28		
COC Number		A159187		A131761		A131762	A131763		
	UNITS	**SSC1**	**QC Batch**	**SS8-4**	**QC Batch**	**SS8-15**	**SS10-2**	**RDL**	**QC Batch**
Elements									
Soluble (Hot water) Boron (B)	mg/kg	<0.10	7629590	<0.10	7629590	<0.10	0.12	0.10	7629590
Hex. Chromium (Cr 6+)	mg/kg	<0.15	7628398	<0.15	7628398	0.33	<0.15	0.15	7628398
Total Antimony (Sb)	mg/kg	<1.0	7629380	<1.0	7629680	<1.0	<1.0	1.0	7629380
Total Arsenic (As)	mg/kg	2.3	7629380	2.0	7629680	3.3	<1.0	1.0	7629380
Total Barium (Ba)	mg/kg	19	7629380	25	7629680	28	63	10	7629380
Total Beryllium (Be)	mg/kg	<0.40	7629380	<0.40	7629680	<0.40	<0.40	0.40	7629380
Total Cadmium (Cd)	mg/kg	<0.10	7629380	<0.10	7629680	<0.10	<0.10	0.10	7629380
Total Chromium (Cr)	mg/kg	18	7629380	37	7629680	38	69	1.0	7629380
Total Cobalt (Co)	mg/kg	5.0	7629380	6.1	7629680	5.8	13	1.0	7629380
Total Copper (Cu)	mg/kg	18	7629380	31	7629680	10	15	5.0	7629380
Total Lead (Pb)	mg/kg	2.3	7629380	3.4	7629680	3.3	4.9	1.0	7629380
Total Mercury (Hg)	mg/kg	<0.050	7629380	<0.050	7629680	<0.050	<0.050	0.050	7629380
Total Molybdenum (Mo)	mg/kg	<0.40	7629380	0.69	7629680	1.3	12	0.40	7629380
Total Nickel (Ni)	mg/kg	16	7629380	25	7629680	35	160	1.0	7629380
Total Selenium (Se)	mg/kg	<0.50	7629380	<0.50	7629680	<0.50	<0.50	0.50	7629380
Total Silver (Ag)	mg/kg	<1.0	7629380	<1.0	7629680	<1.0	<1.0	1.0	7629380
Total Thallium (Tl)	mg/kg	<0.30	7629380	<0.30	7629680	<0.30	<0.30	0.30	7629380
Total Tin (Sn)	mg/kg	<1.0	7629380	<1.0	7629680	<1.0	1.4	1.0	7629380
Total Uranium (U)	mg/kg	1.2	7629380	2.3	7629680	2.1	5.4	1.0	7629380
Total Vanadium (V)	mg/kg	30	7629380	32	7629680	15	23	1.0	7629380
Total Zinc (Zn)	mg/kg	18	7629380	28	7629680	22	40	10	7629380

RDL = Reportable Detection Limit

Maxxam Job #: B476653
Report Date: 2014/09/09

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICO MINE
Sampler Initials: TH

REGULATED METALS (CCME/AT1) - SOILS

Maxxam ID		KM2780		KM2793	KM2794		
Sampling Date		2014/08/28		2014/08/28	2014/08/28		
COC Number		A131766		A131765	A131765		
	UNITS	**SS10-23**	**QC Batch**	**SSC2**	**SSC3**	**RDL**	**QC Batch**
Elements							
Soluble (Hot water) Boron (B)	mg/kg	0.73	7631035	<0.10	<0.10	0.10	7629590
Hex. Chromium (Cr 6+)	mg/kg	<0.15	7630638	<0.15	<0.15	0.15	7628398
Total Antimony (Sb)	mg/kg	<1.0	7630978	<1.0	<1.0	1.0	7629380
Total Arsenic (As)	mg/kg	1.1	7630978	2.1	3.9	1.0	7629380
Total Barium (Ba)	mg/kg	39	7630978	26	21	10	7629380
Total Beryllium (Be)	mg/kg	0.47	7630978	<0.40	<0.40	0.40	7629380
Total Cadmium (Cd)	mg/kg	<0.10	7630978	<0.10	<0.10	0.10	7629380
Total Chromium (Cr)	mg/kg	37	7630978	17	27	1.0	7629380
Total Cobalt (Co)	mg/kg	13	7630978	5.4	4.8	1.0	7629380
Total Copper (Cu)	mg/kg	17	7630978	14	8.7	5.0	7629380
Total Lead (Pb)	mg/kg	21	7630978	2.3	2.5	1.0	7629380
Total Mercury (Hg)	mg/kg	<0.050	7630978	<0.050	<0.050	0.050	7629380
Total Molybdenum (Mo)	mg/kg	2.7	7630978	<0.40	<0.40	0.40	7629380
Total Nickel (Ni)	mg/kg	64	7630978	15	16	1.0	7629380
Total Selenium (Se)	mg/kg	<0.50	7630978	<0.50	<0.50	0.50	7629380
Total Silver (Ag)	mg/kg	<1.0	7630978	<1.0	<1.0	1.0	7629380
Total Thallium (Tl)	mg/kg	<0.30	7630978	<0.30	<0.30	0.30	7629380
Total Tin (Sn)	mg/kg	1.0	7630978	<1.0	<1.0	1.0	7629380
Total Uranium (U)	mg/kg	5.1	7630978	1.1	<1.0	1.0	7629380
Total Vanadium (V)	mg/kg	14	7630978	20	18	1.0	7629380
Total Zinc (Zn)	mg/kg	24	7630978	18	17	10	7629380

RDL = Reportable Detection Limit

Maxxam Job #: B476653
Report Date: 2014/09/09

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICO MINE
Sampler Initials: TH

RESULTS OF CHEMICAL ANALYSES OF SOIL

Maxxam ID		KM2689		KM2695	KM2710	KM2713	KM2715		
Sampling Date		2014/08/26		2014/08/26	2014/08/27	2014/08/27	2014/08/27		
COC Number		A159187		A159187	A159188	A159188	A159188		
	UNITS	**SSC1**	**QC Batch**	**SS9-2**	**SS9-6**	**SS9-9**	**SS9-11**	**RDL**	**QC Batch**
Physical Properties									
Moisture	%	10	7621694	16	7.2	6.8	7.4	0.30	7621693

RDL = Reportable Detection Limit

Maxxam ID		KM2728	KM2743	KM2749	KM2752		KM2775		
Sampling Date		2014/08/27	2014/08/27	2014/08/27	2014/08/27		2014/08/28		
COC Number		A131760	A131762	A131762	A131762		A131764		
	UNITS	**SS7-3**	**SS8-9 0-20**	**SS8-15**	**SS8-18**	**QC Batch**	**SS10-18**	**RDL**	**QC Batch**
Physical Properties									
Moisture	%	5.5	6.0	N/A	17	7621639	2.2	0.30	7621633
Sieve - Pan	%	N/A	N/A	5.1	N/A	7624921	N/A	0.20	N/A
Sieve - #200 (>0.075mm)	%	N/A	N/A	95	N/A	7624921	N/A	0.20	N/A
Grain Size	%	N/A	N/A	COARSE	N/A	7624921	N/A	0.20	N/A

N/A = Not Applicable
RDL = Reportable Detection Limit

Maxxam ID		KM2779		KM2793		KM2794		
Sampling Date		2014/08/28		2014/08/28		2014/08/28		
COC Number		A131766		A131765		A131765		
	UNITS	**SS10-22**	**QC Batch**	**SSC2**	**QC Batch**	**SSC3**	**RDL**	**QC Batch**
Physical Properties								
Moisture	%	4.1	7621639	15	7621717	7.3	0.30	7621694

RDL = Reportable Detection Limit

Maxxam Job #: B476653
Report Date: 2014/09/09

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICO MINE
Sampler Initials: TH

SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		KM2737		KM2749		KM2780		
Sampling Date		2014/08/27		2014/08/27		2014/08/28		
COC Number		A131761		A131762		A131766		
	UNITS	**SS8-4**	**RDL**	**SS8-15**	**RDL**	**SS10-23**	**RDL**	**QC Batch**
Polycyclic Aromatics								
Acenaphthene	mg/kg	0.16	0.050	1.3	0.050	<0.0050	0.0050	7621942
Benzo[a]pyrene equivalency	mg/kg	<0.10	0.10	<0.10	0.10	<0.10	0.10	7621468
Acenaphthylene	mg/kg	<0.058 (1)	0.058	0.095	0.050	<0.0050	0.0050	7621942
Acridine	mg/kg	1.7	0.10	7.6	0.10	<0.010	0.010	7621942
Anthracene	mg/kg	<0.18 (1)	0.18	<0.59 (1)	0.59	<0.0040	0.0040	7621942
Benzo(a)anthracene	mg/kg	<0.050	0.050	<0.050	0.050	<0.0050	0.0050	7621942
Benzo(b&j)fluoranthene	mg/kg	<0.050	0.050	<0.050	0.050	<0.0050	0.0050	7621942
Benzo(k)fluoranthene	mg/kg	<0.050	0.050	<0.050	0.050	<0.0050	0.0050	7621942
Benzo(g,h,i)perylene	mg/kg	<0.050	0.050	<0.050	0.050	<0.0050	0.0050	7621942
Benzo(c)phenanthrene	mg/kg	<0.050	0.050	<0.050	0.050	<0.0050	0.0050	7621942
Benzo(a)pyrene	mg/kg	<0.050	0.050	<0.050	0.050	<0.0050	0.0050	7621942
Benzo[e]pyrene	mg/kg	<0.050	0.050	<0.050	0.050	<0.0050	0.0050	7621942
Chrysene	mg/kg	<0.050	0.050	<0.050	0.050	<0.0050	0.0050	7621942
Dibenz(a,h)anthracene	mg/kg	<0.050	0.050	<0.050	0.050	<0.0050	0.0050	7621942
Fluoranthene	mg/kg	<0.050	0.050	0.29	0.050	<0.0050	0.0050	7621942
Fluorene	mg/kg	<0.36 (1)	0.36	0.81	0.050	<0.0050	0.0050	7621942
Indeno(1,2,3-cd)pyrene	mg/kg	<0.050	0.050	<0.050	0.050	<0.0050	0.0050	7621942
2-Methylnaphthalene	mg/kg	<0.050	0.050	<0.050	0.050	<0.0050	0.0050	7621942
Naphthalene	mg/kg	<0.058 (1)	0.058	<0.057 (1)	0.057	0.0092	0.0050	7621942
Phenanthrene	mg/kg	0.29	0.050	1.8	0.050	<0.0050	0.0050	7621942
Perylene	mg/kg	<0.050	0.050	<0.050	0.050	<0.0050	0.0050	7621942
Pyrene	mg/kg	0.34	0.050	0.88	0.050	<0.0050	0.0050	7621942
Quinoline	mg/kg	<0.10	0.10	<0.10	0.10	<0.010	0.010	7621942
Surrogate Recovery (%)								
D10-ANTHRACENE (sur.)	%	131 (2)	N/A	124	N/A	92	N/A	7621942
D12-BENZO(A)PYRENE (sur.)	%	114	N/A	110	N/A	106	N/A	7621942
D8-ACENAPHTHYLENE (sur.)	%	116	N/A	115	N/A	97	N/A	7621942
TERPHENYL-D14 (sur.)	%	127	N/A	121	N/A	105	N/A	7621942

N/A = Not Applicable
RDL = Reportable Detection Limit
(1) Detection limits raised due to matrix interference.
(2) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Maxxam Job #: B476653
Report Date: 2014/09/09

TETRA TECH EBA INC.
Client Project #: E14103202-01
Site Location: JERICO MINE
Sampler Initials: TH

Package 1	5.7°C
Package 2	5.0°C
Package 3	5.7°C
Package 4	4.7°C

Each temperature is the average of up to three cooler temperatures taken at receipt

General Comments

Sample KM2737-01: PAH - Detection limits raised due to matrix interference.

Sample KM2749-01: PAH - Detection limits raised due to matrix interference.

Results relate only to the items tested.

TETRA TECH EBA INC.
Attention: ROBERT ZSCHUPPE
Client Project #: E14103202-01
P.O. #:
Site Location: JERICO MINE

Quality Assurance Report

Maxxam Job Number: EYKB476653

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7621633	ZZ	Method Blank	Moisture	2014/09/02	<0.30		%	
		RPD	Moisture	2014/09/02	9.2		%	20
7621636	ZZ	Method Blank	Moisture	2014/09/02	<0.30		%	
		RPD [KM2757-01]	Moisture	2014/09/02	8.9		%	20
7621639	ZZ	Method Blank	Moisture	2014/09/02	<0.30		%	
		RPD	Moisture	2014/09/02	5.2		%	20
7621648	ZZ	Method Blank	Moisture	2014/09/02	<0.30		%	
		RPD	Moisture	2014/09/02	0.9		%	20
7621693	ZZ	Method Blank	Moisture	2014/09/02	<0.30		%	
		RPD [KM2745-02]	Moisture	2014/09/02	5.6		%	20
7621694	ZZ	Method Blank	Moisture	2014/09/02	<0.30		%	
		RPD	Moisture	2014/09/02	1		%	20
7621701	KK5	Matrix Spike						
		[KM2771-02]	O-TERPHENYL (sur.)	2014/09/05		99	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/05		NC	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2014/09/05		NC	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2014/09/05		104	%	50 - 130
		Spiked Blank	O-TERPHENYL (sur.)	2014/09/05		91	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/05		106	%	70 - 130
			F3 (C16-C34 Hydrocarbons)	2014/09/05		109	%	70 - 130
			F4 (C34-C50 Hydrocarbons)	2014/09/05		107	%	70 - 130
		Method Blank	O-TERPHENYL (sur.)	2014/09/05		99	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/05	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2014/09/05	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2014/09/05	<50		mg/kg	
		RPD [KM2771-02]	F2 (C10-C16 Hydrocarbons)	2014/09/05	26.1		%	50
			F3 (C16-C34 Hydrocarbons)	2014/09/05	20.1		%	50
			F4 (C34-C50 Hydrocarbons)	2014/09/05	NC		%	50
7621702	SHM	Matrix Spike						
		[KM2785-02]	O-TERPHENYL (sur.)	2014/09/04		100	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/04		98	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2014/09/04		94	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2014/09/04		87	%	50 - 130
		Spiked Blank	O-TERPHENYL (sur.)	2014/09/04		99	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/04		109	%	70 - 130
			F3 (C16-C34 Hydrocarbons)	2014/09/04		104	%	70 - 130
			F4 (C34-C50 Hydrocarbons)	2014/09/04		95	%	70 - 130
		Method Blank	O-TERPHENYL (sur.)	2014/09/04		80	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/04	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2014/09/04	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2014/09/04	<50		mg/kg	
		RPD [KM2785-02]	F2 (C10-C16 Hydrocarbons)	2014/09/04	NC		%	50
			F3 (C16-C34 Hydrocarbons)	2014/09/04	NC		%	50
			F4 (C34-C50 Hydrocarbons)	2014/09/04	NC		%	50
7621717	ZZ	Method Blank	Moisture	2014/09/02	<0.30		%	
		RPD	Moisture	2014/09/02	3.4		%	20
7621777	PS7	Matrix Spike						
		[KM2764-02]	1,4-Difluorobenzene (sur.)	2014/09/04		100	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/09/04		101	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/09/04		105	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/04		105	%	60 - 140
			Benzene	2014/09/04		91	%	60 - 140
			Toluene	2014/09/04		89	%	60 - 140
			Ethylbenzene	2014/09/04		93	%	60 - 140
			m & p-Xylene	2014/09/04		92	%	60 - 140

TETRA TECH EBA INC.
Attention: ROBERT ZSCHUPPE
Client Project #: E14103202-01
P.O. #:
Site Location: JERICO MINE

Quality Assurance Report (Continued)

Maxxam Job Number: EYKB476653

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7621777 PS7	Matrix Spike						
	[KM2764-02]	o-Xylene	2014/09/04		91	%	60 - 140
		(C6-C10)	2014/09/04		136	%	60 - 140
	Spiked Blank	1,4-Difluorobenzene (sur.)	2014/09/04		99	%	60 - 140
		4-Bromofluorobenzene (sur.)	2014/09/04		101	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2014/09/04		112	%	60 - 130
		D4-1,2-Dichloroethane (sur.)	2014/09/04		104	%	60 - 140
		Benzene	2014/09/04		93	%	60 - 140
		Toluene	2014/09/04		91	%	60 - 140
		Ethylbenzene	2014/09/04		96	%	60 - 140
		m & p-Xylene	2014/09/04		94	%	60 - 140
		o-Xylene	2014/09/04		93	%	60 - 140
		(C6-C10)	2014/09/04		122	%	60 - 140
	Method Blank	1,4-Difluorobenzene (sur.)	2014/09/04		97	%	60 - 140
		4-Bromofluorobenzene (sur.)	2014/09/04		99	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2014/09/04		108	%	60 - 130
		D4-1,2-Dichloroethane (sur.)	2014/09/04		104	%	60 - 140
		Benzene	2014/09/04	<0.0050		mg/kg	
		Toluene	2014/09/04	<0.020		mg/kg	
		Ethylbenzene	2014/09/04	<0.010		mg/kg	
		Xylenes (Total)	2014/09/04	<0.040		mg/kg	
		m & p-Xylene	2014/09/04	<0.040		mg/kg	
		o-Xylene	2014/09/04	<0.020		mg/kg	
		F1 (C6-C10) - BTEX	2014/09/04	<12		mg/kg	
		(C6-C10)	2014/09/04	<12		mg/kg	
	RPD [KM2764-02]	Benzene	2014/09/04	NC		%	50
		Toluene	2014/09/04	NC		%	50
		Ethylbenzene	2014/09/04	NC		%	50
		Xylenes (Total)	2014/09/04	NC		%	50
		m & p-Xylene	2014/09/04	NC		%	50
		o-Xylene	2014/09/04	NC		%	50
		F1 (C6-C10) - BTEX	2014/09/04	NC		%	50
		(C6-C10)	2014/09/04	NC		%	50
7621780 NM5	Matrix Spike						
	[KM2776-02]	1,4-Difluorobenzene (sur.)	2014/09/04		111	%	60 - 140
		4-Bromofluorobenzene (sur.)	2014/09/04		95	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2014/09/04		99	%	60 - 130
		D4-1,2-Dichloroethane (sur.)	2014/09/04		98	%	60 - 140
		Benzene	2014/09/04		114	%	60 - 140
		Toluene	2014/09/04		100	%	60 - 140
		Ethylbenzene	2014/09/04		102	%	60 - 140
		m & p-Xylene	2014/09/04		101	%	60 - 140
		o-Xylene	2014/09/04		96	%	60 - 140
		(C6-C10)	2014/09/04		98	%	60 - 140
	Spiked Blank	1,4-Difluorobenzene (sur.)	2014/09/04		108	%	60 - 140
		4-Bromofluorobenzene (sur.)	2014/09/04		97	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2014/09/04		102	%	60 - 130
		D4-1,2-Dichloroethane (sur.)	2014/09/04		101	%	60 - 140
		Benzene	2014/09/04		115	%	60 - 140
		Toluene	2014/09/04		101	%	60 - 140
		Ethylbenzene	2014/09/04		102	%	60 - 140
		m & p-Xylene	2014/09/04		106	%	60 - 140
		o-Xylene	2014/09/04		97	%	60 - 140
		(C6-C10)	2014/09/04		105	%	60 - 140
	Method Blank	1,4-Difluorobenzene (sur.)	2014/09/04		108	%	60 - 140

TETRA TECH EBA INC.
Attention: ROBERT ZSCHUPPE
Client Project #: E14103202-01
P.O. #:
Site Location: JERICO MINE

Quality Assurance Report (Continued)

Maxxam Job Number: EYKB476653

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7621780	NM5	Method Blank	4-Bromofluorobenzene (sur.)	2014/09/04		94	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/09/04		100	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/04		101	%	60 - 140
			Benzene	2014/09/04	<0.0050		mg/kg	
			Toluene	2014/09/04	<0.020		mg/kg	
			Ethylbenzene	2014/09/04	<0.010		mg/kg	
			Xylenes (Total)	2014/09/04	<0.040		mg/kg	
			m & p-Xylene	2014/09/04	<0.040		mg/kg	
			o-Xylene	2014/09/04	<0.020		mg/kg	
			F1 (C6-C10) - BTEX	2014/09/04	<12		mg/kg	
			(C6-C10)	2014/09/04	<12		mg/kg	
		RPD [KM2776-02]	Benzene	2014/09/04	NC		%	50
			Toluene	2014/09/04	NC		%	50
			Ethylbenzene	2014/09/04	NC		%	50
			Xylenes (Total)	2014/09/04	NC		%	50
			m & p-Xylene	2014/09/04	NC		%	50
			o-Xylene	2014/09/04	NC		%	50
			F1 (C6-C10) - BTEX	2014/09/04	NC		%	50
			(C6-C10)	2014/09/04	NC		%	50
7621836	NM5	Matrix Spike	1,4-Difluorobenzene (sur.)	2014/09/04		115	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/09/04		87	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/09/04		92	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/04		102	%	60 - 140
			Benzene	2014/09/04		107	%	60 - 140
			Toluene	2014/09/04		98	%	60 - 140
			Ethylbenzene	2014/09/04		97	%	60 - 140
			m & p-Xylene	2014/09/04		100	%	60 - 140
			o-Xylene	2014/09/04		91	%	60 - 140
			(C6-C10)	2014/09/04		87	%	60 - 140
		Spiked Blank	1,4-Difluorobenzene (sur.)	2014/09/05		106	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/09/05		88	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/09/05		95	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/05		100	%	60 - 140
			Benzene	2014/09/05		110	%	60 - 140
			Toluene	2014/09/05		96	%	60 - 140
			Ethylbenzene	2014/09/05		98	%	60 - 140
			m & p-Xylene	2014/09/05		99	%	60 - 140
			o-Xylene	2014/09/05		95	%	60 - 140
			(C6-C10)	2014/09/05		107	%	60 - 140
		Method Blank	1,4-Difluorobenzene (sur.)	2014/09/05		109	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/09/05		91	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/09/05		97	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/05		101	%	60 - 140
			Benzene	2014/09/05	<0.0050		mg/kg	
			Toluene	2014/09/05	<0.020		mg/kg	
			Ethylbenzene	2014/09/05	<0.010		mg/kg	
			Xylenes (Total)	2014/09/05	<0.040		mg/kg	
			m & p-Xylene	2014/09/05	<0.040		mg/kg	
			o-Xylene	2014/09/05	<0.020		mg/kg	
			F1 (C6-C10) - BTEX	2014/09/05	<12		mg/kg	
			(C6-C10)	2014/09/05	<12		mg/kg	
		RPD	Benzene	2014/09/05	NC		%	50
			Toluene	2014/09/05	NC		%	50
			Ethylbenzene	2014/09/05	NC		%	50
			Xylenes (Total)	2014/09/05	NC		%	50

TETRA TECH EBA INC.
Attention: ROBERT ZSCHUPPE
Client Project #: E14103202-01
P.O. #:
Site Location: JERICO MINE

Quality Assurance Report (Continued)

Maxxam Job Number: EYKB476653

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7621836	NM5	RPD	m & p-Xylene	2014/09/05	NC		%	50
			o-Xylene	2014/09/05	NC		%	50
			F1 (C6-C10) - BTEX	2014/09/05	NC		%	50
			(C6-C10)	2014/09/05	NC		%	50
7621838	PS7	Matrix Spike [KM2694-02]	1,4-Difluorobenzene (sur.)	2014/09/05		100	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/09/05		110	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/09/05		108	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/05		109	%	60 - 140
			Benzene	2014/09/05		86	%	60 - 140
			Toluene	2014/09/05		85	%	60 - 140
			Ethylbenzene	2014/09/05		87	%	60 - 140
			m & p-Xylene	2014/09/05		85	%	60 - 140
			o-Xylene	2014/09/05		NC	%	60 - 140
			(C6-C10)	2014/09/05		NC	%	60 - 140
		Spiked Blank	1,4-Difluorobenzene (sur.)	2014/09/05		98	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/09/05		99	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/09/05		103	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/05		105	%	60 - 140
			Benzene	2014/09/05		88	%	60 - 140
			Toluene	2014/09/05		87	%	60 - 140
			Ethylbenzene	2014/09/05		91	%	60 - 140
			m & p-Xylene	2014/09/05		89	%	60 - 140
			o-Xylene	2014/09/05		89	%	60 - 140
			(C6-C10)	2014/09/05		122	%	60 - 140
		Method Blank	1,4-Difluorobenzene (sur.)	2014/09/05		98	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/09/05		99	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/09/05		104	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/05		105	%	60 - 140
			Benzene	2014/09/05	<0.0050		mg/kg	
			Toluene	2014/09/05	<0.020		mg/kg	
			Ethylbenzene	2014/09/05	<0.010		mg/kg	
			Xylenes (Total)	2014/09/05	<0.040		mg/kg	
			m & p-Xylene	2014/09/05	<0.040		mg/kg	
			o-Xylene	2014/09/05	<0.020		mg/kg	
			F1 (C6-C10) - BTEX	2014/09/05	<12		mg/kg	
			(C6-C10)	2014/09/05	<12		mg/kg	
		RPD [KM2694-02]	Benzene	2014/09/05	NC		%	50
			Toluene	2014/09/05	NC		%	50
			Ethylbenzene	2014/09/05	NC		%	50
			Xylenes (Total)	2014/09/05	18.7		%	50
			m & p-Xylene	2014/09/05	21.5		%	50
			o-Xylene	2014/09/05	16.8		%	50
			F1 (C6-C10) - BTEX	2014/09/05	2.8		%	50
			(C6-C10)	2014/09/05	3.0		%	50
7621932	GG3	Matrix Spike	O-TERPHENYL (sur.)	2014/09/05		85	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/05		107	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2014/09/05		107	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2014/09/05		98	%	50 - 130
		Spiked Blank	O-TERPHENYL (sur.)	2014/09/05		78	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/05		91	%	70 - 130
			F3 (C16-C34 Hydrocarbons)	2014/09/05		92	%	70 - 130
			F4 (C34-C50 Hydrocarbons)	2014/09/05		88	%	70 - 130
		Method Blank	O-TERPHENYL (sur.)	2014/09/05		84	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/05	<10		mg/kg	

TETRA TECH EBA INC.
Attention: ROBERT ZSCHUPPE
Client Project #: E14103202-01
P.O. #:
Site Location: JERICO MINE

Quality Assurance Report (Continued)

Maxxam Job Number: EYKB476653

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7621932	GG3	Method Blank	F3 (C16-C34 Hydrocarbons)	2014/09/05	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2014/09/05	<50		mg/kg	
		RPD	F2 (C10-C16 Hydrocarbons)	2014/09/05	NC		%	50
			F3 (C16-C34 Hydrocarbons)	2014/09/05	NC		%	50
			F4 (C34-C50 Hydrocarbons)	2014/09/05	NC		%	50
7621942	BC5	Matrix Spike	D10-ANTHRACENE (sur.)	2014/09/04		88	%	50 - 130
			D12-BENZO(A)PYRENE (sur.)	2014/09/04		99	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2014/09/04		98	%	50 - 130
			TERPHENYL-D14 (sur.)	2014/09/04		107	%	50 - 130
			Acenaphthene	2014/09/04		87	%	50 - 130
			Acenaphthylene	2014/09/04		71	%	50 - 130
			Acridine	2014/09/04		NC	%	50 - 130
			Anthracene	2014/09/04		72	%	50 - 130
			Benzo(a)anthracene	2014/09/04		79	%	50 - 130
			Benzo(b&j)fluoranthene	2014/09/04		78	%	50 - 130
			Benzo(k)fluoranthene	2014/09/04		72	%	50 - 130
			Benzo(g,h,i)perylene	2014/09/04		73	%	50 - 130
			Benzo(c)phenanthrene	2014/09/04		78	%	50 - 130
			Benzo(a)pyrene	2014/09/04		79	%	50 - 130
			Benzo[e]pyrene	2014/09/04		85	%	50 - 130
			Chrysene	2014/09/04		79	%	50 - 130
			Dibenz(a,h)anthracene	2014/09/04		67	%	50 - 130
			Fluoranthene	2014/09/04		89	%	50 - 130
			Fluorene	2014/09/04		NC	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2014/09/04		71	%	50 - 130
			2-Methylnaphthalene	2014/09/04		NC	%	50 - 130
			Naphthalene	2014/09/04		73	%	50 - 130
			Phenanthrene	2014/09/04		NC	%	50 - 130
			Perylene	2014/09/04		79	%	50 - 130
			Pyrene	2014/09/04		90	%	50 - 130
			Quinoline	2014/09/04		NC	%	50 - 130
		Spiked Blank	D10-ANTHRACENE (sur.)	2014/09/04		89	%	50 - 130
			D12-BENZO(A)PYRENE (sur.)	2014/09/04		97	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2014/09/04		95	%	50 - 130
			TERPHENYL-D14 (sur.)	2014/09/04		96	%	50 - 130
			Acenaphthene	2014/09/04		85	%	50 - 130
			Acenaphthylene	2014/09/04		90	%	50 - 130
			Acridine	2014/09/04		65	%	50 - 130
			Anthracene	2014/09/04		85	%	50 - 130
			Benzo(a)anthracene	2014/09/04		93	%	50 - 130
			Benzo(b&j)fluoranthene	2014/09/04		89	%	50 - 130
			Benzo(k)fluoranthene	2014/09/04		87	%	50 - 130
			Benzo(g,h,i)perylene	2014/09/04		86	%	50 - 130
			Benzo(c)phenanthrene	2014/09/04		93	%	50 - 130
			Benzo(a)pyrene	2014/09/04		89	%	50 - 130
			Benzo[e]pyrene	2014/09/04		97	%	50 - 130
			Chrysene	2014/09/04		95	%	50 - 130
			Dibenz(a,h)anthracene	2014/09/04		69	%	50 - 130
			Fluoranthene	2014/09/04		94	%	50 - 130
			Fluorene	2014/09/04		83	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2014/09/04		81	%	50 - 130
			2-Methylnaphthalene	2014/09/04		85	%	50 - 130
			Naphthalene	2014/09/04		86	%	50 - 130
			Phenanthrene	2014/09/04		89	%	50 - 130
			Perylene	2014/09/04		91	%	50 - 130

TETRA TECH EBA INC.
Attention: ROBERT ZSCHUPPE
Client Project #: E14103202-01
P.O. #:
Site Location: JERICO MINE

Quality Assurance Report (Continued)

Maxxam Job Number: EYKB476653

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7621942	BC5	Spiked Blank	Pyrene	2014/09/04		95	%	50 - 130
			Quinoline	2014/09/04		88	%	50 - 130
		Method Blank	D10-ANTHRACENE (sur.)	2014/09/04		88	%	50 - 130
			D12-BENZO(A)PYRENE (sur.)	2014/09/04		93	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2014/09/04		92	%	50 - 130
			TERPHENYL-D14 (sur.)	2014/09/04		95	%	50 - 130
			Acenaphthene	2014/09/04	<0.0050		mg/kg	
			Acenaphthylene	2014/09/04	<0.0050		mg/kg	
			Acridine	2014/09/04	<0.010		mg/kg	
			Anthracene	2014/09/04	<0.0040		mg/kg	
			Benzo(a)anthracene	2014/09/04	<0.0050		mg/kg	
			Benzo(b&j)fluoranthene	2014/09/04	<0.0050		mg/kg	
			Benzo(k)fluoranthene	2014/09/04	<0.0050		mg/kg	
			Benzo(g,h,i)perylene	2014/09/04	<0.0050		mg/kg	
			Benzo(c)phenanthrene	2014/09/04	<0.0050		mg/kg	
			Benzo(a)pyrene	2014/09/04	<0.0050		mg/kg	
			Benzo[e]pyrene	2014/09/04	<0.0050		mg/kg	
			Chrysene	2014/09/04	<0.0050		mg/kg	
			Dibenz(a,h)anthracene	2014/09/04	<0.0050		mg/kg	
			Fluoranthene	2014/09/04	<0.0050		mg/kg	
			Fluorene	2014/09/04	<0.0050		mg/kg	
			Indeno(1,2,3-cd)pyrene	2014/09/04	<0.0050		mg/kg	
			2-Methylnaphthalene	2014/09/04	<0.0050		mg/kg	
			Naphthalene	2014/09/04	<0.0050		mg/kg	
			Phenanthrene	2014/09/04	<0.0050		mg/kg	
			Perylene	2014/09/04	<0.0050		mg/kg	
			Pyrene	2014/09/04	<0.0050		mg/kg	
			Quinoline	2014/09/04	<0.010		mg/kg	
		RPD	Acenaphthene	2014/09/05	15.7		%	50
			Acenaphthylene	2014/09/05	25.1 (1)		%	50
			Acridine	2014/09/05	35.3		%	50
			Anthracene	2014/09/05	32.2 (1)		%	50
			Benzo(a)anthracene	2014/09/05	NC		%	50
			Benzo(b&j)fluoranthene	2014/09/05	NC		%	50
			Benzo(k)fluoranthene	2014/09/05	NC		%	50
			Benzo(g,h,i)perylene	2014/09/05	NC		%	50
			Benzo(c)phenanthrene	2014/09/05	NC		%	50
			Benzo(a)pyrene	2014/09/05	NC		%	50
			Benzo[e]pyrene	2014/09/05	NC		%	50
			Chrysene	2014/09/05	NC		%	50
			Dibenz(a,h)anthracene	2014/09/05	NC		%	50
			Fluoranthene	2014/09/05	NC		%	50
			Fluorene	2014/09/05	46.6		%	50
			Indeno(1,2,3-cd)pyrene	2014/09/05	NC		%	50
			2-Methylnaphthalene	2014/09/05	4.1		%	50
			Naphthalene	2014/09/05	1.9		%	50
			Phenanthrene	2014/09/05	31.8		%	50
			Perylene	2014/09/05	NC		%	50
			Pyrene	2014/09/05	NC		%	50
			Quinoline	2014/09/05	35.3 (1)		%	50
7621952	KK5	Matrix Spike						
		[KM2694-02]	O-TERPHENYL (sur.)	2014/09/05		92	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/05		NC	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2014/09/05		NC	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2014/09/05		99	%	50 - 130

TETRA TECH EBA INC.
Attention: ROBERT ZSCHUPPE
Client Project #: E14103202-01
P.O. #:
Site Location: JERICO MINE

Quality Assurance Report (Continued)

Maxxam Job Number: EYKB476653

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7621952	KK5	Spiked Blank	O-TERPHENYL (sur.)	2014/09/05		95	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/05		113	%	70 - 130
			F3 (C16-C34 Hydrocarbons)	2014/09/05		115	%	70 - 130
			F4 (C34-C50 Hydrocarbons)	2014/09/05		111	%	70 - 130
		Method Blank	O-TERPHENYL (sur.)	2014/09/05		105	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/05	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2014/09/05	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2014/09/05	<50		mg/kg	
		RPD [KM2694-02]	F2 (C10-C16 Hydrocarbons)	2014/09/05	0.1		%	50
			F3 (C16-C34 Hydrocarbons)	2014/09/05	3.4		%	50
			F4 (C34-C50 Hydrocarbons)	2014/09/05	NC		%	50
7621958	RPA	Matrix Spike						
		[KM2721-02]	O-TERPHENYL (sur.)	2014/09/05		78	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/05		98	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2014/09/05		NC	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2014/09/05		NC	%	50 - 130
		Spiked Blank	O-TERPHENYL (sur.)	2014/09/05		82	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/05		105	%	70 - 130
			F3 (C16-C34 Hydrocarbons)	2014/09/05		105	%	70 - 130
			F4 (C34-C50 Hydrocarbons)	2014/09/05		96	%	70 - 130
		Method Blank	O-TERPHENYL (sur.)	2014/09/05		92	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/05	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2014/09/05	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2014/09/05	<50		mg/kg	
		RPD [KM2721-02]	F2 (C10-C16 Hydrocarbons)	2014/09/05	NC		%	50
			F3 (C16-C34 Hydrocarbons)	2014/09/05	11.8		%	50
			F4 (C34-C50 Hydrocarbons)	2014/09/05	5.6		%	50
7623070	ZZ	Method Blank	Moisture	2014/09/03	<0.30		%	
		RPD	Moisture	2014/09/03	2.0		%	20
7623251	PS7	Matrix Spike	1,4-Difluorobenzene (sur.)	2014/09/05		118	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/09/05		122	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/09/05		107	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/05		126	%	60 - 140
			Benzene	2014/09/05		94	%	60 - 140
			Toluene	2014/09/05		108	%	60 - 140
			Ethylbenzene	2014/09/05		NC	%	60 - 140
			m & p-Xylene	2014/09/05		NC	%	60 - 140
			o-Xylene	2014/09/05		109	%	60 - 140
			(C6-C10)	2014/09/05		NC	%	60 - 140
		Spiked Blank	1,4-Difluorobenzene (sur.)	2014/09/05		95	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/09/05		100	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/09/05		101	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/05		107	%	60 - 140
			Benzene	2014/09/05		85	%	60 - 140
			Toluene	2014/09/05		82	%	60 - 140
			Ethylbenzene	2014/09/05		86	%	60 - 140
			m & p-Xylene	2014/09/05		84	%	60 - 140
			o-Xylene	2014/09/05		86	%	60 - 140
			(C6-C10)	2014/09/05		122	%	60 - 140
		Method Blank	1,4-Difluorobenzene (sur.)	2014/09/05		85	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/09/05		90	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/09/05		83	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/05		98	%	60 - 140
			Benzene	2014/09/05	<0.0050		mg/kg	
			Toluene	2014/09/05	<0.020		mg/kg	

TETRA TECH EBA INC.
Attention: ROBERT ZSCHUPPE
Client Project #: E14103202-01
P.O. #:
Site Location: JERICO MINE

Quality Assurance Report (Continued)

Maxxam Job Number: EYKB476653

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7623251	PS7	Method Blank	Ethylbenzene	2014/09/05	<0.010		mg/kg	
			Xylenes (Total)	2014/09/05	<0.040		mg/kg	
			m & p-Xylene	2014/09/05	<0.040		mg/kg	
			o-Xylene	2014/09/05	<0.020		mg/kg	
			F1 (C6-C10) - BTEX	2014/09/05	<12		mg/kg	
			(C6-C10)	2014/09/05	<12		mg/kg	
		RPD	Benzene	2014/09/05	9.6		%	50
			Toluene	2014/09/05	26.9		%	50
			Ethylbenzene	2014/09/05	18.1		%	50
			Xylenes (Total)	2014/09/05	22.5		%	50
			m & p-Xylene	2014/09/05	22.6		%	50
			o-Xylene	2014/09/05	17.6		%	50
			F1 (C6-C10) - BTEX	2014/09/05	6.1		%	50
			(C6-C10)	2014/09/05	6.5		%	50
7623263	JR1	Matrix Spike	O-TERPHENYL (sur.)	2014/09/03		86	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/03		NC	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2014/09/03		96	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2014/09/03		90	%	50 - 130
		Spiked Blank	O-TERPHENYL (sur.)	2014/09/03		102	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/03		116	%	70 - 130
			F3 (C16-C34 Hydrocarbons)	2014/09/03		116	%	70 - 130
			F4 (C34-C50 Hydrocarbons)	2014/09/03		107	%	70 - 130
		Method Blank	O-TERPHENYL (sur.)	2014/09/03		92	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/03	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2014/09/03	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2014/09/03	<50		mg/kg	
		RPD	F2 (C10-C16 Hydrocarbons)	2014/09/03	16.9		%	50
			F3 (C16-C34 Hydrocarbons)	2014/09/03	NC		%	50
			F4 (C34-C50 Hydrocarbons)	2014/09/03	NC		%	50
7624921	EI2	QC Standard	Sieve - Pan	2014/09/04		99	%	91 - 109
			Sieve - #200 (>0.075mm)	2014/09/04		102	%	84 - 116
		RPD	Sieve - Pan	2014/09/04	4.8		%	35
			Sieve - #200 (>0.075mm)	2014/09/04	2.5		%	35
7628398	LMD	Matrix Spike	Hex. Chromium (Cr 6+)	2014/09/07		91	%	75 - 125
		Spiked Blank	Hex. Chromium (Cr 6+)	2014/09/07		94	%	80 - 120
		Method Blank	Hex. Chromium (Cr 6+)	2014/09/07	<0.15		mg/kg	
		RPD	Hex. Chromium (Cr 6+)	2014/09/07	NC		%	35
7629380	SF3	Matrix Spike	Total Antimony (Sb)	2014/09/08		95	%	75 - 125
			Total Arsenic (As)	2014/09/08		100	%	75 - 125
			Total Barium (Ba)	2014/09/08		NC	%	75 - 125
			Total Beryllium (Be)	2014/09/08		104	%	75 - 125
			Total Cadmium (Cd)	2014/09/08		99	%	75 - 125
			Total Chromium (Cr)	2014/09/08		NC	%	75 - 125
			Total Cobalt (Co)	2014/09/08		99	%	75 - 125
			Total Copper (Cu)	2014/09/08		100	%	75 - 125
			Total Lead (Pb)	2014/09/08		101	%	75 - 125
			Total Mercury (Hg)	2014/09/08		99	%	75 - 125
			Total Molybdenum (Mo)	2014/09/08		103	%	75 - 125
			Total Nickel (Ni)	2014/09/08		97	%	75 - 125
			Total Selenium (Se)	2014/09/08		100	%	75 - 125
			Total Silver (Ag)	2014/09/08		102	%	75 - 125
			Total Thallium (Tl)	2014/09/08		101	%	75 - 125
			Total Tin (Sn)	2014/09/08		104	%	75 - 125
			Total Uranium (U)	2014/09/08		89	%	75 - 125
			Total Vanadium (V)	2014/09/08		104	%	75 - 125

TETRA TECH EBA INC.
Attention: ROBERT ZSCHUPPE
Client Project #: E14103202-01
P.O. #:
Site Location: JERICO MINE

Quality Assurance Report (Continued)

Maxxam Job Number: EYKB476653

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7629380 SF3	Matrix Spike	Total Zinc (Zn)	2014/09/08		103	%	75 - 125
	QC Standard	Total Arsenic (As)	2014/09/08		125	%	50 - 150
		Total Barium (Ba)	2014/09/08		110	%	69 - 131
		Total Chromium (Cr)	2014/09/08		111	%	41 - 159
		Total Cobalt (Co)	2014/09/08		107	%	75 - 125
		Total Copper (Cu)	2014/09/08		106	%	73 - 127
		Total Lead (Pb)	2014/09/08		104	%	54 - 146
		Total Nickel (Ni)	2014/09/08		113	%	61 - 139
		Total Vanadium (V)	2014/09/08		127	%	50 - 150
		Total Zinc (Zn)	2014/09/08		112	%	72 - 128
	Spiked Blank	Total Antimony (Sb)	2014/09/08		96	%	75 - 125
		Total Arsenic (As)	2014/09/08		98	%	75 - 125
		Total Barium (Ba)	2014/09/08		95	%	75 - 125
		Total Beryllium (Be)	2014/09/08		99	%	75 - 125
		Total Cadmium (Cd)	2014/09/08		96	%	75 - 125
		Total Chromium (Cr)	2014/09/08		97	%	75 - 125
		Total Cobalt (Co)	2014/09/08		98	%	75 - 125
		Total Copper (Cu)	2014/09/08		99	%	75 - 125
		Total Lead (Pb)	2014/09/08		100	%	75 - 125
		Total Mercury (Hg)	2014/09/08		101	%	75 - 125
		Total Molybdenum (Mo)	2014/09/08		100	%	75 - 125
		Total Nickel (Ni)	2014/09/08		98	%	75 - 125
		Total Selenium (Se)	2014/09/08		98	%	75 - 125
		Total Silver (Ag)	2014/09/08		99	%	75 - 125
		Total Thallium (Tl)	2014/09/08		100	%	75 - 125
		Total Tin (Sn)	2014/09/08		101	%	75 - 125
		Total Uranium (U)	2014/09/08		97	%	75 - 125
		Total Vanadium (V)	2014/09/08		101	%	75 - 125
		Total Zinc (Zn)	2014/09/08		102	%	75 - 125
	Method Blank	Total Antimony (Sb)	2014/09/08	<1.0		mg/kg	
		Total Arsenic (As)	2014/09/08	<1.0		mg/kg	
		Total Barium (Ba)	2014/09/08	<10		mg/kg	
		Total Beryllium (Be)	2014/09/08	<0.40		mg/kg	
		Total Cadmium (Cd)	2014/09/08	<0.10		mg/kg	
		Total Chromium (Cr)	2014/09/08	<1.0		mg/kg	
		Total Cobalt (Co)	2014/09/08	<1.0		mg/kg	
		Total Copper (Cu)	2014/09/08	<5.0		mg/kg	
		Total Lead (Pb)	2014/09/08	<1.0		mg/kg	
		Total Mercury (Hg)	2014/09/08	0.073, RDL=0.050		mg/kg	
		Total Molybdenum (Mo)	2014/09/08	<0.40		mg/kg	
		Total Nickel (Ni)	2014/09/08	<1.0		mg/kg	
		Total Selenium (Se)	2014/09/08	<0.50		mg/kg	
		Total Silver (Ag)	2014/09/08	<1.0		mg/kg	
		Total Thallium (Tl)	2014/09/08	<0.30		mg/kg	
		Total Tin (Sn)	2014/09/08	<1.0		mg/kg	
		Total Uranium (U)	2014/09/08	<1.0		mg/kg	
		Total Vanadium (V)	2014/09/08	<1.0		mg/kg	
		Total Zinc (Zn)	2014/09/08	<10		mg/kg	
	RPD	Total Antimony (Sb)	2014/09/08	NC		%	35
		Total Arsenic (As)	2014/09/08	NC		%	35
		Total Barium (Ba)	2014/09/08	1.0		%	35
		Total Beryllium (Be)	2014/09/08	NC		%	35
		Total Cadmium (Cd)	2014/09/08	NC		%	35
		Total Chromium (Cr)	2014/09/08	20.4		%	35
		Total Cobalt (Co)	2014/09/08	NC		%	35

TETRA TECH EBA INC.
Attention: ROBERT ZSCHUPPE
Client Project #: E14103202-01
P.O. #:
Site Location: JERICO MINE

Quality Assurance Report (Continued)

Maxxam Job Number: EYKB476653

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7629380	SF3	RPD	Total Copper (Cu)	2014/09/08	NC		%	35
			Total Lead (Pb)	2014/09/08	NC		%	35
			Total Mercury (Hg)	2014/09/08	NC		%	35
			Total Molybdenum (Mo)	2014/09/08	NC		%	35
			Total Nickel (Ni)	2014/09/08	20.3		%	35
			Total Selenium (Se)	2014/09/08	NC		%	35
			Total Silver (Ag)	2014/09/08	NC		%	35
			Total Thallium (Tl)	2014/09/08	NC		%	35
			Total Tin (Sn)	2014/09/08	NC		%	35
			Total Uranium (U)	2014/09/08	NC		%	35
			Total Vanadium (V)	2014/09/08	2.3		%	35
			Total Zinc (Zn)	2014/09/08	NC		%	35
7629590	JHC	Matrix Spike	Soluble (Hot water) Boron (B)	2014/09/08		96	%	75 - 125
		Spiked Blank	Soluble (Hot water) Boron (B)	2014/09/08		105	%	75 - 125
		Method Blank	Soluble (Hot water) Boron (B)	2014/09/08	<0.10		mg/kg	
		RPD	Soluble (Hot water) Boron (B)	2014/09/08	NC		%	35
7629680	NC3	Matrix Spike	Total Antimony (Sb)	2014/09/08		95	%	75 - 125
			Total Arsenic (As)	2014/09/08		99	%	75 - 125
			Total Barium (Ba)	2014/09/08		NC	%	75 - 125
			Total Beryllium (Be)	2014/09/08		104	%	75 - 125
			Total Cadmium (Cd)	2014/09/08		100	%	75 - 125
			Total Chromium (Cr)	2014/09/08		103	%	75 - 125
			Total Cobalt (Co)	2014/09/08		99	%	75 - 125
			Total Copper (Cu)	2014/09/08		99	%	75 - 125
			Total Lead (Pb)	2014/09/08		102	%	75 - 125
			Total Mercury (Hg)	2014/09/08		104	%	75 - 125
			Total Molybdenum (Mo)	2014/09/08		104	%	75 - 125
			Total Nickel (Ni)	2014/09/08		102	%	75 - 125
			Total Selenium (Se)	2014/09/08		102	%	75 - 125
			Total Silver (Ag)	2014/09/08		103	%	75 - 125
			Total Thallium (Tl)	2014/09/08		103	%	75 - 125
			Total Tin (Sn)	2014/09/08		105	%	75 - 125
			Total Uranium (U)	2014/09/08		96	%	75 - 125
			Total Vanadium (V)	2014/09/08		104	%	75 - 125
			Total Zinc (Zn)	2014/09/08		NC	%	75 - 125
		QC Standard	Total Arsenic (As)	2014/09/08		115	%	50 - 150
			Total Barium (Ba)	2014/09/08		109	%	69 - 131
			Total Chromium (Cr)	2014/09/08		105	%	41 - 159
			Total Cobalt (Co)	2014/09/08		104	%	75 - 125
			Total Copper (Cu)	2014/09/08		106	%	73 - 127
			Total Lead (Pb)	2014/09/08		106	%	54 - 146
			Total Nickel (Ni)	2014/09/08		114	%	61 - 139
			Total Vanadium (V)	2014/09/08		122	%	50 - 150
			Total Zinc (Zn)	2014/09/08		110	%	72 - 128
		Spiked Blank	Total Antimony (Sb)	2014/09/08		96	%	75 - 125
			Total Arsenic (As)	2014/09/08		100	%	75 - 125
			Total Barium (Ba)	2014/09/08		96	%	75 - 125
			Total Beryllium (Be)	2014/09/08		99	%	75 - 125
			Total Cadmium (Cd)	2014/09/08		96	%	75 - 125
			Total Chromium (Cr)	2014/09/08		98	%	75 - 125
			Total Cobalt (Co)	2014/09/08		99	%	75 - 125
			Total Copper (Cu)	2014/09/08		101	%	75 - 125
			Total Lead (Pb)	2014/09/08		100	%	75 - 125
			Total Mercury (Hg)	2014/09/08		103	%	75 - 125
			Total Molybdenum (Mo)	2014/09/08		101	%	75 - 125

TETRA TECH EBA INC.
Attention: ROBERT ZSCHUPPE
Client Project #: E14103202-01
P.O. #:
Site Location: JERICO MINE

Quality Assurance Report (Continued)

Maxxam Job Number: EYKB476653

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7629680	NC3	Spiked Blank	Total Nickel (Ni)	2014/09/08		100	%	75 - 125
			Total Selenium (Se)	2014/09/08		99	%	75 - 125
			Total Silver (Ag)	2014/09/08		100	%	75 - 125
			Total Thallium (Tl)	2014/09/08		102	%	75 - 125
			Total Tin (Sn)	2014/09/08		100	%	75 - 125
			Total Uranium (U)	2014/09/08		99	%	75 - 125
			Total Vanadium (V)	2014/09/08		101	%	75 - 125
			Total Zinc (Zn)	2014/09/08		104	%	75 - 125
		Method Blank	Total Antimony (Sb)	2014/09/08	<1.0		mg/kg	
			Total Arsenic (As)	2014/09/08	<1.0		mg/kg	
			Total Barium (Ba)	2014/09/08	<10		mg/kg	
			Total Beryllium (Be)	2014/09/08	<0.40		mg/kg	
			Total Cadmium (Cd)	2014/09/08	<0.10		mg/kg	
			Total Chromium (Cr)	2014/09/08	<1.0		mg/kg	
			Total Cobalt (Co)	2014/09/08	<1.0		mg/kg	
			Total Copper (Cu)	2014/09/08	<5.0		mg/kg	
			Total Lead (Pb)	2014/09/08	<1.0		mg/kg	
			Total Mercury (Hg)	2014/09/08	<0.050		mg/kg	
			Total Molybdenum (Mo)	2014/09/08	<0.40		mg/kg	
			Total Nickel (Ni)	2014/09/08	<1.0		mg/kg	
			Total Selenium (Se)	2014/09/08	<0.50		mg/kg	
			Total Silver (Ag)	2014/09/08	<1.0		mg/kg	
			Total Thallium (Tl)	2014/09/08	<0.30		mg/kg	
			Total Tin (Sn)	2014/09/08	<1.0		mg/kg	
			Total Uranium (U)	2014/09/08	<1.0		mg/kg	
			Total Vanadium (V)	2014/09/08	<1.0		mg/kg	
			Total Zinc (Zn)	2014/09/08	<10		mg/kg	
		RPD	Total Antimony (Sb)	2014/09/08	NC		%	35
			Total Arsenic (As)	2014/09/08	13.2		%	35
			Total Barium (Ba)	2014/09/08	23.3		%	35
			Total Beryllium (Be)	2014/09/08	NC		%	35
			Total Cadmium (Cd)	2014/09/08	NC		%	35
			Total Chromium (Cr)	2014/09/08	30.2		%	35
			Total Cobalt (Co)	2014/09/08	0.5		%	35
			Total Copper (Cu)	2014/09/08	NC		%	35
			Total Lead (Pb)	2014/09/08	2.1		%	35
			Total Mercury (Hg)	2014/09/08	NC		%	35
			Total Molybdenum (Mo)	2014/09/08	NC		%	35
			Total Nickel (Ni)	2014/09/08	11.4		%	35
			Total Selenium (Se)	2014/09/08	NC		%	35
			Total Silver (Ag)	2014/09/08	NC		%	35
			Total Thallium (Tl)	2014/09/08	NC		%	35
			Total Tin (Sn)	2014/09/08	NC		%	35
			Total Uranium (U)	2014/09/08	NC		%	35
			Total Vanadium (V)	2014/09/08	2.3		%	35
			Total Zinc (Zn)	2014/09/08	NC		%	35
7630638	KD5	Matrix Spike	Hex. Chromium (Cr 6+)	2014/09/09		11 (2)	%	75 - 125
		Spiked Blank	Hex. Chromium (Cr 6+)	2014/09/09		93	%	80 - 120
		Method Blank	Hex. Chromium (Cr 6+)	2014/09/09	<0.15		mg/kg	
		RPD	Hex. Chromium (Cr 6+)	2014/09/09	NC		%	35
7630978	NC3	Matrix Spike	Total Antimony (Sb)	2014/09/09		90	%	75 - 125
			Total Arsenic (As)	2014/09/09		95	%	75 - 125
			Total Barium (Ba)	2014/09/09		NC	%	75 - 125
			Total Beryllium (Be)	2014/09/09		97	%	75 - 125
			Total Cadmium (Cd)	2014/09/09		92	%	75 - 125

TETRA TECH EBA INC.
Attention: ROBERT ZSCHUPPE
Client Project #: E14103202-01
P.O. #:
Site Location: JERICO MINE

Quality Assurance Report (Continued)

Maxxam Job Number: EYKB476653

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7630978	NC3	Matrix Spike	Total Chromium (Cr)	2014/09/09		92	%	75 - 125
			Total Cobalt (Co)	2014/09/09		94	%	75 - 125
			Total Copper (Cu)	2014/09/09		94	%	75 - 125
			Total Lead (Pb)	2014/09/09		88	%	75 - 125
			Total Mercury (Hg)	2014/09/09		85	%	75 - 125
			Total Molybdenum (Mo)	2014/09/09		98	%	75 - 125
			Total Nickel (Ni)	2014/09/09		89	%	75 - 125
			Total Selenium (Se)	2014/09/09		90	%	75 - 125
			Total Silver (Ag)	2014/09/09		96	%	75 - 125
			Total Thallium (Tl)	2014/09/09		87	%	75 - 125
			Total Tin (Sn)	2014/09/09		98	%	75 - 125
			Total Uranium (U)	2014/09/09		87	%	75 - 125
			Total Vanadium (V)	2014/09/09		103	%	75 - 125
			Total Zinc (Zn)	2014/09/09		NC	%	75 - 125
		QC Standard	Total Arsenic (As)	2014/09/09		122	%	50 - 150
			Total Barium (Ba)	2014/09/09		116	%	69 - 131
			Total Chromium (Cr)	2014/09/09		111	%	41 - 159
			Total Cobalt (Co)	2014/09/09		113	%	75 - 125
			Total Copper (Cu)	2014/09/09		105	%	73 - 127
			Total Lead (Pb)	2014/09/09		99	%	54 - 146
			Total Nickel (Ni)	2014/09/09		119	%	61 - 139
			Total Vanadium (V)	2014/09/09		132	%	50 - 150
			Total Zinc (Zn)	2014/09/09		108	%	72 - 128
		Spiked Blank	Total Antimony (Sb)	2014/09/09		91	%	75 - 125
			Total Arsenic (As)	2014/09/09		93	%	75 - 125
			Total Barium (Ba)	2014/09/09		94	%	75 - 125
			Total Beryllium (Be)	2014/09/09		95	%	75 - 125
			Total Cadmium (Cd)	2014/09/09		91	%	75 - 125
			Total Chromium (Cr)	2014/09/09		92	%	75 - 125
			Total Cobalt (Co)	2014/09/09		93	%	75 - 125
			Total Copper (Cu)	2014/09/09		92	%	75 - 125
			Total Lead (Pb)	2014/09/09		81	%	75 - 125
			Total Mercury (Hg)	2014/09/09		86	%	75 - 125
			Total Molybdenum (Mo)	2014/09/09		94	%	75 - 125
			Total Nickel (Ni)	2014/09/09		92	%	75 - 125
			Total Selenium (Se)	2014/09/09		89	%	75 - 125
			Total Silver (Ag)	2014/09/09		95	%	75 - 125
			Total Thallium (Tl)	2014/09/09		86	%	75 - 125
			Total Tin (Sn)	2014/09/09		96	%	75 - 125
			Total Uranium (U)	2014/09/09		90	%	75 - 125
			Total Vanadium (V)	2014/09/09		96	%	75 - 125
			Total Zinc (Zn)	2014/09/09		93	%	75 - 125
		Method Blank	Total Antimony (Sb)	2014/09/09	<1.0		mg/kg	
			Total Arsenic (As)	2014/09/09	<1.0		mg/kg	
			Total Barium (Ba)	2014/09/09	<10		mg/kg	
			Total Beryllium (Be)	2014/09/09	<0.40		mg/kg	
			Total Cadmium (Cd)	2014/09/09	<0.10		mg/kg	
			Total Chromium (Cr)	2014/09/09	<1.0		mg/kg	
			Total Cobalt (Co)	2014/09/09	<1.0		mg/kg	
			Total Copper (Cu)	2014/09/09	<5.0		mg/kg	
			Total Lead (Pb)	2014/09/09	<1.0		mg/kg	
			Total Mercury (Hg)	2014/09/09	<0.050		mg/kg	
			Total Molybdenum (Mo)	2014/09/09	<0.40		mg/kg	
			Total Nickel (Ni)	2014/09/09	<1.0		mg/kg	
			Total Selenium (Se)	2014/09/09	<0.50		mg/kg	

TETRA TECH EBA INC.
Attention: ROBERT ZSCHUPPE
Client Project #: E14103202-01
P.O. #:
Site Location: JERICO MINE

Quality Assurance Report (Continued)

Maxxam Job Number: EYKB476653

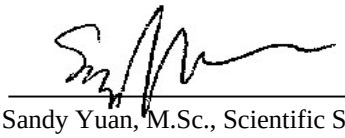
QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7630978	NC3	Method Blank	Total Silver (Ag)	2014/09/09	<1.0		mg/kg	
			Total Thallium (Tl)	2014/09/09	<0.30		mg/kg	
			Total Tin (Sn)	2014/09/09	<1.0		mg/kg	
			Total Uranium (U)	2014/09/09	<1.0		mg/kg	
			Total Vanadium (V)	2014/09/09	<1.0		mg/kg	
			Total Zinc (Zn)	2014/09/09	<10		mg/kg	
		RPD	Total Arsenic (As)	2014/09/09	2.1		%	35
			Total Barium (Ba)	2014/09/09	3.6		%	35
			Total Cadmium (Cd)	2014/09/09	NC		%	35
			Total Chromium (Cr)	2014/09/09	9.4		%	35
			Total Cobalt (Co)	2014/09/09	2.1		%	35
			Total Copper (Cu)	2014/09/09	NC		%	35
			Total Lead (Pb)	2014/09/09	6.9		%	35
			Total Mercury (Hg)	2014/09/09	NC		%	35
			Total Nickel (Ni)	2014/09/09	2.8		%	35
			Total Zinc (Zn)	2014/09/09	NC		%	35
7631035	JK9	Matrix Spike	Soluble (Hot water) Boron (B)	2014/09/09		109	%	75 - 125
		Spiked Blank	Soluble (Hot water) Boron (B)	2014/09/09		105	%	75 - 125
		Method Blank	Soluble (Hot water) Boron (B)	2014/09/09	<0.10		mg/kg	
		RPD	Soluble (Hot water) Boron (B)	2014/09/09	1.7		%	35

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.
QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.
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 (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).
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 (one or both samples < 5x RDL).
(1) Detection limits raised due to matrix interference.
(2) Matrix Spike exceeds acceptance limits due to matrix interference. Reanalysis yields similar results.

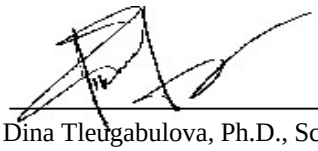
Validation Signature Page

Maxxam Job #: B476653

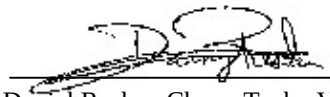
The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



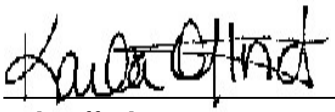
Sandy Yuan, M.Sc., Scientific Specialist



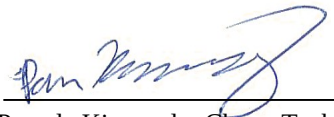
Dina Tleugabulova, Ph.D., Scientific Specialist, Inorganics Department



Daniel Reslan, Chem. Tech., Volatiles Supervisor



Karla Offord, B.Sc., Supervisor, Extractable Hydrocarbons



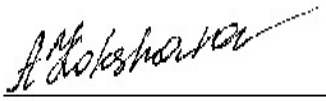
Pamela Kimmerly, Chem. Tech., Team Lead

Validation Signature Page

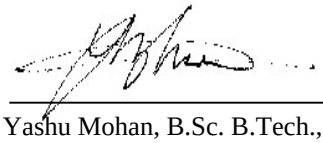
Maxxam Job #: B476653

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Kelly Gip, B.Sc., Senior Analyst



Anna Koksharova, M.Sc., Senior Analyst



Yashu Mohan, B.Sc. B.Tech., Senior Analyst

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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.

Your P.O. #: E14103202
Your C.O.C. #: A131767, A131768, A131769

Attention: ROBERT ZSCHUPPE
TETRA TECH EBA INC.
14940-123 AVENUE
EDMONTON, AB
CANADA T5V 1B4

Report Date: 2014/09/10
Report #: R1639427
Version: 1P

CERTIFICATE OF ANALYSIS – PARTIAL RESULTS

MAXXAM JOB #: B477081
Received: 2014/09/01, 11:15

Sample Matrix: Soil
Samples Received: 12

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 by HS GC/MS (MeOH extract)	12	2014/09/03	2014/09/06	AB SOP-00039	CCME CWS/EPA 8260C m
CCME Hydrocarbons (F2-F4 in soil)	12	2014/09/03	2014/09/06	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS
Moisture	12	N/A	2014/09/04	AB SOP-00002	CCME PHC-CWS

Sample Matrix: Water
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	5	N/A	2014/09/04	AB SOP-00005	SM 22 2320 B m
Alkalinity @25C (pp, total), CO3,HCO3,OH	1	N/A	2014/09/06	AB SOP-00005	SM 22 2320 B m
BTEX/F1 in Water by HS GC/MS	3	N/A	2014/09/08	AB SOP-00039	CCME CWS/EPA 8260C m
Cadmium - low level CCME - Dissolved	1	N/A	2014/09/08	AB SOP-00043	EPA 200.8 R5.4 m
Cadmium - low level CCME - Dissolved	5	N/A	2014/09/09	AB SOP-00043	EPA 200.8 R5.4 m
Cadmium - low level CCME (Total)	5	2014/09/03	2014/09/09	AB SOP-00014 / AB SOP-00043	EPA 200.8 R5.4m
Chloride by Automated Colourimetry	6	N/A	2014/09/07	AB SOP-00020	SM 22 4500-Cl G m
Conductivity @25C	5	N/A	2014/09/04	AB SOP-00005	SM 22 2510 B m
Conductivity @25C	1	N/A	2014/09/06	AB SOP-00005	SM 22 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16)	3	2014/09/05	2014/09/06	AB SOP-00040 AB SOP-00037	EPA3510/CCME PHCCWS
Hardness	2	N/A	2014/09/08	AB WI-00065	SM 2340B
Hardness	4	N/A	2014/09/10	AB WI-00065	SM 2340B
Elements by ICP - Dissolved	4	N/A	2014/09/09	AB SOP-00042	EPA 200.7 CFR 2012 m
Elements by ICP-Dissolved-Lab Filtered	2	N/A	2014/09/08	AB SOP-00042	EPA 200.7
Elements by ICP - Total	3	2014/09/07	2014/09/09	AB SOP-00014 / AB SOP-00042	EPA 200.7 CFR 2012 m
Elements by ICP - Total	2	2014/09/09	2014/09/10	AB SOP-00014 / AB SOP-00042	EPA 200.7 CFR 2012 m
Elements by ICPMS - Dissolved	4	N/A	2014/09/06	AB SOP-00043	EPA 200.8 R5.4 m
Elements by ICPMS-Dissolved-Lab Filtered	2	N/A	2014/09/09	AB SOP-00043	EPA 200.8 R5.4 m

Maxxam Analytics – Partial/Rush Results

Your P.O. #: E14103202
Your C.O.C. #: A131767, A131768, A131769

Attention: ROBERT ZSCHUPPE
TETRA TECH EBA INC.
14940-123 AVENUE
EDMONTON, AB
CANADA T5V 1B4

Report Date: 2014/09/10
Report #: R1639427
Version: 1P

CERTIFICATE OF ANALYSIS – PARTIAL RESULTS

Sample Matrix: Water
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Elements by ICPMS - Total	3	2014/09/07	2014/09/08	AB SOP-00014 / AB SOP-00043	EPA 200.8 R5.4 m
Elements by ICPMS - Total	2	2014/09/09	2014/09/09	AB SOP-00014 / AB SOP-00043	EPA 200.8 R5.4 m
Ion Balance	2	N/A	2014/09/08	AB WI-00065	SM 1030E
Ion Balance	4	N/A	2014/09/10	AB WI-00065	SM 1030E
Sum of cations, anions	2	N/A	2014/09/08	AB WI-00065	SM 1030E
Sum of cations, anions	4	N/A	2014/09/10	AB WI-00065	SM 1030E
Nitrate and Nitrite	6	N/A	2014/09/08	AB SOP-00023	Auto Calc
Nitrate + Nitrite-N (calculated)	6	N/A	2014/09/08	AB SOP-00023	SM 4110-B
Nitrogen, (Nitrite, Nitrate) by IC	6	N/A	2014/09/07	AB SOP-00023	SM 22 4110 B m
pH @25°C (Alkalinity titrator)	5	N/A	2014/09/04	AB SOP-00005	SM 22 4500-H B m
pH @25°C (Alkalinity titrator)	1	N/A	2014/09/06	AB SOP-00005	SM 22 4500-H B m
Sulphate by Automated Colourimetry	6	N/A	2014/09/07	AB SOP-00018	SM 22 4500-SO4 E m
Total Dissolved Solids (Calculated)	2	N/A	2014/09/08	AB WI-00065	SM 1030E
Total Dissolved Solids (Calculated)	4	N/A	2014/09/10	AB WI-00065	SM 1030E

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Sherlyne Sim, B.Eng, Project Manager
Email: SSim@maxxam.ca
Phone# (780) 577-7113

==========

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.

Total cover pages: 2

Maxxam Analytics – PartialRush Results

TETRA TECH EBA INC.

Maxxam Job #: B477081
Report Date: 2014/09/10

Your P.O. #: E14103202

AT1 BTEX AND F1-F2 (WATER)

Maxxam ID		KM5919	KM5920	KM5926		
Sampling Date		2014/08/31 08:30	2014/08/31 09:00	2014/08/31 08:30		
COC Number		A131769	A131769	A131769		
	UNITS	**14MW01**	**14MW03**	**MWDUP1**	**RDL**	**QC Batch**
Hydrocarbons						
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	0.10	7624962
Volatiles						
Benzene	mg/L	<0.00040	<0.00040	<0.00040	0.00040	7624939
Toluene	mg/L	<0.00040	0.0020	<0.00040	0.00040	7624939
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	0.00040	7624939
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	0.00080	7624939
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	0.00040	7624939
Xylenes (Total)	mg/L	<0.00080	<0.00080	<0.00080	0.00080	7624939
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	0.10	7624939
(C6-C10)	mg/L	<0.10	<0.10	<0.10	0.10	7624939
Surrogate Recovery (%)						
1,4-Difluorobenzene (sur.)	%	101	98	97	N/A	7624939
4-Bromofluorobenzene (sur.)	%	101	98	97	N/A	7624939
D4-1,2-Dichloroethane (sur.)	%	113	108	101	N/A	7624939
O-TERPHENYL (sur.)	%	85	92	97	N/A	7624962

N/A = Not Applicable
RDL = Reportable Detection Limit

Maxxam Analytics – Partial/Rush Results

TETRA TECH EBA INC.

Maxxam Job #: B477081
Report Date: 2014/09/10

Your P.O. #: E14103202

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KM5560	KM5562	KM5563	KM5564	KM5566	KM5568		
Sampling Date		2014/08/30	2014/08/30	2014/08/30	2014/08/30	2014/08/30	2014/08/30		
COC Number		A131767	A131767	A131767	A131767	A131767	A131767		
	UNITS	**SS8-30 0-40**	**SS8-31 20-40**	**SS8-31 40-70**	**SS8-32 0-30**	**SS8-32 50-70**	**SS8-33 20-40**	**RDL**	**QC Batch**
Physical Properties									
Moisture	%	3.9	7.7	17	5.6	17	5.4	0.30	7624767
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	<10	<10	820	<10	10	7624935
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	<50	<50	<50	620	<50	50	7624935
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	<50	<50	<50	<50	50	7624935
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	Yes	Yes	N/A	7624935
Volatiles									
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	7624905
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	7624905
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7624905
Xylenes (Total)	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7624905
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7624905
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	7624905
F1 (C6-C10) - BTEX	mg/kg	<12	<12	<12	<12	<12	<12	12	7624905
(C6-C10)	mg/kg	<12	<12	<12	<12	<12	<12	12	7624905
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	100	103	108	100	108	109	N/A	7624905
4-Bromofluorobenzene (sur.)	%	106	99	101	104	103	111	N/A	7624905
D10-ETHYLBENZENE (sur.)	%	99	101	101	99	104	115	N/A	7624905
D4-1,2-Dichloroethane (sur.)	%	103	102	100	103	104	105	N/A	7624905
O-TERPHENYL (sur.)	%	94	97	93	99	98	98	N/A	7624935

N/A = Not Applicable
RDL = Reportable Detection Limit

Maxxam Analytics - Partial/Rush Results

TETRA TECH EBA INC.

Maxxam Job #: B477081
Report Date: 2014/09/10

Your P.O. #: E14103202

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KM5597	KM5599	KM5601	KM5603	KM5605	KM5607		
Sampling Date		2014/08/30	2014/08/30	2014/08/31	2014/08/31	2014/08/31	2014/08/31		
COC Number		A131768	A131768	A131768	A131768	A131768	A131768		
	UNITS	**SS8-34 0-30**	**SS8-34 50-70**	**SS8-35 20-40**	**SS8-36 20-40**	**SS8-37 50-60**	**SS8-38 50-60**	**RDL**	**QC Batch**
Physical Properties									
Moisture	%	4.1	15	5.6	6.4	5.0	5.7	0.30	7624767
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	17	<10	<10	<10	<10	<10	10	7624935
F3 (C16-C34 Hydrocarbons)	mg/kg	57	<50	<50	<50	<50	<50	50	7624935
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	<50	<50	<50	<50	50	7624935
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	Yes	Yes	N/A	7624935
Volatiles									
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	7624905
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	7624905
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7624905
Xylenes (Total)	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7624905
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7624905
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	7624905
F1 (C6-C10) - BTEX	mg/kg	<12	<12	<12	<12	<12	<12	12	7624905
(C6-C10)	mg/kg	<12	<12	<12	<12	<12	<12	12	7624905
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	98	107	101	102	81	102	N/A	7624905
4-Bromofluorobenzene (sur.)	%	105	103	103	101	113	104	N/A	7624905
D10-ETHYLBENZENE (sur.)	%	93	99	100	100	86	100	N/A	7624905
D4-1,2-Dichloroethane (sur.)	%	99	101	103	101	154 (1)	105	N/A	7624905
O-TERPHENYL (sur.)	%	96	95	98	95	96	92	N/A	7624935

N/A = Not Applicable
RDL = Reportable Detection Limit
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Maxxam Analytics - Partial/Rush Results

TETRA TECH EBA INC.

Maxxam Job #: B477081
Report Date: 2014/09/10

Your P.O. #: E14103202

Maxxam Analytics - Partial/Rush Results

ROUTINE WATER (WATER)

Maxxam ID		KM5921		KM5923		KM5925		
Sampling Date		2014/08/31 11:15		2014/08/31 10:40		2014/08/31 11:40		
COC Number		A131769		A131769		A131769		
	UNITS	**14MW04**	**QC Batch**	**14MW06**	**QC Batch**	**14MWC2**	**RDL**	**QC Batch**
Calculated Parameters								
Anion Sum	meq/L	1.6	7624697	0.97	7624697	1.4	N/A	7624570
Cation Sum	meq/L	1.6	7624697	1.2	7624697	2.1	N/A	7624570
Hardness (CaCO3)	mg/L	67	7624695	38	7624695	91	0.50	7624568
Ion Balance	N/A	1.0	7624696	1.3	7624696	1.5	0.010	7624569
Dissolved Nitrate (NO3)	mg/L	33	7624698	1.0	7624698	<0.044	0.044	7624496
Nitrate plus Nitrite (N)	mg/L	7.6	7624699	0.25	7624699	<0.010	0.010	7624497
Dissolved Nitrite (NO2)	mg/L	0.33	7624698	0.040	7624698	<0.033	0.033	7624496
Total Dissolved Solids	mg/L	100	7624700	57	7624700	80	10	7624571
Misc. Inorganics								
Conductivity	uS/cm	160	7628053	97	7625397	130	1.0	7625397
pH	pH	7.43	7628048	6.83	7625390	7.55	N/A	7625390
Anions								
Alkalinity (PP as CaCO3)	mg/L	<0.50	7628052	<0.50	7625396	<0.50	0.50	7625396
Alkalinity (Total as CaCO3)	mg/L	24	7628052	35	7625396	64	0.50	7625396
Bicarbonate (HCO3)	mg/L	29	7628052	43	7625396	78	0.50	7625396
Carbonate (CO3)	mg/L	<0.50	7628052	<0.50	7625396	<0.50	0.50	7625396
Hydroxide (OH)	mg/L	<0.50	7628052	<0.50	7625396	<0.50	0.50	7625396
Dissolved Sulphate (SO4)	mg/L	22	7626879	6.6	7626879	3.3	1.0	7626879
Dissolved Chloride (Cl)	mg/L	2.6	7626858	3.9	7626858	1.1	1.0	7626858
Nutrients								
Dissolved Nitrite (N)	mg/L	0.10	7625604	0.012	7625604	<0.010	0.010	7625604
Dissolved Nitrate (N)	mg/L	7.4	7625604	0.24	7625604	<0.010	0.010	7625604

RDL = Reportable Detection Limit

TETRA TECH EBA INC.

Maxxam Job #: B477081
Report Date: 2014/09/10

Your P.O. #: E14103202

ROUTINE WATER (WATER)

Maxxam ID		KM5927		
Sampling Date		2014/08/31 10:40		
COC Number		A131769		
	UNITS	**MWDUP2**	**RDL**	**QC Batch**
Calculated Parameters				
Anion Sum	meq/L	1.0	N/A	7624570
Cation Sum	meq/L	1.2	N/A	7624570
Hardness (CaCO3)	mg/L	39	0.50	7624568
Ion Balance	N/A	1.2	0.010	7624569
Dissolved Nitrate (NO3)	mg/L	1.0	0.044	7624496
Nitrate plus Nitrite (N)	mg/L	0.24	0.010	7624497
Dissolved Nitrite (NO2)	mg/L	0.044	0.033	7624496
Total Dissolved Solids	mg/L	58	10	7624571
Misc. Inorganics				
Conductivity	uS/cm	98	1.0	7625397
pH	pH	6.88	N/A	7625390
Anions				
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	7625396
Alkalinity (Total as CaCO3)	mg/L	36	0.50	7625396
Bicarbonate (HCO3)	mg/L	44	0.50	7625396
Carbonate (CO3)	mg/L	<0.50	0.50	7625396
Hydroxide (OH)	mg/L	<0.50	0.50	7625396
Dissolved Sulphate (SO4)	mg/L	8.0	1.0	7626879
Dissolved Chloride (Cl)	mg/L	3.2	1.0	7626858
Nutrients				
Dissolved Nitrite (N)	mg/L	0.013	0.010	7625604
Dissolved Nitrate (N)	mg/L	0.23	0.010	7625604

RDL = Reportable Detection Limit

Maxxam Analytics – Partial/Rush Results

TETRA TECH EBA INC.

Maxxam Job #: B477081
Report Date: 2014/09/10

Your P.O. #: E14103202

Maxxam Analytics - Partial/Rush Results

ROUTINE WATER - FILTERED (WATER)

Maxxam ID		KM5922			KM5924		
Sampling Date		2014/08/31 11:00			2014/08/31 10:03		
COC Number		A131769			A131769		
	UNITS	**14MW05**	**RDL**	**QC Batch**	**14MWC1**	**RDL**	**QC Batch**
Calculated Parameters							
Anion Sum	meq/L	0.57	N/A	7623772	0.21	N/A	7624570
Cation Sum	meq/L	0.86	N/A	7623772	0.30	N/A	7624570
Hardness (CaCO3)	mg/L	28	0.50	7623770	11	0.50	7624568
Ion Balance	N/A	1.5	0.010	7623771	1.4	0.010	7624569
Dissolved Nitrate (NO3)	mg/L	0.63	0.44	7624496	9.3	0.044	7624496
Nitrate plus Nitrite (N)	mg/L	0.14	0.10	7624497	2.1	0.010	7624497
Dissolved Nitrite (NO2)	mg/L	<0.33	0.33	7624496	<0.033	0.033	7624496
Total Dissolved Solids	mg/L	36	10	7623773	18	10	7624571
Misc. Inorganics							
Conductivity	uS/cm	63	1.0	7625397	33	1.0	7625397
pH	pH	6.60	N/A	7625390	5.04	N/A	7625390
Anions							
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	7625396	<0.50	0.50	7625396
Alkalinity (Total as CaCO3)	mg/L	24	0.50	7625396	<0.50	0.50	7625396
Bicarbonate (HCO3)	mg/L	29	0.50	7625396	<0.50	0.50	7625396
Carbonate (CO3)	mg/L	<0.50	0.50	7625396	<0.50	0.50	7625396
Hydroxide (OH)	mg/L	<0.50	0.50	7625396	<0.50	0.50	7625396
Dissolved Sulphate (SO4)	mg/L	<1.0	1.0	7626879	1.1	1.0	7626879
Dissolved Chloride (Cl)	mg/L	3.1	1.0	7626858	1.3	1.0	7626858
Nutrients							
Dissolved Nitrite (N)	mg/L	<0.10 (1)	0.10	7625604	<0.010	0.010	7625604
Dissolved Nitrate (N)	mg/L	0.14 (1)	0.10	7625604	2.1	0.010	7625604

RDL = Reportable Detection Limit
(1) Detection limits raised due to sample matrix.

TETRA TECH EBA INC.

Maxxam Job #: B477081
Report Date: 2014/09/10

Your P.O. #: E14103202

Maxxam Analytics - Partial/Rush Results

REGULATED METALS (CCME/AT1) - DISSOLVED

Maxxam ID		KM5921	KM5923	KM5925	KM5927		
Sampling Date		2014/08/31 11:15	2014/08/31 10:40	2014/08/31 11:40	2014/08/31 10:40		
COC Number		A131769	A131769	A131769	A131769		
	UNITS	**14MW04**	**14MW06**	**14MWC2**	**MWDUP2**	**RDL**	**QC Batch**
Low Level Elements							
Dissolved Cadmium (Cd)	ug/L	0.038	<0.020	0.027	<0.020	0.020	7623347
Elements							
Dissolved Aluminum (Al)	mg/L	0.17	0.34	0.22	0.37	0.0030	7625570
Dissolved Antimony (Sb)	mg/L	<0.00060	<0.00060	<0.00060	<0.00060	0.00060	7625570
Dissolved Arsenic (As)	mg/L	0.00031	0.0021	0.0012	0.0025	0.00020	7625570
Dissolved Barium (Ba)	mg/L	0.023	0.020	0.022	0.020	0.010	7629389
Dissolved Beryllium (Be)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7625570
Dissolved Boron (B)	mg/L	0.039	<0.020 (1)	<0.020	0.020 (1)	0.020	7629389
Dissolved Calcium (Ca)	mg/L	16	8.2	22	8.3	0.30	7629389
Dissolved Chromium (Cr)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7625570
Dissolved Cobalt (Co)	mg/L	0.00085	0.0065	0.0020	0.0070	0.00030	7625570
Dissolved Copper (Cu)	mg/L	0.0046	0.0033	0.0070	0.0031	0.00020	7625570
Dissolved Iron (Fe)	mg/L	0.13	4.1	1.2	4.4	0.060	7629389
Dissolved Lead (Pb)	mg/L	<0.00020	0.00023	0.00028	<0.00020	0.00020	7625570
Dissolved Lithium (Li)	mg/L	<0.020	<0.020	<0.020	<0.020	0.020	7629389
Dissolved Magnesium (Mg)	mg/L	6.9	4.3	8.8	4.3	0.20	7629389
Dissolved Manganese (Mn)	mg/L	0.079	0.33	0.97	0.33	0.0040	7629389
Dissolved Molybdenum (Mo)	mg/L	0.0015	0.00026	0.00084	0.00026	0.00020	7625570
Dissolved Nickel (Ni)	mg/L	0.0014	0.0029	0.0017	0.0031	0.00050	7625570
Dissolved Phosphorus (P)	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	7629389
Dissolved Potassium (K)	mg/L	1.1	1.0	2.5	1.0	0.30	7629389
Dissolved Selenium (Se)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	7625570
Dissolved Silicon (Si)	mg/L	3.6	3.7	5.1	3.7	0.10	7629389
Dissolved Silver (Ag)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	7625570
Dissolved Sodium (Na)	mg/L	5.4	6.1	2.3	6.0	0.50	7629389
Dissolved Strontium (Sr)	mg/L	0.065	0.043	0.035	0.044	0.020	7629389
Dissolved Sulphur (S)	mg/L	6.4	2.7	1.0	2.8	0.20	7629389
Dissolved Thallium (Tl)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	7625570
Dissolved Tin (Sn)	mg/L	0.0020	<0.0010	<0.0010	<0.0010	0.0010	7625570
Dissolved Titanium (Ti)	mg/L	0.012	0.0076	0.0056	0.0086	0.0010	7625570
Dissolved Uranium (U)	mg/L	0.00036	0.00022	0.0053	0.00022	0.00010	7625570

RDL = Reportable Detection Limit
(1) Dissolved greater than total. Results are within limits of uncertainty(MU).

TETRA TECH EBA INC.

Maxxam Job #: B477081
Report Date: 2014/09/10

Your P.O. #: E14103202

REGULATED METALS (CCME/AT1) - DISSOLVED

Maxxam ID		KM5921	KM5923	KM5925	KM5927		
Sampling Date		2014/08/31 11:15	2014/08/31 10:40	2014/08/31 11:40	2014/08/31 10:40		
COC Number		A131769	A131769	A131769	A131769		
	UNITS	**14MW04**	**14MW06**	**14MWC2**	**MWDUP2**	**RDL**	**QC Batch**
Dissolved Vanadium (V)	mg/L	0.0014	0.0024	0.0017	0.0024	0.0010	7625570
Dissolved Zinc (Zn)	mg/L	0.069	0.082	0.0097	0.087	0.0030	7625570

RDL = Reportable Detection Limit

Maxxam Analytics - Partial/Rush Results

TETRA TECH EBA INC.

Maxxam Job #: B477081
Report Date: 2014/09/10

Your P.O. #: E14103202

Maxxam Analytics - Partial/Rush Results

REGULATED METALS (CCME/AT1) - DISSOLVED

Maxxam ID		KM5922	KM5924		
Sampling Date		2014/08/31 11:00	2014/08/31 10:03		
COC Number		A131769	A131769		
	UNITS	**14MW05**	**14MWC1**	**RDL**	**QC Batch**
Low Level Elements					
Dissolved Cadmium (Cd)	ug/L	0.056	0.021	0.020	7623347
Lab Filtered Elements					
Dissolved Aluminum (Al)	mg/L	0.61	0.60	0.0030	7628818
Dissolved Antimony (Sb)	mg/L	<0.00060	<0.00060	0.00060	7628818
Dissolved Arsenic (As)	mg/L	0.0039	0.00034	0.00020	7628818
Dissolved Barium (Ba)	mg/L	0.017	0.020	0.010	7629396
Dissolved Beryllium (Be)	mg/L	<0.0010	<0.0010	0.0010	7628818
Dissolved Boron (B)	mg/L	<0.020	<0.020	0.020	7629396
Dissolved Calcium (Ca)	mg/L	7.5	3.5	0.30	7629396
Dissolved Chromium (Cr)	mg/L	0.0027	<0.0010	0.0010	7628818
Dissolved Cobalt (Co)	mg/L	0.0022	0.0028	0.00030	7628818
Dissolved Copper (Cu)	mg/L	0.048	0.0048	0.00020	7628818
Dissolved Iron (Fe)	mg/L	4.9	0.46	0.060	7629396
Dissolved Lead (Pb)	mg/L	0.00061	<0.00020	0.00020	7628818
Dissolved Lithium (Li)	mg/L	<0.020	<0.020	0.020	7629396
Dissolved Magnesium (Mg)	mg/L	2.1	0.52	0.20	7629396
Dissolved Manganese (Mn)	mg/L	0.096	0.012	0.0040	7629396
Dissolved Molybdenum (Mo)	mg/L	0.0020	<0.00020	0.00020	7628818
Dissolved Nickel (Ni)	mg/L	0.0077	0.0018	0.00050	7628818
Dissolved Phosphorus (P)	mg/L	<0.10	<0.10	0.10	7629396
Dissolved Potassium (K)	mg/L	1.1	<0.30	0.30	7629396
Dissolved Selenium (Se)	mg/L	<0.00020	<0.00020	0.00020	7628818
Dissolved Silicon (Si)	mg/L	12	6.0	0.10	7629396
Dissolved Silver (Ag)	mg/L	<0.00010	<0.00010	0.00010	7628818
Dissolved Sodium (Na)	mg/L	2.5	1.3	0.50	7629396
Dissolved Strontium (Sr)	mg/L	0.024	<0.020	0.020	7629396
Dissolved Sulphur (S)	mg/L	0.97	0.99	0.20	7629396
Dissolved Thallium (Tl)	mg/L	<0.00020	<0.00020	0.00020	7628818
Dissolved Tin (Sn)	mg/L	0.0013	<0.0010	0.0010	7628818
Dissolved Titanium (Ti)	mg/L	0.022	0.014	0.0010	7628818
Dissolved Uranium (U)	mg/L	0.0025	0.00084	0.00010	7628818
Dissolved Vanadium (V)	mg/L	0.014	0.0022	0.0010	7628818

RDL = Reportable Detection Limit

TETRA TECH EBA INC.

Maxxam Job #: B477081
Report Date: 2014/09/10

Your P.O. #: E14103202

REGULATED METALS (CCME/AT1) - DISSOLVED

Maxxam ID		KM5922	KM5924		
Sampling Date		2014/08/31 11:00	2014/08/31 10:03		
COC Number		A131769	A131769		
	UNITS	**14MW05**	**14MWC1**	**RDL**	**QC Batch**
Dissolved Zinc (Zn)	mg/L	0.13	0.041	0.0030	7628818

RDL = Reportable Detection Limit

Maxxam Analytics - Partial/Rush Results

TETRA TECH EBA INC.

Maxxam Job #: B477081
Report Date: 2014/09/10

Your P.O. #: E14103202

Maxxam Analytics – Partial/Rush Results

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		KM5921			KM5922		
Sampling Date		2014/08/31 11:15			2014/08/31 11:00		
COC Number		A131769			A131769		
	UNITS	**14MW04**	**RDL**	**QC Batch**	**14MW05**	**RDL**	**QC Batch**
Low Level Elements							
Total Cadmium (Cd)	ug/L	0.48	0.020	7623412	5.8	0.40	7623412
Elements							
Total Aluminum (Al)	mg/L	75	0.0030	7628625	590	0.060	7630518
Total Antimony (Sb)	mg/L	<0.00060	0.00060	7628625	<0.012	0.012	7630518
Total Arsenic (As)	mg/L	0.024	0.00020	7628625	0.49	0.0040	7630518
Total Barium (Ba)	mg/L	0.47	0.010	7628627	3.4	0.010	7630532
Total Beryllium (Be)	mg/L	0.0028	0.0010	7628625	0.026	0.020	7630518
Total Boron (B)	mg/L	0.045	0.020	7628627	0.064	0.020	7630532
Total Calcium (Ca)	mg/L	34	0.30	7628627	180	0.30	7630532
Total Chromium (Cr)	mg/L	0.22	0.0010	7628625	2.2	0.020	7630518
Total Cobalt (Co)	mg/L	0.046	0.00030	7628625	0.40	0.0060	7630518
Total Copper (Cu)	mg/L	0.30	0.00020	7628625	3.6	0.0040	7630518
Total Iron (Fe)	mg/L	79	0.060	7628627	1300 (1)	0.60	7630532
Total Lead (Pb)	mg/L	0.035	0.00020	7628625	0.24	0.0040	7630518
Total Lithium (Li)	mg/L	0.16	0.020	7628627	1.6	0.020	7630532
Total Magnesium (Mg)	mg/L	39	0.20	7628627	310	0.20	7630532
Total Manganese (Mn)	mg/L	0.79	0.0040	7628627	7.4	0.0040	7630532
Total Molybdenum (Mo)	mg/L	0.0028	0.00020	7628625	0.016	0.0040	7630518
Total Nickel (Ni)	mg/L	0.17	0.00050	7628625	1.3	0.010	7630518
Total Phosphorus (P)	mg/L	6.3	0.10	7628627	50	0.10	7630532
Total Potassium (K)	mg/L	14	0.30	7628627	89	0.30	7630532
Total Selenium (Se)	mg/L	0.00081	0.00020	7628625	0.012	0.0040	7630518
Total Silicon (Si)	mg/L	58	0.10	7628627	340 (1)	1.0	7630532
Total Silver (Ag)	mg/L	0.00038	0.00010	7628625	0.0045	0.0020	7630518
Total Sodium (Na)	mg/L	7.1	0.50	7628627	15	0.50	7630532
Total Strontium (Sr)	mg/L	0.13	0.020	7628627	0.59	0.020	7630532
Total Sulphur (S)	mg/L	7.9	0.20	7628627	18	0.20	7630532
Total Thallium (Tl)	mg/L	0.0012	0.00020	7628625	0.011	0.0040	7630518
Total Tin (Sn)	mg/L	0.014	0.0010	7628625	0.069	0.020	7630518
Total Titanium (Ti)	mg/L	3.5	0.0010	7628625	29 (1)	0.10	7630518
Total Uranium (U)	mg/L	0.042	0.00010	7628625	0.39	0.0020	7630518

RDL = Reportable Detection Limit
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

TETRA TECH EBA INC.

Maxxam Job #: B477081
Report Date: 2014/09/10

Your P.O. #: E14103202

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		KM5921			KM5922		
Sampling Date		2014/08/31 11:15			2014/08/31 11:00		
COC Number		A131769			A131769		
	UNITS	**14MW04**	**RDL**	**QC Batch**	**14MW05**	**RDL**	**QC Batch**
Total Vanadium (V)	mg/L	0.22	0.0010	7628625	2.8	0.020	7630518
Total Zinc (Zn)	mg/L	0.55	0.0030	7628625	3.0	0.060	7630518

RDL = Reportable Detection Limit

Maxxam Analytics - Partial/Rush Results

TETRA TECH EBA INC.

Maxxam Job #: B477081
Report Date: 2014/09/10

Your P.O. #: E14103202

Maxxam Analytics – Partial/Rush Results

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		KM5923			KM5924		
Sampling Date		2014/08/31 10:40			2014/08/31 10:03		
COC Number		A131769			A131769		
	UNITS	**14MW06**	**RDL**	**QC Batch**	**14MWC1**	**RDL**	**QC Batch**
Low Level Elements							
Total Cadmium (Cd)	ug/L	0.68	0.020	7623412	1.4	0.40	7623412
Elements							
Total Aluminum (Al)	mg/L	61	0.0030	7628625	210	0.060	7630518
Total Antimony (Sb)	mg/L	<0.00060	0.00060	7628625	<0.012	0.012	7630518
Total Arsenic (As)	mg/L	0.071	0.00020	7628625	0.047	0.0040	7630518
Total Barium (Ba)	mg/L	0.47	0.010	7628627	0.91	0.010	7630532
Total Beryllium (Be)	mg/L	0.0024	0.0010	7628625	<0.020	0.020	7630518
Total Boron (B)	mg/L	<0.020	0.020	7628627	<0.020	0.020	7630532
Total Calcium (Ca)	mg/L	45	0.30	7628627	54	0.30	7630532
Total Chromium (Cr)	mg/L	0.16	0.0010	7628625	0.29	0.020	7630518
Total Cobalt (Co)	mg/L	0.057	0.00030	7628625	0.087	0.0060	7630518
Total Copper (Cu)	mg/L	0.22	0.00020	7628625	0.75	0.0040	7630518
Total Iron (Fe)	mg/L	91	0.060	7628627	240 (1)	0.60	7630532
Total Lead (Pb)	mg/L	0.035	0.00020	7628625	0.071	0.0040	7630518
Total Lithium (Li)	mg/L	0.14	0.020	7628627	0.16	0.020	7630532
Total Magnesium (Mg)	mg/L	31	0.20	7628627	39	0.20	7630532
Total Manganese (Mn)	mg/L	1.6	0.0040	7628627	0.96	0.0040	7630532
Total Molybdenum (Mo)	mg/L	0.0030	0.00020	7628625	<0.0040	0.0040	7630518
Total Nickel (Ni)	mg/L	0.12	0.00050	7628625	0.23	0.010	7630518
Total Phosphorus (P)	mg/L	14	0.10	7628627	21	0.10	7630532
Total Potassium (K)	mg/L	12	0.30	7628627	7.1	0.30	7630532
Total Selenium (Se)	mg/L	0.00072	0.00020	7628625	0.0062	0.0040	7630518
Total Silicon (Si)	mg/L	55	0.10	7628627	120 (1)	1.0	7630532
Total Silver (Ag)	mg/L	0.00028	0.00010	7628625	0.0023	0.0020	7630518
Total Sodium (Na)	mg/L	7.9	0.50	7628627	7.2	0.50	7630532
Total Strontium (Sr)	mg/L	0.14	0.020	7628627	0.21	0.020	7630532
Total Sulphur (S)	mg/L	3.1	0.20	7628627	20	0.20	7630532
Total Thallium (Tl)	mg/L	0.00086	0.00020	7628625	<0.0040	0.0040	7630518
Total Tin (Sn)	mg/L	0.0037	0.0010	7628625	<0.020	0.020	7630518
Total Titanium (Ti)	mg/L	2.7	0.0010	7628625	3.3	0.020	7630518
Total Uranium (U)	mg/L	0.010	0.00010	7628625	0.23	0.0020	7630518

RDL = Reportable Detection Limit
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

TETRA TECH EBA INC.

Maxxam Job #: B477081
Report Date: 2014/09/10

Your P.O. #: E14103202

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		KM5923			KM5924		
Sampling Date		2014/08/31 10:40			2014/08/31 10:03		
COC Number		A131769			A131769		
	UNITS	**14MW06**	**RDL**	**QC Batch**	**14MWC1**	**RDL**	**QC Batch**
Total Vanadium (V)	mg/L	0.21	0.0010	7628625	0.41	0.020	7630518
Total Zinc (Zn)	mg/L	0.67	0.0030	7628625	0.75	0.060	7630518

RDL = Reportable Detection Limit

Maxxam Analytics - Partial/Rush Results

TETRA TECH EBA INC.

Maxxam Job #: B477081
Report Date: 2014/09/10

Your P.O. #: E14103202

Maxxam Analytics - Partial/Rush Results

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		KM5927		
Sampling Date		2014/08/31 10:40		
COC Number		A131769		
	UNITS	**MWDUP2**	**RDL**	**QC Batch**
Low Level Elements				
Total Cadmium (Cd)	ug/L	0.92	0.020	7623412
Elements				
Total Aluminum (Al)	mg/L	76	0.0030	7628625
Total Antimony (Sb)	mg/L	<0.00060	0.00060	7628625
Total Arsenic (As)	mg/L	0.086	0.00020	7628625
Total Barium (Ba)	mg/L	0.59	0.010	7628627
Total Beryllium (Be)	mg/L	0.0033	0.0010	7628625
Total Boron (B)	mg/L	<0.020	0.020	7628627
Total Calcium (Ca)	mg/L	61	0.30	7628627
Total Chromium (Cr)	mg/L	0.20	0.0010	7628625
Total Cobalt (Co)	mg/L	0.070	0.00030	7628625
Total Copper (Cu)	mg/L	0.28	0.00020	7628625
Total Iron (Fe)	mg/L	110	0.060	7628627
Total Lead (Pb)	mg/L	0.041	0.00020	7628625
Total Lithium (Li)	mg/L	0.18	0.020	7628627
Total Magnesium (Mg)	mg/L	38	0.20	7628627
Total Manganese (Mn)	mg/L	2.0	0.0040	7628627
Total Molybdenum (Mo)	mg/L	0.0035	0.00020	7628625
Total Nickel (Ni)	mg/L	0.16	0.00050	7628625
Total Phosphorus (P)	mg/L	19	0.10	7628627
Total Potassium (K)	mg/L	15	0.30	7628627
Total Selenium (Se)	mg/L	0.00090	0.00020	7628625
Total Silicon (Si)	mg/L	61	0.10	7628627
Total Silver (Ag)	mg/L	0.00034	0.00010	7628625
Total Sodium (Na)	mg/L	8.2	0.50	7628627
Total Strontium (Sr)	mg/L	0.18	0.020	7628627
Total Sulphur (S)	mg/L	3.3	0.20	7628627
Total Thallium (Tl)	mg/L	0.0011	0.00020	7628625
Total Tin (Sn)	mg/L	0.0044	0.0010	7628625
Total Titanium (Ti)	mg/L	3.5	0.0010	7628625
Total Uranium (U)	mg/L	0.012	0.00010	7628625
Total Vanadium (V)	mg/L	0.26	0.0010	7628625

RDL = Reportable Detection Limit

TETRA TECH EBA INC.

Maxxam Job #: B477081
Report Date: 2014/09/10

Your P.O. #: E14103202

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		KM5927		
Sampling Date		2014/08/31 10:40		
COC Number		A131769		
	UNITS	**MWDUP2**	**RDL**	**QC Batch**
Total Zinc (Zn)	mg/L	0.82	0.0030	7628625

RDL = Reportable Detection Limit

Maxxam Analytics - Partial/Rush Results

TETRA TECH EBA INC.

Maxxam Job #: B477081
Report Date: 2014/09/10

Your P.O. #: E14103202

Maxxam Analytics - Partial/Rush Results

Package 1	3.7°C
Package 2	6.0°C
Package 3	8.0°C

Each temperature is the average of up to three cooler temperatures taken at receipt

General Comments

Sample KM5922-01: Cation anion balance exceeds normal acceptance limits due to the low concentrations of ions being measured.
Detection limits raised due to sample matrix. Parameters affected are total Al, Cr, Co, Cu, Pb, Sb, Mo, Ni, Se, Ag, As, Tl, Sn, U, V, Zn, Be, Cd.

Sample KM5923-01: Cation anion balance exceeds normal acceptance limits due to the low concentrations of ions being measured.

Sample KM5924-01: Cation anion balance exceeds normal acceptance limits due to the low concentrations of ions being measured.
Detection limits raised due to sample matrix. Parameters affected are total Al, Cr, Co, Cu, Pb, Sb, Mo, Ni, Se, Ag, As, Tl, Sn, Ti, U, V, Zn, Be, Cd.

Sample KM5925-01: Cation anion balance exceeds normal acceptance limits due to the low concentrations of ions being measured.

Sample KM5927-01: Cation anion balance exceeds normal acceptance limits due to the low concentrations of ions being measured.

Results relate only to the items tested.

TETRA TECH EBA INC.
Attention: ROBERT ZSCHUPPE
Client Project #:
P.O. #: E14103202
Site Location:

Quality Assurance Report

Maxxam Job Number: EB477081

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7624767	ZZ	Method Blank	Moisture	2014/09/04	<0.30		%	
		RPD [KM5603-02]	Moisture	2014/09/04	11.6		%	20
7624905	NM5	Matrix Spike	1,4-Difluorobenzene (sur.)	2014/09/06		105	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/09/06		105	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/09/06		103	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/06		105	%	60 - 140
			Benzene	2014/09/06		101	%	60 - 140
			Toluene	2014/09/06		97	%	60 - 140
			Ethylbenzene	2014/09/06		102	%	60 - 140
			m & p-Xylene	2014/09/06		101	%	60 - 140
			o-Xylene	2014/09/06		101	%	60 - 140
			(C6-C10)	2014/09/06		101	%	60 - 140
		Spiked Blank	1,4-Difluorobenzene (sur.)	2014/09/06		98	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/09/06		101	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/09/06		99	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/06		104	%	60 - 140
			Benzene	2014/09/06		100	%	60 - 140
			Toluene	2014/09/06		91	%	60 - 140
			Ethylbenzene	2014/09/06		98	%	60 - 140
			m & p-Xylene	2014/09/06		98	%	60 - 140
			o-Xylene	2014/09/06		95	%	60 - 140
			(C6-C10)	2014/09/06		98	%	60 - 140
		Method Blank	1,4-Difluorobenzene (sur.)	2014/09/06		100	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/09/06		102	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/09/06		96	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/06		103	%	60 - 140
			Benzene	2014/09/06	<0.0050		mg/kg	
			Toluene	2014/09/06	<0.020		mg/kg	
			Ethylbenzene	2014/09/06	<0.010		mg/kg	
			Xylenes (Total)	2014/09/06	<0.040		mg/kg	
			m & p-Xylene	2014/09/06	<0.040		mg/kg	
			o-Xylene	2014/09/06	<0.020		mg/kg	
			F1 (C6-C10) - BTEX	2014/09/06	<12		mg/kg	
			(C6-C10)	2014/09/06	<12		mg/kg	
		RPD	Benzene	2014/09/06	NC		%	50
			Toluene	2014/09/06	NC		%	50
			Ethylbenzene	2014/09/06	NC		%	50
			Xylenes (Total)	2014/09/06	NC		%	50
			m & p-Xylene	2014/09/06	NC		%	50
			o-Xylene	2014/09/06	NC		%	50
			F1 (C6-C10) - BTEX	2014/09/06	NC		%	50
			(C6-C10)	2014/09/06	NC		%	50
7624935	KK5	Matrix Spike	O-TERPHENYL (sur.)	2014/09/06		86	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/06		98	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2014/09/06		98	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2014/09/06		96	%	50 - 130
		Spiked Blank	O-TERPHENYL (sur.)	2014/09/06		93	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/06		106	%	70 - 130
			F3 (C16-C34 Hydrocarbons)	2014/09/06		106	%	70 - 130
			F4 (C34-C50 Hydrocarbons)	2014/09/06		97	%	70 - 130
		Method Blank	O-TERPHENYL (sur.)	2014/09/06		97	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/06	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2014/09/06	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2014/09/06	<50		mg/kg	
		RPD	F2 (C10-C16 Hydrocarbons)	2014/09/06	NC		%	50

Maxxam Analytics – Partial/Rush Results

TETRA TECH EBA INC.
Attention: ROBERT ZSCHUPPE
Client Project #:
P.O. #: E14103202
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: EB477081

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7624935	KK5	RPD	F3 (C16-C34 Hydrocarbons)	2014/09/06	NC		%	50
			F4 (C34-C50 Hydrocarbons)	2014/09/06	NC		%	50
7624939	RC6	Matrix Spike	1,4-Difluorobenzene (sur.)	2014/09/08		96	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/09/08		92	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/08		98	%	70 - 130
			Benzene	2014/09/08		NC	%	70 - 130
			Toluene	2014/09/08		NC	%	70 - 130
			Ethylbenzene	2014/09/08		NC	%	70 - 130
			m & p-Xylene	2014/09/08		NC	%	70 - 130
			o-Xylene	2014/09/08		87	%	70 - 130
			(C6-C10)	2014/09/08		NC	%	70 - 130
		Spiked Blank	1,4-Difluorobenzene (sur.)	2014/09/08		94	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/09/08		95	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/08		96	%	70 - 130
			Benzene	2014/09/08		83	%	70 - 130
			Toluene	2014/09/08		80	%	70 - 130
			Ethylbenzene	2014/09/08		85	%	70 - 130
			m & p-Xylene	2014/09/08		84	%	70 - 130
			o-Xylene	2014/09/08		85	%	70 - 130
			(C6-C10)	2014/09/08		111	%	70 - 130
		Method Blank	1,4-Difluorobenzene (sur.)	2014/09/08		102	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/09/08		96	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/08		104	%	70 - 130
			Benzene	2014/09/08	<0.00040		mg/L	
			Toluene	2014/09/08	<0.00040		mg/L	
			Ethylbenzene	2014/09/08	<0.00040		mg/L	
			m & p-Xylene	2014/09/08	<0.00080		mg/L	
			o-Xylene	2014/09/08	<0.00040		mg/L	
			Xylenes (Total)	2014/09/08	<0.00080		mg/L	
			F1 (C6-C10) - BTEX	2014/09/08	<0.10		mg/L	
			(C6-C10)	2014/09/08	<0.10		mg/L	
		RPD	Benzene	2014/09/08	6.3		%	40
			Toluene	2014/09/08	1.9		%	40
			Ethylbenzene	2014/09/08	NC		%	40
			m & p-Xylene	2014/09/08	NC		%	40
			o-Xylene	2014/09/08	0.5		%	40
			Xylenes (Total)	2014/09/08	1.3		%	40
			F1 (C6-C10) - BTEX	2014/09/08	NC		%	40
			(C6-C10)	2014/09/08	NC		%	40
7624962	GG3	Matrix Spike	O-TERPHENYL (sur.)	2014/09/06		99	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/06		119	%	50 - 130
		Spiked Blank	O-TERPHENYL (sur.)	2014/09/06		94	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/06		107	%	70 - 130
		Method Blank	O-TERPHENYL (sur.)	2014/09/06		88	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/06	<0.10		mg/L	
		RPD	F2 (C10-C16 Hydrocarbons)	2014/09/06	NC		%	40
7625390	MA4	Spiked Blank	pH	2014/09/04		100	%	97 - 103
		RPD	pH	2014/09/04	0.1		%	N/A
7625396	MA4	Spiked Blank	Alkalinity (Total as CaCO3)	2014/09/04		101	%	80 - 120
		Method Blank	Alkalinity (PP as CaCO3)	2014/09/04	<0.50		mg/L	
			Alkalinity (Total as CaCO3)	2014/09/04	<0.50		mg/L	
			Bicarbonate (HCO3)	2014/09/04	<0.50		mg/L	
			Carbonate (CO3)	2014/09/04	<0.50		mg/L	
			Hydroxide (OH)	2014/09/04	<0.50		mg/L	
		RPD	Alkalinity (PP as CaCO3)	2014/09/04	NC		%	20

Maxxam Analytics – Partial/Rush Results

TETRA TECH EBA INC.
Attention: ROBERT ZSCHUPPE
Client Project #:
P.O. #: E14103202
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: EB477081

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7625396	MA4	RPD	Alkalinity (Total as CaCO3)	2014/09/04	0.5		%	20
			Bicarbonate (HCO3)	2014/09/04	0.5		%	20
			Carbonate (CO3)	2014/09/04	NC		%	20
			Hydroxide (OH)	2014/09/04	NC		%	20
7625397	MA4	Spiked Blank	Conductivity	2014/09/04		102	%	90 - 110
		Method Blank	Conductivity	2014/09/04	<1.0		uS/cm	
		RPD	Conductivity	2014/09/04	0		%	20
7625570	SF3	Matrix Spike						
		[KM5921-03]	Dissolved Aluminum (Al)	2014/09/07		NC	%	80 - 120
			Dissolved Antimony (Sb)	2014/09/07		113	%	80 - 120
			Dissolved Arsenic (As)	2014/09/07		107	%	80 - 120
			Dissolved Beryllium (Be)	2014/09/07		123 (1)	%	80 - 120
			Dissolved Chromium (Cr)	2014/09/07		104	%	80 - 120
			Dissolved Cobalt (Co)	2014/09/07		100	%	80 - 120
			Dissolved Copper (Cu)	2014/09/07		101	%	80 - 120
			Dissolved Lead (Pb)	2014/09/07		102	%	80 - 120
			Dissolved Molybdenum (Mo)	2014/09/07		114	%	80 - 120
			Dissolved Nickel (Ni)	2014/09/07		102	%	80 - 120
			Dissolved Selenium (Se)	2014/09/07		111	%	80 - 120
			Dissolved Silver (Ag)	2014/09/07		97	%	80 - 120
			Dissolved Thallium (Tl)	2014/09/07		112	%	80 - 120
			Dissolved Tin (Sn)	2014/09/07		116	%	80 - 120
			Dissolved Titanium (Ti)	2014/09/07		110	%	80 - 120
			Dissolved Uranium (U)	2014/09/07		100	%	80 - 120
			Dissolved Vanadium (V)	2014/09/07		119	%	80 - 120
			Dissolved Zinc (Zn)	2014/09/07		NC	%	80 - 120
		Spiked Blank	Dissolved Aluminum (Al)	2014/09/07		98	%	80 - 120
			Dissolved Antimony (Sb)	2014/09/07		80	%	80 - 120
			Dissolved Arsenic (As)	2014/09/07		95	%	80 - 120
			Dissolved Beryllium (Be)	2014/09/07		108	%	80 - 120
			Dissolved Chromium (Cr)	2014/09/07		93	%	80 - 120
			Dissolved Cobalt (Co)	2014/09/07		91	%	80 - 120
			Dissolved Copper (Cu)	2014/09/07		96	%	80 - 120
			Dissolved Lead (Pb)	2014/09/07		90	%	80 - 120
			Dissolved Molybdenum (Mo)	2014/09/07		98	%	80 - 120
			Dissolved Nickel (Ni)	2014/09/07		92	%	80 - 120
			Dissolved Selenium (Se)	2014/09/07		96	%	80 - 120
			Dissolved Silver (Ag)	2014/09/07		89	%	80 - 120
			Dissolved Thallium (Tl)	2014/09/07		99	%	80 - 120
			Dissolved Tin (Sn)	2014/09/07		99	%	80 - 120
			Dissolved Titanium (Ti)	2014/09/07		95	%	80 - 120
			Dissolved Uranium (U)	2014/09/07		96	%	80 - 120
			Dissolved Vanadium (V)	2014/09/07		98	%	80 - 120
			Dissolved Zinc (Zn)	2014/09/07		95	%	80 - 120
		Method Blank	Dissolved Aluminum (Al)	2014/09/06	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2014/09/06	<0.00060		mg/L	
			Dissolved Arsenic (As)	2014/09/06	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2014/09/06	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2014/09/06	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2014/09/06	<0.00030		mg/L	
			Dissolved Copper (Cu)	2014/09/06	<0.00020		mg/L	
			Dissolved Lead (Pb)	2014/09/06	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2014/09/06	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2014/09/06	<0.00050		mg/L	
			Dissolved Selenium (Se)	2014/09/06	<0.00020		mg/L	

Maxxam Analytics – Partial/Rush Results

TETRA TECH EBA INC.
Attention: ROBERT ZSCHUPPE
Client Project #:
P.O. #: E14103202
Site Location:

Maxxam Analytics - Partial/Rush Results

Quality Assurance Report (Continued)

Maxxam Job Number: EB477081

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7625570	SF3	Method Blank	Dissolved Silver (Ag)	2014/09/06	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2014/09/06	<0.00020		mg/L	
			Dissolved Tin (Sn)	2014/09/06	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2014/09/06	<0.0010		mg/L	
			Dissolved Uranium (U)	2014/09/06	<0.00010		mg/L	
			Dissolved Vanadium (V)	2014/09/06	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2014/09/06	<0.0030		mg/L	
		RPD [KM5921-03]	Dissolved Aluminum (Al)	2014/09/06	4.1		%	20
			Dissolved Antimony (Sb)	2014/09/06	NC		%	20
			Dissolved Arsenic (As)	2014/09/06	NC		%	20
			Dissolved Beryllium (Be)	2014/09/06	NC		%	20
			Dissolved Chromium (Cr)	2014/09/06	NC		%	20
			Dissolved Cobalt (Co)	2014/09/06	NC		%	20
			Dissolved Copper (Cu)	2014/09/06	0.2		%	20
			Dissolved Lead (Pb)	2014/09/06	NC		%	20
			Dissolved Molybdenum (Mo)	2014/09/06	8.4		%	20
			Dissolved Nickel (Ni)	2014/09/06	NC		%	20
			Dissolved Selenium (Se)	2014/09/06	NC		%	20
			Dissolved Silver (Ag)	2014/09/06	NC		%	20
			Dissolved Thallium (Tl)	2014/09/06	NC		%	20
			Dissolved Tin (Sn)	2014/09/06	NC		%	20
			Dissolved Titanium (Ti)	2014/09/06	3.9		%	20
			Dissolved Uranium (U)	2014/09/06	NC		%	20
			Dissolved Vanadium (V)	2014/09/06	NC		%	20
			Dissolved Zinc (Zn)	2014/09/06	1.5		%	20
7625604	SB8	Matrix Spike	Dissolved Nitrite (N)	2014/09/07		101	%	80 - 120
			Dissolved Nitrate (N)	2014/09/07		103	%	80 - 120
		Spiked Blank	Dissolved Nitrite (N)	2014/09/07		101	%	80 - 120
			Dissolved Nitrate (N)	2014/09/07		103	%	80 - 120
		Method Blank	Dissolved Nitrite (N)	2014/09/07	<0.010		mg/L	
			Dissolved Nitrate (N)	2014/09/07	<0.010		mg/L	
		RPD	Dissolved Nitrite (N)	2014/09/08	NC		%	20
			Dissolved Nitrate (N)	2014/09/08	NC		%	20
7626858	LMD	Matrix Spike [KM5921-01]	Dissolved Chloride (Cl)	2014/09/07		100	%	80 - 120
		Spiked Blank	Dissolved Chloride (Cl)	2014/09/07		99	%	80 - 120
		Method Blank	Dissolved Chloride (Cl)	2014/09/07	<1.0		mg/L	
		RPD [KM5921-01]	Dissolved Chloride (Cl)	2014/09/07	NC		%	20
7626879	LMD	Matrix Spike [KM5921-01]	Dissolved Sulphate (SO4)	2014/09/07		NC	%	80 - 120
		Spiked Blank	Dissolved Sulphate (SO4)	2014/09/07		99	%	80 - 120
		Method Blank	Dissolved Sulphate (SO4)	2014/09/07	<1.0		mg/L	
		RPD [KM5921-01]	Dissolved Sulphate (SO4)	2014/09/07	0.4		%	20
7628048	CCO	Spiked Blank	pH	2014/09/06		100	%	97 - 103
		RPD	pH	2014/09/06	0.4		%	N/A
7628052	CCO	Spiked Blank	Alkalinity (Total as CaCO3)	2014/09/06		101	%	80 - 120
		Method Blank	Alkalinity (PP as CaCO3)	2014/09/06	<0.50		mg/L	
			Alkalinity (Total as CaCO3)	2014/09/06	<0.50		mg/L	
			Bicarbonate (HCO3)	2014/09/06	<0.50		mg/L	
			Carbonate (CO3)	2014/09/06	<0.50		mg/L	
			Hydroxide (OH)	2014/09/06	<0.50		mg/L	
		RPD	Alkalinity (PP as CaCO3)	2014/09/06	NC		%	20
			Alkalinity (Total as CaCO3)	2014/09/06	1.2		%	20
			Bicarbonate (HCO3)	2014/09/06	1.2		%	20
			Carbonate (CO3)	2014/09/06	NC		%	20

TETRA TECH EBA INC.
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Quality Assurance Report (Continued)

Maxxam Job Number: EB477081

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7628052	CCO	RPD	Hydroxide (OH)	2014/09/06	NC		%	20
7628053	CCO	Spiked Blank	Conductivity	2014/09/06		100	%	90 - 110
		Method Blank	Conductivity	2014/09/06	<1.0		uS/cm	
		RPD	Conductivity	2014/09/06	0.8		%	20
7628625	SF3	Matrix Spike	Total Aluminum (Al)	2014/09/08		NC	%	80 - 120
			Total Antimony (Sb)	2014/09/08		114	%	80 - 120
			Total Arsenic (As)	2014/09/08		107	%	80 - 120
			Total Beryllium (Be)	2014/09/08		106	%	80 - 120
			Total Chromium (Cr)	2014/09/08		105	%	80 - 120
			Total Cobalt (Co)	2014/09/08		100	%	80 - 120
			Total Copper (Cu)	2014/09/08		97	%	80 - 120
			Total Lead (Pb)	2014/09/08		100	%	80 - 120
			Total Molybdenum (Mo)	2014/09/08		NC	%	80 - 120
			Total Nickel (Ni)	2014/09/08		98	%	80 - 120
			Total Selenium (Se)	2014/09/08		98	%	80 - 120
			Total Silver (Ag)	2014/09/08		102	%	80 - 120
			Total Thallium (Tl)	2014/09/08		99	%	80 - 120
			Total Tin (Sn)	2014/09/08		118	%	80 - 120
			Total Titanium (Ti)	2014/09/08		107	%	80 - 120
			Total Uranium (U)	2014/09/08		105	%	80 - 120
			Total Vanadium (V)	2014/09/08		111	%	80 - 120
			Total Zinc (Zn)	2014/09/08		106	%	80 - 120
		Spiked Blank	Total Aluminum (Al)	2014/09/08		106	%	80 - 120
			Total Antimony (Sb)	2014/09/08		103	%	80 - 120
			Total Arsenic (As)	2014/09/08		101	%	80 - 120
			Total Beryllium (Be)	2014/09/08		97	%	80 - 120
			Total Chromium (Cr)	2014/09/08		101	%	80 - 120
			Total Cobalt (Co)	2014/09/08		101	%	80 - 120
			Total Copper (Cu)	2014/09/08		102	%	80 - 120
			Total Lead (Pb)	2014/09/08		105	%	80 - 120
			Total Molybdenum (Mo)	2014/09/08		106	%	80 - 120
			Total Nickel (Ni)	2014/09/08		102	%	80 - 120
			Total Selenium (Se)	2014/09/08		100	%	80 - 120
			Total Silver (Ag)	2014/09/08		103	%	80 - 120
			Total Thallium (Tl)	2014/09/08		104	%	80 - 120
			Total Tin (Sn)	2014/09/08		108	%	80 - 120
			Total Titanium (Ti)	2014/09/08		104	%	80 - 120
			Total Uranium (U)	2014/09/08		103	%	80 - 120
			Total Vanadium (V)	2014/09/08		104	%	80 - 120
			Total Zinc (Zn)	2014/09/08		105	%	80 - 120
		Method Blank	Total Aluminum (Al)	2014/09/08	<0.0030		mg/L	
			Total Antimony (Sb)	2014/09/08	<0.00060		mg/L	
			Total Arsenic (As)	2014/09/08	<0.00020		mg/L	
			Total Beryllium (Be)	2014/09/08	<0.0010		mg/L	
			Total Chromium (Cr)	2014/09/08	<0.0010		mg/L	
			Total Cobalt (Co)	2014/09/08	<0.00030		mg/L	
			Total Copper (Cu)	2014/09/08	<0.00020		mg/L	
			Total Lead (Pb)	2014/09/08	<0.00020		mg/L	
			Total Molybdenum (Mo)	2014/09/08	<0.00020		mg/L	
			Total Nickel (Ni)	2014/09/08	<0.00050		mg/L	
			Total Selenium (Se)	2014/09/08	<0.00020		mg/L	
			Total Silver (Ag)	2014/09/08	<0.00010		mg/L	
			Total Thallium (Tl)	2014/09/08	<0.00020		mg/L	
			Total Tin (Sn)	2014/09/08	<0.0010		mg/L	
			Total Titanium (Ti)	2014/09/08	<0.0010		mg/L	

Maxxam Analytics – Partial/Rush Results

TETRA TECH EBA INC.
Attention: ROBERT ZSCHUPPE
Client Project #:
P.O. #: E14103202
Site Location:

Maxxam Analytics – Partial/Rush Results

Quality Assurance Report (Continued)

Maxxam Job Number: EB477081

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7628625	SF3	Method Blank	Total Uranium (U)	2014/09/08	<0.00010		mg/L	
			Total Vanadium (V)	2014/09/08	<0.0010		mg/L	
			Total Zinc (Zn)	2014/09/08	<0.0030		mg/L	
		RPD	Total Aluminum (Al)	2014/09/08	0.5		%	20
			Total Antimony (Sb)	2014/09/08	4.5		%	20
			Total Arsenic (As)	2014/09/08	4.0		%	20
			Total Beryllium (Be)	2014/09/08	NC		%	20
			Total Chromium (Cr)	2014/09/08	1.9		%	20
			Total Cobalt (Co)	2014/09/08	6.6		%	20
			Total Copper (Cu)	2014/09/08	1.7		%	20
			Total Lead (Pb)	2014/09/08	3.3		%	20
			Total Molybdenum (Mo)	2014/09/08	0.4		%	20
			Total Nickel (Ni)	2014/09/08	1.5		%	20
			Total Selenium (Se)	2014/09/08	5.1		%	20
			Total Silver (Ag)	2014/09/08	NC		%	20
			Total Thallium (Tl)	2014/09/08	NC		%	20
			Total Tin (Sn)	2014/09/08	NC		%	20
			Total Titanium (Ti)	2014/09/08	NC		%	20
			Total Uranium (U)	2014/09/08	NC		%	20
			Total Vanadium (V)	2014/09/08	7.0		%	20
			Total Zinc (Zn)	2014/09/08	NC		%	20
7628627	LT4	Matrix Spike	Total Barium (Ba)	2014/09/09		87	%	80 - 120
			Total Boron (B)	2014/09/09		100	%	80 - 120
			Total Calcium (Ca)	2014/09/09		NC	%	80 - 120
			Total Iron (Fe)	2014/09/09		94	%	80 - 120
			Total Lithium (Li)	2014/09/09		91	%	80 - 120
			Total Magnesium (Mg)	2014/09/09		98	%	80 - 120
			Total Manganese (Mn)	2014/09/09		88	%	80 - 120
			Total Phosphorus (P)	2014/09/09		97	%	80 - 120
			Total Potassium (K)	2014/09/09		NC	%	80 - 120
			Total Silicon (Si)	2014/09/09		101	%	80 - 120
			Total Sodium (Na)	2014/09/09		NC	%	80 - 120
			Total Strontium (Sr)	2014/09/09		NC	%	80 - 120
		Spiked Blank	Total Barium (Ba)	2014/09/09		99	%	80 - 120
			Total Boron (B)	2014/09/09		100	%	80 - 120
			Total Calcium (Ca)	2014/09/09		92	%	80 - 120
			Total Iron (Fe)	2014/09/09		100	%	80 - 120
			Total Lithium (Li)	2014/09/09		95	%	80 - 120
			Total Magnesium (Mg)	2014/09/09		103	%	80 - 120
			Total Manganese (Mn)	2014/09/09		92	%	80 - 120
			Total Phosphorus (P)	2014/09/09		95	%	80 - 120
			Total Potassium (K)	2014/09/09		109	%	80 - 120
			Total Silicon (Si)	2014/09/09		97	%	80 - 120
			Total Sodium (Na)	2014/09/09		110	%	80 - 120
			Total Strontium (Sr)	2014/09/09		97	%	80 - 120
			Total Sulphur (S)	2014/09/09		97	%	80 - 120
		Method Blank	Total Barium (Ba)	2014/09/09	<0.010		mg/L	
			Total Boron (B)	2014/09/09	<0.020		mg/L	
			Total Calcium (Ca)	2014/09/09	<0.30		mg/L	
			Total Iron (Fe)	2014/09/09	<0.060		mg/L	
			Total Lithium (Li)	2014/09/09	<0.020		mg/L	
			Total Magnesium (Mg)	2014/09/09	<0.20		mg/L	
			Total Manganese (Mn)	2014/09/09	<0.0040		mg/L	
			Total Phosphorus (P)	2014/09/09	<0.10		mg/L	
			Total Potassium (K)	2014/09/09	<0.30		mg/L	

TETRA TECH EBA INC.
Attention: ROBERT ZSCHUPPE
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Quality Assurance Report (Continued)

Maxxam Job Number: EB477081

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7628627 LT4	Method Blank	Total Silicon (Si)	2014/09/09	<0.10		mg/L	
		Total Sodium (Na)	2014/09/09	<0.50		mg/L	
		Total Strontium (Sr)	2014/09/09	<0.020		mg/L	
		Total Sulphur (S)	2014/09/09	<0.20		mg/L	
	RPD	Total Barium (Ba)	2014/09/09	0.3		%	20
		Total Boron (B)	2014/09/09	0.6		%	20
		Total Calcium (Ca)	2014/09/09	0.4		%	20
		Total Iron (Fe)	2014/09/09	NC		%	20
		Total Lithium (Li)	2014/09/09	NC		%	20
		Total Magnesium (Mg)	2014/09/09	NC		%	20
		Total Manganese (Mn)	2014/09/09	NC		%	20
		Total Phosphorus (P)	2014/09/09	NC		%	20
		Total Potassium (K)	2014/09/09	0.4		%	20
		Total Silicon (Si)	2014/09/09	0.2		%	20
		Total Sodium (Na)	2014/09/09	1.4		%	20
		Total Strontium (Sr)	2014/09/09	0.2		%	20
		Total Sulphur (S)	2014/09/09	0.1		%	20
7628818 SF3	Matrix Spike	Dissolved Aluminum (Al)	2014/09/09		102	%	80 - 120
		Dissolved Antimony (Sb)	2014/09/09		96	%	80 - 120
		Dissolved Arsenic (As)	2014/09/09		102	%	80 - 120
		Dissolved Beryllium (Be)	2014/09/09		104	%	80 - 120
		Dissolved Chromium (Cr)	2014/09/09		99	%	80 - 120
		Dissolved Cobalt (Co)	2014/09/09		98	%	80 - 120
		Dissolved Copper (Cu)	2014/09/09		98	%	80 - 120
		Dissolved Lead (Pb)	2014/09/09		97	%	80 - 120
		Dissolved Molybdenum (Mo)	2014/09/09		106	%	80 - 120
		Dissolved Nickel (Ni)	2014/09/09		100	%	80 - 120
		Dissolved Selenium (Se)	2014/09/09		104	%	80 - 120
		Dissolved Silver (Ag)	2014/09/09		93	%	80 - 120
		Dissolved Thallium (Tl)	2014/09/09		99	%	80 - 120
		Dissolved Tin (Sn)	2014/09/09		110	%	80 - 120
		Dissolved Titanium (Ti)	2014/09/09		105	%	80 - 120
		Dissolved Uranium (U)	2014/09/09		102	%	80 - 120
		Dissolved Vanadium (V)	2014/09/09		104	%	80 - 120
		Dissolved Zinc (Zn)	2014/09/09		99	%	80 - 120
	Spiked Blank	Dissolved Aluminum (Al)	2014/09/09		102	%	80 - 120
		Dissolved Antimony (Sb)	2014/09/09		89	%	80 - 120
		Dissolved Arsenic (As)	2014/09/09		100	%	80 - 120
		Dissolved Beryllium (Be)	2014/09/09		103	%	80 - 120
		Dissolved Chromium (Cr)	2014/09/09		99	%	80 - 120
		Dissolved Cobalt (Co)	2014/09/09		100	%	80 - 120
		Dissolved Copper (Cu)	2014/09/09		101	%	80 - 120
		Dissolved Lead (Pb)	2014/09/09		103	%	80 - 120
		Dissolved Molybdenum (Mo)	2014/09/09		104	%	80 - 120
		Dissolved Nickel (Ni)	2014/09/09		99	%	80 - 120
		Dissolved Selenium (Se)	2014/09/09		102	%	80 - 120
		Dissolved Silver (Ag)	2014/09/09		93	%	80 - 120
		Dissolved Thallium (Tl)	2014/09/09		103	%	80 - 120
		Dissolved Tin (Sn)	2014/09/09		104	%	80 - 120
		Dissolved Titanium (Ti)	2014/09/09		98	%	80 - 120
		Dissolved Uranium (U)	2014/09/09		102	%	80 - 120
		Dissolved Vanadium (V)	2014/09/09		101	%	80 - 120
		Dissolved Zinc (Zn)	2014/09/09		102	%	80 - 120
	Method Blank	Dissolved Aluminum (Al)	2014/09/09	<0.0030		mg/L	
		Dissolved Antimony (Sb)	2014/09/09	<0.00060		mg/L	

Maxxam Analytics – Partial/Rush Results

TETRA TECH EBA INC.
Attention: ROBERT ZSCHUPPE
Client Project #:
P.O. #: E14103202
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Quality Assurance Report (Continued)

Maxxam Job Number: EB477081

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7628818	SF3	Method Blank	Dissolved Arsenic (As)	2014/09/09	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2014/09/09	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2014/09/09	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2014/09/09	<0.00030		mg/L	
			Dissolved Copper (Cu)	2014/09/09	<0.00020		mg/L	
			Dissolved Lead (Pb)	2014/09/09	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2014/09/09	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2014/09/09	<0.00050		mg/L	
			Dissolved Selenium (Se)	2014/09/09	<0.00020		mg/L	
			Dissolved Silver (Ag)	2014/09/09	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2014/09/09	<0.00020		mg/L	
			Dissolved Tin (Sn)	2014/09/09	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2014/09/09	<0.0010		mg/L	
			Dissolved Uranium (U)	2014/09/09	<0.00010		mg/L	
			Dissolved Vanadium (V)	2014/09/09	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2014/09/09	<0.0030		mg/L	
		RPD	Dissolved Aluminum (Al)	2014/09/09	NC		%	20
			Dissolved Antimony (Sb)	2014/09/09	NC		%	20
			Dissolved Arsenic (As)	2014/09/09	NC		%	20
			Dissolved Beryllium (Be)	2014/09/09	NC		%	20
			Dissolved Chromium (Cr)	2014/09/09	NC		%	20
			Dissolved Cobalt (Co)	2014/09/09	NC		%	20
			Dissolved Copper (Cu)	2014/09/09	0.4		%	20
			Dissolved Lead (Pb)	2014/09/09	NC		%	20
			Dissolved Molybdenum (Mo)	2014/09/09	0.6		%	20
			Dissolved Nickel (Ni)	2014/09/09	0.3		%	20
			Dissolved Selenium (Se)	2014/09/09	NC		%	20
			Dissolved Silver (Ag)	2014/09/09	NC		%	20
			Dissolved Thallium (Tl)	2014/09/09	NC		%	20
			Dissolved Tin (Sn)	2014/09/09	NC		%	20
			Dissolved Titanium (Ti)	2014/09/09	NC		%	20
			Dissolved Uranium (U)	2014/09/09	0.2		%	20
			Dissolved Vanadium (V)	2014/09/09	NC		%	20
			Dissolved Zinc (Zn)	2014/09/09	NC		%	20
7629389	SDH	Matrix Spike	Dissolved Barium (Ba)	2014/09/09		96	%	80 - 120
			Dissolved Boron (B)	2014/09/09		104	%	80 - 120
			Dissolved Calcium (Ca)	2014/09/09		NC	%	80 - 120
			Dissolved Iron (Fe)	2014/09/09		NC	%	80 - 120
			Dissolved Lithium (Li)	2014/09/09		94	%	80 - 120
			Dissolved Magnesium (Mg)	2014/09/09		101	%	80 - 120
			Dissolved Manganese (Mn)	2014/09/09		95	%	80 - 120
			Dissolved Phosphorus (P)	2014/09/09		100	%	80 - 120
			Dissolved Potassium (K)	2014/09/09		105	%	80 - 120
			Dissolved Silicon (Si)	2014/09/09		NC	%	80 - 120
			Dissolved Sodium (Na)	2014/09/09		102	%	80 - 120
			Dissolved Strontium (Sr)	2014/09/09		94	%	80 - 120
		Spiked Blank	Dissolved Barium (Ba)	2014/09/09		95	%	80 - 120
			Dissolved Boron (B)	2014/09/09		102	%	80 - 120
			Dissolved Calcium (Ca)	2014/09/09		96	%	80 - 120
			Dissolved Iron (Fe)	2014/09/09		99	%	80 - 120
			Dissolved Lithium (Li)	2014/09/09		93	%	80 - 120
			Dissolved Magnesium (Mg)	2014/09/09		103	%	80 - 120
			Dissolved Manganese (Mn)	2014/09/09		93	%	80 - 120
			Dissolved Phosphorus (P)	2014/09/09		95	%	80 - 120
			Dissolved Potassium (K)	2014/09/09		105	%	80 - 120

Maxxam Analytics – Partial/Rush Results

TETRA TECH EBA INC.
Attention: ROBERT ZSCHUPPE
Client Project #:
P.O. #: E14103202
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: EB477081

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7629389	SDH	Spiked Blank	Dissolved Silicon (Si)	2014/09/09		98	%	80 - 120
			Dissolved Sodium (Na)	2014/09/09		105	%	80 - 120
			Dissolved Strontium (Sr)	2014/09/09		94	%	80 - 120
			Dissolved Sulphur (S)	2014/09/09		96	%	80 - 120
		Method Blank	Dissolved Barium (Ba)	2014/09/09	<0.010		mg/L	
			Dissolved Boron (B)	2014/09/09	<0.020		mg/L	
			Dissolved Calcium (Ca)	2014/09/09	<0.30		mg/L	
			Dissolved Iron (Fe)	2014/09/09	<0.060		mg/L	
			Dissolved Lithium (Li)	2014/09/09	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2014/09/09	<0.20		mg/L	
			Dissolved Manganese (Mn)	2014/09/09	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2014/09/09	<0.10		mg/L	
			Dissolved Potassium (K)	2014/09/09	<0.30		mg/L	
			Dissolved Silicon (Si)	2014/09/09	<0.10		mg/L	
			Dissolved Sodium (Na)	2014/09/09	<0.50		mg/L	
			Dissolved Strontium (Sr)	2014/09/09	<0.020		mg/L	
			Dissolved Sulphur (S)	2014/09/09	<0.20		mg/L	
		RPD	Dissolved Barium (Ba)	2014/09/09	0.2		%	20
			Dissolved Boron (B)	2014/09/09	2.7		%	20
			Dissolved Calcium (Ca)	2014/09/09	1.4		%	20
			Dissolved Iron (Fe)	2014/09/09	0.5		%	20
			Dissolved Lithium (Li)	2014/09/09	NC		%	20
			Dissolved Magnesium (Mg)	2014/09/09	1		%	20
			Dissolved Manganese (Mn)	2014/09/09	2.1		%	20
			Dissolved Phosphorus (P)	2014/09/09	2.3		%	20
			Dissolved Potassium (K)	2014/09/09	2.1		%	20
			Dissolved Silicon (Si)	2014/09/09	0.4		%	20
			Dissolved Sodium (Na)	2014/09/09	2.2		%	20
			Dissolved Strontium (Sr)	2014/09/09	0.1		%	20
			Dissolved Sulphur (S)	2014/09/09	NC		%	20
7629396	LT4	Matrix Spike	Dissolved Barium (Ba)	2014/09/08		90	%	80 - 120
			Dissolved Boron (B)	2014/09/08		98	%	80 - 120
			Dissolved Calcium (Ca)	2014/09/08		NC	%	80 - 120
			Dissolved Iron (Fe)	2014/09/08		86	%	80 - 120
			Dissolved Lithium (Li)	2014/09/08		94	%	80 - 120
			Dissolved Magnesium (Mg)	2014/09/08		99	%	80 - 120
			Dissolved Manganese (Mn)	2014/09/08		80	%	80 - 120
			Dissolved Phosphorus (P)	2014/09/08		94	%	80 - 120
			Dissolved Potassium (K)	2014/09/08		93	%	80 - 120
			Dissolved Silicon (Si)	2014/09/08		96	%	80 - 120
			Dissolved Sodium (Na)	2014/09/08		91	%	80 - 120
			Dissolved Strontium (Sr)	2014/09/08		83	%	80 - 120
		Spiked Blank	Dissolved Barium (Ba)	2014/09/08		95	%	80 - 120
			Dissolved Boron (B)	2014/09/08		99	%	80 - 120
			Dissolved Calcium (Ca)	2014/09/08		97	%	80 - 120
			Dissolved Iron (Fe)	2014/09/08		97	%	80 - 120
			Dissolved Lithium (Li)	2014/09/08		95	%	80 - 120
			Dissolved Magnesium (Mg)	2014/09/08		98	%	80 - 120
			Dissolved Manganese (Mn)	2014/09/08		96	%	80 - 120
			Dissolved Phosphorus (P)	2014/09/08		93	%	80 - 120
			Dissolved Potassium (K)	2014/09/08		95	%	80 - 120
			Dissolved Silicon (Si)	2014/09/08		96	%	80 - 120
			Dissolved Sodium (Na)	2014/09/08		94	%	80 - 120
			Dissolved Strontium (Sr)	2014/09/08		94	%	80 - 120
			Dissolved Sulphur (S)	2014/09/08		97	%	80 - 120

Maxxam Analytics – Partial/Rush Results

TETRA TECH EBA INC.
Attention: ROBERT ZSCHUPPE
Client Project #:
P.O. #: E14103202
Site Location:

Maxxam Analytics – Partial/Rush Results

Quality Assurance Report (Continued)

Maxxam Job Number: EB477081

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7629396 LT4	Method Blank	Dissolved Barium (Ba)	2014/09/08	<0.010		mg/L	
		Dissolved Boron (B)	2014/09/08	<0.020		mg/L	
		Dissolved Calcium (Ca)	2014/09/08	<0.30		mg/L	
		Dissolved Iron (Fe)	2014/09/08	<0.060		mg/L	
		Dissolved Lithium (Li)	2014/09/08	<0.020		mg/L	
		Dissolved Magnesium (Mg)	2014/09/08	<0.20		mg/L	
		Dissolved Manganese (Mn)	2014/09/08	<0.0040		mg/L	
		Dissolved Phosphorus (P)	2014/09/08	<0.10		mg/L	
		Dissolved Potassium (K)	2014/09/08	<0.30		mg/L	
		Dissolved Silicon (Si)	2014/09/08	<0.10		mg/L	
		Dissolved Sodium (Na)	2014/09/08	<0.50		mg/L	
		Dissolved Strontium (Sr)	2014/09/08	<0.020		mg/L	
		Dissolved Sulphur (S)	2014/09/08	<0.20		mg/L	
	RPD	Dissolved Barium (Ba)	2014/09/08	0.2		%	20
		Dissolved Boron (B)	2014/09/08	NC		%	20
		Dissolved Calcium (Ca)	2014/09/08	1.1		%	20
		Dissolved Iron (Fe)	2014/09/08	NC		%	20
		Dissolved Lithium (Li)	2014/09/08	NC		%	20
		Dissolved Magnesium (Mg)	2014/09/08	0.3		%	20
		Dissolved Manganese (Mn)	2014/09/08	0.8		%	20
		Dissolved Phosphorus (P)	2014/09/08	NC		%	20
		Dissolved Potassium (K)	2014/09/08	0.2		%	20
		Dissolved Silicon (Si)	2014/09/08	0.7		%	20
		Dissolved Sodium (Na)	2014/09/08	3.2		%	20
		Dissolved Strontium (Sr)	2014/09/08	0.5		%	20
		Dissolved Sulphur (S)	2014/09/08	0.5		%	20
7630518 SF3	Matrix Spike	Total Aluminum (Al)	2014/09/09		NC	%	80 - 120
		Total Antimony (Sb)	2014/09/09		113	%	80 - 120
		Total Arsenic (As)	2014/09/09		112	%	80 - 120
		Total Beryllium (Be)	2014/09/09		109	%	80 - 120
		Total Chromium (Cr)	2014/09/09		106	%	80 - 120
		Total Cobalt (Co)	2014/09/09		106	%	80 - 120
		Total Copper (Cu)	2014/09/09		106	%	80 - 120
		Total Lead (Pb)	2014/09/09		108	%	80 - 120
		Total Molybdenum (Mo)	2014/09/09		115	%	80 - 120
		Total Nickel (Ni)	2014/09/09		105	%	80 - 120
		Total Selenium (Se)	2014/09/09		109	%	80 - 120
		Total Silver (Ag)	2014/09/09		111	%	80 - 120
		Total Thallium (Tl)	2014/09/09		111	%	80 - 120
		Total Tin (Sn)	2014/09/09		116	%	80 - 120
		Total Titanium (Ti)	2014/09/09		102	%	80 - 120
		Total Uranium (U)	2014/09/09		110	%	80 - 120
		Total Vanadium (V)	2014/09/09		111	%	80 - 120
		Total Zinc (Zn)	2014/09/09		111	%	80 - 120
	Spiked Blank	Total Aluminum (Al)	2014/09/09		102	%	80 - 120
		Total Antimony (Sb)	2014/09/09		103	%	80 - 120
		Total Arsenic (As)	2014/09/09		103	%	80 - 120
		Total Beryllium (Be)	2014/09/09		103	%	80 - 120
		Total Chromium (Cr)	2014/09/09		101	%	80 - 120
		Total Cobalt (Co)	2014/09/09		103	%	80 - 120
		Total Copper (Cu)	2014/09/09		104	%	80 - 120
		Total Lead (Pb)	2014/09/09		107	%	80 - 120
		Total Molybdenum (Mo)	2014/09/09		106	%	80 - 120
		Total Nickel (Ni)	2014/09/09		103	%	80 - 120
		Total Selenium (Se)	2014/09/09		102	%	80 - 120

TETRA TECH EBA INC.
Attention: ROBERT ZSCHUPPE
Client Project #:
P.O. #: E14103202
Site Location:

Maxxam Analytics – Partial/Rush Results

Quality Assurance Report (Continued)

Maxxam Job Number: EB477081

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7630518	SF3	Spiked Blank	Total Silver (Ag)	2014/09/09		104	%	80 - 120
			Total Thallium (Tl)	2014/09/09		106	%	80 - 120
			Total Tin (Sn)	2014/09/09		107	%	80 - 120
			Total Titanium (Ti)	2014/09/09		97	%	80 - 120
			Total Uranium (U)	2014/09/09		106	%	80 - 120
			Total Vanadium (V)	2014/09/09		106	%	80 - 120
			Total Zinc (Zn)	2014/09/09		105	%	80 - 120
		Method Blank	Total Aluminum (Al)	2014/09/09	<0.0030		mg/L	
			Total Antimony (Sb)	2014/09/09	<0.00060		mg/L	
			Total Arsenic (As)	2014/09/09	<0.00020		mg/L	
			Total Beryllium (Be)	2014/09/09	<0.0010		mg/L	
			Total Chromium (Cr)	2014/09/09	<0.0010		mg/L	
			Total Cobalt (Co)	2014/09/09	<0.00030		mg/L	
			Total Copper (Cu)	2014/09/09	<0.00020		mg/L	
			Total Lead (Pb)	2014/09/09	<0.00020		mg/L	
			Total Molybdenum (Mo)	2014/09/09	<0.00020		mg/L	
			Total Nickel (Ni)	2014/09/09	<0.00050		mg/L	
			Total Selenium (Se)	2014/09/09	<0.00020		mg/L	
			Total Silver (Ag)	2014/09/09	<0.00010		mg/L	
			Total Thallium (Tl)	2014/09/09	<0.00020		mg/L	
			Total Tin (Sn)	2014/09/09	<0.0010		mg/L	
			Total Titanium (Ti)	2014/09/09	<0.0010		mg/L	
			Total Uranium (U)	2014/09/09	<0.00010		mg/L	
			Total Vanadium (V)	2014/09/09	<0.0010		mg/L	
			Total Zinc (Zn)	2014/09/09	<0.0030		mg/L	
		RPD	Total Aluminum (Al)	2014/09/09	7.9		%	20
			Total Antimony (Sb)	2014/09/09	NC		%	20
			Total Arsenic (As)	2014/09/09	3.4		%	20
			Total Beryllium (Be)	2014/09/09	NC		%	20
			Total Chromium (Cr)	2014/09/09	NC		%	20
			Total Cobalt (Co)	2014/09/09	NC		%	20
			Total Copper (Cu)	2014/09/09	NC		%	20
			Total Lead (Pb)	2014/09/09	NC		%	20
			Total Molybdenum (Mo)	2014/09/09	NC		%	20
			Total Nickel (Ni)	2014/09/09	1.5		%	20
			Total Selenium (Se)	2014/09/09	NC		%	20
			Total Silver (Ag)	2014/09/09	NC		%	20
			Total Thallium (Tl)	2014/09/09	NC		%	20
			Total Tin (Sn)	2014/09/09	NC		%	20
			Total Titanium (Ti)	2014/09/09	NC		%	20
			Total Uranium (U)	2014/09/09	0.3		%	20
			Total Vanadium (V)	2014/09/09	NC		%	20
			Total Zinc (Zn)	2014/09/09	NC		%	20
7630532	JK9	Matrix Spike	Total Barium (Ba)	2014/09/09		101	%	80 - 120
			Total Boron (B)	2014/09/09		104	%	80 - 120
			Total Calcium (Ca)	2014/09/09		NC	%	80 - 120
			Total Iron (Fe)	2014/09/09		NC	%	80 - 120
			Total Lithium (Li)	2014/09/09		102	%	80 - 120
			Total Magnesium (Mg)	2014/09/09		NC	%	80 - 120
			Total Manganese (Mn)	2014/09/09		102	%	80 - 120
			Total Phosphorus (P)	2014/09/09		103	%	80 - 120
			Total Potassium (K)	2014/09/09		106	%	80 - 120
			Total Silicon (Si)	2014/09/09		NC	%	80 - 120
			Total Sodium (Na)	2014/09/09		NC	%	80 - 120
			Total Strontium (Sr)	2014/09/09		100	%	80 - 120

TETRA TECH EBA INC.
Attention: ROBERT ZSCHUPPE
Client Project #:
P.O. #: E14103202
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: EB477081

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7630532	JK9	Spiked Blank	Total Barium (Ba)	2014/09/09		104	%	80 - 120
			Total Boron (B)	2014/09/09		105	%	80 - 120
			Total Calcium (Ca)	2014/09/09		111	%	80 - 120
			Total Iron (Fe)	2014/09/09		109	%	80 - 120
			Total Lithium (Li)	2014/09/09		100	%	80 - 120
			Total Magnesium (Mg)	2014/09/09		106	%	80 - 120
			Total Manganese (Mn)	2014/09/09		107	%	80 - 120
			Total Phosphorus (P)	2014/09/09		103	%	80 - 120
			Total Potassium (K)	2014/09/09		104	%	80 - 120
			Total Silicon (Si)	2014/09/09		106	%	80 - 120
			Total Sodium (Na)	2014/09/09		104	%	80 - 120
			Total Strontium (Sr)	2014/09/09		103	%	80 - 120
			Total Sulphur (S)	2014/09/09		104	%	80 - 120
		Method Blank	Total Barium (Ba)	2014/09/09	<0.010		mg/L	
			Total Boron (B)	2014/09/09	<0.020		mg/L	
			Total Calcium (Ca)	2014/09/09	<0.30		mg/L	
			Total Iron (Fe)	2014/09/09	<0.060		mg/L	
			Total Lithium (Li)	2014/09/09	<0.020		mg/L	
			Total Magnesium (Mg)	2014/09/09	<0.20		mg/L	
			Total Manganese (Mn)	2014/09/09	<0.0040		mg/L	
			Total Phosphorus (P)	2014/09/09	<0.10		mg/L	
			Total Potassium (K)	2014/09/09	<0.30		mg/L	
			Total Silicon (Si)	2014/09/09	<0.10		mg/L	
			Total Sodium (Na)	2014/09/09	<0.50		mg/L	
			Total Strontium (Sr)	2014/09/09	<0.020		mg/L	
			Total Sulphur (S)	2014/09/09	<0.20		mg/L	
		RPD	Total Barium (Ba)	2014/09/10	0.4		%	20
			Total Boron (B)	2014/09/10	NC		%	20
			Total Calcium (Ca)	2014/09/10	1.2		%	20
			Total Iron (Fe)	2014/09/10	0.7		%	20
			Total Lithium (Li)	2014/09/10	NC		%	20
			Total Magnesium (Mg)	2014/09/10	0.2		%	20
			Total Manganese (Mn)	2014/09/10	0.5		%	20
			Total Phosphorus (P)	2014/09/10	NC		%	20
			Total Potassium (K)	2014/09/10	0.9		%	20
			Total Silicon (Si)	2014/09/10	0.7		%	20
			Total Sodium (Na)	2014/09/10	0.3		%	20
			Total Strontium (Sr)	2014/09/10	0.5		%	20
			Total Sulphur (S)	2014/09/10	1		%	20

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.
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).
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 (one or both samples < 5x RDL).
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Maxxam Analytics – Partial/Rush Results

Maxxam

Calgary: 4000 19st St. NE, T2E 6P8. Ph: (403) 291-3077, Fax: (403) 735-2240, Toll free: (800) 386-7247
Edmonton: 9331 - 48 Street, T6B 2R4. Ph: (780) 577-7100, Fax: (780) 450-4187, Toll free: (877) 485-8889
www.maxxamanalytics.com

09/017(3) JWP

Chain of Custody

A131767

Page: 1 of 3

Company:	Invoice To: Tetra Tech EBA	C/O Report Address ☐
Contact:	Robert Zschuppe	
Address:	14940123 Ave	
	Prov: AB	PC:
Contact #s:	Ph: 780 451 2130	Cell:

Report To:	Same as Invoice ☑
Prov:	PC:
Ph:	Cell:

Report Distribution (E-Mail):
michele.crawford@tetratech.com
tyrel.hensley@tetratech.com
robert.zschuppe@tetratech.com

REGULATORY GUIDELINES:
- ☐ AT1
- ☒ CCME
- ☐ Regulated Drinking Water
- ☐ Other:

All samples are held for 60 calendar days after sample receipt, unless specified otherwise.

PO #: E14103202
Project # / Name:
Site Location:
Quote #:
Sampled By:

SERVICE REQUESTED: ☐ RUSH (Contact lab to reserve) Date Required: ☐ REGULAR (5 to 7 Days)

See reverse for package specifics

	Sample ID	Depth (unit)	Matrix GW / SW Soil	Date/Time Sampled YY/MM/DD 24:00	SOIL: BTEX F1-F4	Sieve (75 micron)	Regulated Metals (CCME / AT1)	Salinity 4	Assessment ICP Metals	Basic Class II Landfill	WATER: ☐BTEX F1 ☐VOCs	☐BTEX F1-F2 ☐BTEX F1-F4	☐ Routine Water ☐ Turb ☐ F	☐ TOC ☐ DOC	Regulated Metals (CCME / AT1) Total	Dissolved	Mercury ☐ Total ☐ Dissolved	Other Analysis: Total lead	Leachable lead	HOLD - Do not Analyze	# of Containers Submitted
1	TANK 2-1	—	Fuel	14/08/31																X	11
2	DR 2-1	—	fuel	"																X	11
3	Pb 1-1	-	paint	"														X	X		1
4	SS 8-30	0-40	soil	14/08/30																X	2
5	SS 8-31	0-20																			2
6	"	20-40																			2
7	"	40-70																			2
8	SS 8-32	0-30																			2
9	"	30-50																			2
10	"	50-70																			2
11	SS 8-33	0-20																			2
12	"	20-40																			2

RECEIVED IN YELLOWKNIFE
By: Jenna Walter 11:15
2014-09-01
4-4-3
Temp: 7-5-6
8-8-8

ACR/DWR

F/P

Please indicate Filtered, Preserved or Both (F, P, F/P)

Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):
Michele Crawford/Michele Crawford	14/08/31	0900
Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):

Special Instructions:

# of Jars Used & Not Submitted

LAB USE ONLY

Received By:	Date:	Time:	Maxxam Job #: B477081
Jenna Walter	20140902	0945	Custody Seal / Temperature / Ice

Lab Comments: see ACTR

Maxxam

Calgary: 4000 19st St. NE, T2E 6P8. Ph: (403) 291-3077, Fax: (403) 735-2240, Toll free: (800) 386-7247
Edmonton: 9331 - 48 Street, T6B 2R4. Ph: (780) 577-7100, Fax: (780) 450-4187, Toll free: (877) 465-8889
www.maxxamanalytics.com

Chain of Custody

A131768

	Invoice To: C/O Report Address ☐	Report To: Same as Invoice ☐	Report Distribution (E-Mail):
Company:	Same as page 1		
Contact:			
Address:			
	Prov: PC:	Prov: PC:	
Contact #s:	Ph: Cell:	Ph: Cell:	

REGULATORY GUIDELINES:
☐ AT1
☒ CCME
☐ Regulated Drinking Water
☐ Other:

All samples are held for 60 calendar days after sample receipt, unless specified otherwise.

PO #:
Project # / Name:
Site Location:
Quote #:
Sampled By:

SERVICE REQUESTED: ☐ **RUSH** (Contact lab to reserve) **Date Required:** ☐ REGULAR (5 to 7 Days)

See reverse for package specifics

	Sample ID	Depth (unit)	Matrix GW / SW Soil	Date/Time Sampled YY/MM/DD 24:00
1	SS8-34	0-30	Soil	14/08/30
2	"	30-50		
3	"	50-70		
4	SS8-35	0-20		14/08/31
5	"	20-40		
6	SS8-36	0-20		
7	"	20-40		
8	SS8-37	0-50		
9	"	50-60		
10	SS8-38	0-50		
11	"	50-60		
12				

SOIL: BTEX F1-F4; Sieve (75 micron); Regulated Metals (CCME / AT1); Salinity 4; Assessment ICP Metals; Basic Class II Landfill

WATER: ☐BTEX F1; ☐BTEX F1-F2; ☐BTEX F1-F4; ☐ Routine Water ☐ Turb ☐ F; ☐ TOC ☐ DOC; Regulated Metals (CCME / AT1) — Total, Dissolved; Mercury ☐ Total ☐ Dissolved

Other Analysis

HOLD - Do not Analyze: X (sample 1)

# of Containers Submitted: 2 (all samples)

RECEIVED IN YELLOWKNIFE
By: Michelle Gute Michelle
2014-09-01 11:15 Arctic

Temp: 4 4 3 / 7 1 5 1 6 / 8 8 5 6

F / P

Please indicate Filtered, Preserved or Both (F, P, F/P)

Relinquished By (Signature/Print): Michael / Michele Crawford — Date (YY/MM/DD): 14/08/31 — Time (24:00): 0900

Relinquished By (Signature/Print): — Date (YY/MM/DD): — Time (24:00):

Special Instructions:

# of Jars Used & Not Submitted

LAB USE ONLY

Received By: Jenna Walter — Date: 20140902 — Time: 0945

Maxxam Job #: B47701

Lab Comments: See COR

Custody Seal	Temperature	Ice

Maxxam

Calgary: 4000 19st St. NE, T2E 6P8. Ph: (403) 291-3077, Fax: (403) 735-2240, Toll free: (800) 386-7247
Edmonton: 9331 - 48 Street, T6B 2R4. Ph: (780) 577-7100, Fax: (780) 450-4187, Toll free: (877) 465-8889
www.maxxamanalytics.com

JHF **Chain of Custody** A131769

Page: 3 of 3

	Invoice To: C/O Report Address ☐	Report To: Same as Invoice ☐	Report Distribution (E-Mail):
Company:			
Contact:	Same as page 1		
Address:			
	Prov: PC:	Prov: PC:	
Contact #s:	Ph: Cell:	Ph: Cell:	

REGULATORY GUIDELINES:
☐ AT1
☑ CCME
☐ Regulated Drinking Water
☐ Other:

All samples are held for 60 calendar days after sample receipt, unless specified otherwise.

PO #:
Project # / Name:
Site Location:
Quote #:
Sampled By:

SERVICE REQUESTED: ☐ **RUSH** (Contact lab to reserve) Date Required: ☐ REGULAR (5 to 7 Days)

See reverse for package specifics

	Sample ID	Depth (unit)	Matrix GW / SW Soil	Date/Time Sampled YY/MM/DD 24:00	SOIL: BTEX F1-F4	Sieve (75 micron)	Regulated Metals (CCME / AT1)	Salinity 4	Assessment ICP Metals	Basic Class II Landfill	WATER: ☐BTEX F1 ☐VOCs	☑BTEX F1-F2 ☐BTEX F1-F4	☑Routine Water ☐Turb ☐F	☐TOC ☐DOC	Regulated Metals (CCME / AT1) Total	Regulated Metals (CCME / AT1) Dissolved	Mercury ☐Total ☐Dissolved	Other Analysis	HOLD - Do not Analyze	# of Containers Submitted
1	14MW01		GW	14/08/31 8:30								✓								5
2	14MW02			8:23																
3	14MW03			9:00								✓								4
4	14MW04			11:15									✓		✓	✓				3
5	14MW05			11:00									✓		✓	✓		Didn't preserve total metals		2
6	14MW06			10:40									✓		✓	✓				3
7	14MWC1			10:03									✓		✓	✓		Didn't preserve total metals		2
8	14MWC2			11:40									✓			✓		RECEIVED IN YELLOWKNIFE		2
9	MW Dup1			08:30								✓						By: Michelle Gueck 11:15		5
10	MW Dup2			10:40									✓		✓	✓		2014-09-01		3
11																		4-43		
12																		756		

Please indicate Filtered, Preserved or Both (F, P, F/P) → P F/P

Temp: 8 / 8 / 8 Avg

Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):
Karla Langlois Karla Langlois	14/09/01	09:30
Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):

Special Instructions: Lab to filter to analyze dissolved metals in 14MW05 and 14MWC1

# of Jars Used & Not Submitted

LAB USE ONLY

Received By:	Date:	Time:	Maxxam Job #: B477021
Jena Walters	20140902	0945	

Lab Comments:

Custody Seal	Temperature	Ice
	See ACTR	

Maxxam

ADDITIONAL COOLER TEMPERATURE RECORD

CHAIN-OF-CUSTODY RECORD

CHAIN OF CUSTODY #	
Page 1 of 3	A131767
Page 2 of 3	A131768
Page 3 of 3	A131769
Page ___ of ___	
Page ___ of ___	
Page ___ of ___	
Page ___ of ___	
Page ___ of ___	
Page ___ of ___	
Page ___ of ___	
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Page ___ of ___	
Page ___ of ___	
Page ___ of ___	
Page ___ of ___	
Page ___ of ___	

COOLER OBSERVATIONS:

MAXXAM JOB#:

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT	✓		TEMP	3	7	2
INTACT	✓			1	2	3
ICE PRESENT	✓					

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT	✓		TEMP	4	8	3
INTACT	✓			1	2	3
ICE PRESENT	✓					

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT	✓		TEMP	2	2	1
INTACT	✓			1	2	3
ICE PRESENT	✓					

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

RECEIVED BY (SIGN & PRINT)		DATE (YYYY/MM/DD)	TIME (HH:MM)
	Jenna Walter	20140902	0945

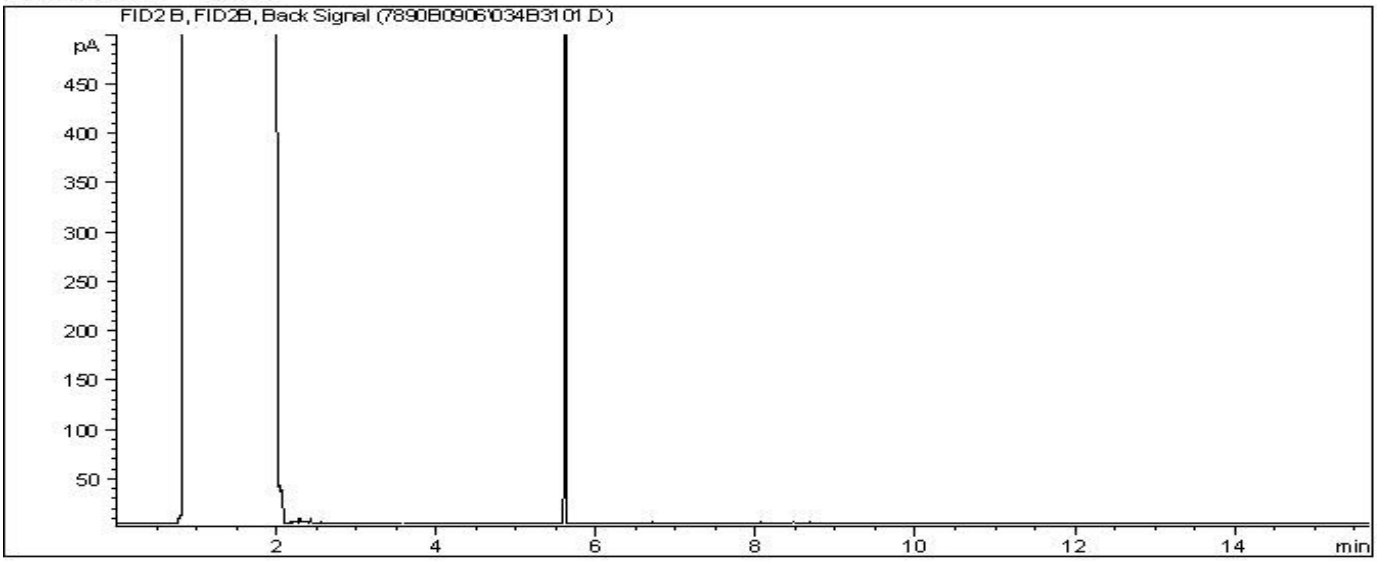
TETRA TECH EBA INC.

Report Date: 2014/09/10
Maxxam Job #: B477081
Maxxam Sample: KM5560

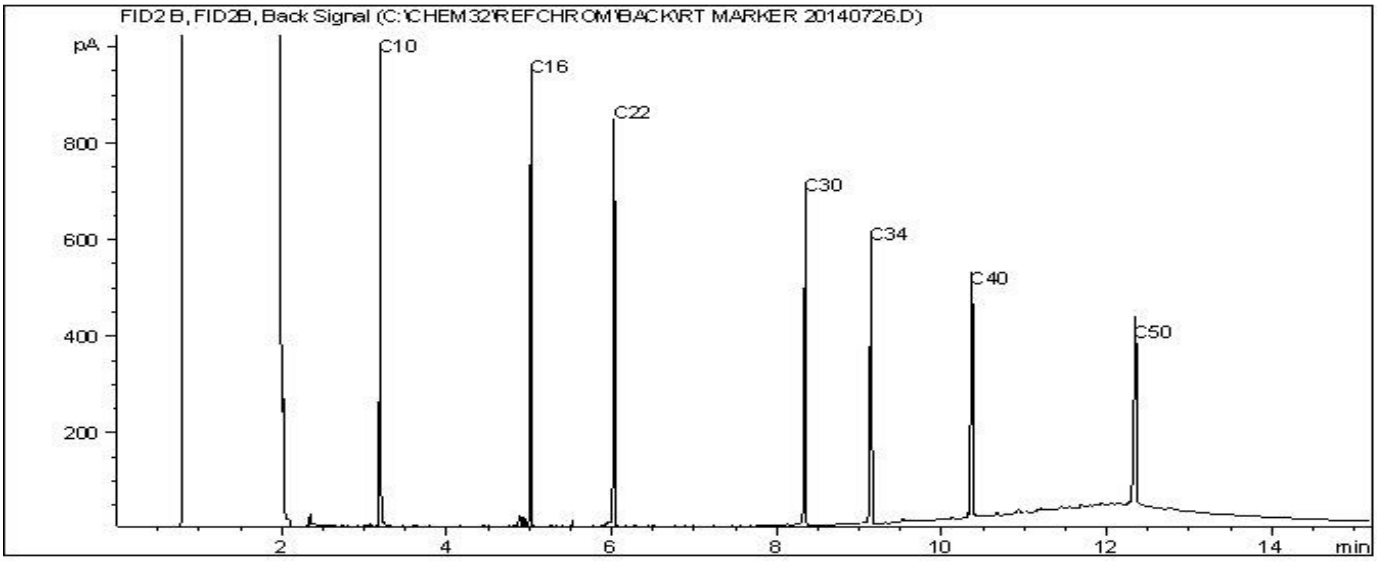
Client ID: SS8-30 0-40

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.

Maxxam Analytics - Partial/Rush Results

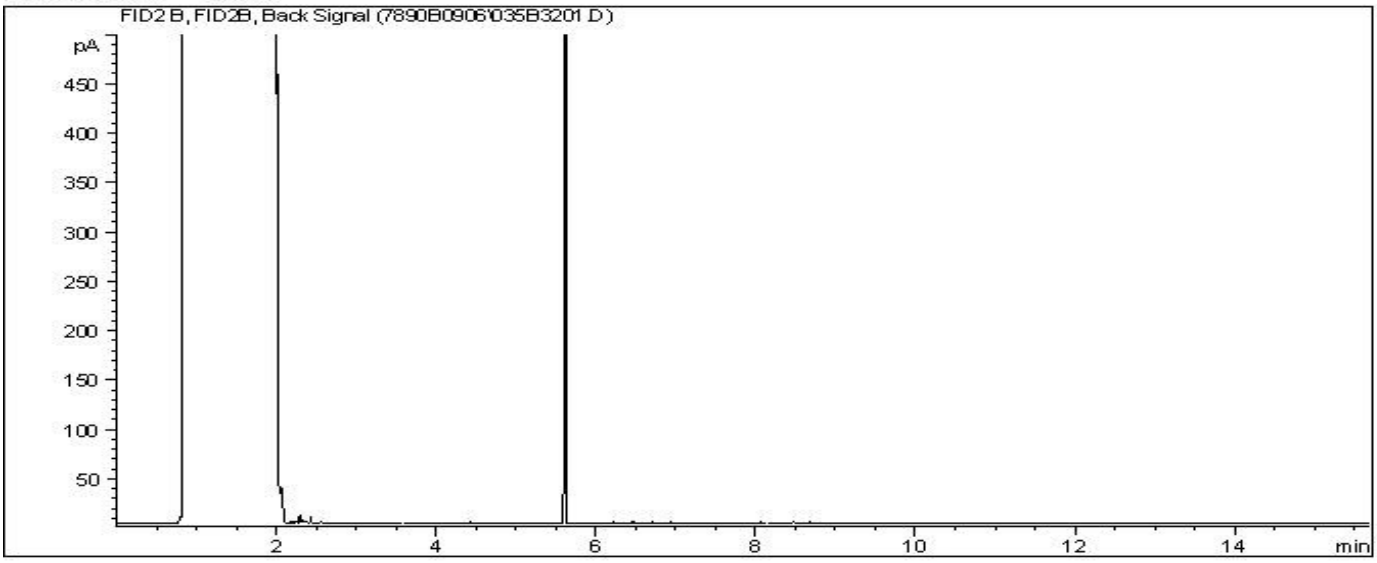
TETRA TECH EBA INC.

Report Date: 2014/09/10
Maxxam Job #: B477081
Maxxam Sample: KM5562

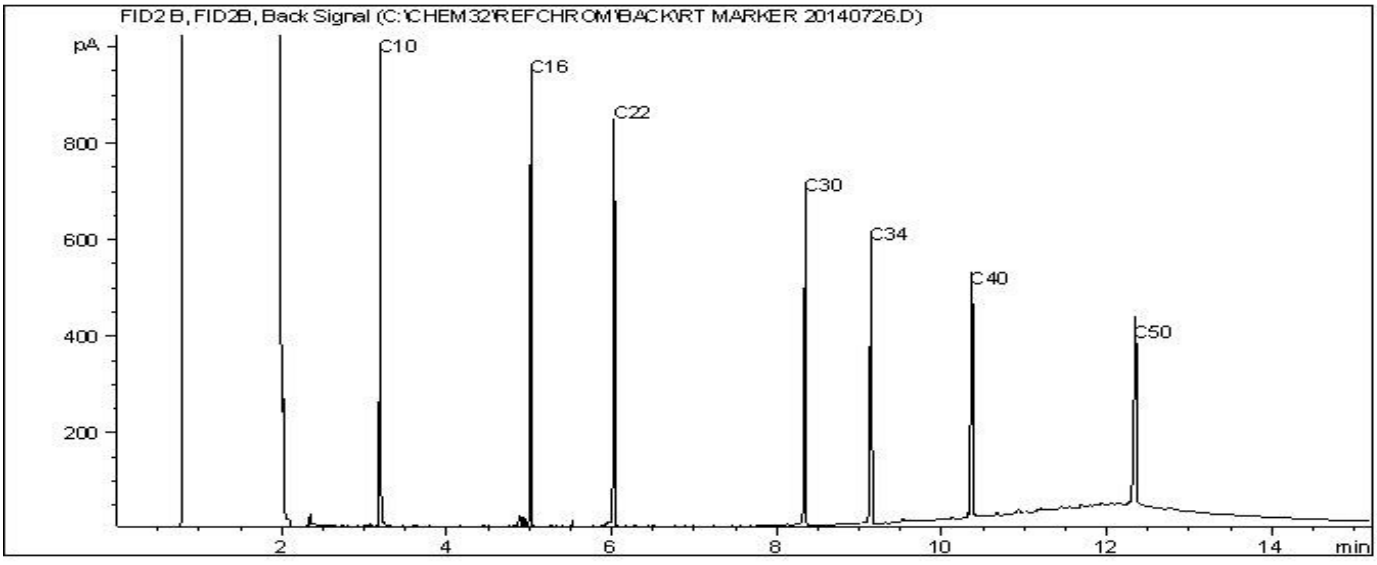
Client ID: SS8-31 20-40

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.

Maxxam Analytics - Partial/Rush Results

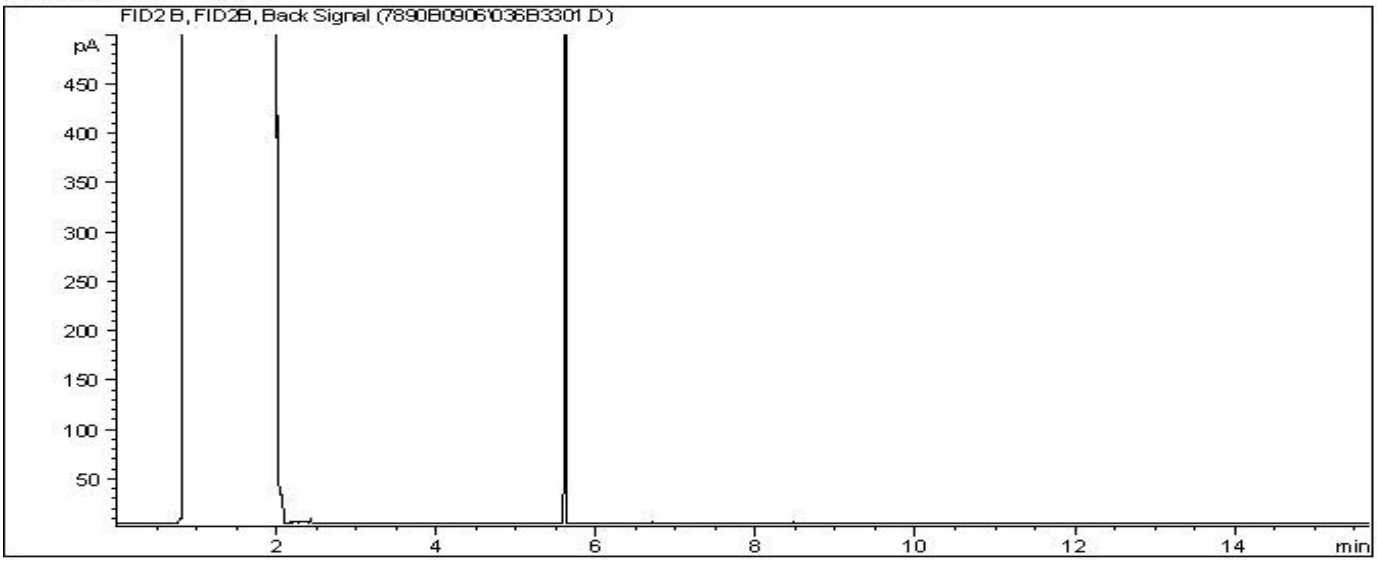
TETRA TECH EBA INC.

Report Date: 2014/09/10
Maxxam Job #: B477081
Maxxam Sample: KM5563

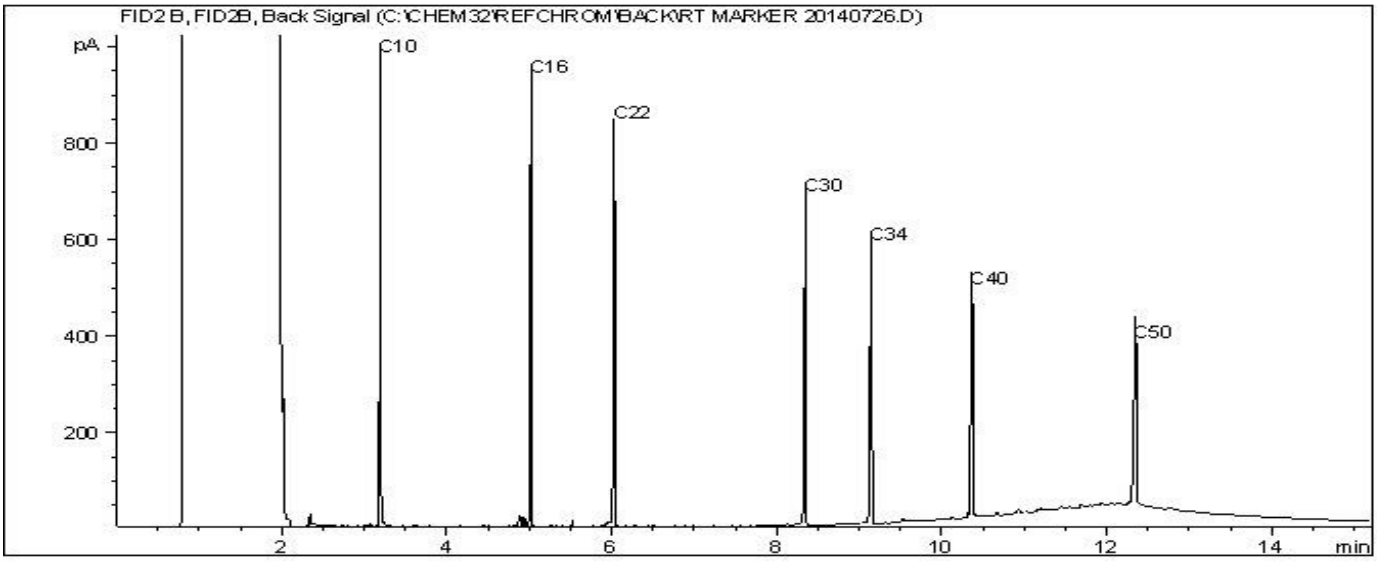
Client ID: SS8-31 40-70

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.

Maxxam Analytics - Partial/Rush Results

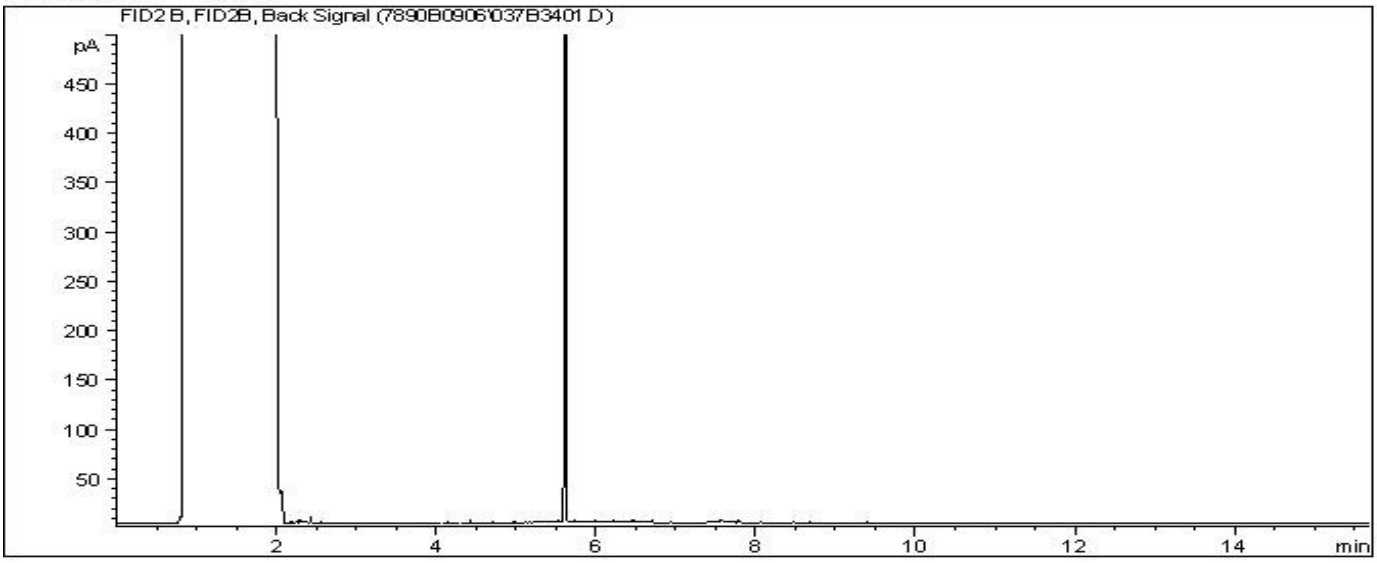
TETRA TECH EBA INC.

Report Date: 2014/09/10
Maxxam Job #: B477081
Maxxam Sample: KM5564

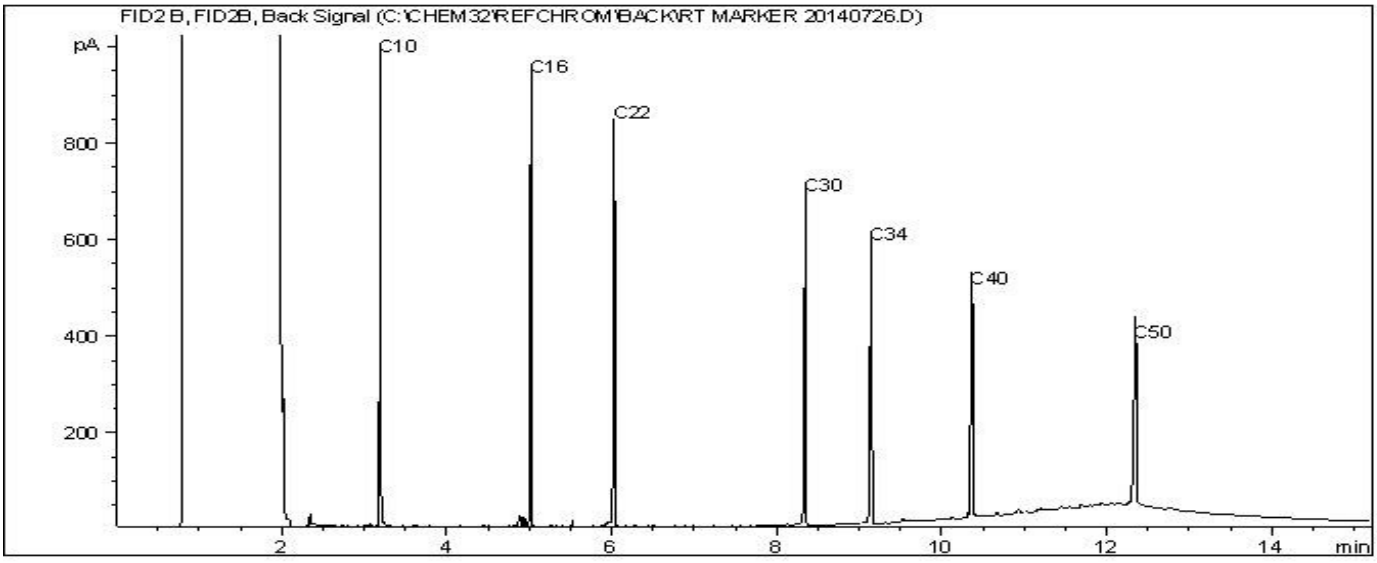
Client ID: SS8-32 0-30

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.

Maxxam Analytics - Partial/Rush Results

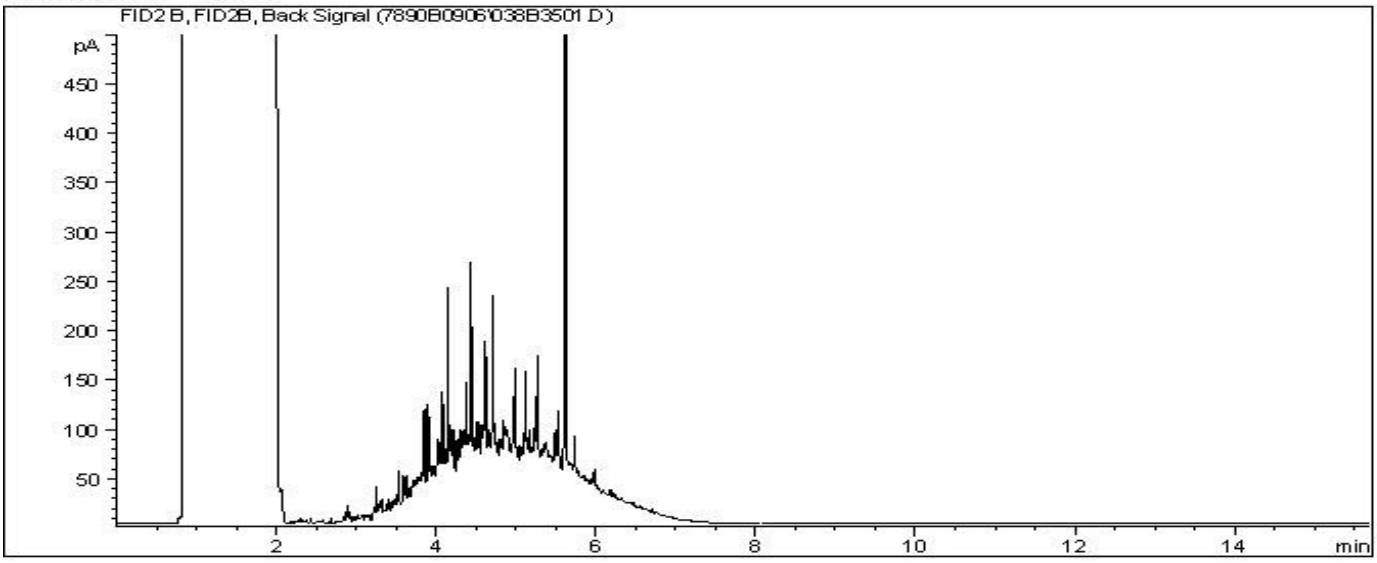
TETRA TECH EBA INC.

Report Date: 2014/09/10
Maxxam Job #: B477081
Maxxam Sample: KM5566

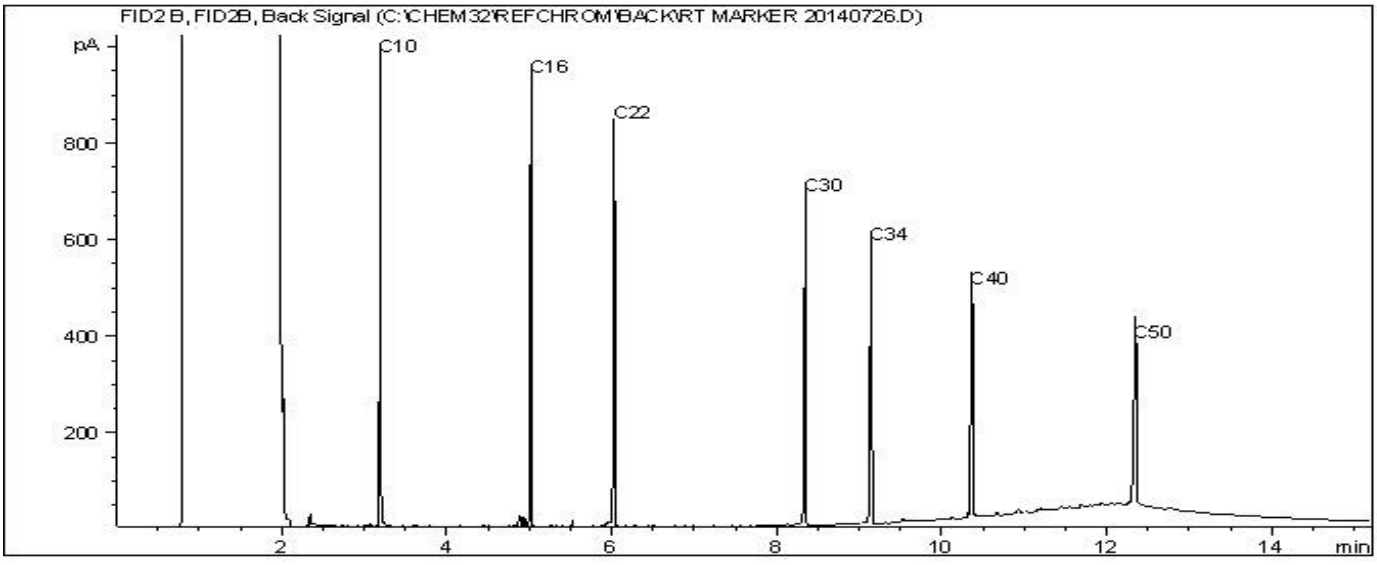
Client ID: SS8-32 50-70

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.

Maxxam Analytics - Partial/Rush Results

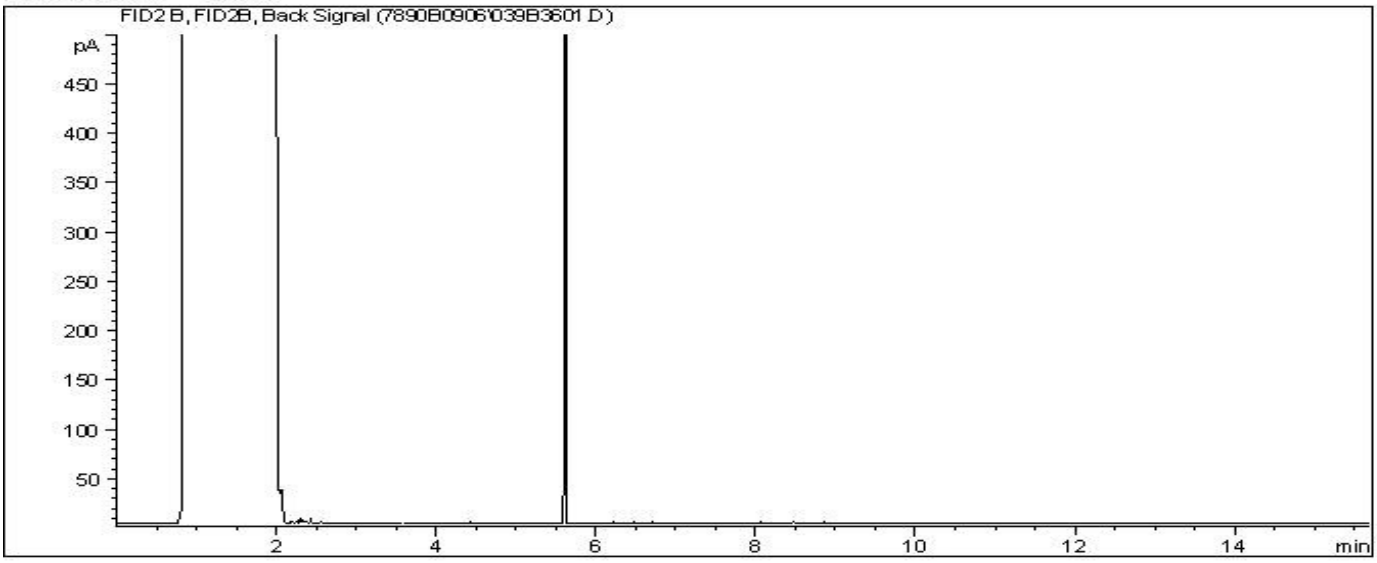
TETRA TECH EBA INC.

Report Date: 2014/09/10
Maxxam Job #: B477081
Maxxam Sample: KM5568

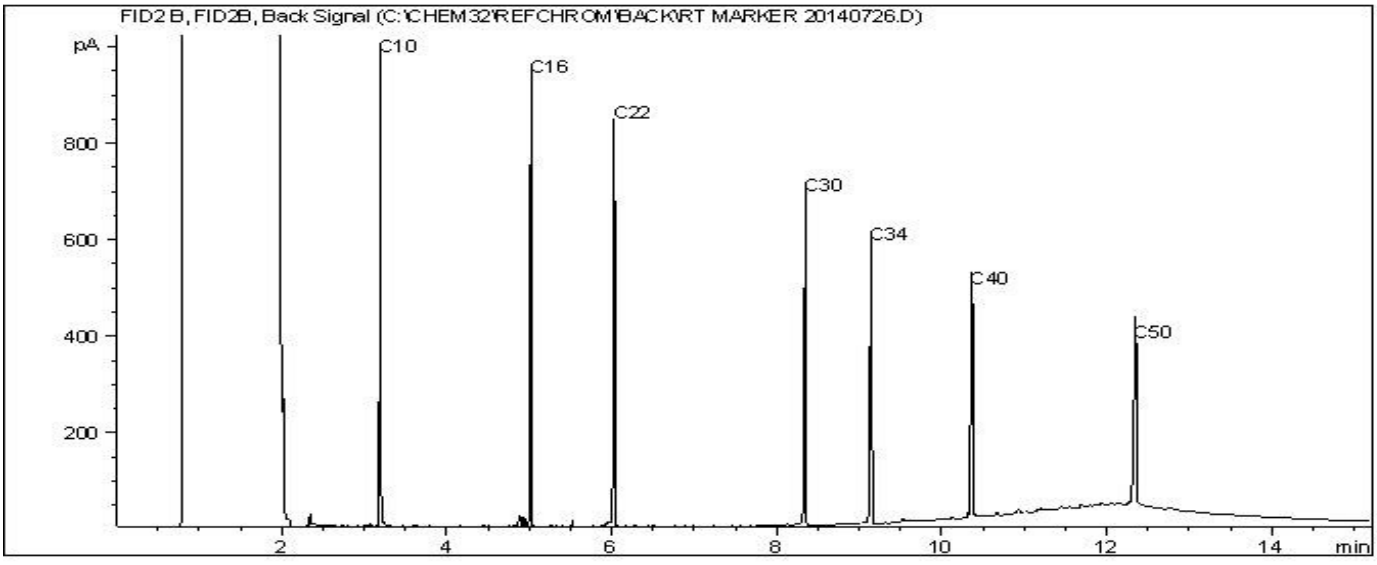
Client ID: SS8-33 20-40

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.

Maxxam Analytics - Partial/Rush Results

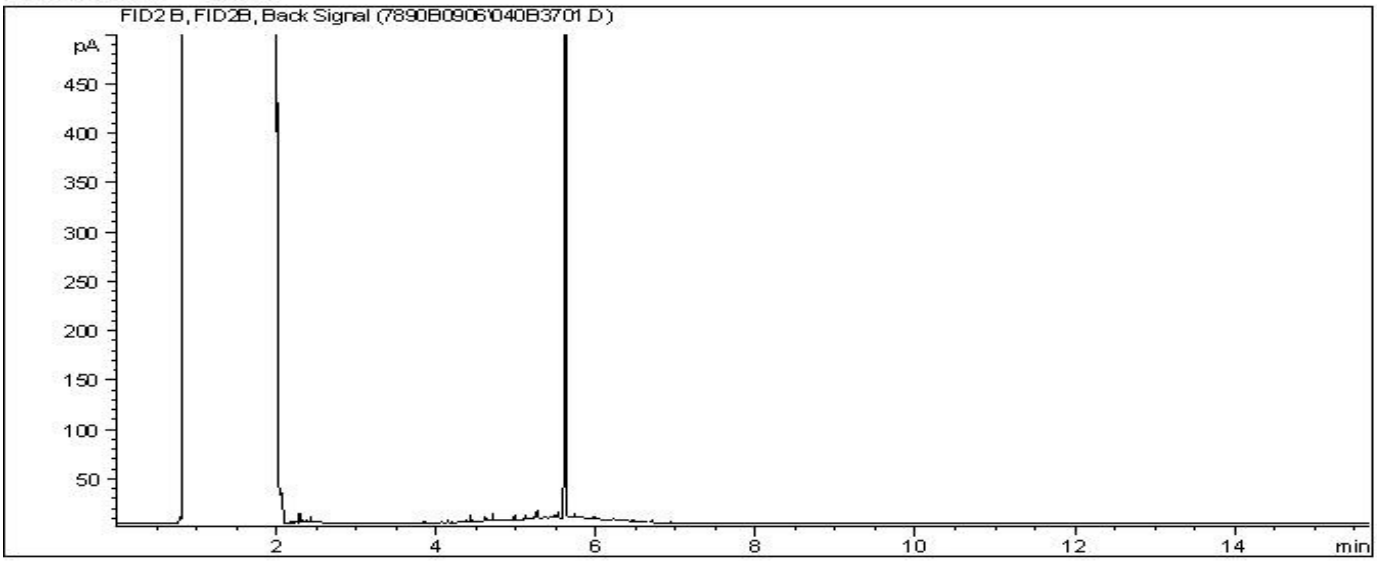
TETRA TECH EBA INC.

Report Date: 2014/09/10
Maxxam Job #: B477081
Maxxam Sample: KM5597

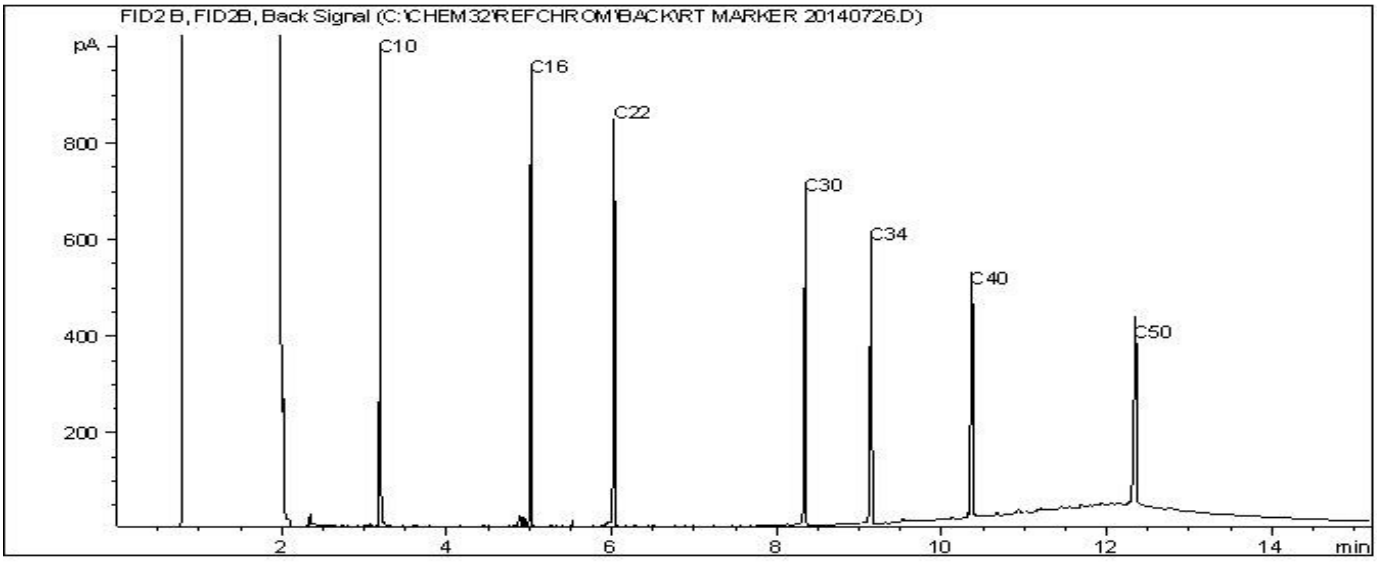
Client ID: SS8-34 0-30

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.

Maxxam Analytics - Partial/Rush Results

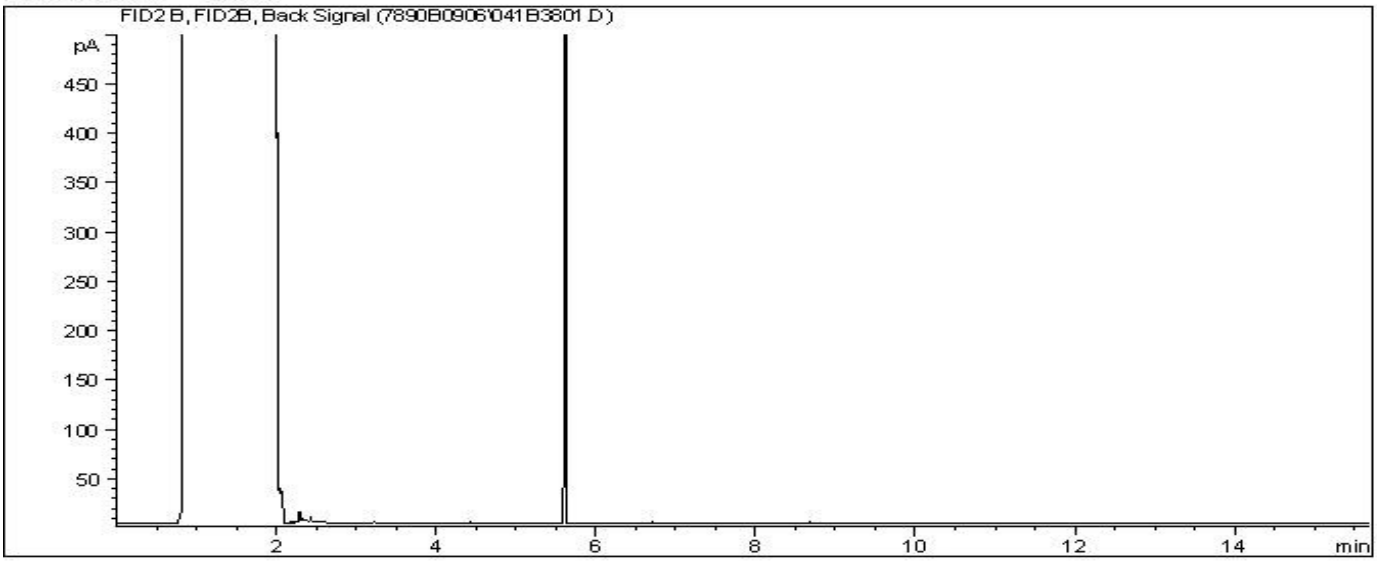
TETRA TECH EBA INC.

Report Date: 2014/09/10
Maxxam Job #: B477081
Maxxam Sample: KM5599

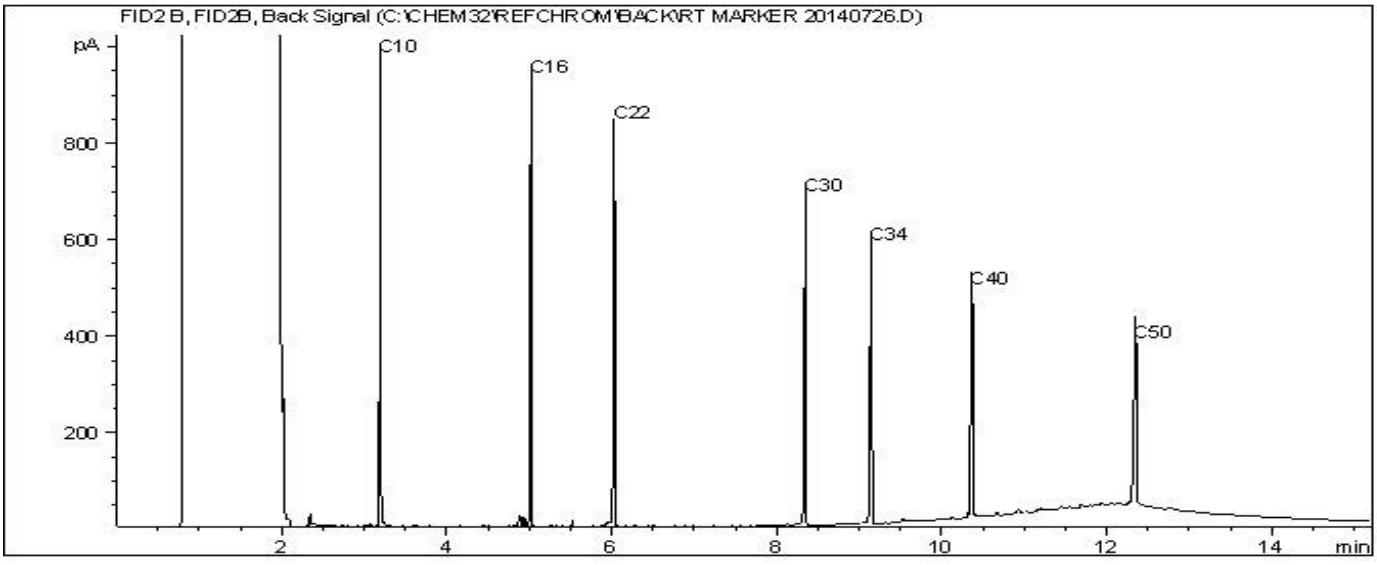
Client ID: SS8-34 50-70

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.

Maxxam Analytics - Partial/Rush Results

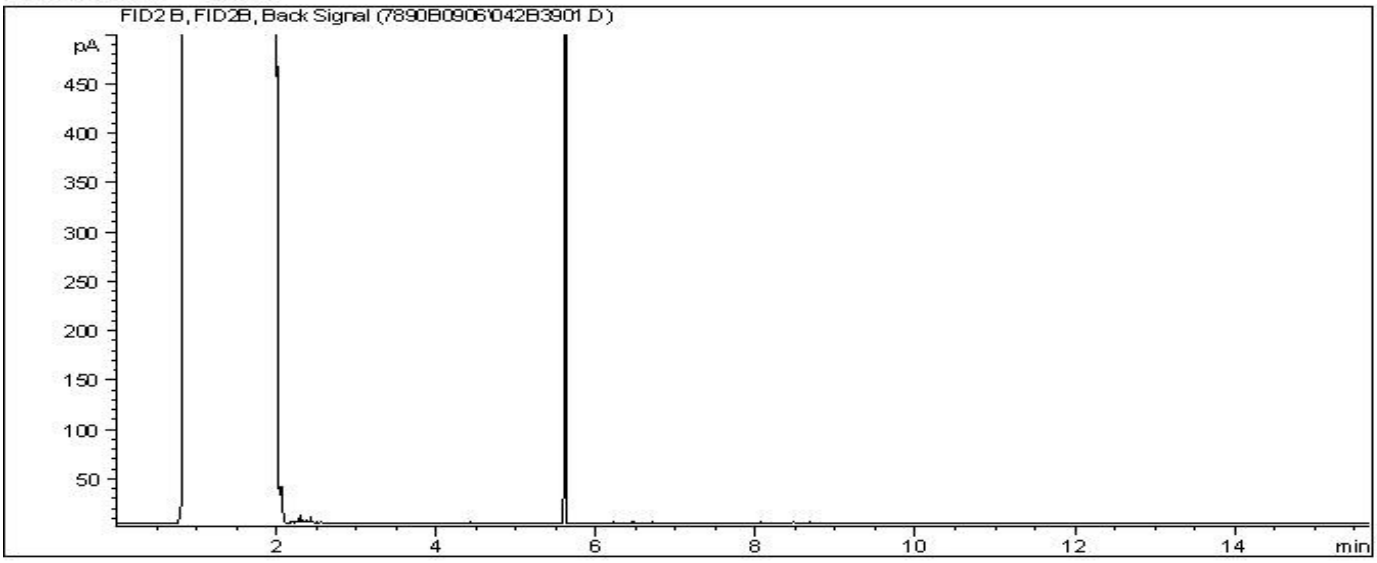
TETRA TECH EBA INC.

Report Date: 2014/09/10
Maxxam Job #: B477081
Maxxam Sample: KM5601

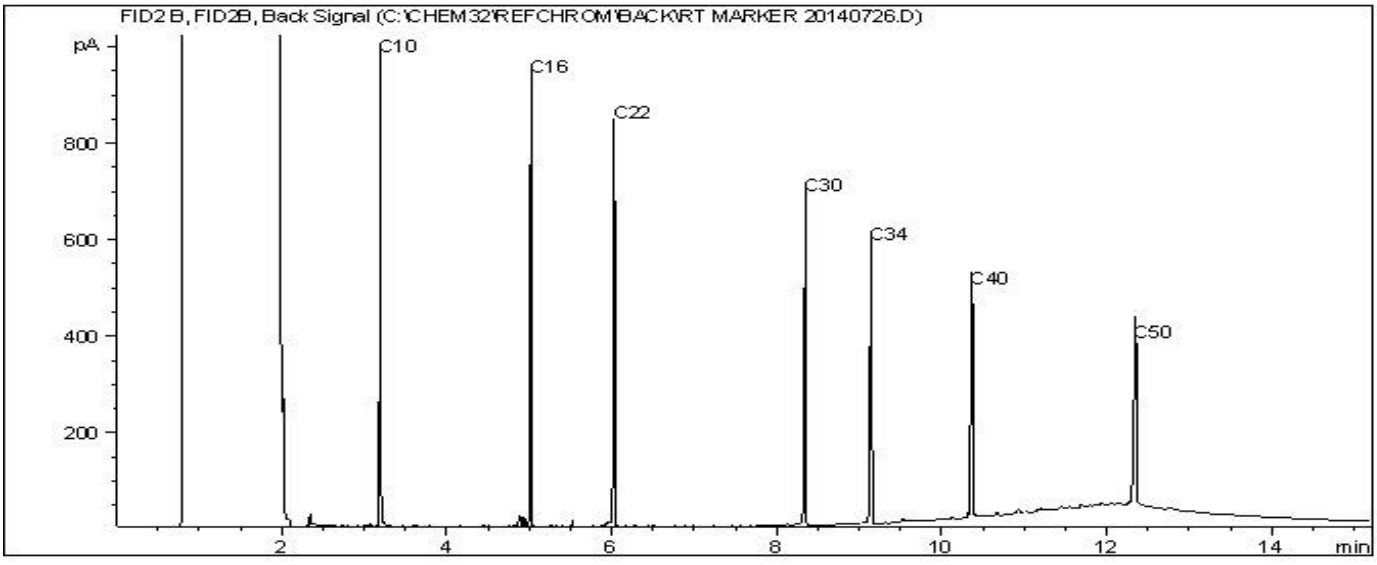
Client ID: SS8-35 20-40

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+

Page 1 of 1

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Analytics - Partial/Rush Results

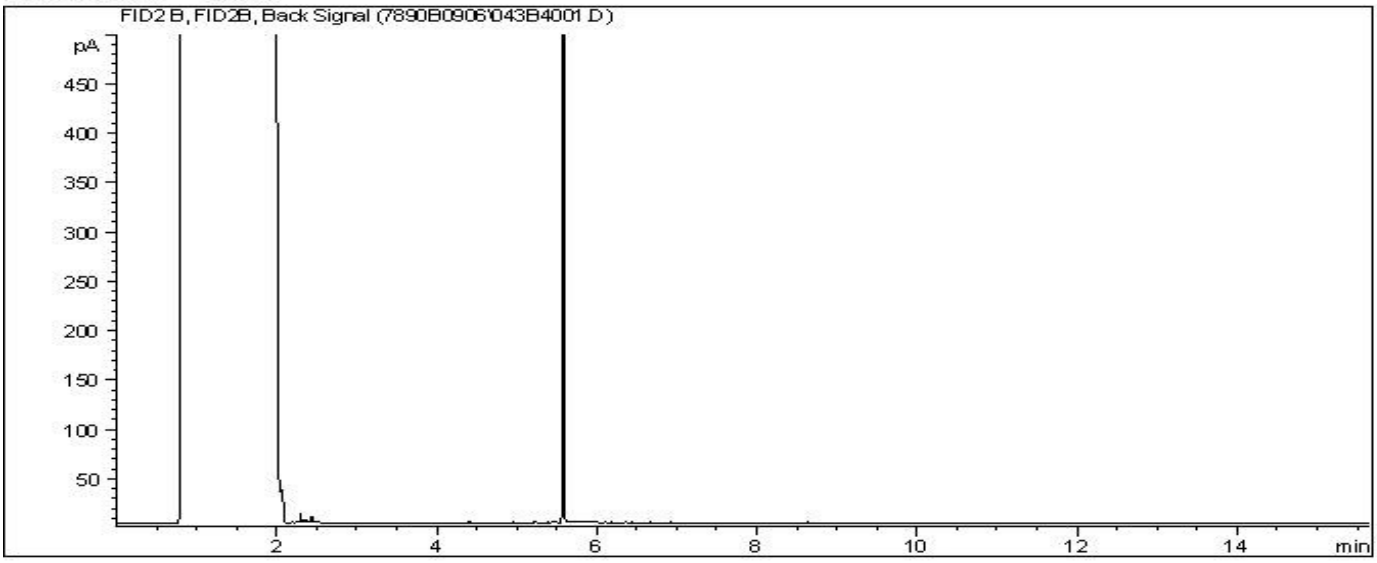
TETRA TECH EBA INC.

Report Date: 2014/09/10
Maxxam Job #: B477081
Maxxam Sample: KM5603

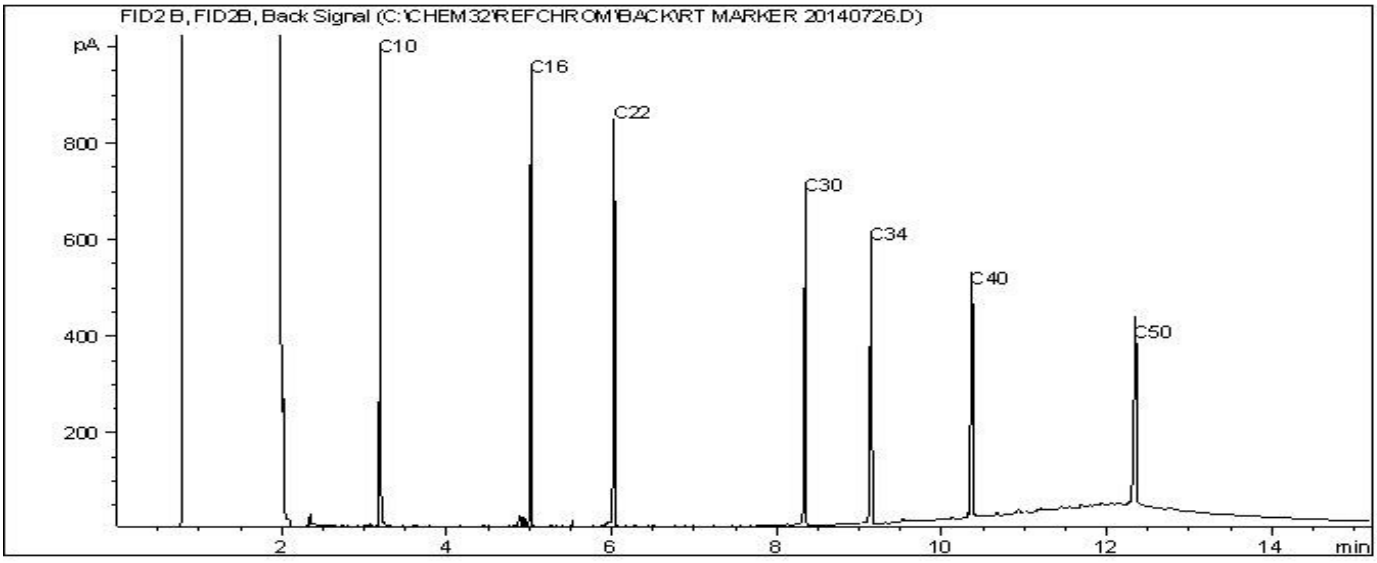
Client ID: SS8-36 20-40

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+	

Page 1 of 1

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Analytics - Partial/Rush Results

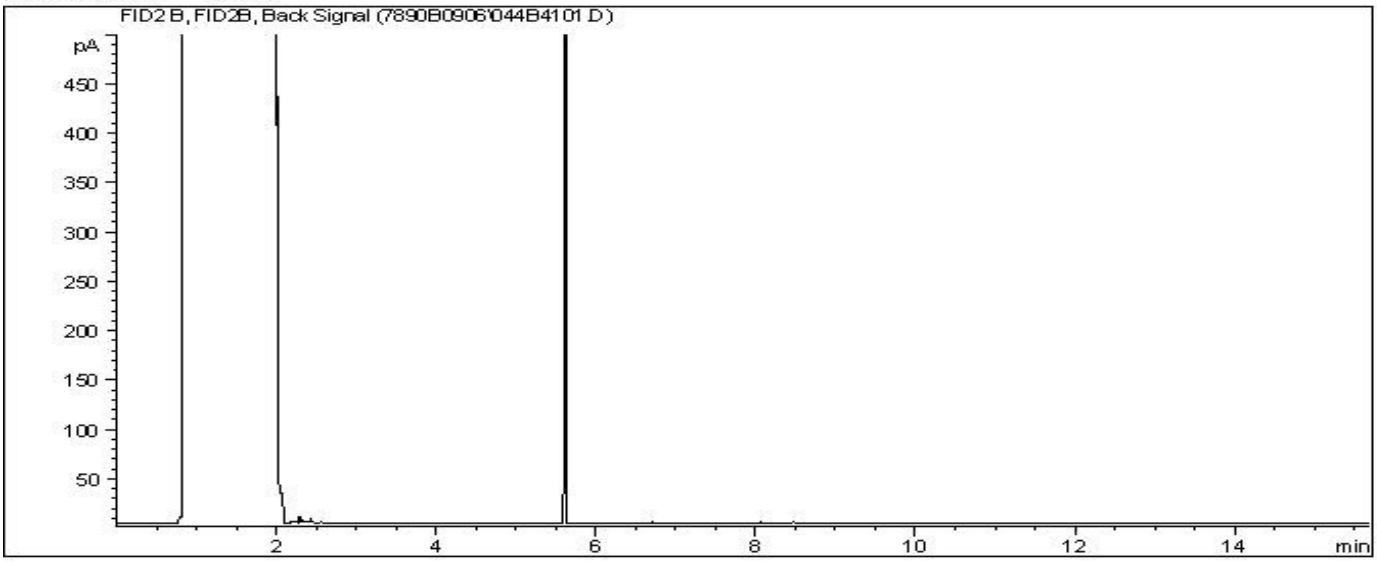
TETRA TECH EBA INC.

Report Date: 2014/09/10
Maxxam Job #: B477081
Maxxam Sample: KM5605

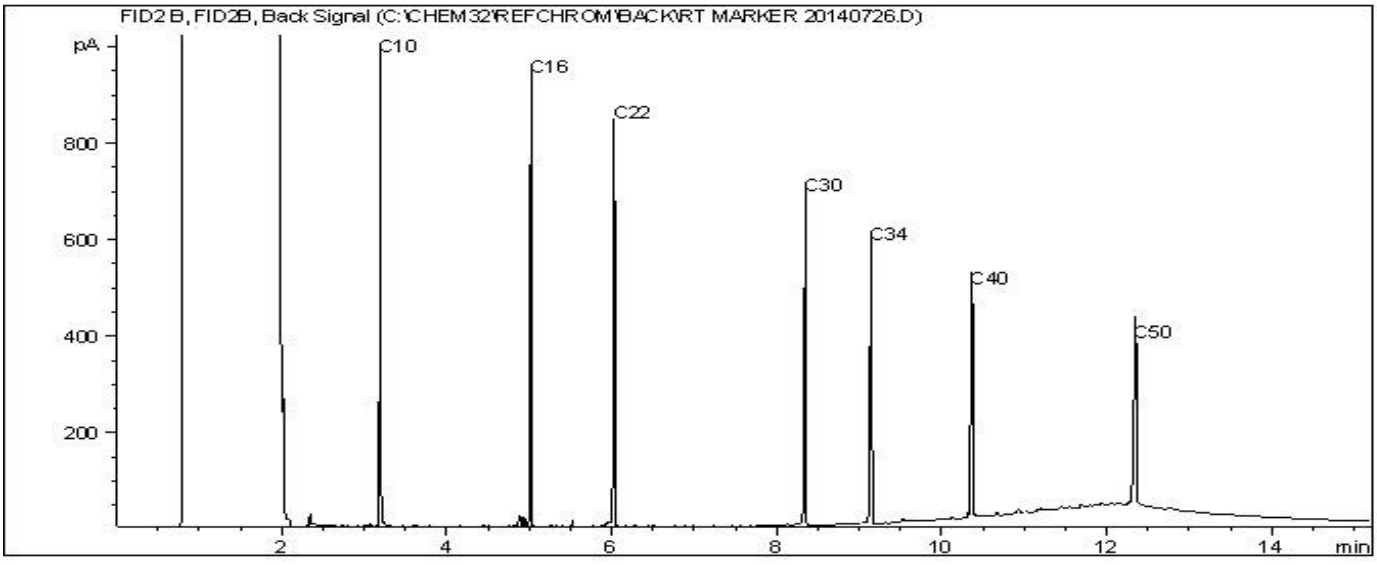
Client ID: SS8-37 50-60

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.

Maxxam Analytics - Partial/Rush Results

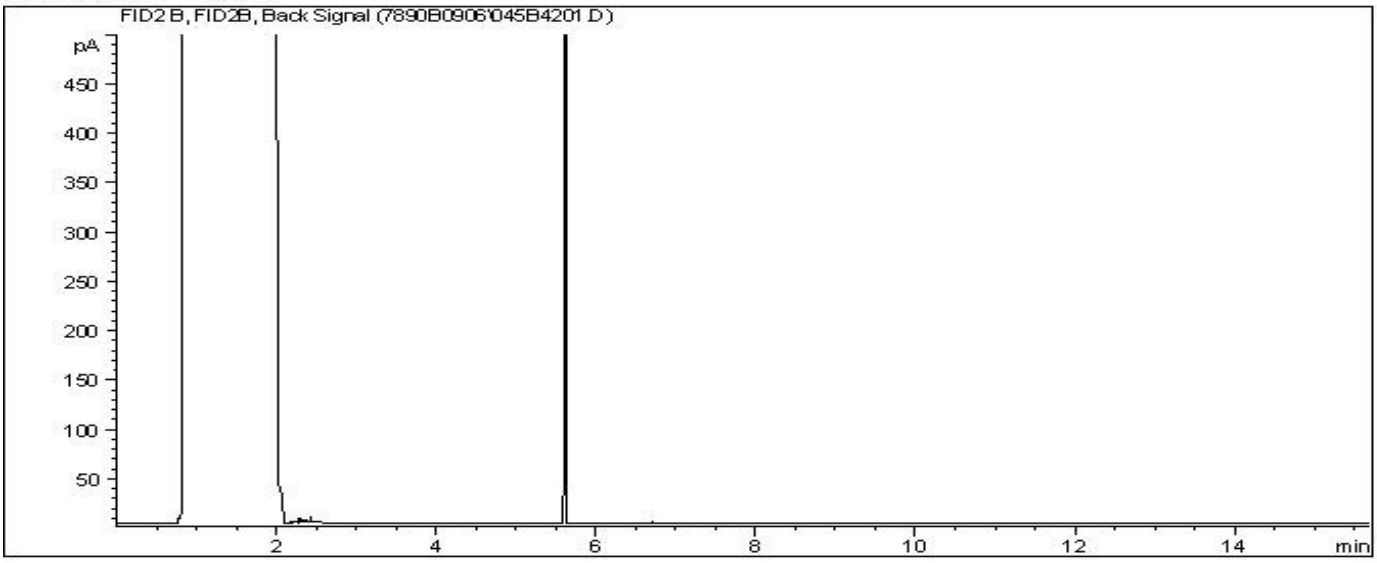
TETRA TECH EBA INC.

Report Date: 2014/09/10
Maxxam Job #: B477081
Maxxam Sample: KM5607

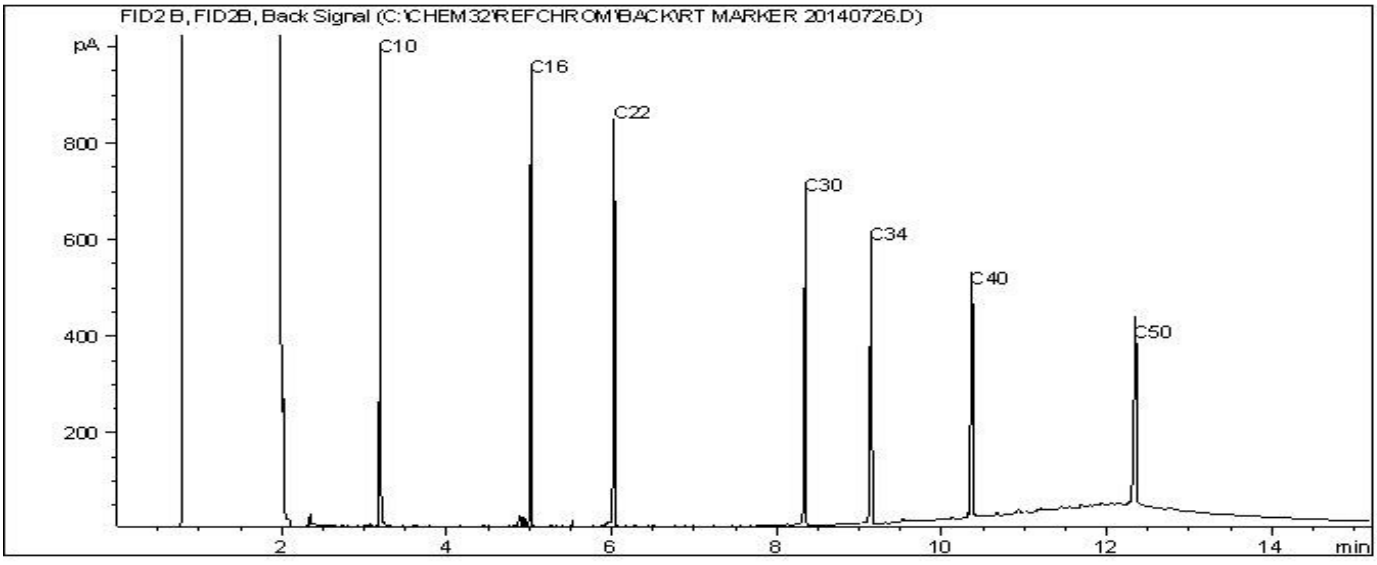
Client ID: SS8-38 50-60

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.

Maxxam Analytics - Partial/Rush Results

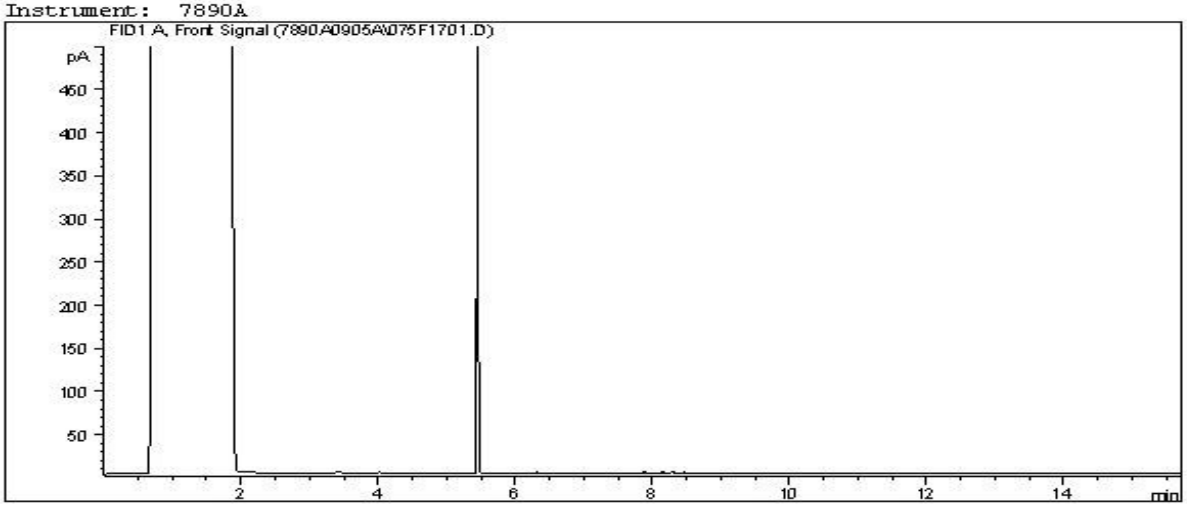
TETRA TECH EBA INC.

Report Date: 2014/09/10
Maxxam Job #: B477081
Maxxam Sample: KM5919

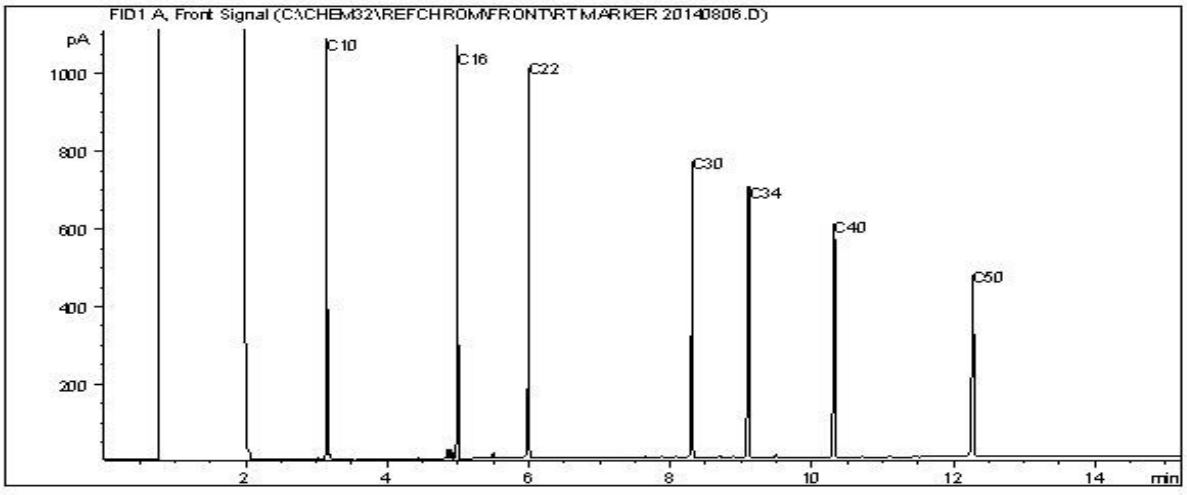
Client ID: 14MW01

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890A



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+

Page 1 of 1

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Analytics - Partial/Rush Results

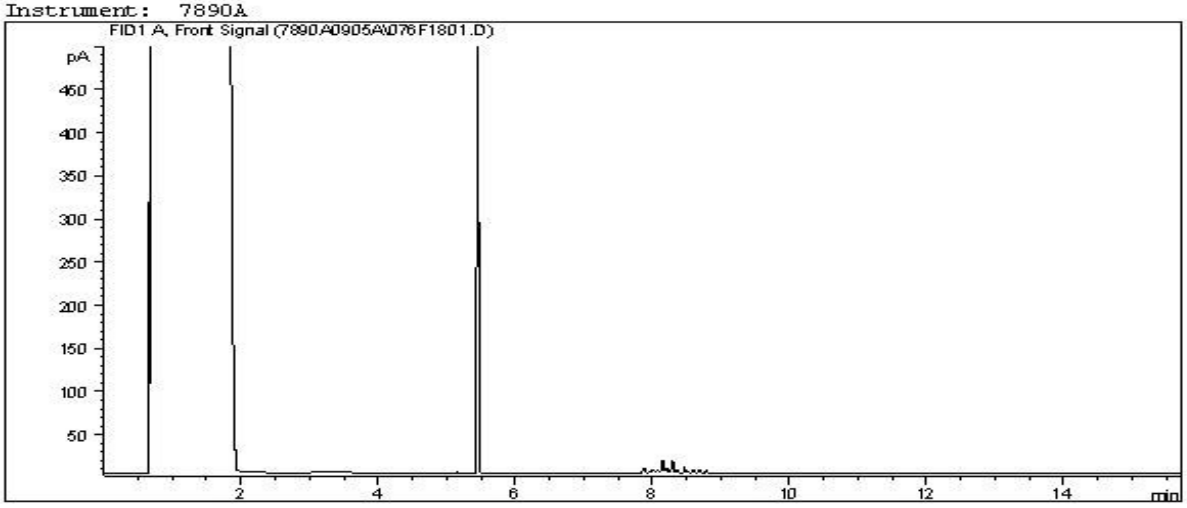
TETRA TECH EBA INC.

Report Date: 2014/09/10
Maxxam Job #: B477081
Maxxam Sample: KM5920

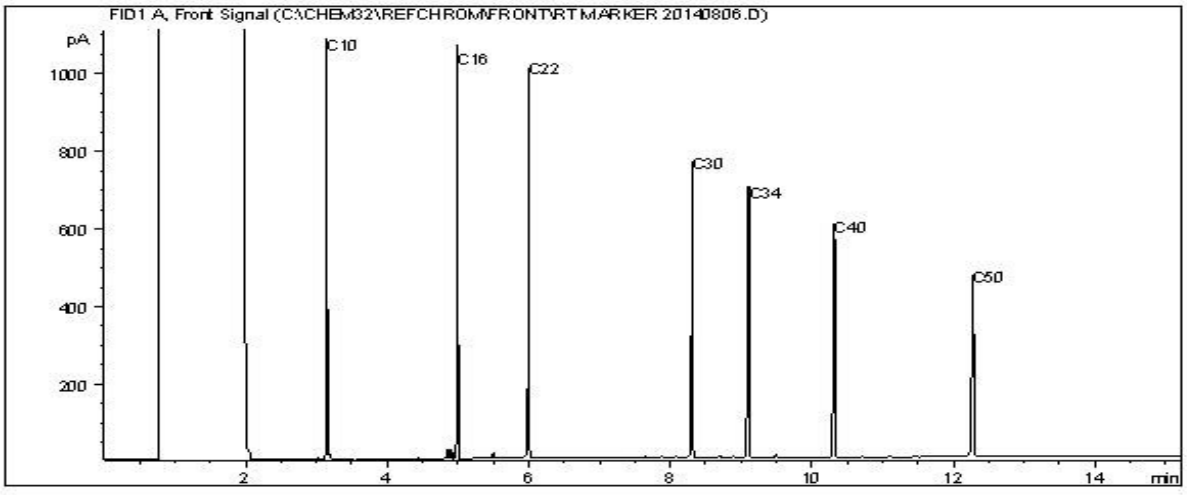
Client ID: 14MW03

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890A



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+

Page 1 of 1

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Analytics - Partial/Rush Results

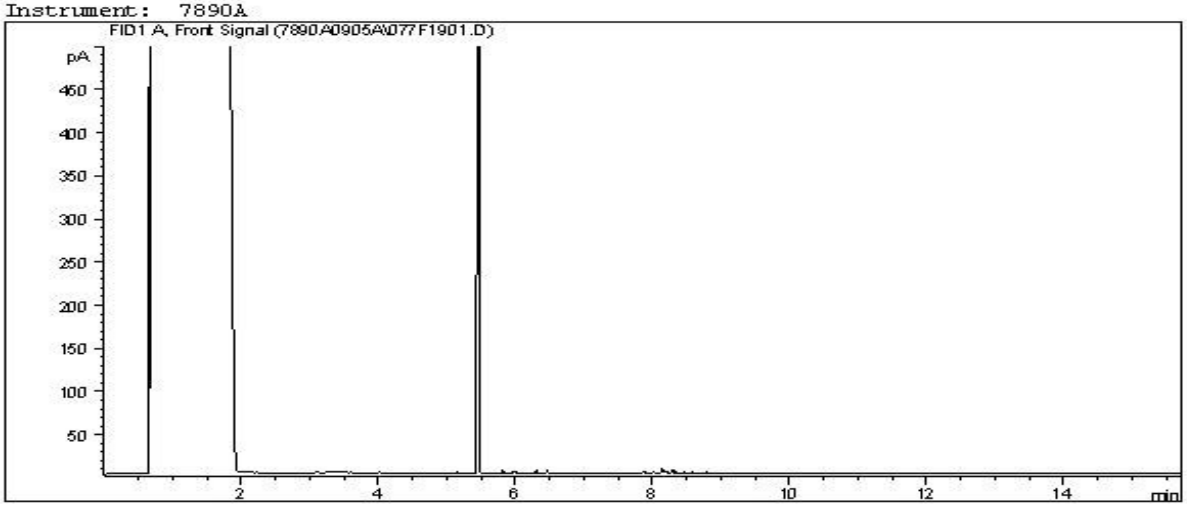
TETRA TECH EBA INC.

Report Date: 2014/09/10
Maxxam Job #: B477081
Maxxam Sample: KM5926

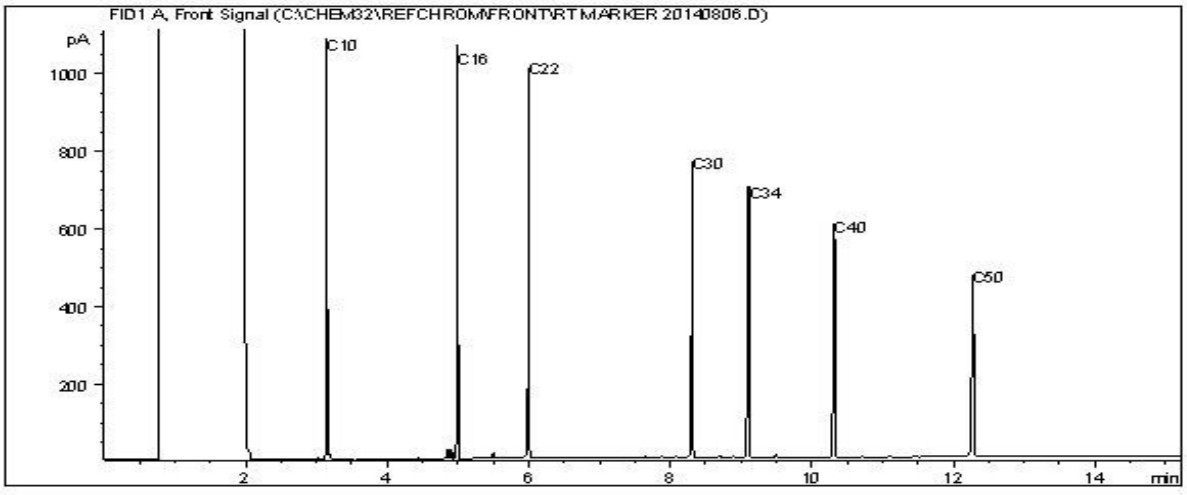
Client ID: MWDUP1

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890A



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+

Page 1 of 1

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Analytics - Partial/Rush Results

Tetra Tech EBA Inc.
ATTN: Karla Langlois
PO Box 2244 STN M
201- 4916 49 Street
Yellowknife NT X1A 2P7

Date Received: 29-AUG-14
Report Date: 02-OCT-14 09:02 (MT)
Version: FINAL

Client Phone: 867-766-3728

Certificate of Analysis

Lab Work Order #: L1510213

Project P.O. #:	NOT SUBMITTED
Job Reference:	414103202
C of C Numbers:	1, 2
Legal Site Desc:	Jericho

Rick Zolkiewski
General Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-1 JER-AEM-22							
Sampled By: CLIENT on 25-AUG-14 @ 12:00							
Matrix: Water							
Total ICPOES & HR-ICPMS in Water							
Hardness							
Hardness (as CaCO3)	17.6		1.3	mg/L		23-SEP-14	
Total Metals by ICPOES (Undigested)							
Calcium (Ca)-Total	3.78		0.030	mg/L		17-SEP-14	R2952008
Iron (Fe)-Total	0.076		0.010	mg/L		17-SEP-14	R2952008
Magnesium (Mg)-Total	2.14		0.030	mg/L		17-SEP-14	R2952008
Phosphorus (P)-Total	<0.050		0.050	mg/L		17-SEP-14	R2952008
Potassium (K)-Total	0.476		0.050	mg/L		17-SEP-14	R2952008
Silicon (Si)-Total	0.661		0.050	mg/L		17-SEP-14	R2952008
Sodium (Na)-Total	1.21		0.20	mg/L		17-SEP-14	R2952008
Miscellaneous Parameters							
Ammonia, Total (as N)	0.0163		0.0050	mg/L		15-SEP-14	R2947433
Mercury (Hg)-Total	0.0000052		0.0000050	mg/L		13-SEP-14	R2946530
Total Organic Carbon	6.1		1.0	mg/L		17-SEP-14	R2948905
Phosphorus (P)-Total	0.0089		0.0010	mg/L		16-SEP-14	R2949323
Total Suspended Solids	<3.0		3.0	mg/L		31-AUG-14	R2934268
Turbidity	0.86		0.10	NTU		17-SEP-14	R2950911
Total Metals in Water by HR-ICPMS(Ultra)							
Aluminum (Al)-Total	0.0390		0.00020	mg/L		12-SEP-14	R2956094
Antimony (Sb)-Total	0.0000099		0.0000050	mg/L		12-SEP-14	R2956094
Arsenic (As)-Total	0.000322		0.000020	mg/L		12-SEP-14	R2956094
Barium (Ba)-Total	0.00201		0.000020	mg/L		12-SEP-14	R2956094
Beryllium (Be)-Total	0.0000052		0.0000020	mg/L		12-SEP-14	R2956094
Bismuth (Bi)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2956094
Boron (B)-Total	<0.0050		0.0050	mg/L		12-SEP-14	R2956094
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Cesium (Cs)-Total	0.0000052		0.0000050	mg/L		12-SEP-14	R2956094
Chromium (Cr)-Total	0.000187		0.000050	mg/L		12-SEP-14	R2956094
Cobalt (Co)-Total	0.0000498		0.0000050	mg/L		12-SEP-14	R2956094
Copper (Cu)-Total	0.00161		0.000050	mg/L		12-SEP-14	R2956094
Gallium (Ga)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2956094
Lead (Pb)-Total	0.0000167		0.0000050	mg/L		12-SEP-14	R2956094
Lithium (Li)-Total	0.00042		0.00020	mg/L		12-SEP-14	R2956094
Manganese (Mn)-Total	0.00662		0.0000050	mg/L		12-SEP-14	R2956094
Molybdenum (Mo)-Total	0.000041		0.000010	mg/L		12-SEP-14	R2956094
Nickel (Ni)-Total	0.000889		0.000050	mg/L		12-SEP-14	R2956094
Rhenium (Re)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Rubidium (Rb)-Total	0.000874		0.0000050	mg/L		12-SEP-14	R2956094
Selenium (Se)-Total	0.000043		0.000040	mg/L		12-SEP-14	R2956094
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Strontium (Sr)-Total	0.00851		0.000010	mg/L		12-SEP-14	R2956094
Tellurium (Te)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Thallium (Tl)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2956094
Thorium (Th)-Total	0.0000199		0.0000050	mg/L		12-SEP-14	R2956094
Tin (Sn)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Titanium (Ti)-Total	0.000859		0.000050	mg/L		12-SEP-14	R2956094
Tungsten (W)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Uranium (U)-Total	0.000281		0.0000010	mg/L		12-SEP-14	R2956094
Vanadium (V)-Total	0.000116		0.000010	mg/L		12-SEP-14	R2956094
Yttrium (Y)-Total	0.000114		0.0000050	mg/L		12-SEP-14	R2956094
Zinc (Zn)-Total	0.00029		0.00010	mg/L		12-SEP-14	R2956094

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-1 JER-AEM-22							
Sampled By: CLIENT on 25-AUG-14 @ 12:00							
Matrix: Water							
Total Metals in Water by HR-ICPMS(Ultra)							
Zirconium (Zr)-Total	0.000048		0.000010	mg/L		12-SEP-14	R2956094
Routine Water Analysis - Low Level							
Chloride by IC							
Chloride (Cl)	0.52		0.50	mg/L		30-AUG-14	R2939362
Dissolved Metals in Water by CRC ICPMS							
Calcium (Ca)-Dissolved	3.57		0.50	mg/L		15-SEP-14	R2947735
Magnesium (Mg)-Dissolved	2.10		0.10	mg/L		15-SEP-14	R2947735
Potassium (K)-Dissolved	0.43		0.10	mg/L		15-SEP-14	R2947735
Sodium (Na)-Dissolved	1.4		1.0	mg/L		15-SEP-14	R2947735
Fluoride by IC							
Fluoride (F)	<0.020		0.020	mg/L		30-AUG-14	R2939362
Ion Balance Calculation							
Ion Balance	Low EC			%		18-SEP-14	R2951830
TDS (Calculated)	19.3			mg/L		18-SEP-14	R2951830
Hardness (as CaCO3)	17.6			mg/L		18-SEP-14	R2951830
Nitrate in Water (Calculation)							
Nitrate (as N)	0.0155		0.0060	mg/L		03-SEP-14	
Nitrite & Nitrate in Water by Colour							
Nitrate and Nitrite (as N)	0.0155		0.0060	mg/L		02-SEP-14	R2935954
Nitrite in Water by Colour							
Nitrite (as N)	<0.0020		0.0020	mg/L		02-SEP-14	R2935954
Sulfate by IC (Low Level)							
Sulfate (SO4)	2.07		0.050	mg/L		30-AUG-14	R2939362
pH, Conductivity and Total Alkalinity							
pH	7.26		0.10	pH		01-SEP-14	R2934271
Conductivity (EC)	42.5		0.20	uS/cm		01-SEP-14	R2934271
Bicarbonate (HCO3)	18.6		5.0	mg/L		01-SEP-14	R2934271
Carbonate (CO3)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Hydroxide (OH)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Alkalinity, Total (as CaCO3)	15.2		2.0	mg/L		01-SEP-14	R2934271
L1510213-2 JER-AEM-23							
Sampled By: CLIENT on 25-AUG-14 @ 12:00							
Matrix: Water							
Total ICPOES & HR-ICPMS in Water							
Hardness							
Hardness (as CaCO3)	15.1		1.3	mg/L		23-SEP-14	
Total Metals by ICPOES (Undigested)							
Calcium (Ca)-Total	3.24		0.030	mg/L		17-SEP-14	R2952008
Iron (Fe)-Total	0.081		0.010	mg/L		17-SEP-14	R2952008
Magnesium (Mg)-Total	1.85		0.030	mg/L		17-SEP-14	R2952008
Phosphorus (P)-Total	<0.050		0.050	mg/L		17-SEP-14	R2952008
Potassium (K)-Total	0.618		0.050	mg/L		17-SEP-14	R2952008
Silicon (Si)-Total	0.724		0.050	mg/L		17-SEP-14	R2952008
Sodium (Na)-Total	1.58		0.20	mg/L		17-SEP-14	R2952008
Miscellaneous Parameters							
Ammonia, Total (as N)	0.0229		0.0050	mg/L		15-SEP-14	R2947433
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		13-SEP-14	R2946530
Total Organic Carbon	6.5		1.0	mg/L		17-SEP-14	R2948905
Phosphorus (P)-Total	0.0056		0.0010	mg/L		16-SEP-14	R2949323
Total Suspended Solids	<3.0		3.0	mg/L		31-AUG-14	R2934268
Turbidity	0.96		0.10	NTU		17-SEP-14	R2950911

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-2 JER-AEM-23							
Sampled By: CLIENT on 25-AUG-14 @ 12:00							
Matrix: Water							
Total Metals in Water by HR-ICPMS(Ultra)							
Aluminum (Al)-Total	0.0617		0.00020	mg/L		12-SEP-14	R2956094
Antimony (Sb)-Total	0.0000118		0.0000050	mg/L		12-SEP-14	R2956094
Arsenic (As)-Total	0.000277		0.000020	mg/L		12-SEP-14	R2956094
Barium (Ba)-Total	0.00321		0.000020	mg/L		12-SEP-14	R2956094
Beryllium (Be)-Total	0.0000075		0.0000020	mg/L		12-SEP-14	R2956094
Bismuth (Bi)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2956094
Boron (B)-Total	<0.0050		0.0050	mg/L		12-SEP-14	R2956094
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Cesium (Cs)-Total	0.0000070		0.0000050	mg/L		12-SEP-14	R2956094
Chromium (Cr)-Total	0.000175		0.000050	mg/L		12-SEP-14	R2956094
Cobalt (Co)-Total	0.0000494		0.0000050	mg/L		12-SEP-14	R2956094
Copper (Cu)-Total	0.00246		0.000050	mg/L		12-SEP-14	R2956094
Gallium (Ga)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2956094
Lead (Pb)-Total	0.0000193		0.0000050	mg/L		12-SEP-14	R2956094
Lithium (Li)-Total	0.00044		0.00020	mg/L		12-SEP-14	R2956094
Manganese (Mn)-Total	0.00324		0.0000050	mg/L		12-SEP-14	R2956094
Molybdenum (Mo)-Total	0.000087		0.000010	mg/L		12-SEP-14	R2956094
Nickel (Ni)-Total	0.000561		0.000050	mg/L		12-SEP-14	R2956094
Rhenium (Re)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Rubidium (Rb)-Total	0.00116		0.0000050	mg/L		12-SEP-14	R2956094
Selenium (Se)-Total	0.000054		0.000040	mg/L		12-SEP-14	R2956094
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Strontium (Sr)-Total	0.0141		0.000010	mg/L		12-SEP-14	R2956094
Tellurium (Te)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Thallium (Tl)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2956094
Thorium (Th)-Total	0.0000288		0.0000050	mg/L		12-SEP-14	R2956094
Tin (Sn)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Titanium (Ti)-Total	0.000942		0.000050	mg/L		12-SEP-14	R2956094
Tungsten (W)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Uranium (U)-Total	0.000192		0.0000010	mg/L		12-SEP-14	R2956094
Vanadium (V)-Total	0.000152		0.000010	mg/L		12-SEP-14	R2956094
Yttrium (Y)-Total	0.000171		0.0000050	mg/L		12-SEP-14	R2956094
Zinc (Zn)-Total	0.00044		0.00010	mg/L		12-SEP-14	R2956094
Zirconium (Zr)-Total	0.000073		0.000010	mg/L		12-SEP-14	R2956094
Routine Water Analysis - Low Level							
Chloride by IC							
Chloride (Cl)	0.61		0.50	mg/L		30-AUG-14	R2939362
Dissolved Metals in Water by CRC ICPMS							
Calcium (Ca)-Dissolved	3.12		0.50	mg/L		15-SEP-14	R2947735
Magnesium (Mg)-Dissolved	1.77		0.10	mg/L		15-SEP-14	R2947735
Potassium (K)-Dissolved	0.59		0.10	mg/L		15-SEP-14	R2947735
Sodium (Na)-Dissolved	1.7		1.0	mg/L		15-SEP-14	R2947735
Fluoride by IC							
Fluoride (F)	<0.020		0.020	mg/L		30-AUG-14	R2939362
Ion Balance Calculation							
Ion Balance	Low EC			%		18-SEP-14	R2951830
TDS (Calculated)	18.7			mg/L		18-SEP-14	R2951830
Hardness (as CaCO3)	15.1			mg/L		18-SEP-14	R2951830
Nitrate in Water (Calculation)							
Nitrate (as N)	0.0762		0.0060	mg/L		03-SEP-14	
Nitrite & Nitrate in Water by Colour							
Nitrate and Nitrite (as N)	0.0785		0.0060	mg/L		02-SEP-14	R2935954

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-2 JER-AEM-23							
Sampled By: CLIENT on 25-AUG-14 @ 12:00							
Matrix: Water							
Nitrite in Water by Colour							
Nitrite (as N)	0.0023		0.0020	mg/L		02-SEP-14	R2935954
Sulfate by IC (Low Level)							
Sulfate (SO4)	3.25		0.050	mg/L		30-AUG-14	R2939362
pH, Conductivity and Total Alkalinity							
pH	7.05		0.10	pH		01-SEP-14	R2934271
Conductivity (EC)	40.6		0.20	uS/cm		01-SEP-14	R2934271
Bicarbonate (HCO3)	14.9		5.0	mg/L		01-SEP-14	R2934271
Carbonate (CO3)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Hydroxide (OH)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Alkalinity, Total (as CaCO3)	12.2		2.0	mg/L		01-SEP-14	R2934271
L1510213-3 JER-AEM-24							
Sampled By: CLIENT on 25-AUG-14 @ 12:00							
Matrix: Water							
Total ICPOES & HR-ICPMS in Water							
Hardness							
Hardness (as CaCO3)	10.5		1.3	mg/L		23-SEP-14	
Total Metals by ICPOES (Undigested)							
Calcium (Ca)-Total	2.34		0.030	mg/L		17-SEP-14	R2952008
Iron (Fe)-Total	0.040		0.010	mg/L		17-SEP-14	R2952008
Magnesium (Mg)-Total	1.21		0.030	mg/L		17-SEP-14	R2952008
Phosphorus (P)-Total	<0.050		0.050	mg/L		17-SEP-14	R2952008
Potassium (K)-Total	0.350		0.050	mg/L		17-SEP-14	R2952008
Silicon (Si)-Total	0.471		0.050	mg/L		17-SEP-14	R2952008
Sodium (Na)-Total	0.82		0.20	mg/L		17-SEP-14	R2952008
Miscellaneous Parameters							
Ammonia, Total (as N)	0.0221		0.0050	mg/L		15-SEP-14	R2947433
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		13-SEP-14	R2946530
Total Organic Carbon	4.6		1.0	mg/L		17-SEP-14	R2948905
Phosphorus (P)-Total	0.0041		0.0010	mg/L		16-SEP-14	R2949323
Total Suspended Solids	<3.0		3.0	mg/L		31-AUG-14	R2934268
Turbidity	0.46		0.10	NTU		17-SEP-14	R2950911
Total Metals in Water by HR-ICPMS(Ultra)							
Aluminum (Al)-Total	0.0276		0.00020	mg/L		12-SEP-14	R2956094
Antimony (Sb)-Total	0.0000080		0.0000050	mg/L		12-SEP-14	R2956094
Arsenic (As)-Total	0.000228		0.000020	mg/L		12-SEP-14	R2956094
Barium (Ba)-Total	0.00201		0.000020	mg/L		12-SEP-14	R2956094
Beryllium (Be)-Total	0.0000050		0.0000020	mg/L		12-SEP-14	R2956094
Bismuth (Bi)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2956094
Boron (B)-Total	<0.0050		0.0050	mg/L		12-SEP-14	R2956094
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Cesium (Cs)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Chromium (Cr)-Total	0.000104		0.000050	mg/L		12-SEP-14	R2956094
Cobalt (Co)-Total	0.0000317		0.0000050	mg/L		12-SEP-14	R2956094
Copper (Cu)-Total	0.00155		0.000050	mg/L		12-SEP-14	R2956094
Gallium (Ga)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2956094
Lead (Pb)-Total	0.0000070		0.0000050	mg/L		12-SEP-14	R2956094
Lithium (Li)-Total	0.00035		0.00020	mg/L		12-SEP-14	R2956094
Manganese (Mn)-Total	0.00334		0.0000050	mg/L		12-SEP-14	R2956094
Molybdenum (Mo)-Total	0.000029		0.000010	mg/L		12-SEP-14	R2956094
Nickel (Ni)-Total	0.000436		0.000050	mg/L		12-SEP-14	R2956094
Rhenium (Re)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-3 JER-AEM-24							
Sampled By: CLIENT on 25-AUG-14 @ 12:00							
Matrix: Water							
Total Metals in Water by HR-ICPMS(Ultra)							
Rubidium (Rb)-Total	0.000755		0.0000050	mg/L		12-SEP-14	R2956094
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-14	R2956094
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Strontium (Sr)-Total	0.00686		0.000010	mg/L		12-SEP-14	R2956094
Tellurium (Te)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Thallium (Tl)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2956094
Thorium (Th)-Total	0.0000177		0.0000050	mg/L		12-SEP-14	R2956094
Tin (Sn)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Titanium (Ti)-Total	0.000333		0.000050	mg/L		12-SEP-14	R2956094
Tungsten (W)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Uranium (U)-Total	0.000132		0.0000010	mg/L		12-SEP-14	R2956094
Vanadium (V)-Total	0.000076		0.000010	mg/L		12-SEP-14	R2956094
Yttrium (Y)-Total	0.0000980		0.0000050	mg/L		12-SEP-14	R2956094
Zinc (Zn)-Total	0.00035		0.00010	mg/L		12-SEP-14	R2956094
Zirconium (Zr)-Total	0.000038		0.000010	mg/L		12-SEP-14	R2956094
Routine Water Analysis - Low Level							
Chloride by IC							
Chloride (Cl)	0.69		0.50	mg/L		30-AUG-14	R2939362
Dissolved Metals in Water by CRC ICPMS							
Calcium (Ca)-Dissolved	2.27		0.50	mg/L		15-SEP-14	R2947735
Magnesium (Mg)-Dissolved	1.18		0.10	mg/L		15-SEP-14	R2947735
Potassium (K)-Dissolved	0.35		0.10	mg/L		15-SEP-14	R2947735
Sodium (Na)-Dissolved	<1.0		1.0	mg/L		15-SEP-14	R2947735
Fluoride by IC							
Fluoride (F)	<0.020		0.020	mg/L		30-AUG-14	R2939362
Ion Balance Calculation							
Ion Balance	Low EC			%		18-SEP-14	R2951830
TDS (Calculated)	12.7			mg/L		18-SEP-14	R2951830
Hardness (as CaCO3)	10.5			mg/L		18-SEP-14	R2951830
Nitrate in Water (Calculation)							
Nitrate (as N)	0.0234		0.0060	mg/L		03-SEP-14	
Nitrite & Nitrate in Water by Colour							
Nitrate and Nitrite (as N)	0.0255		0.0060	mg/L		02-SEP-14	R2935954
Nitrite in Water by Colour							
Nitrite (as N)	0.0021		0.0020	mg/L		02-SEP-14	R2935954
Sulfate by IC (Low Level)							
Sulfate (SO4)	2.07		0.050	mg/L		30-AUG-14	R2939362
pH, Conductivity and Total Alkalinity							
pH	6.87		0.10	pH		01-SEP-14	R2934271
Conductivity (EC)	26.3		0.20	uS/cm		01-SEP-14	R2934271
Bicarbonate (HCO3)	12.2		5.0	mg/L		01-SEP-14	R2934271
Carbonate (CO3)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Hydroxide (OH)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Alkalinity, Total (as CaCO3)	10.0		2.0	mg/L		01-SEP-14	R2934271
L1510213-4 JER-AEM-26							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Total ICPOES & HR-ICPMS in Water							
Hardness							
Hardness (as CaCO3)	42.9		1.3	mg/L		23-SEP-14	
Total Metals by ICPOES (Undigested)							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-4 JER-AEM-26							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Total Metals by ICPOES (Undigested)							
Calcium (Ca)-Total	9.98		0.030	mg/L		17-SEP-14	R2952008
Iron (Fe)-Total	0.057		0.010	mg/L		17-SEP-14	R2952008
Magnesium (Mg)-Total	4.59		0.030	mg/L		17-SEP-14	R2952008
Phosphorus (P)-Total	<0.050		0.050	mg/L		17-SEP-14	R2952008
Potassium (K)-Total	0.917		0.050	mg/L		17-SEP-14	R2952008
Silicon (Si)-Total	0.169		0.050	mg/L		17-SEP-14	R2952008
Sodium (Na)-Total	1.86		0.20	mg/L		17-SEP-14	R2952008
Miscellaneous Parameters							
Ammonia, Total (as N)	0.0112		0.0050	mg/L		15-SEP-14	R2947433
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		13-SEP-14	R2946530
Total Organic Carbon	3.8		1.0	mg/L		17-SEP-14	R2948905
Phosphorus (P)-Total	0.0044		0.0010	mg/L		16-SEP-14	R2949323
Total Suspended Solids	<3.0		3.0	mg/L		02-SEP-14	R2936095
Turbidity	0.68		0.10	NTU		17-SEP-14	R2950911
Total Metals in Water by HR-ICPMS(Ultra)							
Aluminum (Al)-Total	0.00615		0.00020	mg/L		12-SEP-14	R2956094
Antimony (Sb)-Total	0.0000112		0.0000050	mg/L		12-SEP-14	R2956094
Arsenic (As)-Total	0.000267		0.000020	mg/L		12-SEP-14	R2956094
Barium (Ba)-Total	0.00666		0.000020	mg/L		12-SEP-14	R2956094
Beryllium (Be)-Total	<0.0000020		0.0000020	mg/L		12-SEP-14	R2956094
Bismuth (Bi)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2956094
Boron (B)-Total	<0.0050		0.0050	mg/L		12-SEP-14	R2956094
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Cesium (Cs)-Total	0.0000096		0.0000050	mg/L		12-SEP-14	R2956094
Chromium (Cr)-Total	0.000104		0.000050	mg/L		12-SEP-14	R2956094
Cobalt (Co)-Total	0.0000297		0.0000050	mg/L		12-SEP-14	R2956094
Copper (Cu)-Total	0.000714		0.000050	mg/L		12-SEP-14	R2956094
Gallium (Ga)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2956094
Lead (Pb)-Total	0.0000121		0.0000050	mg/L		12-SEP-14	R2956094
Lithium (Li)-Total	0.00050		0.00020	mg/L		12-SEP-14	R2956094
Manganese (Mn)-Total	0.00897		0.0000050	mg/L		12-SEP-14	R2956094
Molybdenum (Mo)-Total	0.000062		0.000010	mg/L		12-SEP-14	R2956094
Nickel (Ni)-Total	0.00129		0.000050	mg/L		12-SEP-14	R2956094
Rhenium (Re)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Rubidium (Rb)-Total	0.00221		0.0000050	mg/L		12-SEP-14	R2956094
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-14	R2956094
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Strontium (Sr)-Total	0.0402		0.000010	mg/L		12-SEP-14	R2956094
Tellurium (Te)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Thallium (Tl)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2956094
Thorium (Th)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Tin (Sn)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Titanium (Ti)-Total	0.000215		0.000050	mg/L		12-SEP-14	R2956094
Tungsten (W)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Uranium (U)-Total	0.000372		0.0000010	mg/L		12-SEP-14	R2956094
Vanadium (V)-Total	0.000039		0.000010	mg/L		12-SEP-14	R2956094
Yttrium (Y)-Total	0.0000185		0.0000050	mg/L		12-SEP-14	R2956094
Zinc (Zn)-Total	0.00019		0.00010	mg/L		12-SEP-14	R2956094
Zirconium (Zr)-Total	0.000010		0.000010	mg/L		12-SEP-14	R2956094
Routine Water Analysis - Low Level							
Chloride by IC							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-4 JER-AEM-26							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Chloride by IC							
Chloride (Cl)	1.65		0.50	mg/L		30-AUG-14	R2939362
Dissolved Metals in Water by CRC ICPMS							
Calcium (Ca)-Dissolved	9.49		0.50	mg/L		15-SEP-14	R2947735
Magnesium (Mg)-Dissolved	4.65		0.10	mg/L		15-SEP-14	R2947735
Potassium (K)-Dissolved	0.91		0.10	mg/L		15-SEP-14	R2947735
Sodium (Na)-Dissolved	2.1		1.0	mg/L		15-SEP-14	R2947735
Fluoride by IC							
Fluoride (F)	0.027		0.020	mg/L		30-AUG-14	R2939362
Ion Balance Calculation							
Ion Balance	Low EC			%		18-SEP-14	R2951830
TDS (Calculated)	46.4			mg/L		18-SEP-14	R2951830
Hardness (as CaCO3)	42.8			mg/L		18-SEP-14	R2951830
Nitrate in Water (Calculation)							
Nitrate (as N)	0.0298		0.0060	mg/L		03-SEP-14	
Nitrite & Nitrate in Water by Colour							
Nitrate and Nitrite (as N)	0.0298		0.0060	mg/L		02-SEP-14	R2935954
Nitrite in Water by Colour							
Nitrite (as N)	<0.0020		0.0020	mg/L		02-SEP-14	R2935954
Sulfate by IC (Low Level)							
Sulfate (SO4)	1.02		0.050	mg/L		30-AUG-14	R2939362
pH, Conductivity and Total Alkalinity							
pH	7.66		0.10	pH		01-SEP-14	R2934271
Conductivity (EC)	95.9		0.20	uS/cm		01-SEP-14	R2934271
Bicarbonate (HCO3)	53.8		5.0	mg/L		01-SEP-14	R2934271
Carbonate (CO3)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Hydroxide (OH)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Alkalinity, Total (as CaCO3)	44.1		2.0	mg/L		01-SEP-14	R2934271
L1510213-5 JER-AEM-27							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Total ICPOES & HR-ICPMS in Water							
Hardness							
Hardness (as CaCO3)	16.5		1.3	mg/L		29-SEP-14	
Total Metals in Water by HR-ICPMS							
Aluminum (Al)-Total	0.0363		0.0030	mg/L		18-SEP-14	R2963254
Antimony (Sb)-Total	<0.000020	DLB	0.000020	mg/L		18-SEP-14	R2963254
Arsenic (As)-Total	0.000267		0.000050	mg/L		18-SEP-14	R2963254
Barium (Ba)-Total	0.00221		0.00010	mg/L		18-SEP-14	R2963254
Beryllium (Be)-Total	<0.0000050		0.0000050	mg/L		18-SEP-14	R2963254
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L		18-SEP-14	R2963254
Boron (B)-Total	<0.0050		0.0050	mg/L		18-SEP-14	R2963254
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		18-SEP-14	R2963254
Cesium (Cs)-Total	0.0000064		0.0000050	mg/L		18-SEP-14	R2963254
Chromium (Cr)-Total	<0.00050		0.00050	mg/L		18-SEP-14	R2963254
Cobalt (Co)-Total	<0.000050		0.000050	mg/L		18-SEP-14	R2963254
Copper (Cu)-Total	0.00163		0.00050	mg/L		18-SEP-14	R2963254
Gallium (Ga)-Total	<0.000050		0.000050	mg/L		18-SEP-14	R2963254
Lead (Pb)-Total	<0.000050		0.000050	mg/L		18-SEP-14	R2963254
Lithium (Li)-Total	0.00057		0.00020	mg/L		18-SEP-14	R2963254
Manganese (Mn)-Total	0.00537		0.00020	mg/L		18-SEP-14	R2963254
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		18-SEP-14	R2963254

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-5 JER-AEM-27							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Total Metals in Water by HR-ICPMS							
Nickel (Ni)-Total	0.00056		0.00020	mg/L		18-SEP-14	R2963254
Rhenium (Re)-Total	<0.0000050		0.0000050	mg/L		18-SEP-14	R2963254
Rubidium (Rb)-Total	0.000784		0.000020	mg/L		18-SEP-14	R2963254
Selenium (Se)-Total	<0.00020		0.00020	mg/L		18-SEP-14	R2963254
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		18-SEP-14	R2963254
Strontium (Sr)-Total	0.00861		0.000050	mg/L		18-SEP-14	R2963254
Tellurium (Te)-Total	<0.000010		0.000010	mg/L		18-SEP-14	R2963254
Thallium (Tl)-Total	0.0000025		0.0000020	mg/L		18-SEP-14	R2963254
Thorium (Th)-Total	0.0000172		0.0000050	mg/L		18-SEP-14	R2963254
Tin (Sn)-Total	<0.00020		0.00020	mg/L		18-SEP-14	R2963254
Titanium (Ti)-Total	0.00089		0.00020	mg/L		18-SEP-14	R2963254
Tungsten (W)-Total	<0.000010		0.000010	mg/L		18-SEP-14	R2963254
Uranium (U)-Total	0.000281		0.0000020	mg/L		18-SEP-14	R2963254
Vanadium (V)-Total	0.000119		0.000050	mg/L		18-SEP-14	R2963254
Yttrium (Y)-Total	0.0000848		0.0000050	mg/L		18-SEP-14	R2963254
Zinc (Zn)-Total	<0.0030		0.0030	mg/L		18-SEP-14	R2963254
Zirconium (Zr)-Total	0.000088		0.000050	mg/L		18-SEP-14	R2963254
Total Metals in Water by ICPOES							
Calcium (Ca)-Total	3.59		0.050	mg/L		19-SEP-14	R2953207
Iron (Fe)-Total	0.075		0.030	mg/L		19-SEP-14	R2953207
Magnesium (Mg)-Total	1.95		0.10	mg/L		19-SEP-14	R2953207
Phosphorus (P)-Total	<0.30		0.30	mg/L		19-SEP-14	R2953207
Potassium (K)-Total	<2.0		2.0	mg/L		19-SEP-14	R2953207
Silicon (Si)-Total	0.483		0.050	mg/L		19-SEP-14	R2953207
Sodium (Na)-Total	<2.0		2.0	mg/L		19-SEP-14	R2953207
Miscellaneous Parameters							
Ammonia, Total (as N)	0.0350		0.0050	mg/L		15-SEP-14	R2947433
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		13-SEP-14	R2946530
Total Organic Carbon	6.8		1.0	mg/L		17-SEP-14	R2948905
Phosphorus (P)-Total	0.0054		0.0010	mg/L		16-SEP-14	R2949323
Total Suspended Solids	<3.0		3.0	mg/L		02-SEP-14	R2936095
Turbidity	1.07		0.10	NTU		17-SEP-14	R2950911
Routine Water Analysis - Low Level							
Chloride by IC							
Chloride (Cl)	<0.50		0.50	mg/L		30-AUG-14	R2939362
Dissolved Metals in Water by CRC ICPMS							
Calcium (Ca)-Dissolved	3.50		0.50	mg/L		15-SEP-14	R2947735
Magnesium (Mg)-Dissolved	1.89		0.10	mg/L		15-SEP-14	R2947735
Potassium (K)-Dissolved	0.37		0.10	mg/L		15-SEP-14	R2947735
Sodium (Na)-Dissolved	<1.0		1.0	mg/L		15-SEP-14	R2947735
Fluoride by IC							
Fluoride (F)	<0.020		0.020	mg/L		30-AUG-14	R2939362
Ion Balance Calculation							
Ion Balance	Low EC			%		18-SEP-14	R2951830
TDS (Calculated)	16.1			mg/L		18-SEP-14	R2951830
Hardness (as CaCO3)	16.5			mg/L		18-SEP-14	R2951830
Nitrate in Water (Calculation)							
Nitrate (as N)	0.0081		0.0060	mg/L		03-SEP-14	
Nitrite & Nitrate in Water by Colour							
Nitrate and Nitrite (as N)	0.0081		0.0060	mg/L		02-SEP-14	R2935954
Nitrite in Water by Colour							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-5 JER-AEM-27							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Nitrite in Water by Colour							
Nitrite (as N)	<0.0020		0.0020	mg/L		02-SEP-14	R2935954
Sulfate by IC (Low Level)							
Sulfate (SO4)	1.02		0.050	mg/L		30-AUG-14	R2939362
pH, Conductivity and Total Alkalinity							
pH	7.16		0.10	pH		01-SEP-14	R2934271
Conductivity (EC)	37.7		0.20	uS/cm		01-SEP-14	R2934271
Bicarbonate (HCO3)	18.8		5.0	mg/L		01-SEP-14	R2934271
Carbonate (CO3)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Hydroxide (OH)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Alkalinity, Total (as CaCO3)	15.4		2.0	mg/L		01-SEP-14	R2934271
L1510213-6 SWQ-04							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Total ICPOES & HR-ICPMS in Water							
Hardness							
Hardness (as CaCO3)	69.9		1.3	mg/L		24-SEP-14	
Total Metals by ICPOES (Undigested)							
Calcium (Ca)-Total	12.5		0.030	mg/L		17-SEP-14	R2952008
Iron (Fe)-Total	0.071		0.010	mg/L		17-SEP-14	R2952008
Magnesium (Mg)-Total	9.03		0.030	mg/L		17-SEP-14	R2952008
Phosphorus (P)-Total	<0.050		0.050	mg/L		17-SEP-14	R2952008
Potassium (K)-Total	5.94		0.050	mg/L		17-SEP-14	R2952008
Silicon (Si)-Total	0.150		0.050	mg/L		17-SEP-14	R2952008
Sodium (Na)-Total	7.60		0.20	mg/L		17-SEP-14	R2952008
Miscellaneous Parameters							
Ammonia, Total (as N)	0.0096		0.0050	mg/L		15-SEP-14	R2947433
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		13-SEP-14	R2946530
Total Organic Carbon	4.8		1.0	mg/L		17-SEP-14	R2948905
Phosphorus (P)-Total	0.0080		0.0010	mg/L		16-SEP-14	R2949323
Total Suspended Solids	<3.0		3.0	mg/L		02-SEP-14	R2936095
Turbidity	0.86		0.10	NTU		17-SEP-14	R2950911
Total Metals in Water by HR-ICPMS(Ultra)							
Aluminum (Al)-Total	0.0144		0.00020	mg/L		12-SEP-14	R2956094
Antimony (Sb)-Total	0.0000654		0.0000050	mg/L		12-SEP-14	R2956094
Arsenic (As)-Total	0.000500		0.000020	mg/L		12-SEP-14	R2956094
Barium (Ba)-Total	0.0243		0.000020	mg/L		12-SEP-14	R2956094
Beryllium (Be)-Total	0.0000022		0.0000020	mg/L		12-SEP-14	R2956094
Bismuth (Bi)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2956094
Boron (B)-Total	0.0255		0.0050	mg/L		22-SEP-14	R2957868
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Cesium (Cs)-Total	0.0000442		0.0000050	mg/L		12-SEP-14	R2956094
Chromium (Cr)-Total	0.000092		0.000050	mg/L		12-SEP-14	R2956094
Cobalt (Co)-Total	0.0000740		0.0000050	mg/L		12-SEP-14	R2956094
Copper (Cu)-Total	0.00178		0.000050	mg/L		12-SEP-14	R2956094
Gallium (Ga)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2956094
Lead (Pb)-Total	0.0000216		0.0000050	mg/L		12-SEP-14	R2956094
Lithium (Li)-Total	0.00100		0.00020	mg/L		12-SEP-14	R2956094
Manganese (Mn)-Total	0.0446		0.0000050	mg/L		12-SEP-14	R2956094
Molybdenum (Mo)-Total	0.00262		0.000010	mg/L		12-SEP-14	R2956094
Nickel (Ni)-Total	0.00119		0.000050	mg/L		12-SEP-14	R2956094
Rhenium (Re)-Total	0.0000109		0.0000050	mg/L		12-SEP-14	R2956094

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-6 SWQ-04							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Total Metals in Water by HR-ICPMS(Ultra)							
Rubidium (Rb)-Total	0.0123		0.0000050	mg/L		12-SEP-14	R2956094
Selenium (Se)-Total	0.000099		0.000040	mg/L		12-SEP-14	R2956094
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Strontium (Sr)-Total	0.232		0.000010	mg/L		12-SEP-14	R2956094
Tellurium (Te)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Thallium (Tl)-Total	0.0000035		0.0000010	mg/L		12-SEP-14	R2956094
Thorium (Th)-Total	0.0000084		0.0000050	mg/L		12-SEP-14	R2956094
Tin (Sn)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Titanium (Ti)-Total	0.000432		0.000050	mg/L		12-SEP-14	R2956094
Tungsten (W)-Total	0.000068		0.000010	mg/L		12-SEP-14	R2956094
Uranium (U)-Total	0.00458		0.0000010	mg/L		12-SEP-14	R2956094
Vanadium (V)-Total	0.000092		0.000010	mg/L		12-SEP-14	R2956094
Yttrium (Y)-Total	0.0000383		0.0000050	mg/L		12-SEP-14	R2956094
Zinc (Zn)-Total	0.00034		0.00010	mg/L		12-SEP-14	R2956094
Zirconium (Zr)-Total	0.000017		0.000010	mg/L		12-SEP-14	R2956094
Routine Water Analysis - Low Level							
Chloride by IC							
Chloride (Cl)	4.54		0.50	mg/L		30-AUG-14	R2939362
Dissolved Metals in Water by CRC ICPMS							
Calcium (Ca)-Dissolved	12.7		0.50	mg/L		15-SEP-14	R2947735
Magnesium (Mg)-Dissolved	9.27		0.10	mg/L		15-SEP-14	R2947735
Potassium (K)-Dissolved	6.30		0.10	mg/L		15-SEP-14	R2947735
Sodium (Na)-Dissolved	8.3		1.0	mg/L		15-SEP-14	R2947735
Fluoride by IC							
Fluoride (F)	0.074		0.020	mg/L		30-AUG-14	R2939362
Ion Balance Calculation							
Ion Balance	108			%		18-SEP-14	R2951830
TDS (Calculated)	96.0			mg/L		18-SEP-14	R2951830
Hardness (as CaCO3)	69.9			mg/L		18-SEP-14	R2951830
Nitrate in Water (Calculation)							
Nitrate (as N)	0.0195		0.0060	mg/L		03-SEP-14	
Nitrite & Nitrate in Water by Colour							
Nitrate and Nitrite (as N)	0.0223		0.0060	mg/L		02-SEP-14	R2935954
Nitrite in Water by Colour							
Nitrite (as N)	0.0028		0.0020	mg/L		02-SEP-14	R2935954
Sulfate by IC (Low Level)							
Sulfate (SO4)	14.9		0.050	mg/L		30-AUG-14	R2939362
pH, Conductivity and Total Alkalinity							
pH	7.95		0.10	pH		01-SEP-14	R2934271
Conductivity (EC)	186		0.20	uS/cm		01-SEP-14	R2934271
Bicarbonate (HCO3)	81.0		5.0	mg/L		01-SEP-14	R2934271
Carbonate (CO3)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Hydroxide (OH)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Alkalinity, Total (as CaCO3)	66.4		2.0	mg/L		01-SEP-14	R2934271
L1510213-7 JER-AEM-09							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Total ICPOES & HR-ICPMS in Water							
Hardness							
Hardness (as CaCO3)	42.4		1.3	mg/L		24-SEP-14	
Total Metals by ICPOES (Undigested)							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-7 JER-AEM-09							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Total Metals by ICPOES (Undigested)							
Calcium (Ca)-Total	9.02		0.030	mg/L		17-SEP-14	R2952008
Iron (Fe)-Total	0.093		0.010	mg/L		17-SEP-14	R2952008
Magnesium (Mg)-Total	4.97		0.030	mg/L		17-SEP-14	R2952008
Phosphorus (P)-Total	<0.050		0.050	mg/L		17-SEP-14	R2952008
Potassium (K)-Total	1.15		0.050	mg/L		17-SEP-14	R2952008
Silicon (Si)-Total	1.57		0.050	mg/L		17-SEP-14	R2952008
Sodium (Na)-Total	3.08		0.20	mg/L		17-SEP-14	R2952008
Miscellaneous Parameters							
Ammonia, Total (as N)	0.0184		0.0050	mg/L		15-SEP-14	R2947433
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		13-SEP-14	R2946530
Total Organic Carbon	7.8		1.0	mg/L		17-SEP-14	R2948905
Phosphorus (P)-Total	0.0044		0.0010	mg/L		16-SEP-14	R2949323
Total Suspended Solids	<3.0		3.0	mg/L		02-SEP-14	R2936095
Turbidity	0.97		0.10	NTU		17-SEP-14	R2950911
Total Metals in Water by HR-ICPMS(Ultra)							
Aluminum (Al)-Total	0.0467		0.00020	mg/L		12-SEP-14	R2956094
Antimony (Sb)-Total	0.0000629		0.0000050	mg/L		12-SEP-14	R2956094
Arsenic (As)-Total	0.000309		0.000020	mg/L		12-SEP-14	R2956094
Barium (Ba)-Total	0.00773		0.000020	mg/L		12-SEP-14	R2956094
Beryllium (Be)-Total	0.0000124		0.0000020	mg/L		12-SEP-14	R2956094
Bismuth (Bi)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2956094
Boron (B)-Total	0.0154		0.0050	mg/L		22-SEP-14	R2957868
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Cesium (Cs)-Total	0.0000189		0.0000050	mg/L		12-SEP-14	R2956094
Chromium (Cr)-Total	0.000262		0.000050	mg/L		12-SEP-14	R2956094
Cobalt (Co)-Total	0.0000891		0.0000050	mg/L		12-SEP-14	R2956094
Copper (Cu)-Total	0.00319		0.000050	mg/L		12-SEP-14	R2956094
Gallium (Ga)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2956094
Lead (Pb)-Total	0.0000627		0.0000050	mg/L		12-SEP-14	R2956094
Lithium (Li)-Total	0.00073		0.00020	mg/L		12-SEP-14	R2956094
Manganese (Mn)-Total	0.00590		0.0000050	mg/L		12-SEP-14	R2956094
Molybdenum (Mo)-Total	0.00108		0.000010	mg/L		12-SEP-14	R2956094
Nickel (Ni)-Total	0.00119		0.000050	mg/L		12-SEP-14	R2956094
Rhenium (Re)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Rubidium (Rb)-Total	0.00154		0.0000050	mg/L		12-SEP-14	R2956094
Selenium (Se)-Total	0.000076		0.000040	mg/L		12-SEP-14	R2956094
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Strontium (Sr)-Total	0.0337		0.000010	mg/L		12-SEP-14	R2956094
Tellurium (Te)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Thallium (Tl)-Total	0.0000021		0.0000010	mg/L		12-SEP-14	R2956094
Thorium (Th)-Total	0.0000632		0.0000050	mg/L		12-SEP-14	R2956094
Tin (Sn)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Titanium (Ti)-Total	0.000926		0.000050	mg/L		12-SEP-14	R2956094
Tungsten (W)-Total	0.000011		0.000010	mg/L		12-SEP-14	R2956094
Uranium (U)-Total	0.00676		0.0000010	mg/L		12-SEP-14	R2956094
Vanadium (V)-Total	0.000142		0.000010	mg/L		12-SEP-14	R2956094
Yttrium (Y)-Total	0.000535		0.0000050	mg/L		12-SEP-14	R2956094
Zinc (Zn)-Total	0.00043		0.00010	mg/L		12-SEP-14	R2956094
Zirconium (Zr)-Total	0.000236		0.000010	mg/L		12-SEP-14	R2956094
Routine Water Analysis - Low Level							
Chloride by IC							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-7 JER-AEM-09							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Chloride by IC							
Chloride (Cl)	1.26		0.50	mg/L		30-AUG-14	R2939362
Dissolved Metals in Water by CRC ICPMS							
Calcium (Ca)-Dissolved	8.56		0.50	mg/L		15-SEP-14	R2947735
Magnesium (Mg)-Dissolved	5.12		0.10	mg/L		15-SEP-14	R2947735
Potassium (K)-Dissolved	1.08		0.10	mg/L		15-SEP-14	R2947735
Sodium (Na)-Dissolved	3.3		1.0	mg/L		15-SEP-14	R2947735
Fluoride by IC							
Fluoride (F)	0.030		0.020	mg/L		30-AUG-14	R2939362
Ion Balance Calculation							
Ion Balance	106			%		18-SEP-14	R2951830
TDS (Calculated)	52.3			mg/L		18-SEP-14	R2951830
Hardness (as CaCO3)	42.5			mg/L		18-SEP-14	R2951830
Nitrate in Water (Calculation)							
Nitrate (as N)	0.958		0.0060	mg/L		03-SEP-14	
Nitrite & Nitrate in Water by Colour							
Nitrate and Nitrite (as N)	0.961		0.0060	mg/L		02-SEP-14	R2935954
Nitrite in Water by Colour							
Nitrite (as N)	0.0033		0.0020	mg/L		02-SEP-14	R2935954
Sulfate by IC (Low Level)							
Sulfate (SO4)	8.08		0.050	mg/L		30-AUG-14	R2939362
pH, Conductivity and Total Alkalinity							
pH	7.60		0.10	pH		01-SEP-14	R2934271
Conductivity (EC)	104		0.20	uS/cm		01-SEP-14	R2934271
Bicarbonate (HCO3)	41.9		5.0	mg/L		01-SEP-14	R2934271
Carbonate (CO3)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Hydroxide (OH)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Alkalinity, Total (as CaCO3)	34.3		2.0	mg/L		01-SEP-14	R2934271
L1510213-8 SWQ-07							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Total ICPOES & HR-ICPMS in Water							
Hardness							
Hardness (as CaCO3)	91.2		1.3	mg/L		23-SEP-14	
Total Metals by ICPOES (Undigested)							
Calcium (Ca)-Total	20.3		0.030	mg/L		17-SEP-14	R2952008
Iron (Fe)-Total	0.105		0.010	mg/L		17-SEP-14	R2952008
Magnesium (Mg)-Total	10.4		0.030	mg/L		17-SEP-14	R2952008
Phosphorus (P)-Total	<0.050		0.050	mg/L		17-SEP-14	R2952008
Potassium (K)-Total	9.81		0.050	mg/L		17-SEP-14	R2952008
Silicon (Si)-Total	1.46		0.050	mg/L		17-SEP-14	R2952008
Sodium (Na)-Total	18.8		0.20	mg/L		17-SEP-14	R2952008
Miscellaneous Parameters							
Ammonia, Total (as N)	0.167		0.0050	mg/L		15-SEP-14	R2947433
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		13-SEP-14	R2946530
Total Organic Carbon	5.1		1.0	mg/L		17-SEP-14	R2948905
Phosphorus (P)-Total	0.0083		0.0010	mg/L		16-SEP-14	R2949323
Total Suspended Solids	<3.0		3.0	mg/L		02-SEP-14	R2936095
Turbidity	0.95		0.10	NTU		17-SEP-14	R2950911
Total Metals in Water by HR-ICPMS(Ultra)							
Aluminum (Al)-Total	0.0280		0.00020	mg/L		12-SEP-14	R2956094
Antimony (Sb)-Total	0.000342		0.0000050	mg/L		12-SEP-14	R2956094

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-8 SWQ-07							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Total Metals in Water by HR-ICPMS(Ultra)							
Arsenic (As)-Total	0.000438		0.000020	mg/L		12-SEP-14	R2956094
Barium (Ba)-Total	0.0395		0.000020	mg/L		12-SEP-14	R2956094
Beryllium (Be)-Total	0.0000033		0.0000020	mg/L		12-SEP-14	R2956094
Bismuth (Bi)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2956094
Boron (B)-Total	0.0442		0.0050	mg/L		12-SEP-14	R2956094
Cadmium (Cd)-Total	0.0000051		0.0000050	mg/L		12-SEP-14	R2956094
Cesium (Cs)-Total	0.0000894		0.0000050	mg/L		12-SEP-14	R2956094
Chromium (Cr)-Total	0.000370		0.000050	mg/L		12-SEP-14	R2956094
Cobalt (Co)-Total	0.000110		0.0000050	mg/L		12-SEP-14	R2956094
Copper (Cu)-Total	0.00201		0.000050	mg/L		12-SEP-14	R2956094
Gallium (Ga)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2956094
Lead (Pb)-Total	0.0000701		0.0000050	mg/L		12-SEP-14	R2956094
Lithium (Li)-Total	0.00173		0.00020	mg/L		12-SEP-14	R2956094
Manganese (Mn)-Total	0.0106		0.0000050	mg/L		12-SEP-14	R2956094
Molybdenum (Mo)-Total	0.0103		0.000010	mg/L		12-SEP-14	R2956094
Nickel (Ni)-Total	0.00325		0.000050	mg/L		12-SEP-14	R2956094
Rhenium (Re)-Total	0.0000357		0.0000050	mg/L		12-SEP-14	R2956094
Rubidium (Rb)-Total	0.0233		0.0000050	mg/L		12-SEP-14	R2956094
Selenium (Se)-Total	0.000561		0.000040	mg/L		12-SEP-14	R2956094
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Strontium (Sr)-Total	0.512		0.000010	mg/L		12-SEP-14	R2956094
Tellurium (Te)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Thallium (Tl)-Total	0.0000112		0.0000010	mg/L		12-SEP-14	R2956094
Thorium (Th)-Total	0.0000195		0.0000050	mg/L		12-SEP-14	R2956094
Tin (Sn)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Titanium (Ti)-Total	0.00112		0.000050	mg/L		12-SEP-14	R2956094
Tungsten (W)-Total	0.000116		0.000010	mg/L		12-SEP-14	R2956094
Uranium (U)-Total	0.0219		0.0000010	mg/L		12-SEP-14	R2956094
Vanadium (V)-Total	0.000262		0.000010	mg/L		12-SEP-14	R2956094
Yttrium (Y)-Total	0.0000678		0.0000050	mg/L		12-SEP-14	R2956094
Zinc (Zn)-Total	0.00034		0.00010	mg/L		12-SEP-14	R2956094
Zirconium (Zr)-Total	0.000046		0.000010	mg/L		12-SEP-14	R2956094
Routine Water Analysis - Low Level							
Chloride by IC							
Chloride (Cl)	6.71		0.50	mg/L		30-AUG-14	R2939362
Dissolved Metals in Water by CRC ICPMS							
Calcium (Ca)-Dissolved	20.0		0.50	mg/L		15-SEP-14	R2947735
Magnesium (Mg)-Dissolved	10.0		0.10	mg/L		15-SEP-14	R2947735
Potassium (K)-Dissolved	10.2		0.10	mg/L		15-SEP-14	R2947735
Sodium (Na)-Dissolved	19.2		1.0	mg/L		15-SEP-14	R2947735
Fluoride by IC							
Fluoride (F)	0.108		0.020	mg/L		30-AUG-14	R2939362
Ion Balance Calculation							
Ion Balance	103			%		18-SEP-14	R2951830
TDS (Calculated)	174			mg/L		18-SEP-14	R2951830
Hardness (as CaCO3)	91.1			mg/L		18-SEP-14	R2951830
Nitrate in Water (Calculation)							
Nitrate (as N)	3.74		0.0060	mg/L		03-SEP-14	
Nitrite & Nitrate in Water by Colour							
Nitrate and Nitrite (as N)	3.78		0.0060	mg/L		02-SEP-14	R2935954
Nitrite in Water by Colour							
Nitrite (as N)	0.0456		0.0020	mg/L		02-SEP-14	R2935954

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-8 SWQ-07							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Sulfate by IC (Low Level)							
Sulfate (SO4)	50.8		0.050	mg/L		30-AUG-14	R2939362
pH, Conductivity and Total Alkalinity							
pH	7.95		0.10	pH		01-SEP-14	R2934271
Conductivity (EC)	309		0.20	uS/cm		01-SEP-14	R2934271
Bicarbonate (HCO3)	80.9		5.0	mg/L		01-SEP-14	R2934271
Carbonate (CO3)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Hydroxide (OH)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Alkalinity, Total (as CaCO3)	66.3		2.0	mg/L		01-SEP-14	R2934271
L1510213-9 SWQ-02							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
BTEX & F1-F4							
BTEX and F1 (C6-C10)							
Benzene	<0.00050		0.00050	mg/L		03-SEP-14	R2933137
Toluene	<0.00050		0.00050	mg/L		03-SEP-14	R2933137
Ethylbenzene	<0.00050		0.00050	mg/L		03-SEP-14	R2933137
o-Xylene	<0.00050		0.00050	mg/L		03-SEP-14	R2933137
m+p-Xylene	<0.00050		0.00050	mg/L		03-SEP-14	R2933137
F1(C6-C10)	<0.10		0.10	mg/L		03-SEP-14	R2933137
F1-BTEX	<0.10		0.10	mg/L		03-SEP-14	R2933137
Xylenes	<0.00071		0.00071	mg/L		03-SEP-14	R2933137
Surrogate: 1,4-Difluorobenzene (SS)	101.7		70-130	%		03-SEP-14	R2933137
Surrogate: 4-Bromofluorobenzene (SS)	85.8		70-130	%		03-SEP-14	R2933137
Surrogate: 3,4-Dichlorotoluene (SS)	102.1		70-130	%		03-SEP-14	R2933137
F2, F3, F4							
F2 (>C10-C16)	<0.25		0.25	mg/L	02-SEP-14	02-SEP-14	R2937325
F3 (C16-C34)	<0.25		0.25	mg/L	02-SEP-14	02-SEP-14	R2937325
F4 (C34-C50)	<0.25		0.25	mg/L	02-SEP-14	02-SEP-14	R2937325
Surrogate: 2-Bromobenzotrifluoride	97.7		50-150	%	02-SEP-14	02-SEP-14	R2937325
Total ICPOES & HR-ICPMS in Water							
Hardness							
Hardness (as CaCO3)	75.7		1.3	mg/L		29-SEP-14	
Total Metals in Water by HR-ICPMS							
Aluminum (Al)-Total	0.0898		0.0030	mg/L		18-SEP-14	R2963254
Antimony (Sb)-Total	0.000287		0.000010	mg/L		18-SEP-14	R2963254
Arsenic (As)-Total	0.000484		0.000050	mg/L		18-SEP-14	R2963254
Barium (Ba)-Total	0.0414		0.00010	mg/L		18-SEP-14	R2963254
Beryllium (Be)-Total	0.0000080		0.0000050	mg/L		18-SEP-14	R2963254
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L		18-SEP-14	R2963254
Boron (B)-Total	0.0463		0.0050	mg/L		18-SEP-14	R2963254
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		18-SEP-14	R2963254
Cesium (Cs)-Total	0.0000655		0.0000050	mg/L		18-SEP-14	R2963254
Chromium (Cr)-Total	<0.00050		0.00050	mg/L		18-SEP-14	R2963254
Cobalt (Co)-Total	0.000080		0.000050	mg/L		18-SEP-14	R2963254
Copper (Cu)-Total	0.00146		0.00050	mg/L		18-SEP-14	R2963254
Gallium (Ga)-Total	<0.000050		0.000050	mg/L		18-SEP-14	R2963254
Lead (Pb)-Total	0.000224		0.000050	mg/L		18-SEP-14	R2963254
Lithium (Li)-Total	0.00341		0.00020	mg/L		18-SEP-14	R2963254
Manganese (Mn)-Total	0.00176		0.00020	mg/L		18-SEP-14	R2963254
Molybdenum (Mo)-Total	0.00708		0.000050	mg/L		18-SEP-14	R2963254
Nickel (Ni)-Total	0.00169		0.00020	mg/L		18-SEP-14	R2963254

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-9 SWQ-02							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Total Metals in Water by HR-ICPMS							
Rhenium (Re)-Total	0.0000083		0.0000050	mg/L		18-SEP-14	R2963254
Rubidium (Rb)-Total	0.00930		0.000020	mg/L		18-SEP-14	R2963254
Selenium (Se)-Total	0.00026		0.00020	mg/L		18-SEP-14	R2963254
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		18-SEP-14	R2963254
Strontium (Sr)-Total	0.244		0.000050	mg/L		18-SEP-14	R2963254
Tellurium (Te)-Total	<0.000010		0.000010	mg/L		18-SEP-14	R2963254
Thallium (Tl)-Total	0.0000070		0.0000020	mg/L		18-SEP-14	R2963254
Thorium (Th)-Total	0.0000357		0.0000050	mg/L		18-SEP-14	R2963254
Tin (Sn)-Total	<0.00020		0.00020	mg/L		18-SEP-14	R2963254
Titanium (Ti)-Total	0.00281		0.00020	mg/L		18-SEP-14	R2963254
Tungsten (W)-Total	0.000496		0.000010	mg/L		18-SEP-14	R2963254
Uranium (U)-Total	0.117		0.0000020	mg/L		18-SEP-14	R2963254
Vanadium (V)-Total	0.000785		0.000050	mg/L		18-SEP-14	R2963254
Yttrium (Y)-Total	0.000171		0.0000050	mg/L		18-SEP-14	R2963254
Zinc (Zn)-Total	<0.0030		0.0030	mg/L		18-SEP-14	R2963254
Zirconium (Zr)-Total	0.000145		0.000050	mg/L		18-SEP-14	R2963254
Total Metals in Water by ICPOES							
Calcium (Ca)-Total	17.6		0.050	mg/L		19-SEP-14	R2953207
Iron (Fe)-Total	0.089		0.030	mg/L		19-SEP-14	R2953207
Magnesium (Mg)-Total	7.66		0.10	mg/L		19-SEP-14	R2953207
Phosphorus (P)-Total	<0.30		0.30	mg/L		19-SEP-14	R2953207
Potassium (K)-Total	3.5		2.0	mg/L		19-SEP-14	R2953207
Silicon (Si)-Total	2.32		0.050	mg/L		19-SEP-14	R2953207
Sodium (Na)-Total	7.1		2.0	mg/L		19-SEP-14	R2953207
Miscellaneous Parameters							
Ammonia, Total (as N)	0.0383		0.0050	mg/L		15-SEP-14	R2947433
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		13-SEP-14	R2946530
Total Organic Carbon	2.0		1.0	mg/L		17-SEP-14	R2948905
Phosphorus (P)-Total	0.0033		0.0010	mg/L		16-SEP-14	R2949323
Total Suspended Solids	3.1		3.0	mg/L		02-SEP-14	R2936095
Turbidity	2.02		0.10	NTU		17-SEP-14	R2950911
Routine Water Analysis - Low Level							
Chloride by IC							
Chloride (Cl)	6.06		0.50	mg/L		30-AUG-14	R2939362
Dissolved Metals in Water by CRC ICPMS							
Calcium (Ca)-Dissolved	17.7		0.50	mg/L		15-SEP-14	R2947735
Magnesium (Mg)-Dissolved	7.63		0.10	mg/L		15-SEP-14	R2947735
Potassium (K)-Dissolved	3.39		0.10	mg/L		15-SEP-14	R2947735
Sodium (Na)-Dissolved	7.2		1.0	mg/L		15-SEP-14	R2947735
Fluoride by IC							
Fluoride (F)	0.059		0.020	mg/L		30-AUG-14	R2939362
Ion Balance Calculation							
Ion Balance	103			%		18-SEP-14	R2951830
TDS (Calculated)	117			mg/L		18-SEP-14	R2951830
Hardness (as CaCO3)	75.6			mg/L		18-SEP-14	R2951830
Nitrate in Water (Calculation)							
Nitrate (as N)	8.86		0.0060	mg/L		03-SEP-14	
Nitrite & Nitrate in Water by Colour							
Nitrate and Nitrite (as N)	8.90		0.0060	mg/L		02-SEP-14	R2935954
Nitrite in Water by Colour							
Nitrite (as N)	0.0384		0.0020	mg/L		02-SEP-14	R2935954

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-9 SWQ-02							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Sulfate by IC (Low Level)							
Sulfate (SO4)	10.0		0.050	mg/L		30-AUG-14	R2939362
pH, Conductivity and Total Alkalinity							
pH	7.76		0.10	pH		01-SEP-14	R2934271
Conductivity (EC)	209		0.20	uS/cm		01-SEP-14	R2934271
Bicarbonate (HCO3)	51.5		5.0	mg/L		01-SEP-14	R2934271
Carbonate (CO3)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Hydroxide (OH)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Alkalinity, Total (as CaCO3)	42.2		2.0	mg/L		01-SEP-14	R2934271
L1510213-10 JER-AEM-10							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Total ICPOES & HR-ICPMS in Water							
Hardness							
Hardness (as CaCO3)	34.3		1.3	mg/L		24-SEP-14	
Total Metals by ICPOES (Undigested)							
Calcium (Ca)-Total	7.51		0.030	mg/L		17-SEP-14	R2952008
Iron (Fe)-Total	0.058		0.010	mg/L		17-SEP-14	R2952008
Magnesium (Mg)-Total	4.02		0.030	mg/L		17-SEP-14	R2952008
Phosphorus (P)-Total	<0.050		0.050	mg/L		17-SEP-14	R2952008
Potassium (K)-Total	0.915		0.050	mg/L		17-SEP-14	R2952008
Silicon (Si)-Total	1.41		0.050	mg/L		17-SEP-14	R2952008
Sodium (Na)-Total	2.51		0.20	mg/L		17-SEP-14	R2952008
Miscellaneous Parameters							
Ammonia, Total (as N)	0.0102		0.0050	mg/L		15-SEP-14	R2947433
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		13-SEP-14	R2946530
Total Organic Carbon	7.2		1.0	mg/L		17-SEP-14	R2948905
Phosphorus (P)-Total	0.0041		0.0010	mg/L		16-SEP-14	R2949323
Total Suspended Solids	<3.0		3.0	mg/L		02-SEP-14	R2936095
Turbidity	0.61		0.10	NTU		17-SEP-14	R2950911
Total Metals in Water by HR-ICPMS(Ultra)							
Aluminum (Al)-Total	0.0395		0.00020	mg/L		12-SEP-14	R2956094
Antimony (Sb)-Total	0.0000435		0.0000050	mg/L		12-SEP-14	R2956094
Arsenic (As)-Total	0.000291		0.000020	mg/L		12-SEP-14	R2956094
Barium (Ba)-Total	0.00775		0.000020	mg/L		12-SEP-14	R2956094
Beryllium (Be)-Total	0.0000116		0.0000020	mg/L		12-SEP-14	R2956094
Bismuth (Bi)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2956094
Boron (B)-Total	0.0115		0.0050	mg/L		22-SEP-14	R2957868
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Cesium (Cs)-Total	0.0000141		0.0000050	mg/L		12-SEP-14	R2956094
Chromium (Cr)-Total	0.000201		0.000050	mg/L		12-SEP-14	R2956094
Cobalt (Co)-Total	0.0000743		0.0000050	mg/L		12-SEP-14	R2956094
Copper (Cu)-Total	0.00374		0.000050	mg/L		12-SEP-14	R2956094
Gallium (Ga)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2956094
Lead (Pb)-Total	0.0000639		0.0000050	mg/L		12-SEP-14	R2956094
Lithium (Li)-Total	0.00063		0.00020	mg/L		12-SEP-14	R2956094
Manganese (Mn)-Total	0.00250		0.0000050	mg/L		12-SEP-14	R2956094
Molybdenum (Mo)-Total	0.000535		0.000010	mg/L		12-SEP-14	R2956094
Nickel (Ni)-Total	0.00138		0.000050	mg/L		12-SEP-14	R2956094
Rhenium (Re)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Rubidium (Rb)-Total	0.00153		0.0000050	mg/L		12-SEP-14	R2956094
Selenium (Se)-Total	0.000073		0.000040	mg/L		12-SEP-14	R2956094

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-10 JER-AEM-10							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Total Metals in Water by HR-ICPMS(Ultra)							
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Strontium (Sr)-Total	0.0252		0.000010	mg/L		12-SEP-14	R2956094
Tellurium (Te)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Thallium (Tl)-Total	0.0000026		0.0000010	mg/L		12-SEP-14	R2956094
Thorium (Th)-Total	0.0000519		0.0000050	mg/L		12-SEP-14	R2956094
Tin (Sn)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Titanium (Ti)-Total	0.000777		0.000050	mg/L		12-SEP-14	R2956094
Tungsten (W)-Total	0.000015		0.000010	mg/L		12-SEP-14	R2956094
Uranium (U)-Total	0.00304		0.0000010	mg/L		12-SEP-14	R2956094
Vanadium (V)-Total	0.000136		0.000010	mg/L		12-SEP-14	R2956094
Yttrium (Y)-Total	0.000358		0.0000050	mg/L		12-SEP-14	R2956094
Zinc (Zn)-Total	0.00454		0.00010	mg/L		12-SEP-14	R2956094
Zirconium (Zr)-Total	0.000158		0.000010	mg/L		12-SEP-14	R2956094
Routine Water Analysis - Low Level							
Chloride by IC							
Chloride (Cl)	1.20		0.50	mg/L		30-AUG-14	R2939362
Dissolved Metals in Water by CRC ICPMS							
Calcium (Ca)-Dissolved	7.14		0.50	mg/L		15-SEP-14	R2947735
Magnesium (Mg)-Dissolved	3.98		0.10	mg/L		15-SEP-14	R2947735
Potassium (K)-Dissolved	0.88		0.10	mg/L		15-SEP-14	R2947735
Sodium (Na)-Dissolved	2.6		1.0	mg/L		15-SEP-14	R2947735
Fluoride by IC							
Fluoride (F)	0.027		0.020	mg/L		30-AUG-14	R2939362
Ion Balance Calculation							
Ion Balance	Low EC			%		18-SEP-14	R2951830
TDS (Calculated)	42.5			mg/L		18-SEP-14	R2951830
Hardness (as CaCO3)	34.2			mg/L		18-SEP-14	R2951830
Nitrate in Water (Calculation)							
Nitrate (as N)	0.548		0.0060	mg/L		03-SEP-14	
Nitrite & Nitrate in Water by Colour							
Nitrate and Nitrite (as N)	0.550		0.0060	mg/L		02-SEP-14	R2935954
Nitrite in Water by Colour							
Nitrite (as N)	0.0020		0.0020	mg/L		02-SEP-14	R2935954
Sulfate by IC (Low Level)							
Sulfate (SO4)	5.95		0.050	mg/L		30-AUG-14	R2939362
pH, Conductivity and Total Alkalinity							
pH	7.52		0.10	pH		01-SEP-14	R2934271
Conductivity (EC)	84.2		0.20	uS/cm		01-SEP-14	R2934271
Bicarbonate (HCO3)	37.0		5.0	mg/L		01-SEP-14	R2934271
Carbonate (CO3)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Hydroxide (OH)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Alkalinity, Total (as CaCO3)	30.4		2.0	mg/L		01-SEP-14	R2934271
L1510213-11 JER-AEM-12							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Total ICPOES & HR-ICPMS in Water							
Hardness							
Hardness (as CaCO3)	6.9		1.3	mg/L		23-SEP-14	
Total Metals by ICPOES (Undigested)							
Calcium (Ca)-Total	1.47		0.030	mg/L		17-SEP-14	R2952008
Iron (Fe)-Total	0.015		0.010	mg/L		17-SEP-14	R2952008

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-11 JER-AEM-12							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Total Metals by ICPOES (Undigested)							
Magnesium (Mg)-Total	0.777		0.030	mg/L		17-SEP-14	R2952008
Phosphorus (P)-Total	<0.050		0.050	mg/L		17-SEP-14	R2952008
Potassium (K)-Total	0.345		0.050	mg/L		17-SEP-14	R2952008
Silicon (Si)-Total	0.239		0.050	mg/L		17-SEP-14	R2952008
Sodium (Na)-Total	0.60		0.20	mg/L		17-SEP-14	R2952008
Miscellaneous Parameters							
Ammonia, Total (as N)	0.0133		0.0050	mg/L		15-SEP-14	R2947433
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		13-SEP-14	R2946530
Total Organic Carbon	3.3		1.0	mg/L		17-SEP-14	R2948905
Phosphorus (P)-Total	0.0029		0.0010	mg/L		16-SEP-14	R2949323
Total Suspended Solids	<3.0		3.0	mg/L		02-SEP-14	R2936095
Turbidity	0.55		0.10	NTU		17-SEP-14	R2950911
Total Metals in Water by HR-ICPMS(Ultra)							
Aluminum (Al)-Total	0.0122		0.00020	mg/L		12-SEP-14	R2956094
Antimony (Sb)-Total	0.0000071		0.0000050	mg/L		12-SEP-14	R2956094
Arsenic (As)-Total	0.000212		0.000020	mg/L		12-SEP-14	R2956094
Barium (Ba)-Total	0.00186		0.000020	mg/L		12-SEP-14	R2956094
Beryllium (Be)-Total	0.0000028		0.0000020	mg/L		12-SEP-14	R2956094
Bismuth (Bi)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2956094
Boron (B)-Total	<0.0050		0.0050	mg/L		12-SEP-14	R2956094
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Cesium (Cs)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Chromium (Cr)-Total	0.000067		0.000050	mg/L		12-SEP-14	R2956094
Cobalt (Co)-Total	0.0000159		0.0000050	mg/L		12-SEP-14	R2956094
Copper (Cu)-Total	0.00114		0.000050	mg/L		12-SEP-14	R2956094
Gallium (Ga)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2956094
Lead (Pb)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Lithium (Li)-Total	0.00062		0.00020	mg/L		12-SEP-14	R2956094
Manganese (Mn)-Total	0.00200		0.0000050	mg/L		12-SEP-14	R2956094
Molybdenum (Mo)-Total	0.000051		0.000010	mg/L		12-SEP-14	R2956094
Nickel (Ni)-Total	0.000297		0.000050	mg/L		12-SEP-14	R2956094
Rhenium (Re)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Rubidium (Rb)-Total	0.000822		0.0000050	mg/L		12-SEP-14	R2956094
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-14	R2956094
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Strontium (Sr)-Total	0.00579		0.000010	mg/L		12-SEP-14	R2956094
Tellurium (Te)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Thallium (Tl)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2956094
Thorium (Th)-Total	0.0000145		0.0000050	mg/L		12-SEP-14	R2956094
Tin (Sn)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Titanium (Ti)-Total	0.000181		0.000050	mg/L		12-SEP-14	R2956094
Tungsten (W)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Uranium (U)-Total	0.000203		0.0000010	mg/L		12-SEP-14	R2956094
Vanadium (V)-Total	0.000045		0.000010	mg/L		12-SEP-14	R2956094
Yttrium (Y)-Total	0.0000653		0.0000050	mg/L		12-SEP-14	R2956094
Zinc (Zn)-Total	0.00039		0.00010	mg/L		12-SEP-14	R2956094
Zirconium (Zr)-Total	0.000021		0.000010	mg/L		12-SEP-14	R2956094
Routine Water Analysis - Low Level							
Chloride by IC							
Chloride (Cl)	<0.50		0.50	mg/L		30-AUG-14	R2939362
Dissolved Metals in Water by CRC ICPMS							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-11 JER-AEM-12							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Dissolved Metals in Water by CRC ICPMS							
Calcium (Ca)-Dissolved	1.47		0.50	mg/L		15-SEP-14	R2947735
Magnesium (Mg)-Dissolved	0.78		0.10	mg/L		15-SEP-14	R2947735
Potassium (K)-Dissolved	0.34		0.10	mg/L		15-SEP-14	R2947735
Sodium (Na)-Dissolved	<1.0		1.0	mg/L		15-SEP-14	R2947735
Fluoride by IC							
Fluoride (F)	<0.020		0.020	mg/L		30-AUG-14	R2939362
Ion Balance Calculation							
Ion Balance	Low EC			%		18-SEP-14	R2951830
TDS (Calculated)	7.5			mg/L		18-SEP-14	R2951830
Hardness (as CaCO3)	6.9			mg/L		18-SEP-14	R2951830
Nitrate in Water (Calculation)							
Nitrate (as N)	0.0136		0.0060	mg/L		03-SEP-14	
Nitrite & Nitrate in Water by Colour							
Nitrate and Nitrite (as N)	0.0136		0.0060	mg/L		02-SEP-14	R2935954
Nitrite in Water by Colour							
Nitrite (as N)	<0.0020		0.0020	mg/L		02-SEP-14	R2935954
Sulfate by IC (Low Level)							
Sulfate (SO4)	0.962		0.050	mg/L		30-AUG-14	R2939362
pH, Conductivity and Total Alkalinity							
pH	6.75		0.10	pH		01-SEP-14	R2934271
Conductivity (EC)	17.7		0.20	uS/cm		01-SEP-14	R2934271
Bicarbonate (HCO3)	7.9		5.0	mg/L		01-SEP-14	R2934271
Carbonate (CO3)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Hydroxide (OH)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Alkalinity, Total (as CaCO3)	6.5		2.0	mg/L		01-SEP-14	R2934271
L1510213-12 2014-CL-S1							
Sampled By: CLIENT on 27-AUG-14 @ 12:00							
Matrix: Water							
Total ICPOES & HR-ICPMS in Water							
Hardness							
Hardness (as CaCO3)	9.9		1.3	mg/L		24-SEP-14	
Total Metals by ICPOES (Undigested)							
Calcium (Ca)-Total	2.13		0.030	mg/L		17-SEP-14	R2952008
Iron (Fe)-Total	0.023		0.010	mg/L		17-SEP-14	R2952008
Magnesium (Mg)-Total	1.13		0.030	mg/L		17-SEP-14	R2952008
Phosphorus (P)-Total	<0.050		0.050	mg/L		17-SEP-14	R2952008
Potassium (K)-Total	0.402		0.050	mg/L		17-SEP-14	R2952008
Silicon (Si)-Total	0.535		0.050	mg/L		17-SEP-14	R2952008
Sodium (Na)-Total	0.85		0.20	mg/L		17-SEP-14	R2952008
Miscellaneous Parameters							
Ammonia, Total (as N)	0.0063		0.0050	mg/L		15-SEP-14	R2947433
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		13-SEP-14	R2946530
Total Organic Carbon	4.0		1.0	mg/L		17-SEP-14	R2948905
Phosphorus (P)-Total	0.0025		0.0010	mg/L		16-SEP-14	R2949323
Total Suspended Solids	<3.0		3.0	mg/L		02-SEP-14	R2936095
Turbidity	0.50		0.10	NTU		17-SEP-14	R2950911
Total Metals in Water by HR-ICPMS(Ultra)							
Aluminum (Al)-Total	0.0186		0.00020	mg/L		12-SEP-14	R2956094
Antimony (Sb)-Total	0.0000078		0.0000050	mg/L		12-SEP-14	R2956094
Arsenic (As)-Total	0.000212		0.000020	mg/L		12-SEP-14	R2956094
Barium (Ba)-Total	0.00253		0.000020	mg/L		12-SEP-14	R2956094

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-12 2014-CL-S1							
Sampled By: CLIENT on 27-AUG-14 @ 12:00							
Matrix: Water							
Total Metals in Water by HR-ICPMS(Ultra)							
Beryllium (Be)-Total	0.0000039		0.0000020	mg/L		12-SEP-14	R2956094
Bismuth (Bi)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2956094
Boron (B)-Total	0.0055		0.0050	mg/L		22-SEP-14	R2957868
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Cesium (Cs)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Chromium (Cr)-Total	0.000087		0.000050	mg/L		12-SEP-14	R2956094
Cobalt (Co)-Total	0.0000276		0.0000050	mg/L		12-SEP-14	R2956094
Copper (Cu)-Total	0.00131		0.000050	mg/L		12-SEP-14	R2956094
Gallium (Ga)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2956094
Lead (Pb)-Total	0.0000067		0.0000050	mg/L		12-SEP-14	R2956094
Lithium (Li)-Total	0.00054		0.00020	mg/L		12-SEP-14	R2956094
Manganese (Mn)-Total	0.00166		0.0000050	mg/L		12-SEP-14	R2956094
Molybdenum (Mo)-Total	0.000145		0.000010	mg/L		12-SEP-14	R2956094
Nickel (Ni)-Total	0.000347		0.000050	mg/L		12-SEP-14	R2956094
Rhenium (Re)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Rubidium (Rb)-Total	0.000864		0.0000050	mg/L		12-SEP-14	R2956094
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-14	R2956094
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Strontium (Sr)-Total	0.00832		0.000010	mg/L		12-SEP-14	R2956094
Tellurium (Te)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Thallium (Tl)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2956094
Thorium (Th)-Total	0.0000215		0.0000050	mg/L		12-SEP-14	R2956094
Tin (Sn)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Titanium (Ti)-Total	0.000227		0.000050	mg/L		12-SEP-14	R2956094
Tungsten (W)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Uranium (U)-Total	0.000395		0.0000010	mg/L		12-SEP-14	R2956094
Vanadium (V)-Total	0.000052		0.000010	mg/L		12-SEP-14	R2956094
Yttrium (Y)-Total	0.000121		0.0000050	mg/L		12-SEP-14	R2956094
Zinc (Zn)-Total	0.00052		0.00010	mg/L		12-SEP-14	R2956094
Zirconium (Zr)-Total	0.000035		0.000010	mg/L		12-SEP-14	R2956094
Routine Water Analysis - Low Level							
Chloride by IC							
Chloride (Cl)	<0.50		0.50	mg/L		30-AUG-14	R2939362
Dissolved Metals in Water by CRC ICPMS							
Calcium (Ca)-Dissolved	2.14		0.50	mg/L		15-SEP-14	R2947735
Magnesium (Mg)-Dissolved	1.11		0.10	mg/L		15-SEP-14	R2947735
Potassium (K)-Dissolved	0.37		0.10	mg/L		15-SEP-14	R2947735
Sodium (Na)-Dissolved	<1.0		1.0	mg/L		15-SEP-14	R2947735
Fluoride by IC							
Fluoride (F)	<0.020		0.020	mg/L		30-AUG-14	R2939362
Ion Balance Calculation							
Ion Balance	Low EC			%		18-SEP-14	R2951830
TDS (Calculated)	10.4			mg/L		18-SEP-14	R2951830
Hardness (as CaCO3)	9.9			mg/L		18-SEP-14	R2951830
Nitrate in Water (Calculation)							
Nitrate (as N)	0.125		0.0060	mg/L		03-SEP-14	
Nitrite & Nitrate in Water by Colour							
Nitrate and Nitrite (as N)	0.125		0.0060	mg/L		02-SEP-14	R2935954
Nitrite in Water by Colour							
Nitrite (as N)	<0.0020		0.0020	mg/L		02-SEP-14	R2935954
Sulfate by IC (Low Level)							
Sulfate (SO4)	1.51		0.050	mg/L		30-AUG-14	R2939362

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-12 2014-CL-S1							
Sampled By: CLIENT on 27-AUG-14 @ 12:00							
Matrix: Water							
pH, Conductivity and Total Alkalinity							
pH	6.83		0.10	pH		01-SEP-14	R2934271
Conductivity (EC)	25.2		0.20	uS/cm		01-SEP-14	R2934271
Bicarbonate (HCO3)	9.6		5.0	mg/L		01-SEP-14	R2934271
Carbonate (CO3)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Hydroxide (OH)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Alkalinity, Total (as CaCO3)	7.8		2.0	mg/L		01-SEP-14	R2934271
L1510213-13 2014-CL-S2							
Sampled By: CLIENT on 27-AUG-14 @ 12:00							
Matrix: Water							
Total ICPOES & HR-ICPMS in Water							
Hardness							
Hardness (as CaCO3)	7.4		1.3	mg/L		23-SEP-14	
Total Metals by ICPOES (Undigested)							
Calcium (Ca)-Total	1.69		0.030	mg/L		17-SEP-14	R2952008
Iron (Fe)-Total	0.020		0.010	mg/L		17-SEP-14	R2952008
Magnesium (Mg)-Total	0.859		0.030	mg/L		17-SEP-14	R2952008
Phosphorus (P)-Total	<0.050		0.050	mg/L		17-SEP-14	R2952008
Potassium (K)-Total	0.342		0.050	mg/L		17-SEP-14	R2952008
Silicon (Si)-Total	0.393		0.050	mg/L		17-SEP-14	R2952008
Sodium (Na)-Total	0.65		0.20	mg/L		17-SEP-14	R2952008
Miscellaneous Parameters							
Ammonia, Total (as N)	0.0104		0.0050	mg/L		15-SEP-14	R2947433
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		13-SEP-14	R2946530
Total Organic Carbon	3.9		1.0	mg/L		17-SEP-14	R2948905
Phosphorus (P)-Total	0.0025		0.0010	mg/L		16-SEP-14	R2949323
Total Suspended Solids	<3.0		3.0	mg/L		02-SEP-14	R2936095
Turbidity	0.43		0.10	NTU		17-SEP-14	R2950911
Total Metals in Water by HR-ICPMS(Ultra)							
Aluminum (Al)-Total	0.0188		0.00020	mg/L		12-SEP-14	R2956094
Antimony (Sb)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Arsenic (As)-Total	0.000229		0.000020	mg/L		12-SEP-14	R2956094
Barium (Ba)-Total	0.00203		0.000020	mg/L		12-SEP-14	R2956094
Beryllium (Be)-Total	0.0000042		0.0000020	mg/L		12-SEP-14	R2956094
Bismuth (Bi)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2956094
Boron (B)-Total	<0.0050		0.0050	mg/L		12-SEP-14	R2956094
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Cesium (Cs)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Chromium (Cr)-Total	0.000080		0.000050	mg/L		12-SEP-14	R2956094
Cobalt (Co)-Total	0.0000211		0.0000050	mg/L		12-SEP-14	R2956094
Copper (Cu)-Total	0.00117		0.000050	mg/L		12-SEP-14	R2956094
Gallium (Ga)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2956094
Lead (Pb)-Total	0.0000071		0.0000050	mg/L		12-SEP-14	R2956094
Lithium (Li)-Total	0.00056		0.00020	mg/L		12-SEP-14	R2956094
Manganese (Mn)-Total	0.00157		0.0000050	mg/L		12-SEP-14	R2956094
Molybdenum (Mo)-Total	0.000039		0.000010	mg/L		12-SEP-14	R2956094
Nickel (Ni)-Total	0.000333		0.000050	mg/L		12-SEP-14	R2956094
Rhenium (Re)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Rubidium (Rb)-Total	0.000787		0.0000050	mg/L		12-SEP-14	R2956094
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-14	R2956094
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Strontium (Sr)-Total	0.00630		0.000010	mg/L		12-SEP-14	R2956094

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-13 2014-CL-S2							
Sampled By: CLIENT on 27-AUG-14 @ 12:00							
Matrix: Water							
Total Metals in Water by HR-ICPMS(Ultra)							
Tellurium (Te)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Thallium (Tl)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2956094
Thorium (Th)-Total	0.0000191		0.0000050	mg/L		12-SEP-14	R2956094
Tin (Sn)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Titanium (Ti)-Total	0.000221		0.000050	mg/L		12-SEP-14	R2956094
Tungsten (W)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Uranium (U)-Total	0.000213		0.0000010	mg/L		12-SEP-14	R2956094
Vanadium (V)-Total	0.000052		0.000010	mg/L		12-SEP-14	R2956094
Yttrium (Y)-Total	0.0000978		0.0000050	mg/L		12-SEP-14	R2956094
Zinc (Zn)-Total	0.00059		0.00010	mg/L		12-SEP-14	R2956094
Zirconium (Zr)-Total	0.000030		0.000010	mg/L		12-SEP-14	R2956094
Routine Water Analysis - Low Level							
Chloride by IC							
Chloride (Cl)	<0.50		0.50	mg/L		30-AUG-14	R2939362
Dissolved Metals in Water by CRC ICPMS							
Calcium (Ca)-Dissolved	1.58		0.50	mg/L		15-SEP-14	R2947735
Magnesium (Mg)-Dissolved	0.84		0.10	mg/L		15-SEP-14	R2947735
Potassium (K)-Dissolved	0.33		0.10	mg/L		15-SEP-14	R2947735
Sodium (Na)-Dissolved	<1.0		1.0	mg/L		15-SEP-14	R2947735
Fluoride by IC							
Fluoride (F)	<0.020		0.020	mg/L		30-AUG-14	R2939362
Ion Balance Calculation							
Ion Balance	Low EC			%		18-SEP-14	R2951830
TDS (Calculated)	8.1			mg/L		18-SEP-14	R2951830
Hardness (as CaCO3)	7.4			mg/L		18-SEP-14	R2951830
Nitrate in Water (Calculation)							
Nitrate (as N)	0.0167		0.0060	mg/L		03-SEP-14	
Nitrite & Nitrate in Water by Colour							
Nitrate and Nitrite (as N)	0.0167		0.0060	mg/L		02-SEP-14	R2935954
Nitrite in Water by Colour							
Nitrite (as N)	<0.0020		0.0020	mg/L		02-SEP-14	R2935954
Sulfate by IC (Low Level)							
Sulfate (SO4)	1.11		0.050	mg/L		30-AUG-14	R2939362
pH, Conductivity and Total Alkalinity							
pH	6.73		0.10	pH		01-SEP-14	R2934271
Conductivity (EC)	19.6		0.20	uS/cm		01-SEP-14	R2934271
Bicarbonate (HCO3)	8.5		5.0	mg/L		01-SEP-14	R2934271
Carbonate (CO3)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Hydroxide (OH)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Alkalinity, Total (as CaCO3)	7.0		2.0	mg/L		01-SEP-14	R2934271
L1510213-14 JER-AEM-13							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Total ICPOES & HR-ICPMS in Water							
Hardness							
Hardness (as CaCO3)	12.0		1.3	mg/L		23-SEP-14	
Total Metals by ICPOES (Undigested)							
Calcium (Ca)-Total	2.93		0.030	mg/L		17-SEP-14	R2952008
Iron (Fe)-Total	0.221		0.010	mg/L		17-SEP-14	R2952008
Magnesium (Mg)-Total	1.23		0.030	mg/L		17-SEP-14	R2952008
Phosphorus (P)-Total	<0.050		0.050	mg/L		17-SEP-14	R2952008

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-14 JER-AEM-13							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Total Metals by ICPOES (Undigested)							
Potassium (K)-Total	0.356		0.050	mg/L		17-SEP-14	R2952008
Silicon (Si)-Total	0.679		0.050	mg/L		17-SEP-14	R2952008
Sodium (Na)-Total	0.68		0.20	mg/L		17-SEP-14	R2952008
Miscellaneous Parameters							
Ammonia, Total (as N)	0.0309		0.0050	mg/L		15-SEP-14	R2947433
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		13-SEP-14	R2946530
Total Organic Carbon	7.5		1.0	mg/L		17-SEP-14	R2948905
Phosphorus (P)-Total	0.0053		0.0010	mg/L		16-SEP-14	R2949323
Total Suspended Solids	<3.0		3.0	mg/L		02-SEP-14	R2936095
Turbidity	0.74		0.10	NTU		17-SEP-14	R2950911
Total Metals in Water by HR-ICPMS(Ultra)							
Aluminum (Al)-Total	0.0466		0.00020	mg/L		12-SEP-14	R2956094
Antimony (Sb)-Total	0.0000082		0.0000050	mg/L		12-SEP-14	R2956094
Arsenic (As)-Total	0.000281		0.000020	mg/L		12-SEP-14	R2956094
Barium (Ba)-Total	0.00245		0.000020	mg/L		12-SEP-14	R2956094
Beryllium (Be)-Total	0.0000094		0.0000020	mg/L		12-SEP-14	R2956094
Bismuth (Bi)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2956094
Boron (B)-Total	<0.0050		0.0050	mg/L		12-SEP-14	R2956094
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Cesium (Cs)-Total	0.0000094		0.0000050	mg/L		12-SEP-14	R2956094
Chromium (Cr)-Total	0.000140		0.000050	mg/L		12-SEP-14	R2956094
Cobalt (Co)-Total	0.0000575		0.0000050	mg/L		12-SEP-14	R2956094
Copper (Cu)-Total	0.00178		0.000050	mg/L		12-SEP-14	R2956094
Gallium (Ga)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2956094
Lead (Pb)-Total	0.0000209		0.0000050	mg/L		12-SEP-14	R2956094
Lithium (Li)-Total	0.00053		0.00020	mg/L		12-SEP-14	R2956094
Manganese (Mn)-Total	0.0153		0.0000050	mg/L		12-SEP-14	R2956094
Molybdenum (Mo)-Total	0.000027		0.000010	mg/L		12-SEP-14	R2956094
Nickel (Ni)-Total	0.000526		0.000050	mg/L		12-SEP-14	R2956094
Rhenium (Re)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Rubidium (Rb)-Total	0.000974		0.0000050	mg/L		12-SEP-14	R2956094
Selenium (Se)-Total	0.000044		0.000040	mg/L		12-SEP-14	R2956094
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Strontium (Sr)-Total	0.00690		0.000010	mg/L		12-SEP-14	R2956094
Tellurium (Te)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Thallium (Tl)-Total	0.0000014		0.0000010	mg/L		12-SEP-14	R2956094
Thorium (Th)-Total	0.0000264		0.0000050	mg/L		12-SEP-14	R2956094
Tin (Sn)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Titanium (Ti)-Total	0.000645		0.000050	mg/L		12-SEP-14	R2956094
Tungsten (W)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Uranium (U)-Total	0.000483		0.0000010	mg/L		12-SEP-14	R2956094
Vanadium (V)-Total	0.000148		0.000010	mg/L		12-SEP-14	R2956094
Yttrium (Y)-Total	0.000232		0.0000050	mg/L		12-SEP-14	R2956094
Zinc (Zn)-Total	0.00050		0.00010	mg/L		12-SEP-14	R2956094
Zirconium (Zr)-Total	0.000097		0.000010	mg/L		12-SEP-14	R2956094
Routine Water Analysis - Low Level							
Chloride by IC							
Chloride (Cl)	<0.50		0.50	mg/L		30-AUG-14	R2939362
Dissolved Metals in Water by CRC ICPMS							
Calcium (Ca)-Dissolved	2.82		0.50	mg/L		15-SEP-14	R2947735
Magnesium (Mg)-Dissolved	1.22		0.10	mg/L		15-SEP-14	R2947735

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-14 JER-AEM-13							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Dissolved Metals in Water by CRC ICPMS							
Potassium (K)-Dissolved	0.37		0.10	mg/L		15-SEP-14	R2947735
Sodium (Na)-Dissolved	<1.0		1.0	mg/L		15-SEP-14	R2947735
Fluoride by IC							
Fluoride (F)	<0.020		0.020	mg/L		30-AUG-14	R2939362
Ion Balance Calculation							
Ion Balance	Low EC			%		18-SEP-14	R2951830
TDS (Calculated)	11.3			mg/L		18-SEP-14	R2951830
Hardness (as CaCO3)	12.1			mg/L		18-SEP-14	R2951830
Nitrate in Water (Calculation)							
Nitrate (as N)	0.0231		0.0060	mg/L		03-SEP-14	
Nitrite & Nitrate in Water by Colour							
Nitrate and Nitrite (as N)	0.0231		0.0060	mg/L		02-SEP-14	R2935954
Nitrite in Water by Colour							
Nitrite (as N)	<0.0020		0.0020	mg/L		02-SEP-14	R2935954
Sulfate by IC (Low Level)							
Sulfate (SO4)	0.450		0.050	mg/L		30-AUG-14	R2939362
pH, Conductivity and Total Alkalinity							
pH	6.94		0.10	pH		01-SEP-14	R2934271
Conductivity (EC)	27.9		0.20	uS/cm		01-SEP-14	R2934271
Bicarbonate (HCO3)	12.9		5.0	mg/L		01-SEP-14	R2934271
Carbonate (CO3)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Hydroxide (OH)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Alkalinity, Total (as CaCO3)	10.6		2.0	mg/L		01-SEP-14	R2934271
L1510213-15 JER-AEM-14							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Total ICPOES & HR-ICPMS in Water							
Hardness							
Hardness (as CaCO3)	11.3		1.3	mg/L		23-SEP-14	
Total Metals by ICPOES (Undigested)							
Calcium (Ca)-Total	2.76		0.030	mg/L		17-SEP-14	R2952008
Iron (Fe)-Total	0.106		0.010	mg/L		17-SEP-14	R2952008
Magnesium (Mg)-Total	1.15		0.030	mg/L		17-SEP-14	R2952008
Phosphorus (P)-Total	<0.050		0.050	mg/L		17-SEP-14	R2952008
Potassium (K)-Total	0.339		0.050	mg/L		17-SEP-14	R2952008
Silicon (Si)-Total	0.790		0.050	mg/L		17-SEP-14	R2952008
Sodium (Na)-Total	0.70		0.20	mg/L		17-SEP-14	R2952008
Miscellaneous Parameters							
Ammonia, Total (as N)	0.0150		0.0050	mg/L		15-SEP-14	R2947433
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		13-SEP-14	R2946530
Total Organic Carbon	6.4		1.0	mg/L		17-SEP-14	R2948905
Phosphorus (P)-Total	0.0047		0.0010	mg/L		16-SEP-14	R2949323
Total Suspended Solids	<3.0		3.0	mg/L		02-SEP-14	R2936095
Turbidity	0.42		0.10	NTU		17-SEP-14	R2950911
Total Metals in Water by HR-ICPMS(Ultra)							
Aluminum (Al)-Total	0.0384		0.00020	mg/L		12-SEP-14	R2956094
Antimony (Sb)-Total	0.0000081		0.0000050	mg/L		12-SEP-14	R2956094
Arsenic (As)-Total	0.000218		0.000020	mg/L		12-SEP-14	R2956094
Barium (Ba)-Total	0.00299		0.000020	mg/L		12-SEP-14	R2956094
Beryllium (Be)-Total	0.0000105		0.0000020	mg/L		12-SEP-14	R2956094
Bismuth (Bi)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2956094

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-15 JER-AEM-14							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Total Metals in Water by HR-ICPMS(Ultra)							
Boron (B)-Total	<0.0050		0.0050	mg/L		12-SEP-14	R2956094
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Cesium (Cs)-Total	0.0000085		0.0000050	mg/L		12-SEP-14	R2956094
Chromium (Cr)-Total	0.000123		0.000050	mg/L		12-SEP-14	R2956094
Cobalt (Co)-Total	0.0000312		0.0000050	mg/L		12-SEP-14	R2956094
Copper (Cu)-Total	0.00188		0.000050	mg/L		12-SEP-14	R2956094
Gallium (Ga)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2956094
Lead (Pb)-Total	0.0000173		0.0000050	mg/L		12-SEP-14	R2956094
Lithium (Li)-Total	0.00045		0.00020	mg/L		12-SEP-14	R2956094
Manganese (Mn)-Total	0.000662		0.0000050	mg/L		12-SEP-14	R2956094
Molybdenum (Mo)-Total	0.000027		0.000010	mg/L		12-SEP-14	R2956094
Nickel (Ni)-Total	0.000472		0.000050	mg/L		12-SEP-14	R2956094
Rhenium (Re)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Rubidium (Rb)-Total	0.000910		0.0000050	mg/L		12-SEP-14	R2956094
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-14	R2956094
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Strontium (Sr)-Total	0.00631		0.000010	mg/L		12-SEP-14	R2956094
Tellurium (Te)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Thallium (Tl)-Total	0.0000011		0.0000010	mg/L		12-SEP-14	R2956094
Thorium (Th)-Total	0.0000259		0.0000050	mg/L		12-SEP-14	R2956094
Tin (Sn)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Titanium (Ti)-Total	0.000447		0.000050	mg/L		12-SEP-14	R2956094
Tungsten (W)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Uranium (U)-Total	0.000385		0.0000010	mg/L		12-SEP-14	R2956094
Vanadium (V)-Total	0.000125		0.000010	mg/L		12-SEP-14	R2956094
Yttrium (Y)-Total	0.000270		0.0000050	mg/L		12-SEP-14	R2956094
Zinc (Zn)-Total	0.00207		0.00010	mg/L		12-SEP-14	R2956094
Zirconium (Zr)-Total	0.000073		0.000010	mg/L		12-SEP-14	R2956094
Routine Water Analysis - Low Level							
Chloride by IC							
Chloride (Cl)	<0.50		0.50	mg/L		30-AUG-14	R2939362
Dissolved Metals in Water by CRC ICPMS							
Calcium (Ca)-Dissolved	2.68		0.50	mg/L		15-SEP-14	R2947735
Magnesium (Mg)-Dissolved	1.12		0.10	mg/L		15-SEP-14	R2947735
Potassium (K)-Dissolved	0.35		0.10	mg/L		15-SEP-14	R2947735
Sodium (Na)-Dissolved	<1.0		1.0	mg/L		15-SEP-14	R2947735
Fluoride by IC							
Fluoride (F)	<0.020		0.020	mg/L		30-AUG-14	R2939362
Ion Balance Calculation							
Ion Balance	Low EC			%		18-SEP-14	R2951830
TDS (Calculated)	10.9			mg/L		18-SEP-14	R2951830
Hardness (as CaCO3)	11.3			mg/L		18-SEP-14	R2951830
Nitrate in Water (Calculation)							
Nitrate (as N)	0.0318		0.0060	mg/L		03-SEP-14	
Nitrite & Nitrate in Water by Colour							
Nitrate and Nitrite (as N)	0.0318		0.0060	mg/L		02-SEP-14	R2935954
Nitrite in Water by Colour							
Nitrite (as N)	<0.0020		0.0020	mg/L		02-SEP-14	R2935954
Sulfate by IC (Low Level)							
Sulfate (SO4)	0.730		0.050	mg/L		30-AUG-14	R2939362
pH, Conductivity and Total Alkalinity							
pH	6.93		0.10	pH		01-SEP-14	R2934271

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-15 JER-AEM-14							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
pH, Conductivity and Total Alkalinity							
Conductivity (EC)	26.4		0.20	uS/cm		01-SEP-14	R2934271
Bicarbonate (HCO3)	11.9		5.0	mg/L		01-SEP-14	R2934271
Carbonate (CO3)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Hydroxide (OH)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Alkalinity, Total (as CaCO3)	9.8		2.0	mg/L		01-SEP-14	R2934271
L1510213-16 JER-AEM-04							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Total ICPOES & HR-ICPMS in Water							
Hardness							
Hardness (as CaCO3)	55.6		1.3	mg/L		29-SEP-14	
Total Metals in Water by HR-ICPMS							
Aluminum (Al)-Total	0.0330		0.0030	mg/L		18-SEP-14	R2963254
Antimony (Sb)-Total	<0.000050	DLB	0.000050	mg/L		18-SEP-14	R2963254
Arsenic (As)-Total	0.000650		0.000050	mg/L		18-SEP-14	R2963254
Barium (Ba)-Total	0.0120		0.00010	mg/L		18-SEP-14	R2963254
Beryllium (Be)-Total	<0.0000050		0.0000050	mg/L		18-SEP-14	R2963254
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L		18-SEP-14	R2963254
Boron (B)-Total	0.0259		0.0050	mg/L		18-SEP-14	R2963254
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		18-SEP-14	R2963254
Cesium (Cs)-Total	0.0000256		0.0000050	mg/L		18-SEP-14	R2963254
Chromium (Cr)-Total	<0.00050		0.00050	mg/L		18-SEP-14	R2963254
Cobalt (Co)-Total	0.000113		0.000050	mg/L		18-SEP-14	R2963254
Copper (Cu)-Total	0.00117		0.00050	mg/L		18-SEP-14	R2963254
Gallium (Ga)-Total	<0.000050		0.000050	mg/L		18-SEP-14	R2963254
Lead (Pb)-Total	<0.000050		0.000050	mg/L		18-SEP-14	R2963254
Lithium (Li)-Total	0.00109		0.00020	mg/L		18-SEP-14	R2963254
Manganese (Mn)-Total	0.0369		0.00020	mg/L		18-SEP-14	R2963254
Molybdenum (Mo)-Total	0.00107		0.000050	mg/L		18-SEP-14	R2963254
Nickel (Ni)-Total	0.00083		0.00020	mg/L		18-SEP-14	R2963254
Rhenium (Re)-Total	0.0000063		0.0000050	mg/L		18-SEP-14	R2963254
Rubidium (Rb)-Total	0.00961		0.000020	mg/L		18-SEP-14	R2963254
Selenium (Se)-Total	<0.00020		0.00020	mg/L		18-SEP-14	R2963254
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		18-SEP-14	R2963254
Strontium (Sr)-Total	0.177		0.000050	mg/L		18-SEP-14	R2963254
Tellurium (Te)-Total	<0.000010		0.000010	mg/L		18-SEP-14	R2963254
Thallium (Tl)-Total	0.0000029		0.0000020	mg/L		18-SEP-14	R2963254
Thorium (Th)-Total	0.0000279		0.0000050	mg/L		18-SEP-14	R2963254
Tin (Sn)-Total	<0.00020		0.00020	mg/L		18-SEP-14	R2963254
Titanium (Ti)-Total	0.00093		0.00020	mg/L		18-SEP-14	R2963254
Tungsten (W)-Total	0.000012		0.000010	mg/L		18-SEP-14	R2963254
Uranium (U)-Total	0.00169		0.0000020	mg/L		18-SEP-14	R2963254
Vanadium (V)-Total	0.000130		0.000050	mg/L		18-SEP-14	R2963254
Yttrium (Y)-Total	0.000101		0.0000050	mg/L		18-SEP-14	R2963254
Zinc (Zn)-Total	<0.0030		0.0030	mg/L		18-SEP-14	R2963254
Zirconium (Zr)-Total	0.000090		0.000050	mg/L		18-SEP-14	R2963254
Total Metals in Water by ICPOES							
Calcium (Ca)-Total	10.9		0.050	mg/L		19-SEP-14	R2953207
Iron (Fe)-Total	0.287		0.030	mg/L		19-SEP-14	R2953207
Magnesium (Mg)-Total	7.10		0.10	mg/L		19-SEP-14	R2953207
Phosphorus (P)-Total	<0.30		0.30	mg/L		19-SEP-14	R2953207

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-16 JER-AEM-04							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Total Metals in Water by ICPOES							
Potassium (K)-Total	4.2		2.0	mg/L		19-SEP-14	R2953207
Silicon (Si)-Total	1.07		0.050	mg/L		19-SEP-14	R2953207
Sodium (Na)-Total	5.7		2.0	mg/L		19-SEP-14	R2953207
Miscellaneous Parameters							
Ammonia, Total (as N)	0.0262		0.0050	mg/L		15-SEP-14	R2947433
Mercury (Hg)-Total	0.0000055		0.0000050	mg/L		13-SEP-14	R2946530
Total Organic Carbon	6.7		1.0	mg/L		17-SEP-14	R2948905
Phosphorus (P)-Total	0.0054		0.0010	mg/L		16-SEP-14	R2949323
Total Suspended Solids	<3.0		3.0	mg/L		02-SEP-14	R2936095
Turbidity	1.44		0.10	NTU		17-SEP-14	R2950911
Routine Water Analysis - Low Level							
Chloride by IC							
Chloride (Cl)	3.07		0.50	mg/L		30-AUG-14	R2939362
Dissolved Metals in Water by CRC ICPMS							
Calcium (Ca)-Dissolved	10.7		0.50	mg/L		15-SEP-14	R2947735
Magnesium (Mg)-Dissolved	7.03		0.10	mg/L		15-SEP-14	R2947735
Potassium (K)-Dissolved	4.08		0.10	mg/L		15-SEP-14	R2947735
Sodium (Na)-Dissolved	5.9		1.0	mg/L		15-SEP-14	R2947735
Fluoride by IC							
Fluoride (F)	0.068		0.020	mg/L		30-AUG-14	R2939362
Ion Balance Calculation							
Ion Balance	105			%		18-SEP-14	R2951830
TDS (Calculated)	73.4			mg/L		18-SEP-14	R2951830
Hardness (as CaCO3)	55.7			mg/L		18-SEP-14	R2951830
Nitrate in Water (Calculation)							
Nitrate (as N)	0.0495		0.0060	mg/L		03-SEP-14	
Nitrite & Nitrate in Water by Colour							
Nitrate and Nitrite (as N)	0.0495	RRV	0.0060	mg/L		02-SEP-14	R2935954
Nitrite in Water by Colour							
Nitrite (as N)	<0.0020	RRV	0.0020	mg/L		02-SEP-14	R2935954
Sulfate by IC (Low Level)							
Sulfate (SO4)	7.62		0.050	mg/L		30-AUG-14	R2939362
pH, Conductivity and Total Alkalinity							
pH	7.79		0.10	pH		01-SEP-14	R2934271
Conductivity (EC)	148		0.20	uS/cm		01-SEP-14	R2934271
Bicarbonate (HCO3)	70.5		5.0	mg/L		01-SEP-14	R2934271
Carbonate (CO3)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Hydroxide (OH)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Alkalinity, Total (as CaCO3)	57.8		2.0	mg/L		01-SEP-14	R2934271
L1510213-17 DUP 1							
Sampled By: CLIENT on 25-AUG-14 @ 12:00							
Matrix: Water							
Total ICPOES & HR-ICPMS in Water							
Hardness							
Hardness (as CaCO3)	10.5		1.3	mg/L		24-SEP-14	
Total Metals by ICPOES (Undigested)							
Calcium (Ca)-Total	2.36		0.030	mg/L		17-SEP-14	R2952008
Iron (Fe)-Total	0.043		0.010	mg/L		17-SEP-14	R2952008
Magnesium (Mg)-Total	1.22		0.030	mg/L		17-SEP-14	R2952008
Phosphorus (P)-Total	<0.050		0.050	mg/L		17-SEP-14	R2952008
Potassium (K)-Total	0.355		0.050	mg/L		17-SEP-14	R2952008

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-17 DUP 1							
Sampled By: CLIENT on 25-AUG-14 @ 12:00							
Matrix: Water							
Total Metals by ICPOES (Undigested)							
Silicon (Si)-Total	0.469		0.050	mg/L		17-SEP-14	R2952008
Sodium (Na)-Total	0.83		0.20	mg/L		17-SEP-14	R2952008
Miscellaneous Parameters							
Ammonia, Total (as N)	0.0180		0.0050	mg/L		15-SEP-14	R2947433
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		13-SEP-14	R2946530
Total Organic Carbon	4.9		1.0	mg/L		17-SEP-14	R2948905
Phosphorus (P)-Total	0.0036		0.0010	mg/L		16-SEP-14	R2949323
Total Suspended Solids	<3.0		3.0	mg/L		31-AUG-14	R2934268
Turbidity	0.47		0.10	NTU		17-SEP-14	R2950911
Total Metals in Water by HR-ICPMS(Ultra)							
Aluminum (Al)-Total	0.0301		0.00020	mg/L		12-SEP-14	R2956094
Antimony (Sb)-Total	0.0000095		0.0000050	mg/L		12-SEP-14	R2956094
Arsenic (As)-Total	0.000245		0.000020	mg/L		12-SEP-14	R2956094
Barium (Ba)-Total	0.00200		0.000020	mg/L		12-SEP-14	R2956094
Beryllium (Be)-Total	0.0000055		0.0000020	mg/L		12-SEP-14	R2956094
Bismuth (Bi)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2956094
Boron (B)-Total	0.0063		0.0050	mg/L		22-SEP-14	R2957868
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Cesium (Cs)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Chromium (Cr)-Total	0.000118		0.000050	mg/L		12-SEP-14	R2956094
Cobalt (Co)-Total	0.0000341		0.0000050	mg/L		12-SEP-14	R2956094
Copper (Cu)-Total	0.00167		0.000050	mg/L		12-SEP-14	R2956094
Gallium (Ga)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2956094
Lead (Pb)-Total	0.0000075		0.0000050	mg/L		12-SEP-14	R2956094
Lithium (Li)-Total	0.00037		0.00020	mg/L		12-SEP-14	R2956094
Manganese (Mn)-Total	0.00344		0.0000050	mg/L		12-SEP-14	R2956094
Molybdenum (Mo)-Total	0.000042		0.000010	mg/L		12-SEP-14	R2956094
Nickel (Ni)-Total	0.000471		0.000050	mg/L		12-SEP-14	R2956094
Rhenium (Re)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Rubidium (Rb)-Total	0.000757		0.0000050	mg/L		12-SEP-14	R2956094
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-14	R2956094
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Strontium (Sr)-Total	0.00702		0.000010	mg/L		12-SEP-14	R2956094
Tellurium (Te)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Thallium (Tl)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2956094
Thorium (Th)-Total	0.0000175		0.0000050	mg/L		12-SEP-14	R2956094
Tin (Sn)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Titanium (Ti)-Total	0.000321		0.000050	mg/L		12-SEP-14	R2956094
Tungsten (W)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Uranium (U)-Total	0.000138		0.0000010	mg/L		12-SEP-14	R2956094
Vanadium (V)-Total	0.000082		0.000010	mg/L		12-SEP-14	R2956094
Yttrium (Y)-Total	0.000102		0.0000050	mg/L		12-SEP-14	R2956094
Zinc (Zn)-Total	0.00039		0.00010	mg/L		12-SEP-14	R2956094
Zirconium (Zr)-Total	0.000040		0.000010	mg/L		12-SEP-14	R2956094
Routine Water Analysis - Low Level							
Chloride by IC							
Chloride (Cl)	<0.50		0.50	mg/L		30-AUG-14	R2939362
Dissolved Metals in Water by CRC ICPMS							
Calcium (Ca)-Dissolved	2.26		0.50	mg/L		15-SEP-14	R2947735
Magnesium (Mg)-Dissolved	1.18		0.10	mg/L		15-SEP-14	R2947735
Potassium (K)-Dissolved	0.34		0.10	mg/L		15-SEP-14	R2947735

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-17 DUP 1							
Sampled By: CLIENT on 25-AUG-14 @ 12:00							
Matrix: Water							
Dissolved Metals in Water by CRC ICPMS							
Sodium (Na)-Dissolved	<1.0		1.0	mg/L		15-SEP-14	R2947735
Fluoride by IC							
Fluoride (F)	<0.020		0.020	mg/L		30-AUG-14	R2939362
Ion Balance Calculation							
Ion Balance	Low EC			%		18-SEP-14	R2951830
TDS (Calculated)	11.3			mg/L		18-SEP-14	R2951830
Hardness (as CaCO3)	10.5			mg/L		18-SEP-14	R2951830
Nitrate in Water (Calculation)							
Nitrate (as N)	0.0264		0.0060	mg/L		03-SEP-14	
Nitrite & Nitrate in Water by Colour							
Nitrate and Nitrite (as N)	0.0289		0.0060	mg/L		02-SEP-14	R2935954
Nitrite in Water by Colour							
Nitrite (as N)	0.0025		0.0020	mg/L		02-SEP-14	R2935954
Sulfate by IC (Low Level)							
Sulfate (SO4)	1.35		0.050	mg/L		30-AUG-14	R2939362
pH, Conductivity and Total Alkalinity							
pH	6.95		0.10	pH		01-SEP-14	R2934271
Conductivity (EC)	26.5		0.20	uS/cm		01-SEP-14	R2934271
Bicarbonate (HCO3)	12.3		5.0	mg/L		01-SEP-14	R2934271
Carbonate (CO3)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Hydroxide (OH)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Alkalinity, Total (as CaCO3)	10.1		2.0	mg/L		01-SEP-14	R2934271
L1510213-18 DUP 2							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Total ICPOES & HR-ICPMS in Water							
Hardness							
Hardness (as CaCO3)	56.1		1.3	mg/L		29-SEP-14	
Total Metals in Water by HR-ICPMS							
Aluminum (Al)-Total	0.0275		0.0030	mg/L		18-SEP-14	R2963254
Antimony (Sb)-Total	<0.000050	DLB	0.000050	mg/L		18-SEP-14	R2963254
Arsenic (As)-Total	0.000642		0.000050	mg/L		18-SEP-14	R2963254
Barium (Ba)-Total	0.0117		0.00010	mg/L		18-SEP-14	R2963254
Beryllium (Be)-Total	0.0000050		0.0000050	mg/L		18-SEP-14	R2963254
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L		18-SEP-14	R2963254
Boron (B)-Total	0.0258		0.0050	mg/L		18-SEP-14	R2963254
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		18-SEP-14	R2963254
Cesium (Cs)-Total	0.0000250		0.0000050	mg/L		18-SEP-14	R2963254
Chromium (Cr)-Total	<0.00050		0.00050	mg/L		18-SEP-14	R2963254
Cobalt (Co)-Total	0.000109		0.000050	mg/L		18-SEP-14	R2963254
Copper (Cu)-Total	0.00116		0.00050	mg/L		18-SEP-14	R2963254
Gallium (Ga)-Total	<0.000050		0.000050	mg/L		18-SEP-14	R2963254
Lead (Pb)-Total	<0.000050		0.000050	mg/L		18-SEP-14	R2963254
Lithium (Li)-Total	0.00105		0.00020	mg/L		18-SEP-14	R2963254
Manganese (Mn)-Total	0.0374		0.00020	mg/L		18-SEP-14	R2963254
Molybdenum (Mo)-Total	0.00109		0.000050	mg/L		18-SEP-14	R2963254
Nickel (Ni)-Total	0.00078		0.00020	mg/L		18-SEP-14	R2963254
Rhenium (Re)-Total	0.0000064		0.0000050	mg/L		18-SEP-14	R2963254
Rubidium (Rb)-Total	0.00988		0.000020	mg/L		18-SEP-14	R2963254
Selenium (Se)-Total	<0.00020		0.00020	mg/L		18-SEP-14	R2963254
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		18-SEP-14	R2963254

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-18 DUP 2							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Total Metals in Water by HR-ICPMS							
Strontium (Sr)-Total	0.170		0.000050	mg/L		18-SEP-14	R2963254
Tellurium (Te)-Total	<0.000010		0.000010	mg/L		18-SEP-14	R2963254
Thallium (Tl)-Total	0.0000028		0.0000020	mg/L		18-SEP-14	R2963254
Thorium (Th)-Total	0.0000206		0.0000050	mg/L		18-SEP-14	R2963254
Tin (Sn)-Total	<0.00020		0.00020	mg/L		18-SEP-14	R2963254
Titanium (Ti)-Total	0.00086		0.00020	mg/L		18-SEP-14	R2963254
Tungsten (W)-Total	0.000012		0.000010	mg/L		18-SEP-14	R2963254
Uranium (U)-Total	0.00157		0.0000020	mg/L		18-SEP-14	R2963254
Vanadium (V)-Total	0.000129		0.000050	mg/L		18-SEP-14	R2963254
Yttrium (Y)-Total	0.000100		0.0000050	mg/L		18-SEP-14	R2963254
Zinc (Zn)-Total	<0.0030		0.0030	mg/L		18-SEP-14	R2963254
Zirconium (Zr)-Total	0.000083		0.000050	mg/L		18-SEP-14	R2963254
Total Metals in Water by ICPOES							
Calcium (Ca)-Total	10.5		0.050	mg/L		19-SEP-14	R2953207
Iron (Fe)-Total	0.273		0.030	mg/L		19-SEP-14	R2953207
Magnesium (Mg)-Total	6.60		0.10	mg/L		19-SEP-14	R2953207
Phosphorus (P)-Total	<0.30		0.30	mg/L		19-SEP-14	R2953207
Potassium (K)-Total	3.8		2.0	mg/L		19-SEP-14	R2953207
Silicon (Si)-Total	0.998		0.050	mg/L		19-SEP-14	R2953207
Sodium (Na)-Total	5.2		2.0	mg/L		19-SEP-14	R2953207
Miscellaneous Parameters							
Ammonia, Total (as N)	0.0331		0.0050	mg/L		15-SEP-14	R2947433
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		13-SEP-14	R2946530
Total Organic Carbon	6.7		1.0	mg/L		17-SEP-14	R2948905
Phosphorus (P)-Total	0.0056		0.0010	mg/L		16-SEP-14	R2949323
Total Suspended Solids	<3.0		3.0	mg/L		02-SEP-14	R2936095
Turbidity	1.38		0.10	NTU		17-SEP-14	R2950911
Routine Water Analysis - Low Level							
Chloride by IC							
Chloride (Cl)	3.17		0.50	mg/L		30-AUG-14	R2939362
Dissolved Metals in Water by CRC ICPMS							
Calcium (Ca)-Dissolved	10.6		0.50	mg/L		15-SEP-14	R2947735
Magnesium (Mg)-Dissolved	7.22		0.10	mg/L		15-SEP-14	R2947735
Potassium (K)-Dissolved	4.11		0.10	mg/L		15-SEP-14	R2947735
Sodium (Na)-Dissolved	5.8		1.0	mg/L		15-SEP-14	R2947735
Fluoride by IC							
Fluoride (F)	0.059		0.020	mg/L		30-AUG-14	R2939362
Ion Balance Calculation							
Ion Balance	105			%		18-SEP-14	R2951830
TDS (Calculated)	73.5			mg/L		18-SEP-14	R2951830
Hardness (as CaCO3)	56.2			mg/L		18-SEP-14	R2951830
Nitrate in Water (Calculation)							
Nitrate (as N)	0.0481		0.0060	mg/L		10-SEP-14	
Nitrite & Nitrate in Water by Colour							
Nitrate and Nitrite (as N)	0.0540	RRV	0.0060	mg/L		05-SEP-14	R2939496
Nitrite in Water by Colour							
Nitrite (as N)	0.0059	RRV	0.0020	mg/L		02-SEP-14	R2935954
Sulfate by IC (Low Level)							
Sulfate (SO4)	7.64		0.050	mg/L		30-AUG-14	R2939362
pH, Conductivity and Total Alkalinity							
pH	7.78		0.10	pH		01-SEP-14	R2934271

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-18 DUP 2							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
pH, Conductivity and Total Alkalinity							
Conductivity (EC)	147		0.20	uS/cm		01-SEP-14	R2934271
Bicarbonate (HCO3)	70.4		5.0	mg/L		01-SEP-14	R2934271
Carbonate (CO3)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Hydroxide (OH)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Alkalinity, Total (as CaCO3)	57.7		2.0	mg/L		01-SEP-14	R2934271
L1510213-19 DUP 3							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
BTEX & F1-F4							
BTEX and F1 (C6-C10)							
Benzene	<0.00050		0.00050	mg/L		03-SEP-14	R2933137
Toluene	<0.00050		0.00050	mg/L		03-SEP-14	R2933137
Ethylbenzene	<0.00050		0.00050	mg/L		03-SEP-14	R2933137
o-Xylene	<0.00050		0.00050	mg/L		03-SEP-14	R2933137
m+p-Xylene	<0.00050		0.00050	mg/L		03-SEP-14	R2933137
F1(C6-C10)	<0.10		0.10	mg/L		03-SEP-14	R2933137
F1-BTEX	<0.10		0.10	mg/L		03-SEP-14	R2933137
Xylenes	<0.00071		0.00071	mg/L		03-SEP-14	R2933137
Surrogate: 1,4-Difluorobenzene (SS)	102.3		70-130	%		03-SEP-14	R2933137
Surrogate: 4-Bromofluorobenzene (SS)	86.4		70-130	%		03-SEP-14	R2933137
Surrogate: 3,4-Dichlorotoluene (SS)	103.3		70-130	%		03-SEP-14	R2933137
F2, F3, F4							
F2 (>C10-C16)	<0.25		0.25	mg/L	02-SEP-14	02-SEP-14	R2937325
F3 (C16-C34)	<0.25		0.25	mg/L	02-SEP-14	02-SEP-14	R2937325
F4 (C34-C50)	<0.25		0.25	mg/L	02-SEP-14	02-SEP-14	R2937325
Surrogate: 2-Bromobenzotrifluoride	99.8		50-150	%	02-SEP-14	02-SEP-14	R2937325
Total ICPOES & HR-ICPMS in Water							
Hardness							
Hardness (as CaCO3)	75.0		1.3	mg/L		29-SEP-14	
Total Metals in Water by HR-ICPMS							
Aluminum (Al)-Total	0.0998		0.0030	mg/L		18-SEP-14	R2963254
Antimony (Sb)-Total	0.000302		0.000010	mg/L		18-SEP-14	R2963254
Arsenic (As)-Total	0.000486		0.000050	mg/L		18-SEP-14	R2963254
Barium (Ba)-Total	0.0434		0.00010	mg/L		18-SEP-14	R2963254
Beryllium (Be)-Total	0.0000081		0.0000050	mg/L		18-SEP-14	R2963254
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L		18-SEP-14	R2963254
Boron (B)-Total	0.0463		0.0050	mg/L		18-SEP-14	R2963254
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		18-SEP-14	R2963254
Cesium (Cs)-Total	0.0000671		0.0000050	mg/L		18-SEP-14	R2963254
Chromium (Cr)-Total	<0.00050		0.00050	mg/L		18-SEP-14	R2963254
Cobalt (Co)-Total	0.000091		0.000050	mg/L		18-SEP-14	R2963254
Copper (Cu)-Total	0.00152		0.00050	mg/L		18-SEP-14	R2963254
Gallium (Ga)-Total	0.000056		0.000050	mg/L		18-SEP-14	R2963254
Lead (Pb)-Total	0.000242		0.000050	mg/L		18-SEP-14	R2963254
Lithium (Li)-Total	0.00340		0.00020	mg/L		18-SEP-14	R2963254
Manganese (Mn)-Total	0.00201		0.00020	mg/L		18-SEP-14	R2963254
Molybdenum (Mo)-Total	0.00754		0.000050	mg/L		18-SEP-14	R2963254
Nickel (Ni)-Total	0.00179		0.00020	mg/L		18-SEP-14	R2963254
Rhenium (Re)-Total	0.0000088		0.0000050	mg/L		18-SEP-14	R2963254
Rubidium (Rb)-Total	0.00911		0.000020	mg/L		18-SEP-14	R2963254
Selenium (Se)-Total	0.00031		0.00020	mg/L		18-SEP-14	R2963254

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-19 DUP 3							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Total Metals in Water by HR-ICPMS							
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		18-SEP-14	R2963254
Strontium (Sr)-Total	0.248		0.000050	mg/L		18-SEP-14	R2963254
Tellurium (Te)-Total	<0.000010		0.000010	mg/L		18-SEP-14	R2963254
Thallium (Tl)-Total	0.0000073		0.0000020	mg/L		18-SEP-14	R2963254
Thorium (Th)-Total	0.0000353		0.0000050	mg/L		18-SEP-14	R2963254
Tin (Sn)-Total	<0.00020		0.00020	mg/L		18-SEP-14	R2963254
Titanium (Ti)-Total	0.00301		0.00020	mg/L		18-SEP-14	R2963254
Tungsten (W)-Total	0.000526		0.000010	mg/L		18-SEP-14	R2963254
Uranium (U)-Total	0.122		0.0000020	mg/L		18-SEP-14	R2963254
Vanadium (V)-Total	0.000826		0.000050	mg/L		18-SEP-14	R2963254
Yttrium (Y)-Total	0.000216		0.0000050	mg/L		18-SEP-14	R2963254
Zinc (Zn)-Total	<0.0030		0.0030	mg/L		18-SEP-14	R2963254
Zirconium (Zr)-Total	0.000179		0.000050	mg/L		18-SEP-14	R2963254
Total Metals in Water by ICPOES							
Calcium (Ca)-Total	17.8		0.050	mg/L		19-SEP-14	R2953207
Iron (Fe)-Total	0.099		0.030	mg/L		19-SEP-14	R2953207
Magnesium (Mg)-Total	7.76		0.10	mg/L		19-SEP-14	R2953207
Phosphorus (P)-Total	<0.30		0.30	mg/L		19-SEP-14	R2953207
Potassium (K)-Total	3.6		2.0	mg/L		19-SEP-14	R2953207
Silicon (Si)-Total	2.37		0.050	mg/L		19-SEP-14	R2953207
Sodium (Na)-Total	7.1		2.0	mg/L		19-SEP-14	R2953207
Miscellaneous Parameters							
Ammonia, Total (as N)	0.0365		0.0050	mg/L		15-SEP-14	R2947433
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		13-SEP-14	R2946530
Total Organic Carbon	1.8		1.0	mg/L		17-SEP-14	R2948905
Phosphorus (P)-Total	0.0025		0.0010	mg/L		16-SEP-14	R2949323
Total Suspended Solids	<3.0		3.0	mg/L		02-SEP-14	R2936095
Turbidity	2.74		0.10	NTU		17-SEP-14	R2950911
Routine Water Analysis - Low Level							
Chloride by IC							
Chloride (Cl)	6.03		0.50	mg/L		30-AUG-14	R2939362
Dissolved Metals in Water by CRC ICPMS							
Calcium (Ca)-Dissolved	17.5		0.50	mg/L		15-SEP-14	R2947735
Magnesium (Mg)-Dissolved	7.58		0.10	mg/L		15-SEP-14	R2947735
Potassium (K)-Dissolved	3.37		0.10	mg/L		15-SEP-14	R2947735
Sodium (Na)-Dissolved	7.1		1.0	mg/L		15-SEP-14	R2947735
Fluoride by IC							
Fluoride (F)	0.067		0.020	mg/L		30-AUG-14	R2939362
Ion Balance Calculation							
Ion Balance	102			%		18-SEP-14	R2951830
TDS (Calculated)	117			mg/L		18-SEP-14	R2951830
Hardness (as CaCO3)	74.9			mg/L		18-SEP-14	R2951830
Nitrate in Water (Calculation)							
Nitrate (as N)	8.95		0.0060	mg/L		03-SEP-14	
Nitrite & Nitrate in Water by Colour							
Nitrate and Nitrite (as N)	8.99		0.0060	mg/L		02-SEP-14	R2935954
Nitrite in Water by Colour							
Nitrite (as N)	0.0384		0.0020	mg/L		02-SEP-14	R2935954
Sulfate by IC (Low Level)							
Sulfate (SO4)	9.86		0.050	mg/L		30-AUG-14	R2939362
pH, Conductivity and Total Alkalinity							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-19 DUP 3							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
pH, Conductivity and Total Alkalinity							
pH	7.71		0.10	pH		01-SEP-14	R2934271
Conductivity (EC)	209		0.20	uS/cm		01-SEP-14	R2934271
Bicarbonate (HCO3)	51.4		5.0	mg/L		01-SEP-14	R2934271
Carbonate (CO3)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Hydroxide (OH)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Alkalinity, Total (as CaCO3)	42.1		2.0	mg/L		01-SEP-14	R2934271
L1510213-20 FIELD BLANK							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Total ICPOES & HR-ICPMS in Water							
Hardness							
Hardness (as CaCO3)	<1.3		1.3	mg/L		01-OCT-14	
Total Metals by ICPOES (Undigested)							
Calcium (Ca)-Total	<0.030		0.030	mg/L		17-SEP-14	R2952008
Iron (Fe)-Total	<0.010		0.010	mg/L		17-SEP-14	R2952008
Magnesium (Mg)-Total	<0.030		0.030	mg/L		17-SEP-14	R2952008
Phosphorus (P)-Total	<0.050		0.050	mg/L		17-SEP-14	R2952008
Potassium (K)-Total	<0.050		0.050	mg/L		17-SEP-14	R2952008
Silicon (Si)-Total	<0.050		0.050	mg/L		17-SEP-14	R2952008
Sodium (Na)-Total	<0.20		0.20	mg/L		17-SEP-14	R2952008
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		15-SEP-14	R2947433
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		13-SEP-14	R2946530
Total Organic Carbon	<1.0		1.0	mg/L		17-SEP-14	R2948905
Phosphorus (P)-Total	<0.0010		0.0010	mg/L		16-SEP-14	R2949323
Total Suspended Solids	<3.0		3.0	mg/L		02-SEP-14	R2936095
Turbidity	<0.10		0.10	NTU		17-SEP-14	R2950911
Total Metals in Water by HR-ICPMS(Ultra)							
Aluminum (Al)-Total	<0.00020		0.00020	mg/L		22-SEP-14	R2957868
Antimony (Sb)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Arsenic (As)-Total	<0.000020		0.000020	mg/L		12-SEP-14	R2956094
Barium (Ba)-Total	<0.000020		0.000020	mg/L		22-SEP-14	R2957868
Beryllium (Be)-Total	<0.0000020		0.0000020	mg/L		12-SEP-14	R2956094
Bismuth (Bi)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2956094
Boron (B)-Total	<0.0050		0.0050	mg/L		12-SEP-14	R2956094
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Cesium (Cs)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Chromium (Cr)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2956094
Cobalt (Co)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Copper (Cu)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2956094
Gallium (Ga)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2956094
Lead (Pb)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Lithium (Li)-Total	<0.00020		0.00020	mg/L		12-SEP-14	R2956094
Manganese (Mn)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Molybdenum (Mo)-Total	<0.000010		0.000010	mg/L		22-SEP-14	R2957868
Nickel (Ni)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2956094
Rhenium (Re)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Rubidium (Rb)-Total	<0.0000050		0.0000050	mg/L		22-SEP-14	R2957868
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-14	R2956094
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Strontium (Sr)-Total	<0.000010		0.000010	mg/L		30-SEP-14	R2967290

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-20 FIELD BLANK							
Sampled By: CLIENT on 26-AUG-14 @ 12:00							
Matrix: Water							
Total Metals in Water by HR-ICPMS(Ultra)							
Tellurium (Te)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Thallium (Tl)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2956094
Thorium (Th)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Tin (Sn)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Titanium (Ti)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2956094
Tungsten (W)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Uranium (U)-Total	<0.0000010		0.0000010	mg/L		22-SEP-14	R2957868
Vanadium (V)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Yttrium (Y)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2956094
Zinc (Zn)-Total	0.00019	RRV	0.00010	mg/L		22-SEP-14	R2957868
Zirconium (Zr)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2956094
Routine Water Analysis - Low Level							
Chloride by IC							
Chloride (Cl)	<0.50		0.50	mg/L		30-AUG-14	R2939362
Dissolved Metals in Water by CRC ICPMS							
Calcium (Ca)-Dissolved	<0.50		0.50	mg/L		15-SEP-14	R2947735
Magnesium (Mg)-Dissolved	<0.10		0.10	mg/L		15-SEP-14	R2947735
Potassium (K)-Dissolved	<0.10		0.10	mg/L		15-SEP-14	R2947735
Sodium (Na)-Dissolved	<1.0		1.0	mg/L		15-SEP-14	R2947735
Fluoride by IC							
Fluoride (F)	<0.020		0.020	mg/L		30-AUG-14	R2939362
Ion Balance Calculation							
Ion Balance	Low TDS			%		18-SEP-14	R2951830
TDS (Calculated)	<1.0			mg/L		18-SEP-14	R2951830
Hardness (as CaCO3)	<1.0			mg/L		18-SEP-14	R2951830
Nitrate in Water (Calculation)							
Nitrate (as N)	<0.0060		0.0060	mg/L		03-SEP-14	
Nitrite & Nitrate in Water by Colour							
Nitrate and Nitrite (as N)	<0.0060		0.0060	mg/L		02-SEP-14	R2935954
Nitrite in Water by Colour							
Nitrite (as N)	<0.0020		0.0020	mg/L		02-SEP-14	R2935954
Sulfate by IC (Low Level)							
Sulfate (SO4)	<0.050		0.050	mg/L		06-SEP-14	R2942215
pH, Conductivity and Total Alkalinity							
pH	5.36		0.10	pH		01-SEP-14	R2934271
Conductivity (EC)	1.37		0.20	uS/cm		01-SEP-14	R2934271
Bicarbonate (HCO3)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Carbonate (CO3)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Hydroxide (OH)	<5.0		5.0	mg/L		01-SEP-14	R2934271
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		01-SEP-14	R2934271
L1510213-21 FIELD BLANK							
Sampled By: CLIENT on 27-AUG-14 @ 12:00							
Matrix: Water							
BTEX & F1-F4							
BTEX and F1 (C6-C10)							
Benzene	<0.00050		0.00050	mg/L		03-SEP-14	R2933137
Toluene	<0.00050		0.00050	mg/L		03-SEP-14	R2933137
Ethylbenzene	<0.00050		0.00050	mg/L		03-SEP-14	R2933137
o-Xylene	<0.00050		0.00050	mg/L		03-SEP-14	R2933137
m+p-Xylene	<0.00050		0.00050	mg/L		03-SEP-14	R2933137
F1(C6-C10)	<0.10		0.10	mg/L		03-SEP-14	R2933137

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510213-21 FIELD BLANK							
Sampled By: CLIENT on 27-AUG-14 @ 12:00							
Matrix: Water							
BTEX and F1 (C6-C10)							
F1-BTEX	<0.10		0.10	mg/L		03-SEP-14	R2933137
Xylenes	<0.00071		0.00071	mg/L		03-SEP-14	R2933137
Surrogate: 1,4-Difluorobenzene (SS)	103.8		70-130	%		03-SEP-14	R2933137
Surrogate: 4-Bromofluorobenzene (SS)	84.7		70-130	%		03-SEP-14	R2933137
Surrogate: 3,4-Dichlorotoluene (SS)	99.0		70-130	%		03-SEP-14	R2933137
F2, F3, F4							
F2 (>C10-C16)	<0.25		0.25	mg/L	02-SEP-14	02-SEP-14	R2937325
F3 (C16-C34)	<0.25		0.25	mg/L	02-SEP-14	02-SEP-14	R2937325
F4 (C34-C50)	<0.25		0.25	mg/L	02-SEP-14	02-SEP-14	R2937325
Surrogate: 2-Bromobenzotrifluoride	99.3		50-150	%	02-SEP-14	02-SEP-14	R2937325

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLB	Detection Limit was raised due to detection of analyte at comparable level in Method Blank.
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BTX,F1-ED	Water	BTEX and F1 (C6-C10)	EPA 5021/8015&8260 GC-MS & FID
C-TOT-ORG-ED	Water	Total Organic Carbon	APHA 5310 B-Instrumental
CL-IC-ED	Water	Chloride by IC	APHA 4110 B-ION CHROMATOGRAPHY
F-IC-ED	Water	Fluoride by IC	APHA 4110 B-ION CHROMATOGRAPHY
F2,F3,F4-ED	Water	F2, F3, F4	EPA 3510/CCME PHC CWS-GC-FID
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-T-L-CVAA-ED	Water	Mercury (Hg)	EPA 245.7 / EPA 245.1
IONBALANCE-ED	Water	Ion Balance Calculation	APHA 1030E
MET-D-CCMS-ED	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030 B&E / EPA SW-846 6020A
MET-T-L-HRMS-VA	Water	Total Metals in Water by HR-ICPMS	EPA 200.8

Trace metals in water are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) modified from US EPA Method 200.8, (Revision 5.5). The procedures may involve preliminary sample treatment by acid digestion modified from APHA Method 3030E.

MET-T-NP-U-HRMS-VA	Water	Total Metals in Water by HR-ICPMS(Ultra)	EPA 200.8

Ultra trace metals in water are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS), modified from US EPA 200.8, (Revision 5.5). The detection limits provided can only be met for undigested samples. This procedure is intended for colorless, non-turbid, acid-preserved water samples (i.e. pristine water samples), having turbidity < 1 NTU and no odor. Where turbidity exceeds 1 NTU, and/or the sample is colored and has an odor, results may be biased low compared to true Total Metals concentrations. ALS recommends that turbidity analysis be requested on samples submitted for this test to aid with interpretation of results.
Where turbidity is <1NTU, undigested metals are equivalent to total metals concentrations.

MET-T-NP-U-ICP-VA	Water	Total Metals by ICPOES (Undigested)	EPA SW-846 6010B

Ultra trace metals in water are analyzed by ICPOES, based on US EPA Method 6010B. The detection limits provided can only be met for undigested samples. This procedure is intended for colorless, non-turbid, acid-preserved water samples (i.e. pristine water samples), having turbidity < 1 NTU and no odor. Where turbidity exceeds 1 NTU, and/or the sample is colored and has an odor, results may be biased low compared to true Total Metals concentrations. ALS recommends that turbidity analysis be requested on samples submitted for this test to aid with interpretation of results.
Where turbidity is <1NTU, undigested metals are equivalent to total metals concentrations.

MET-TOT-ICP-VA	Water	Total Metals in Water by ICPOES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

NH3-L-CFA-ED	Water	Ammonia in Water by Colour	APHA 4500 NH3-NITROGEN (AMMONIA)

This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the automated phenate colourimetric method.

NO2+NO3-L-CFA-ED	Water	Nitrite & Nitrate in Water by Colour	APHA 4500 NO3-F

This analysis is carried out using procedures adapted from APHA Method 4500 NO3-F "Automated Cadmium Reduction Method".

NO2-L-CFA-ED	Water	Nitrite in Water by Colour	APHA 4500 NO2-A and NO3-F

This analysis is carried out using procedures adapted from APHA Method 4500 NO3-F "Automated Cadmium Reduction Method", omitting the Cu-Cd reduction step to be selective for nitrite.

NO3-L-CALC-ED	Water	Nitrate in Water (Calculation)	APHA 4500 NO3-F

Nitrate (as N) is a calculated parameter. Nitrate (as N) = [Nitrate and Nitrite (as N)] - Nitrite (as N).

P-T-L-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH/EC/ALK-ED	Water	pH, Conductivity and Total Alkalinity	APHA 4500-H, 2510, 2320
All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed)			
SO4-L-IC-ED	Water	Sulfate by IC (Low Level)	APHA 4110 B-ION CHROMATOGRAPHY
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
TURBIDITY-ED	Water	Turbidity	APHA 2130 B-Nephelometer

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

1 2

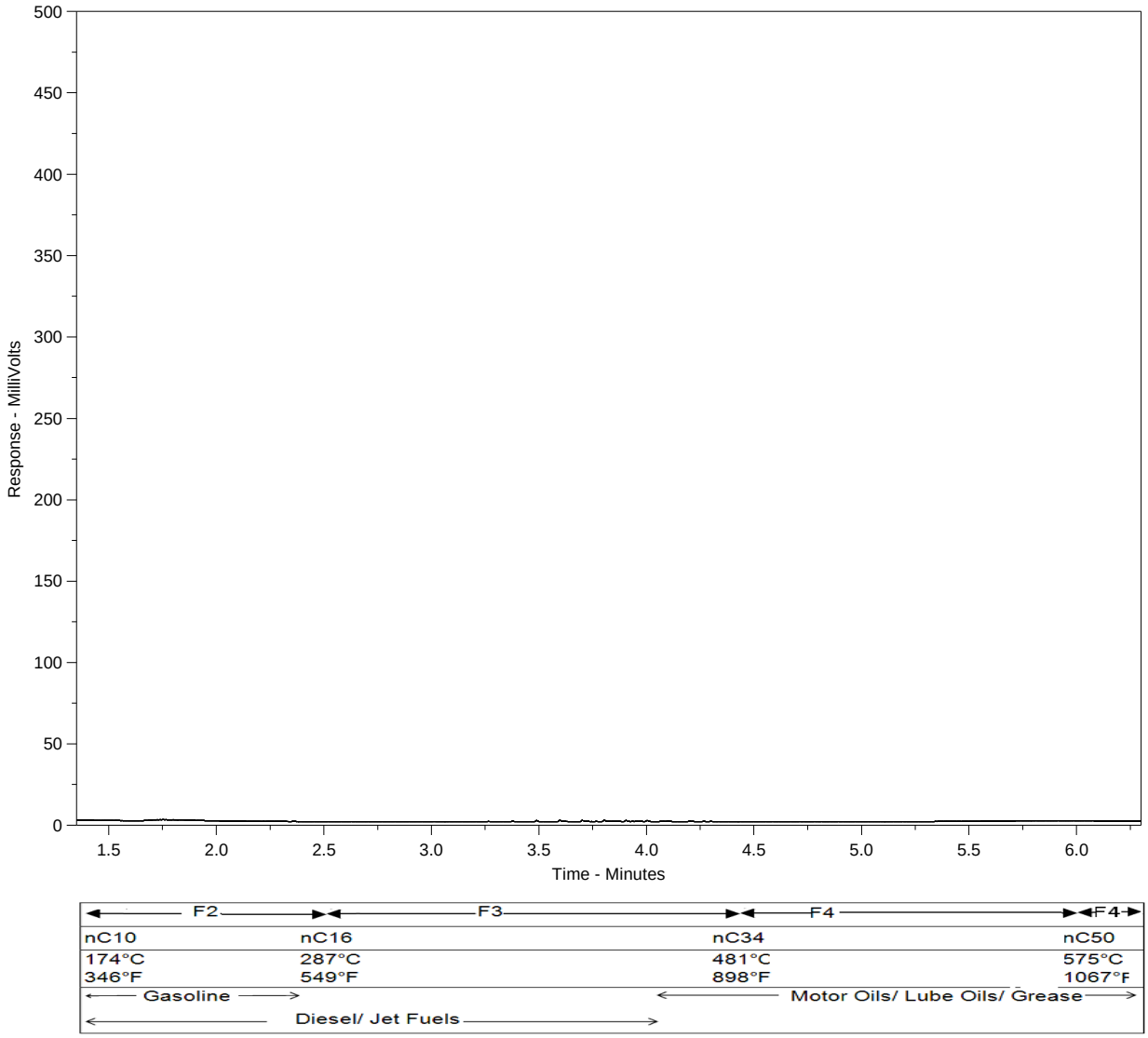
GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Hydrocarbon Distribution Report

ALS Sample ID: L1510213-9
Client ID: SWQ-02



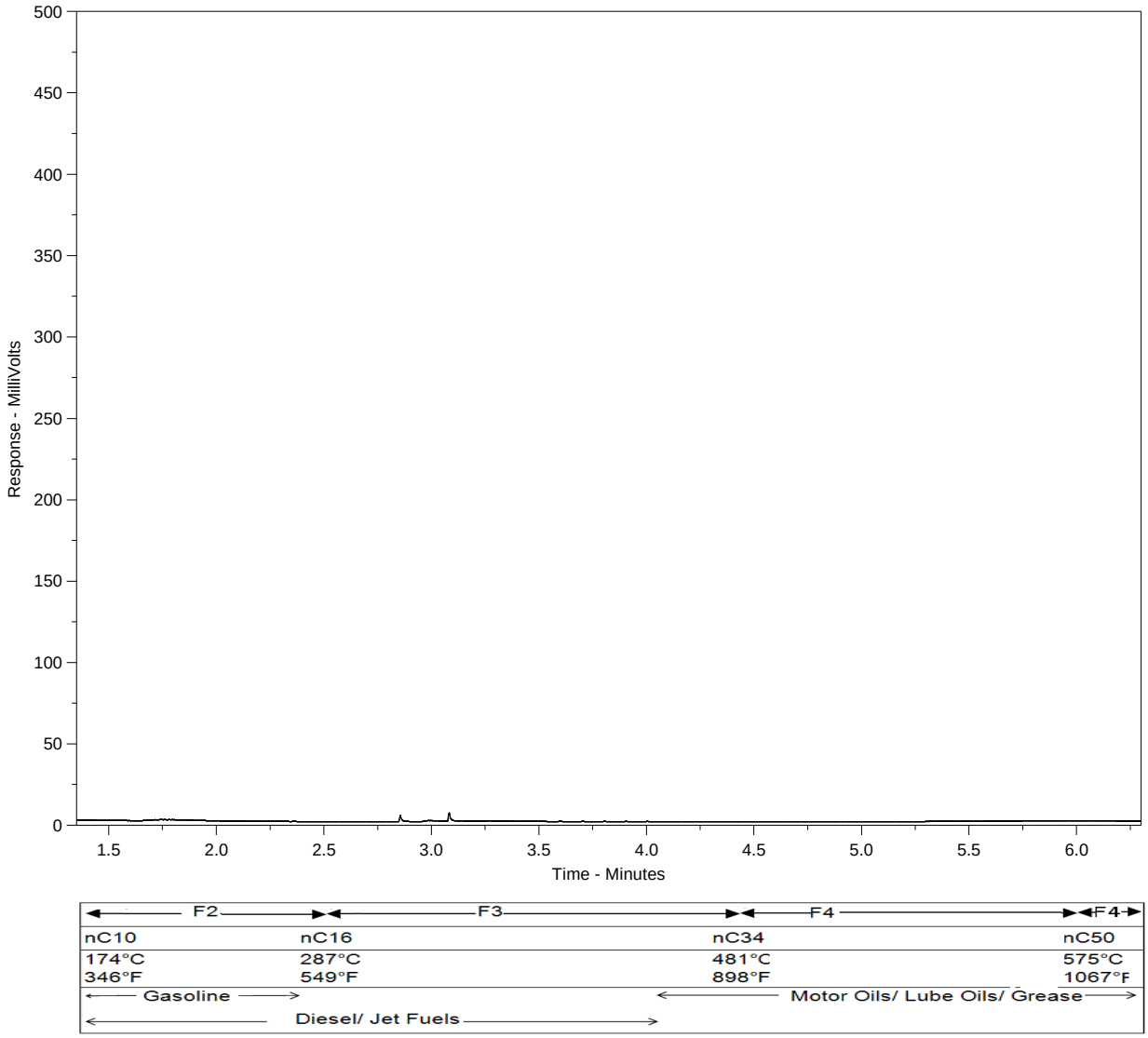
The Canada Wide Standard Hydrocarbon Distribution Report is intended to assist you in characterizing hydrocarbon products that may be present in your sample. The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products as well as a number of specified n-alkane hydrocarbon marker compounds. Comparison of this report with those of reference standards may also assist in characterizing hydrocarbons present in the sample.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note:
This chromatogram was produced with a high temperature GC method that is specific to the Canada-Wide Standard method. Note that retention times and distribution profiles from reports produced using different GC programs will differ.

Hydrocarbon Distribution Report

ALS Sample ID: **L1510213-19**
Client ID: **DUP 3**



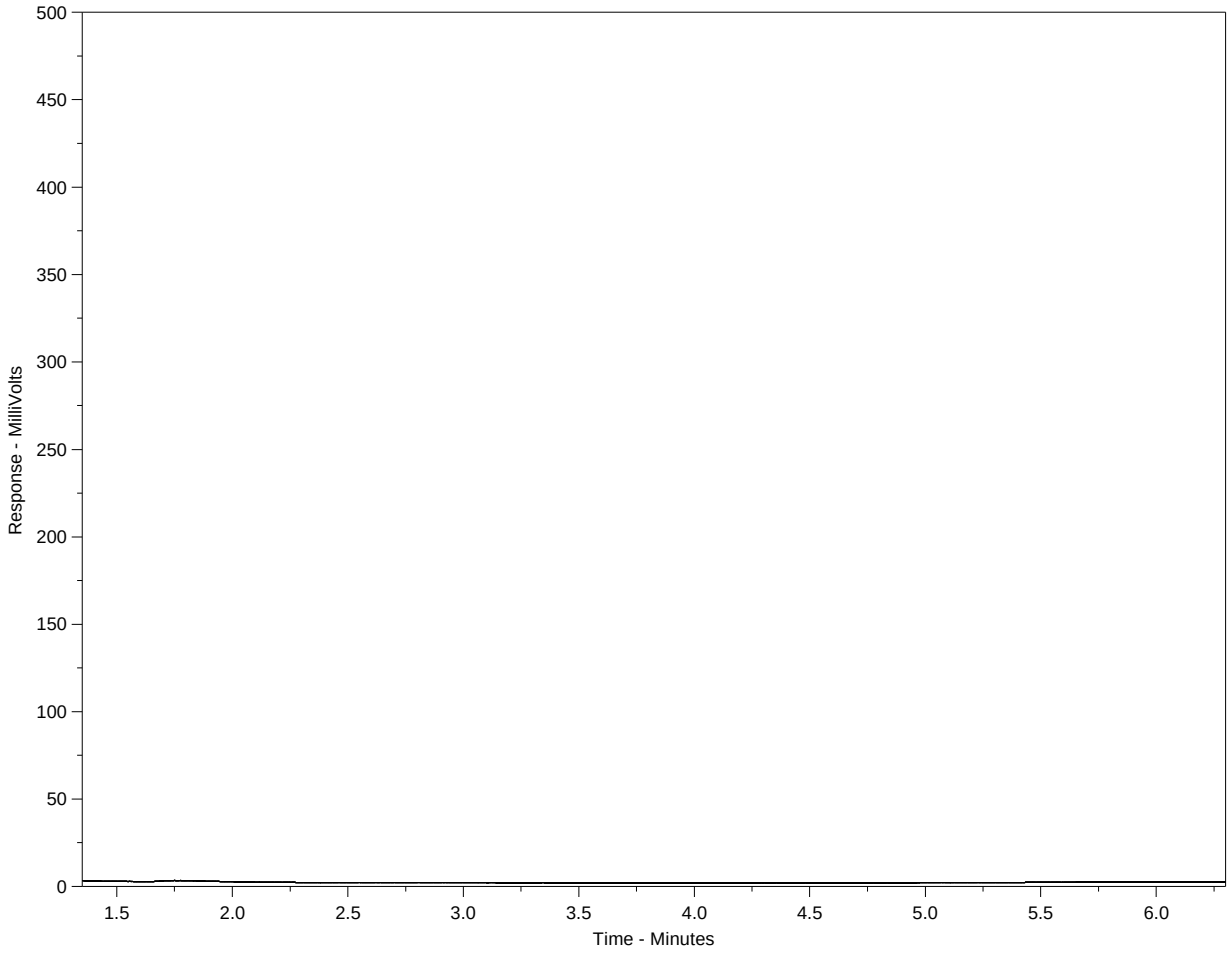
The Canada Wide Standard Hydrocarbon Distribution Report is intended to assist you in characterizing hydrocarbon products that may be present in your sample. The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products as well as a number of specified n-alkane hydrocarbon marker compounds. Comparison of this report with those of reference standards may also assist in characterizing hydrocarbons present in the sample.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note:
This chromatogram was produced with a high temperature GC method that is specific to the Canada-Wide Standard method. Note that retention times and distribution profiles from reports produced using different GC programs will differ.

Hydrocarbon Distribution Report

ALS Sample ID: L1510213-21
Client ID: FIELD BLANK



The Canada Wide Standard Hydrocarbon Distribution Report is intended to assist you in characterizing hydrocarbon products that may be present in your sample. The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products as well as a number of specified n-alkane hydrocarbon marker compounds. Comparison of this report with those of reference standards may also assist in characterizing hydrocarbons present in the sample.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note:
This chromatogram was produced with a high temperature GC method that is specific to the Canada-Wide Standard method. Note that retention times and distribution profiles from reports produced using different GC programs will differ.

10- 365090

ALS Environmental

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Report To		Report Format / Distribution		Service Request (Rush subject to availability - Contact ALS to confirm TAT)
Company:	Tetra Tech EBA	Standard: ✓	Other (specify):	✓ Regular (Standard Turnaround Times - Business Days)
Contact:	Karla Langlois	Select: PDF ✓	Excel ✓ Digital Fax	Priority(2-4 Business Days)-50% surcharge - Contact ALS to confirm TAT
Address:	Suite 201, 4911C-49 st PO Box 2244 Yellowknife, NT	Email 1:	klanglois@eba.ca	Emergency (1-2 Business Days)-100% Surcharge - Contact ALS to confirm TAT
Phone:	920-2287 Fax:	Email 2:		Same Day or Weekend Emergency - Contact ALS to confirm TAT
Invoice To	Same as Report ? (circle) (Yes) or No (if No, provide details)	**Client / Project Information**		**Analysis Request**
	Copy of Invoice with Report? (circle) Yes or No	Job #:	4141033302	(Indicate Filtered or Preserved, F/P)
Company:		PO / AFE:		
Contact:		LSD:	Jericho	
Address:				
Phone:	Fax:	Quote #:	Q46875	
Lab Work Order # (lab use only)	L1510213	**ALS Contact:**	**Sampler:**	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Metals ultra low	Total Mercury ultra low	Routine	Nutrients	BTEX, F1-F2	F3-F4	# of containers
	JER-AEM-22 ✓	25-08-14		Water	✓	✓	✓	✓			4
	JER-AEM-23 ✓	"									4
	JER-AEM-24 ✓	"									4
	JER-AEM-26 ✓	26-08-14									4
	JER-AEM-27 ✓	"									4
	SWQ-04 ✓	"									4
	JER-AEM-09 ✓	"									4
	SWQ-07 ✓	"									4
	SWQ-02 ✓	"									4
	JER-AEM-10 ✓	"									4
	JER-AEM-12 ✓	"									4
	2014-CL-51 ✓	27-08-14									4

L1510213-COFC

Special Instructions / Regulation with water or land use (CCME- Freshwater Aquatic Life/BC CSR-Commercial/AB Tier 1-Natural/ETC) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations Yes / No ? If Yes add SIF
Karla Langlois	29-08-14	8:00am	MT	Aug 29/14	11:00am	°C				

5:2 max 5:2 max 5:3 max

10- 365200

ALS Environmental

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Report To		Report Format / Distribution		Service Request: (Rush subject to availability - Contact ALS to confirm TAT)
Company:	Tetra Tech EBA	Standard: ✓	Other (specify):	Regular (Standard Turnaround Times - Business Days)
Contact:	Karla Langlois	Select: PDF ✓	Excel ✓ Digital Fax	Priority(2-4 Business Days)-50% surcharge - Contact ALS to confirm TAT
Address:		Email 1:	klanglois@eba.ca	Emergency (1-2 Business Days)-100% Surcharge - Contact ALS to confirm TAT
		Email 2:		Same Day or Weekend Emergency - Contact ALS to confirm TAT
Phone:	Fax:			
Invoice To	Same as Report ? (circle) Yes or No (if No, provide details)	**Client / Project Information**		**Analysis Request**
	Copy of Invoice with Report? (circle) Yes or No	Job #:	4141032.02	(Indicate Filtered or Preserved, F/P)
Company:		PO / AFE:		
Contact:		LSD:	Jericho	
Address:				
Phone:	Fax:	Quote #:	Q41875	
Lab Work Order # (lab use only)	L1510213	**ALS Contact:**	**Sampler:**	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Metals (filtered)	Total Mercury (filtered)	Routine	Nutrients	BTEX & F1-F2	F3-F4	Number of Containers
	~~Ger~~ 2014-CL-S2 ✓	27-08-14		Water	✓	✓	✓	✓			7
	JER-AEM-13 ✓	26-08-14									
	JER-AEM-14 ✓	"									
	JER-AEM-04 ✓	"									
	Dup1 ✓	25-08-14									
	Dup2 ✓	26-08-14									
	Dup3 ✓	"							✓	✓	
	Field Blank ✓	"									
	Field Blank ✓	27-08-14							✓	✓	5

L1510213-COFC

Special Instructions / Regulation with water or land use (CCME- Freshwater Aquatic Life/BC CSR-Commercial/AB Tier 1-Natural/ETC) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
			IMT	Aug 29/14	11:00 am	°C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

GENF 18.01 Front

5.0 max 4.2 ans | 5.2 max 4.6 ans | 3.3 max 1.6 ans

Tetra Tech EBA Inc.
ATTN: Karla Langlois
PO Box 2244 STN M
201- 4916 49 Street
Yellowknife NT X1A 2P7

Date Received: 01-SEP-14
Report Date: 20-SEP-14 16:18 (MT)
Version: FINAL

Client Phone: 867-766-3728

Certificate of Analysis

Lab Work Order #: L1510812

Project P.O. #:	NOT SUBMITTED
Job Reference:	Y14103202
C of C Numbers:	10-365201
Legal Site Desc:	Jericho

Rick Zolkiewski
General Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510812-1 JER-AEM-11							
Sampled By: CLIENT on 29-AUG-14 @ 12:00							
Matrix: Water							
Total ICPOES & HR-ICPMS in Water							
Hardness							
Hardness (as CaCO3)	6.7		1.3	mg/L		19-SEP-14	
Total Metals by ICPOES (Undigested)							
Calcium (Ca)-Total	1.47		0.030	mg/L		17-SEP-14	R2952008
Iron (Fe)-Total	0.016		0.010	mg/L		17-SEP-14	R2952008
Magnesium (Mg)-Total	0.783		0.030	mg/L		17-SEP-14	R2952008
Phosphorus (P)-Total	<0.050		0.050	mg/L		17-SEP-14	R2952008
Potassium (K)-Total	0.322		0.050	mg/L		17-SEP-14	R2952008
Silicon (Si)-Total	0.242		0.050	mg/L		17-SEP-14	R2952008
Sodium (Na)-Total	0.60		0.20	mg/L		17-SEP-14	R2952008
Miscellaneous Parameters							
Ammonia, Total (as N)	0.0118		0.0050	mg/L		15-SEP-14	R2947433
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		13-SEP-14	R2946530
Total Organic Carbon	3.7		1.0	mg/L		17-SEP-14	R2951370
Phosphorus (P)-Total	0.0025		0.0010	mg/L		16-SEP-14	R2949323
Total Suspended Solids	<3.0		3.0	mg/L		05-SEP-14	R2939649
Turbidity	0.40		0.10	NTU		17-SEP-14	R2950911
Total Metals in Water by HR-ICPMS(Ultra)							
Aluminum (Al)-Total	0.0132		0.00020	mg/L		12-SEP-14	R2950811
Antimony (Sb)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Arsenic (As)-Total	0.000205		0.000020	mg/L		12-SEP-14	R2950811
Barium (Ba)-Total	0.00160		0.000020	mg/L		12-SEP-14	R2950811
Beryllium (Be)-Total	0.0000020		0.0000020	mg/L		12-SEP-14	R2950811
Bismuth (Bi)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2950811
Boron (B)-Total	<0.0050		0.0050	mg/L		12-SEP-14	R2950811
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Cesium (Cs)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Chromium (Cr)-Total	0.000098		0.000050	mg/L		12-SEP-14	R2950811
Cobalt (Co)-Total	0.0000162		0.0000050	mg/L		12-SEP-14	R2950811
Copper (Cu)-Total	0.00107		0.000050	mg/L		12-SEP-14	R2950811
Gallium (Ga)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2950811
Lead (Pb)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Lithium (Li)-Total	0.00045		0.00020	mg/L		12-SEP-14	R2950811
Manganese (Mn)-Total	0.00187		0.0000050	mg/L		12-SEP-14	R2950811
Molybdenum (Mo)-Total	0.000023		0.000010	mg/L		12-SEP-14	R2950811
Nickel (Ni)-Total	0.000343		0.000050	mg/L		12-SEP-14	R2950811
Rhenium (Re)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Rubidium (Rb)-Total	0.000780		0.0000050	mg/L		12-SEP-14	R2950811
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-14	R2950811
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Strontium (Sr)-Total	0.00542		0.000010	mg/L		12-SEP-14	R2950811
Tellurium (Te)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2950811
Thallium (Tl)-Total	<0.0000010		0.0000010	mg/L		17-SEP-14	R2952628
Thorium (Th)-Total	0.0000101		0.0000050	mg/L		12-SEP-14	R2950811
Tin (Sn)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2950811
Titanium (Ti)-Total	0.000198		0.000050	mg/L		12-SEP-14	R2950811
Tungsten (W)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2950811
Uranium (U)-Total	0.000185		0.0000010	mg/L		12-SEP-14	R2950811
Vanadium (V)-Total	0.000040		0.000010	mg/L		12-SEP-14	R2950811
Yttrium (Y)-Total	0.0000678		0.0000050	mg/L		12-SEP-14	R2950811
Zinc (Zn)-Total	0.00066		0.00010	mg/L		12-SEP-14	R2950811

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510812-1 JER-AEM-11							
Sampled By: CLIENT on 29-AUG-14 @ 12:00							
Matrix: Water							
Total Metals in Water by HR-ICPMS(Ultra)							
Zirconium (Zr)-Total	0.000020		0.000010	mg/L		12-SEP-14	R2950811
Routine Water Analysis - Low Level							
Chloride by IC							
Chloride (Cl)	<0.50		0.50	mg/L		02-SEP-14	R2936312
Dissolved Metals in Water by CRC ICPMS							
Calcium (Ca)-Dissolved	1.46		0.50	mg/L		16-SEP-14	R2949207
Magnesium (Mg)-Dissolved	0.73		0.10	mg/L		16-SEP-14	R2949207
Potassium (K)-Dissolved	0.33		0.10	mg/L		16-SEP-14	R2949207
Sodium (Na)-Dissolved	<1.0		1.0	mg/L		16-SEP-14	R2949207
Fluoride by IC							
Fluoride (F)	<0.020		0.020	mg/L		02-SEP-14	R2936312
Ion Balance Calculation							
Ion Balance	Low EC			%		19-SEP-14	
TDS (Calculated)	7.3			mg/L		19-SEP-14	
Hardness (as CaCO3)	6.7			mg/L		19-SEP-14	
Nitrate in Water (Calculation)							
Nitrate (as N)	0.0077		0.0060	mg/L		04-SEP-14	
Nitrite & Nitrate in Water by Colour							
Nitrate and Nitrite (as N)	0.0101		0.0060	mg/L		03-SEP-14	R2937669
Nitrite in Water by Colour							
Nitrite (as N)	0.0024		0.0020	mg/L		03-SEP-14	R2937669
Sulfate by IC (Low Level)							
Sulfate (SO4)	1.23		0.050	mg/L		02-SEP-14	R2936312
pH, Conductivity and Total Alkalinity							
pH	6.71		0.10	pH		02-SEP-14	R2934871
Conductivity (EC)	17.9		0.20	uS/cm		02-SEP-14	R2934871
Bicarbonate (HCO3)	7.1		5.0	mg/L		02-SEP-14	R2934871
Carbonate (CO3)	<5.0		5.0	mg/L		02-SEP-14	R2934871
Hydroxide (OH)	<5.0		5.0	mg/L		02-SEP-14	R2934871
Alkalinity, Total (as CaCO3)	5.9		2.0	mg/L		02-SEP-14	R2934871
L1510812-2 JER-AEM-15-S							
Sampled By: CLIENT on 29-AUG-14 @ 12:00							
Matrix: Water							
Total ICPOES & HR-ICPMS in Water							
Hardness							
Hardness (as CaCO3)	6.6		1.3	mg/L		19-SEP-14	
Total Metals by ICPOES (Undigested)							
Calcium (Ca)-Total	1.45		0.030	mg/L		17-SEP-14	R2952008
Iron (Fe)-Total	0.014		0.010	mg/L		17-SEP-14	R2952008
Magnesium (Mg)-Total	0.771		0.030	mg/L		17-SEP-14	R2952008
Phosphorus (P)-Total	<0.050		0.050	mg/L		17-SEP-14	R2952008
Potassium (K)-Total	0.341		0.050	mg/L		17-SEP-14	R2952008
Silicon (Si)-Total	0.235		0.050	mg/L		17-SEP-14	R2952008
Sodium (Na)-Total	0.59		0.20	mg/L		17-SEP-14	R2952008
Miscellaneous Parameters							
Ammonia, Total (as N)	0.0137		0.0050	mg/L		15-SEP-14	R2947433
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		13-SEP-14	R2946530
Total Organic Carbon	4.0		1.0	mg/L		17-SEP-14	R2951370
Phosphorus (P)-Total	0.0026		0.0010	mg/L		16-SEP-14	R2949323
Total Suspended Solids	<3.0		3.0	mg/L		05-SEP-14	R2939649
Turbidity	0.44		0.10	NTU		17-SEP-14	R2950911

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510812-2 JER-AEM-15-S							
Sampled By: CLIENT on 29-AUG-14 @ 12:00							
Matrix: Water							
Total Metals in Water by HR-ICPMS(Ultra)							
Aluminum (Al)-Total	0.0125		0.00020	mg/L		12-SEP-14	R2950811
Antimony (Sb)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Arsenic (As)-Total	0.000187		0.000020	mg/L		12-SEP-14	R2950811
Barium (Ba)-Total	0.00154		0.000020	mg/L		12-SEP-14	R2950811
Beryllium (Be)-Total	<0.0000020		0.0000020	mg/L		12-SEP-14	R2950811
Bismuth (Bi)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2950811
Boron (B)-Total	<0.0050		0.0050	mg/L		12-SEP-14	R2950811
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Cesium (Cs)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Chromium (Cr)-Total	0.000057		0.000050	mg/L		12-SEP-14	R2950811
Cobalt (Co)-Total	0.0000172		0.0000050	mg/L		12-SEP-14	R2950811
Copper (Cu)-Total	0.00104		0.000050	mg/L		12-SEP-14	R2950811
Gallium (Ga)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2950811
Lead (Pb)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Lithium (Li)-Total	0.00043		0.00020	mg/L		12-SEP-14	R2950811
Manganese (Mn)-Total	0.00181		0.0000050	mg/L		12-SEP-14	R2950811
Molybdenum (Mo)-Total	0.000021		0.000010	mg/L		12-SEP-14	R2950811
Nickel (Ni)-Total	0.000330		0.000050	mg/L		12-SEP-14	R2950811
Rhenium (Re)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Rubidium (Rb)-Total	0.000794		0.0000050	mg/L		12-SEP-14	R2950811
Selenium (Se)-Total	0.000041		0.000040	mg/L		12-SEP-14	R2950811
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Strontium (Sr)-Total	0.00537		0.000010	mg/L		12-SEP-14	R2950811
Tellurium (Te)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2950811
Thallium (Tl)-Total	<0.0000010		0.0000010	mg/L		17-SEP-14	R2952628
Thorium (Th)-Total	0.0000106		0.0000050	mg/L		12-SEP-14	R2950811
Tin (Sn)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2950811
Titanium (Ti)-Total	0.000193		0.000050	mg/L		12-SEP-14	R2950811
Tungsten (W)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2950811
Uranium (U)-Total	0.000185		0.0000010	mg/L		12-SEP-14	R2950811
Vanadium (V)-Total	0.000042		0.000010	mg/L		12-SEP-14	R2950811
Yttrium (Y)-Total	0.0000666		0.0000050	mg/L		12-SEP-14	R2950811
Zinc (Zn)-Total	0.00033		0.00010	mg/L		12-SEP-14	R2950811
Zirconium (Zr)-Total	0.000019		0.000010	mg/L		12-SEP-14	R2950811
Routine Water Analysis - Low Level							
Chloride by IC							
Chloride (Cl)	<0.50		0.50	mg/L		02-SEP-14	R2936312
Dissolved Metals in Water by CRC ICPMS							
Calcium (Ca)-Dissolved	1.45		0.50	mg/L		16-SEP-14	R2949207
Magnesium (Mg)-Dissolved	0.73		0.10	mg/L		16-SEP-14	R2949207
Potassium (K)-Dissolved	0.33		0.10	mg/L		16-SEP-14	R2949207
Sodium (Na)-Dissolved	<1.0		1.0	mg/L		16-SEP-14	R2949207
Fluoride by IC							
Fluoride (F)	<0.020		0.020	mg/L		02-SEP-14	R2936312
Ion Balance Calculation							
Ion Balance	Low EC			%		19-SEP-14	
TDS (Calculated)	7.3			mg/L		19-SEP-14	
Hardness (as CaCO3)	6.6			mg/L		19-SEP-14	
Nitrate in Water (Calculation)							
Nitrate (as N)	0.0125		0.0060	mg/L		04-SEP-14	
Nitrite & Nitrate in Water by Colour							
Nitrate and Nitrite (as N)	0.0146		0.0060	mg/L		03-SEP-14	R2937669

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510812-2 JER-AEM-15-S							
Sampled By: CLIENT on 29-AUG-14 @ 12:00							
Matrix: Water							
Nitrite in Water by Colour							
Nitrite (as N)	0.0021		0.0020	mg/L		03-SEP-14	R2937669
Sulfate by IC (Low Level)							
Sulfate (SO4)	1.16		0.050	mg/L		02-SEP-14	R2936312
pH, Conductivity and Total Alkalinity							
pH	6.60		0.10	pH		02-SEP-14	R2934871
Conductivity (EC)	17.6		0.20	uS/cm		02-SEP-14	R2934871
Bicarbonate (HCO3)	7.3		5.0	mg/L		02-SEP-14	R2934871
Carbonate (CO3)	<5.0		5.0	mg/L		02-SEP-14	R2934871
Hydroxide (OH)	<5.0		5.0	mg/L		02-SEP-14	R2934871
Alkalinity, Total (as CaCO3)	6.0		2.0	mg/L		02-SEP-14	R2934871
L1510812-3 JER-AEM-15-NB							
Sampled By: CLIENT on 29-AUG-14 @ 12:00							
Matrix: Water							
Total ICPOES & HR-ICPMS in Water							
Hardness							
Hardness (as CaCO3)	6.6		1.3	mg/L		19-SEP-14	
Total Metals by ICPOES (Undigested)							
Calcium (Ca)-Total	1.43		0.030	mg/L		17-SEP-14	R2952008
Iron (Fe)-Total	0.013		0.010	mg/L		17-SEP-14	R2952008
Magnesium (Mg)-Total	0.758		0.030	mg/L		17-SEP-14	R2952008
Phosphorus (P)-Total	<0.050		0.050	mg/L		17-SEP-14	R2952008
Potassium (K)-Total	0.322		0.050	mg/L		17-SEP-14	R2952008
Silicon (Si)-Total	0.361		0.050	mg/L		17-SEP-14	R2952008
Sodium (Na)-Total	0.58		0.20	mg/L		17-SEP-14	R2952008
Miscellaneous Parameters							
Ammonia, Total (as N)	0.0330		0.0050	mg/L		15-SEP-14	R2947433
Mercury (Hg)-Total	0.0000410	RRV	0.0000050	mg/L		13-SEP-14	R2946530
Total Organic Carbon	3.5		1.0	mg/L		17-SEP-14	R2951370
Phosphorus (P)-Total	0.0032		0.0010	mg/L		16-SEP-14	R2949323
Total Suspended Solids	<3.0		3.0	mg/L		05-SEP-14	R2939649
Turbidity	0.38		0.10	NTU		17-SEP-14	R2950911
Total Metals in Water by HR-ICPMS(Ultra)							
Aluminum (Al)-Total	0.0134		0.00020	mg/L		12-SEP-14	R2950811
Antimony (Sb)-Total	0.0000063		0.0000050	mg/L		12-SEP-14	R2950811
Arsenic (As)-Total	0.000197		0.000020	mg/L		12-SEP-14	R2950811
Barium (Ba)-Total	0.00283		0.000020	mg/L		12-SEP-14	R2950811
Beryllium (Be)-Total	<0.0000020		0.0000020	mg/L		12-SEP-14	R2950811
Bismuth (Bi)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2950811
Boron (B)-Total	<0.0050		0.0050	mg/L		12-SEP-14	R2950811
Cadmium (Cd)-Total	0.0000192		0.0000050	mg/L		12-SEP-14	R2950811
Cesium (Cs)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Chromium (Cr)-Total	0.000072		0.000050	mg/L		12-SEP-14	R2950811
Cobalt (Co)-Total	0.0000149		0.0000050	mg/L		12-SEP-14	R2950811
Copper (Cu)-Total	0.0626		0.000050	mg/L		12-SEP-14	R2950811
Gallium (Ga)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2950811
Lead (Pb)-Total	0.000155		0.0000050	mg/L		12-SEP-14	R2950811
Lithium (Li)-Total	0.00044		0.00020	mg/L		12-SEP-14	R2950811
Manganese (Mn)-Total	0.00266		0.0000050	mg/L		12-SEP-14	R2950811
Molybdenum (Mo)-Total	0.000019		0.000010	mg/L		12-SEP-14	R2950811
Nickel (Ni)-Total	0.000345		0.000050	mg/L		12-SEP-14	R2950811
Rhenium (Re)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510812-3 JER-AEM-15-NB							
Sampled By: CLIENT on 29-AUG-14 @ 12:00							
Matrix: Water							
Total Metals in Water by HR-ICPMS(Ultra)							
Rubidium (Rb)-Total	0.000787		0.0000050	mg/L		12-SEP-14	R2950811
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-14	R2950811
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Strontium (Sr)-Total	0.00556		0.000010	mg/L		12-SEP-14	R2950811
Tellurium (Te)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2950811
Thallium (Tl)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2950811
Thorium (Th)-Total	0.0000127		0.0000050	mg/L		12-SEP-14	R2950811
Tin (Sn)-Total	0.00285		0.000010	mg/L		12-SEP-14	R2950811
Titanium (Ti)-Total	0.000121		0.000050	mg/L		12-SEP-14	R2950811
Tungsten (W)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2950811
Uranium (U)-Total	0.000187		0.0000010	mg/L		12-SEP-14	R2950811
Vanadium (V)-Total	0.000032		0.000010	mg/L		12-SEP-14	R2950811
Yttrium (Y)-Total	0.0000695		0.0000050	mg/L		12-SEP-14	R2950811
Zinc (Zn)-Total	0.129		0.00010	mg/L		12-SEP-14	R2950811
Zirconium (Zr)-Total	0.000021		0.000010	mg/L		12-SEP-14	R2950811
Routine Water Analysis - Low Level							
Chloride by IC							
Chloride (Cl)	<0.50		0.50	mg/L		02-SEP-14	R2936312
Dissolved Metals in Water by CRC ICPMS							
Calcium (Ca)-Dissolved	1.47		0.50	mg/L		16-SEP-14	R2949207
Magnesium (Mg)-Dissolved	0.71		0.10	mg/L		16-SEP-14	R2949207
Potassium (K)-Dissolved	0.33		0.10	mg/L		16-SEP-14	R2949207
Sodium (Na)-Dissolved	<1.0		1.0	mg/L		16-SEP-14	R2949207
Fluoride by IC							
Fluoride (F)	<0.020		0.020	mg/L		02-SEP-14	R2936312
Ion Balance Calculation							
Ion Balance	Low EC			%		19-SEP-14	
TDS (Calculated)	7.7			mg/L		19-SEP-14	
Hardness (as CaCO3)	6.6			mg/L		19-SEP-14	
Nitrate in Water (Calculation)							
Nitrate (as N)	0.159		0.0060	mg/L		04-SEP-14	
Nitrite & Nitrate in Water by Colour							
Nitrate and Nitrite (as N)	0.162		0.0060	mg/L		03-SEP-14	R2937669
Nitrite in Water by Colour							
Nitrite (as N)	0.0026		0.0020	mg/L		03-SEP-14	R2937669
Sulfate by IC (Low Level)							
Sulfate (SO4)	1.19		0.050	mg/L		02-SEP-14	R2936312
pH, Conductivity and Total Alkalinity							
pH	6.47		0.10	pH		02-SEP-14	R2934871
Conductivity (EC)	17.9		0.20	uS/cm		02-SEP-14	R2934871
Bicarbonate (HCO3)	6.6		5.0	mg/L		02-SEP-14	R2934871
Carbonate (CO3)	<5.0		5.0	mg/L		02-SEP-14	R2934871
Hydroxide (OH)	<5.0		5.0	mg/L		02-SEP-14	R2934871
Alkalinity, Total (as CaCO3)	5.4		2.0	mg/L		02-SEP-14	R2934871
L1510812-4 JER-AEM-16							
Sampled By: CLIENT on 29-AUG-14 @ 12:00							
Matrix: Water							
Total ICPOES & HR-ICPMS in Water							
Hardness							
Hardness (as CaCO3)	6.6		1.3	mg/L		19-SEP-14	
Total Metals by ICPOES (Undigested)							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510812-4 JER-AEM-16							
Sampled By: CLIENT on 29-AUG-14 @ 12:00							
Matrix: Water							
Total Metals by ICPOES (Undigested)							
Calcium (Ca)-Total	1.46		0.030	mg/L		17-SEP-14	R2952008
Iron (Fe)-Total	0.015		0.010	mg/L		17-SEP-14	R2952008
Magnesium (Mg)-Total	0.781		0.030	mg/L		17-SEP-14	R2952008
Phosphorus (P)-Total	<0.050		0.050	mg/L		17-SEP-14	R2952008
Potassium (K)-Total	0.332		0.050	mg/L		17-SEP-14	R2952008
Silicon (Si)-Total	0.239		0.050	mg/L		17-SEP-14	R2952008
Sodium (Na)-Total	0.59		0.20	mg/L		17-SEP-14	R2952008
Miscellaneous Parameters							
Ammonia, Total (as N)	0.0119		0.0050	mg/L		15-SEP-14	R2947433
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		13-SEP-14	R2946530
Total Organic Carbon	3.6		1.0	mg/L		17-SEP-14	R2951370
Phosphorus (P)-Total	0.0024		0.0010	mg/L		16-SEP-14	R2949323
Total Suspended Solids	<3.0		3.0	mg/L		05-SEP-14	R2939649
Turbidity	0.40		0.10	NTU		17-SEP-14	R2950911
Total Metals in Water by HR-ICPMS(Ultra)							
Aluminum (Al)-Total	0.0124		0.00020	mg/L		12-SEP-14	R2950811
Antimony (Sb)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Arsenic (As)-Total	0.000207		0.000020	mg/L		12-SEP-14	R2950811
Barium (Ba)-Total	0.00163		0.000020	mg/L		12-SEP-14	R2950811
Beryllium (Be)-Total	<0.0000020		0.0000020	mg/L		12-SEP-14	R2950811
Bismuth (Bi)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2950811
Boron (B)-Total	0.0073		0.0050	mg/L		12-SEP-14	R2950811
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Cesium (Cs)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Chromium (Cr)-Total	0.000076		0.000050	mg/L		12-SEP-14	R2950811
Cobalt (Co)-Total	0.0000164		0.0000050	mg/L		12-SEP-14	R2950811
Copper (Cu)-Total	0.00101		0.000050	mg/L		12-SEP-14	R2950811
Gallium (Ga)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2950811
Lead (Pb)-Total	0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Lithium (Li)-Total	0.00084		0.00020	mg/L		12-SEP-14	R2950811
Manganese (Mn)-Total	0.00185		0.0000050	mg/L		12-SEP-14	R2950811
Molybdenum (Mo)-Total	0.000044		0.000010	mg/L		17-SEP-14	R2952628
Nickel (Ni)-Total	0.000292		0.000050	mg/L		12-SEP-14	R2950811
Rhenium (Re)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Rubidium (Rb)-Total	0.000784		0.0000050	mg/L		12-SEP-14	R2950811
Selenium (Se)-Total	0.000057		0.000040	mg/L		12-SEP-14	R2950811
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Strontium (Sr)-Total	0.00534		0.000010	mg/L		12-SEP-14	R2950811
Tellurium (Te)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2950811
Thallium (Tl)-Total	<0.0000010		0.0000010	mg/L		17-SEP-14	R2952628
Thorium (Th)-Total	0.0000108		0.0000050	mg/L		12-SEP-14	R2950811
Tin (Sn)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2950811
Titanium (Ti)-Total	0.000174		0.000050	mg/L		12-SEP-14	R2950811
Tungsten (W)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2950811
Uranium (U)-Total	0.000183		0.0000010	mg/L		12-SEP-14	R2950811
Vanadium (V)-Total	0.000041		0.000010	mg/L		12-SEP-14	R2950811
Yttrium (Y)-Total	0.0000655		0.0000050	mg/L		12-SEP-14	R2950811
Zinc (Zn)-Total	0.00037		0.00010	mg/L		12-SEP-14	R2950811
Zirconium (Zr)-Total	0.000020		0.000010	mg/L		12-SEP-14	R2950811
Routine Water Analysis - Low Level							
Chloride by IC							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510812-4 JER-AEM-16							
Sampled By: CLIENT on 29-AUG-14 @ 12:00							
Matrix: Water							
Chloride by IC							
Chloride (Cl)	<0.50		0.50	mg/L		02-SEP-14	R2936312
Dissolved Metals in Water by CRC ICPMS							
Calcium (Ca)-Dissolved	1.46		0.50	mg/L		16-SEP-14	R2949207
Magnesium (Mg)-Dissolved	0.72		0.10	mg/L		16-SEP-14	R2949207
Potassium (K)-Dissolved	0.33		0.10	mg/L		16-SEP-14	R2949207
Sodium (Na)-Dissolved	<1.0		1.0	mg/L		16-SEP-14	R2949207
Fluoride by IC							
Fluoride (F)	<0.020		0.020	mg/L		02-SEP-14	R2936312
Ion Balance Calculation							
Ion Balance	Low EC			%		19-SEP-14	
TDS (Calculated)	7.0			mg/L		19-SEP-14	
Hardness (as CaCO3)	6.6			mg/L		19-SEP-14	
Nitrate in Water (Calculation)							
Nitrate (as N)	0.0159		0.0060	mg/L		04-SEP-14	
Nitrite & Nitrate in Water by Colour							
Nitrate and Nitrite (as N)	0.0184		0.0060	mg/L		03-SEP-14	R2937669
Nitrite in Water by Colour							
Nitrite (as N)	0.0025		0.0020	mg/L		03-SEP-14	R2937669
Sulfate by IC (Low Level)							
Sulfate (SO4)	1.14		0.050	mg/L		02-SEP-14	R2936312
pH, Conductivity and Total Alkalinity							
pH	6.58		0.10	pH		02-SEP-14	R2934871
Conductivity (EC)	17.4		0.20	uS/cm		02-SEP-14	R2934871
Bicarbonate (HCO3)	6.7		5.0	mg/L		02-SEP-14	R2934871
Carbonate (CO3)	<5.0		5.0	mg/L		02-SEP-14	R2934871
Hydroxide (OH)	<5.0		5.0	mg/L		02-SEP-14	R2934871
Alkalinity, Total (as CaCO3)	5.5		2.0	mg/L		02-SEP-14	R2934871
L1510812-5 TRIP BLANK							
Sampled By: CLIENT on 29-AUG-14 @ 12:00							
Matrix: Water							
Total ICPOES & HR-ICPMS in Water							
Hardness							
Hardness (as CaCO3)	<1.3		1.3	mg/L		19-SEP-14	
Total Metals by ICPOES (Undigested)							
Calcium (Ca)-Total	<0.030		0.030	mg/L		17-SEP-14	R2952008
Iron (Fe)-Total	<0.010		0.010	mg/L		17-SEP-14	R2952008
Magnesium (Mg)-Total	<0.030		0.030	mg/L		17-SEP-14	R2952008
Phosphorus (P)-Total	<0.050		0.050	mg/L		17-SEP-14	R2952008
Potassium (K)-Total	<0.050		0.050	mg/L		17-SEP-14	R2952008
Silicon (Si)-Total	<0.050		0.050	mg/L		17-SEP-14	R2952008
Sodium (Na)-Total	<0.20		0.20	mg/L		17-SEP-14	R2952008
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		15-SEP-14	R2947433
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		13-SEP-14	R2946530
Total Organic Carbon	<1.0		1.0	mg/L		17-SEP-14	R2951370
Phosphorus (P)-Total	<0.0010		0.0010	mg/L		16-SEP-14	R2949323
Total Suspended Solids	<3.0		3.0	mg/L		05-SEP-14	R2939649
Turbidity	<0.10		0.10	NTU		17-SEP-14	R2950911
Total Metals in Water by HR-ICPMS(Ultra)							
Aluminum (Al)-Total	<0.00020		0.00020	mg/L		12-SEP-14	R2950811
Antimony (Sb)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510812-5 TRIP BLANK							
Sampled By: CLIENT on 29-AUG-14 @ 12:00							
Matrix: Water							
Total Metals in Water by HR-ICPMS(Ultra)							
Arsenic (As)-Total	<0.000020		0.000020	mg/L		12-SEP-14	R2950811
Barium (Ba)-Total	<0.000020		0.000020	mg/L		12-SEP-14	R2950811
Beryllium (Be)-Total	<0.0000020		0.0000020	mg/L		12-SEP-14	R2950811
Bismuth (Bi)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2950811
Boron (B)-Total	<0.0050		0.0050	mg/L		12-SEP-14	R2950811
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Cesium (Cs)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Chromium (Cr)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2950811
Cobalt (Co)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Copper (Cu)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2950811
Gallium (Ga)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2950811
Lead (Pb)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Lithium (Li)-Total	<0.00020		0.00020	mg/L		17-SEP-14	R2952628
Manganese (Mn)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Molybdenum (Mo)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2950811
Nickel (Ni)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2950811
Rhenium (Re)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Rubidium (Rb)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-14	R2950811
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Strontium (Sr)-Total	<0.000010		0.000010	mg/L		17-SEP-14	R2952628
Tellurium (Te)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2950811
Thallium (Tl)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2950811
Thorium (Th)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Tin (Sn)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2950811
Titanium (Ti)-Total	<0.000050		0.000050	mg/L		12-SEP-14	R2950811
Tungsten (W)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2950811
Uranium (U)-Total	<0.0000010		0.0000010	mg/L		12-SEP-14	R2950811
Vanadium (V)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2950811
Yttrium (Y)-Total	<0.0000050		0.0000050	mg/L		12-SEP-14	R2950811
Zinc (Zn)-Total	<0.00010		0.00010	mg/L		12-SEP-14	R2950811
Zirconium (Zr)-Total	<0.000010		0.000010	mg/L		12-SEP-14	R2950811
Routine Water Analysis - Low Level							
Chloride by IC							
Chloride (Cl)	<0.50		0.50	mg/L		02-SEP-14	R2936312
Dissolved Metals in Water by CRC ICPMS							
Calcium (Ca)-Dissolved	<0.50		0.50	mg/L		16-SEP-14	R2949207
Magnesium (Mg)-Dissolved	<0.10		0.10	mg/L		16-SEP-14	R2949207
Potassium (K)-Dissolved	<0.10		0.10	mg/L		16-SEP-14	R2949207
Sodium (Na)-Dissolved	<1.0		1.0	mg/L		16-SEP-14	R2949207
Fluoride by IC							
Fluoride (F)	<0.020		0.020	mg/L		02-SEP-14	R2936312
Ion Balance Calculation							
Ion Balance	Low TDS			%		19-SEP-14	
TDS (Calculated)	<1.0			mg/L		19-SEP-14	
Hardness (as CaCO3)	<1.0			mg/L		19-SEP-14	
Nitrate in Water (Calculation)							
Nitrate (as N)	<0.0060		0.0060	mg/L		04-SEP-14	
Nitrite & Nitrate in Water by Colour							
Nitrate and Nitrite (as N)	<0.0060		0.0060	mg/L		03-SEP-14	R2937669
Nitrite in Water by Colour							
Nitrite (as N)	<0.0020		0.0020	mg/L		03-SEP-14	R2937669

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1510812-5 TRIP BLANK							
Sampled By: CLIENT on 29-AUG-14 @ 12:00							
Matrix: Water							
Sulfate by IC (Low Level)							
Sulfate (SO4)	<0.050		0.050	mg/L		02-SEP-14	R2936312
pH, Conductivity and Total Alkalinity							
pH	5.36		0.10	pH		02-SEP-14	R2934871
Conductivity (EC)	1.38		0.20	uS/cm		02-SEP-14	R2934871
Bicarbonate (HCO3)	<5.0		5.0	mg/L		02-SEP-14	R2934871
Carbonate (CO3)	<5.0		5.0	mg/L		02-SEP-14	R2934871
Hydroxide (OH)	<5.0		5.0	mg/L		02-SEP-14	R2934871
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		02-SEP-14	R2934871

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
C-TOT-ORG-ED	Water	Total Organic Carbon	APHA 5310 B-Instrumental
CL-IC-ED	Water	Chloride by IC	APHA 4110 B-ION CHROMATOGRAPHY
F-IC-ED	Water	Fluoride by IC	APHA 4110 B-ION CHROMATOGRAPHY
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
HG-T-L-CVAA-ED	Water	Mercury (Hg)	EPA 245.7 / EPA 245.1
IONBALANCE-ED	Water	Ion Balance Calculation	APHA 1030E
MET-D-CCMS-ED	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030 B&E / EPA SW-846 6020A
MET-T-NP-U-HRMS-VA	Water	Total Metals in Water by HR-ICPMS(Ultra)	EPA 200.8
Ultra trace metals in water are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS), modified from US EPA 200.8, (Revision 5.5). The detection limits provided can only be met for undigested samples. This procedure is intended for colorless, non-turbid, acid-preserved water samples (i.e. pristine water samples), having turbidity < 1 NTU and no odor. Where turbidity exceeds 1 NTU, and/or the sample is colored and has an odor, results may be biased low compared to true Total Metals concentrations. ALS recommends that turbidity analysis be requested on samples submitted for this test to aid with interpretation of results. Where turbidity is <1NTU, undigested metals are equivalent to total metals concentrations.			
MET-T-NP-U-ICP-VA	Water	Total Metals by ICPOES (Undigested)	EPA SW-846 6010B
Ultra trace metals in water are analyzed by ICPOES, based on US EPA Method 6010B. The detection limits provided can only be met for undigested samples. This procedure is intended for colorless, non-turbid, acid-preserved water samples (i.e. pristine water samples), having turbidity < 1 NTU and no odor. Where turbidity exceeds 1 NTU, and/or the sample is colored and has an odor, results may be biased low compared to true Total Metals concentrations. ALS recommends that turbidity analysis be requested on samples submitted for this test to aid with interpretation of results. Where turbidity is <1NTU, undigested metals are equivalent to total metals concentrations.			
NH3-L-CFA-ED	Water	Ammonia in Water by Colour	APHA 4500 NH3-NITROGEN (AMMONIA)
This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the automated phenate colourimetric method.			
NO2+NO3-L-CFA-ED	Water	Nitrite & Nitrate in Water by Colour	APHA 4500 NO3-F
This analysis is carried out using procedures adapted from APHA Method 4500 NO3-F "Automated Cadmium Reduction Method".			
NO2-L-CFA-ED	Water	Nitrite in Water by Colour	APHA 4500 NO2-A and NO3-F
This analysis is carried out using procedures adapted from APHA Method 4500 NO3-F "Automated Cadmium Reduction Method", omitting the Cu-Cd reduction step to be selective for nitrite.			
NO3-L-CALC-ED	Water	Nitrate in Water (Calculation)	APHA 4500 NO3-F
Nitrate (as N) is a calculated parameter. Nitrate (as N) = [Nitrate and Nitrite (as N)] - Nitrite (as N).			
P-T-L-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH/EC/ALK-ED	Water	pH, Conductivity and Total Alkalinity	APHA 4500-H, 2510, 2320
All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed)			
SO4-L-IC-ED	Water	Sulfate by IC (Low Level)	APHA 4110 B-ION CHROMATOGRAPHY
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
TURBIDITY-ED	Water	Turbidity	APHA 2130 B-Nephelometer

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

10-365201

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

10- 365201

ALS Environmental

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Page 1 of 1

Report To		Report Format / Distribution		Service Request: (Rush subject to availability - Contact ALS to confirm TAT)
Company:	TetraTech EBA	Standard: ✓	Other (specify):	✓ Regular (Standard Turnaround Times - Business Days)
Contact:	Karla Langlois	Select: PDF ✓	Excel ✓ Digital Fax	Priority(2-4 Business Days)-50% surcharge - Contact ALS to confirm TAT
Address:	Box 2244, #201, 4916-49 St	Email 1:	klanglois@eba.ca	Emergency (1-2 Business Days)-100% Surcharge - Contact ALS to confirm TAT
	Yellowknife, NT X1A 2P7	Email 2:		Same Day or Weekend Emergency - Contact ALS to confirm TAT
Phone:	867.920.2287 Fax:			
Invoice To	Same as Report ? (circle) (Yes) or No (if No, provide details)	**Client / Project Information**		**Analysis Request**
	Copy of Invoice with Report? (circle) Yes or No	Job #:	Y14103202	(Indicate Filtered or Preserved, F/P)
Company:		PO / AFE:		
Contact:		LSD:	Jericho	
Address:				
Phone:	Fax:	Quote #:	Q46875	
Lab Work Order # (lab use only)	L1510812	**ALS Contact:**	**Sampler:**	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total metals ultra low	Total mercury ultra low	Routine	Nutrients	Number of Containers
	JER-AEM-11	29/08/14		Water	✓	✓	✓	✓	4
	JER-AEM-15-S	↓		↓	↓	↓	↓	↓	↓
	JER-AEM-15-NB								
	JER-AEM-16								
	Trip Blank				✓	✓	✓	✓	4

L1510812-COFC

Special Instructions / Regulation with water or land use (CCME- Freshwater Aquatic Life/BC CSR-Commercial/AB Tier 1-Natural/ETC) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Karla Langlois	Sept 1/14	9:00am	MT	Sep 1/14	11:40 am	5.4 / 4.7 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION | WHITE - LABORATORY COPY | YELLOW - CLIENT COPY | GENF 18.01 Front

Tetra Tech EBA Inc.
ATTN: Karla Langlois
PO Box 2244 STN M
201- 4916 49 Street
Yellowknife NT X1A 2P7

Date Received: 10-OCT-14
Report Date: 20-OCT-14 15:31 (MT)
Version: FINAL

Client Phone: 867-766-3728

Certificate of Analysis

Lab Work Order #: L1531192

Project P.O. #: NOT SUBMITTED
Job Reference: E14103202
C of C Numbers: 10-365287
Legal Site Desc:

Rick Zolkiewski
General Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1531192-1 EQUIPMENT BLANK							
Sampled By: CLIENT on 10-OCT-14 @ 09:00							
Matrix: Water							
Total ICPOES & HR-ICPMS in Water							
Hardness							
Hardness (as CaCO3)	<1.3		1.3	mg/L		20-OCT-14	
Total Metals by ICPOES (Undigested)							
Calcium (Ca)-Total	<0.030		0.030	mg/L		16-OCT-14	R2995529
Iron (Fe)-Total	<0.010		0.010	mg/L		16-OCT-14	R2995529
Magnesium (Mg)-Total	<0.030		0.030	mg/L		16-OCT-14	R2995529
Phosphorus (P)-Total	<0.050		0.050	mg/L		16-OCT-14	R2995529
Potassium (K)-Total	<0.050		0.050	mg/L		16-OCT-14	R2995529
Silicon (Si)-Total	<0.050		0.050	mg/L		16-OCT-14	R2995529
Sodium (Na)-Total	<0.20		0.20	mg/L		16-OCT-14	R2995529
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		15-OCT-14	R2988288
Mercury (Hg)-Total	0.0000142	RRV	0.0000050	mg/L		12-OCT-14	R2982810
Total Organic Carbon	<1.0		1.0	mg/L		14-OCT-14	R2984329
Phosphorus (P)-Total	<0.0010		0.0010	mg/L		16-OCT-14	R2994849
Total Suspended Solids	<3.0		3.0	mg/L		12-OCT-14	R2983250
Turbidity	<0.10		0.10	NTU		16-OCT-14	R2992475
Total Metals in Water by HR-ICPMS(Ultra)							
Aluminum (Al)-Total	0.00064	RRV	0.00020	mg/L		17-OCT-14	R3004091
Antimony (Sb)-Total	<0.0000050		0.0000050	mg/L		16-OCT-14	R3003128
Arsenic (As)-Total	<0.000020		0.000020	mg/L		16-OCT-14	R3003128
Barium (Ba)-Total	<0.000020		0.000020	mg/L		17-OCT-14	R3004091
Beryllium (Be)-Total	<0.0000020		0.0000020	mg/L		16-OCT-14	R3003128
Bismuth (Bi)-Total	<0.0000010		0.0000010	mg/L		16-OCT-14	R3003128
Boron (B)-Total	<0.0050		0.0050	mg/L		16-OCT-14	R3003128
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		16-OCT-14	R3003128
Cesium (Cs)-Total	<0.0000050		0.0000050	mg/L		16-OCT-14	R3003128
Chromium (Cr)-Total	<0.000050		0.000050	mg/L		16-OCT-14	R3003128
Cobalt (Co)-Total	<0.0000050		0.0000050	mg/L		16-OCT-14	R3003128
Copper (Cu)-Total	0.0157	RRV	0.000050	mg/L		17-OCT-14	R3004091
Gallium (Ga)-Total	<0.000050		0.000050	mg/L		16-OCT-14	R3003128
Lead (Pb)-Total	<0.0000050		0.0000050	mg/L		16-OCT-14	R3003128
Lithium (Li)-Total	<0.00020		0.00020	mg/L		16-OCT-14	R3003128
Manganese (Mn)-Total	<0.0000050		0.0000050	mg/L		16-OCT-14	R3003128
Molybdenum (Mo)-Total	<0.000010		0.000010	mg/L		16-OCT-14	R3003128
Nickel (Ni)-Total	<0.000050		0.000050	mg/L		16-OCT-14	R3003128
Rhenium (Re)-Total	<0.0000050		0.0000050	mg/L		16-OCT-14	R3003128
Rubidium (Rb)-Total	<0.0000050		0.0000050	mg/L		16-OCT-14	R3003128
Selenium (Se)-Total	<0.000040		0.000040	mg/L		16-OCT-14	R3003128
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		16-OCT-14	R3003128
Strontium (Sr)-Total	<0.000010		0.000010	mg/L		16-OCT-14	R3003128
Tellurium (Te)-Total	<0.000010		0.000010	mg/L		16-OCT-14	R3003128
Thallium (Tl)-Total	<0.0000010		0.0000010	mg/L		16-OCT-14	R3003128
Thorium (Th)-Total	<0.0000050		0.0000050	mg/L		16-OCT-14	R3003128
Tin (Sn)-Total	0.0184	RRV	0.000010	mg/L		17-OCT-14	R3004091
Titanium (Ti)-Total	<0.000050		0.000050	mg/L		16-OCT-14	R3003128
Tungsten (W)-Total	<0.000010		0.000010	mg/L		16-OCT-14	R3003128
Uranium (U)-Total	<0.0000010		0.0000010	mg/L		16-OCT-14	R3003128
Vanadium (V)-Total	<0.000010		0.000010	mg/L		16-OCT-14	R3003128
Yttrium (Y)-Total	<0.0000050		0.0000050	mg/L		16-OCT-14	R3003128
Zinc (Zn)-Total	0.00070	RRV	0.00010	mg/L		17-OCT-14	R3004091

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1531192-1 EQUIPMENT BLANK							
Sampled By: CLIENT on 10-OCT-14 @ 09:00							
Matrix: Water							
Total Metals in Water by HR-ICPMS(Ultra)							
Zirconium (Zr)-Total	<0.000010		0.000010	mg/L		16-OCT-14	R3003128
Routine Water Analysis - Low Level							
Chloride by IC							
Chloride (Cl)	<0.50		0.50	mg/L		12-OCT-14	R2985037
Dissolved Metals in Water by CRC ICPMS							
Calcium (Ca)-Dissolved	<0.50		0.50	mg/L		15-OCT-14	R2990928
Magnesium (Mg)-Dissolved	<0.10		0.10	mg/L		15-OCT-14	R2990928
Potassium (K)-Dissolved	<0.10		0.10	mg/L		15-OCT-14	R2990928
Sodium (Na)-Dissolved	<1.0		1.0	mg/L		15-OCT-14	R2990928
Fluoride by IC							
Fluoride (F)	<0.020		0.020	mg/L		12-OCT-14	R2985037
Ion Balance Calculation							
Ion Balance	Low EC			%		16-OCT-14	R2993730
TDS (Calculated)	3.2			mg/L		16-OCT-14	R2993730
Hardness (as CaCO3)	<1.0			mg/L		16-OCT-14	R2993730
Nitrate in Water (Calculation)							
Nitrate (as N)	0.733		0.0060	mg/L		15-OCT-14	
Nitrite & Nitrate in Water by Colour							
Nitrate and Nitrite (as N)	0.733		0.0060	mg/L		14-OCT-14	R2987590
Nitrite in Water by Colour							
Nitrite (as N)	<0.0020		0.0020	mg/L		14-OCT-14	R2987590
Sulfate by IC (Low Level)							
Sulfate (SO4)	<0.050		0.050	mg/L		12-OCT-14	R2985037
pH, Conductivity and Total Alkalinity							
pH	5.20		0.10	pH		16-OCT-14	R2992749
Conductivity (EC)	17.3		0.20	uS/cm		16-OCT-14	R2992749
Bicarbonate (HCO3)	<5.0		5.0	mg/L		16-OCT-14	R2992749
Carbonate (CO3)	<5.0		5.0	mg/L		16-OCT-14	R2992749
Hydroxide (OH)	<5.0		5.0	mg/L		16-OCT-14	R2992749
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		16-OCT-14	R2992749

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
C-TOT-ORG-ED	Water	Total Organic Carbon	APHA 5310 B-Instrumental
CL-IC-ED	Water	Chloride by IC	APHA 4110 B-ION CHROMATOGRAPHY
F-IC-ED	Water	Fluoride by IC	APHA 4110 B-ION CHROMATOGRAPHY
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
HG-T-L-CVAA-ED	Water	Mercury (Hg)	EPA 245.7 / EPA 245.1
IONBALANCE-ED	Water	Ion Balance Calculation	APHA 1030E
MET-D-CCMS-ED	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030 B&E / EPA SW-846 6020A
MET-T-NP-U-HRMS-VA	Water	Total Metals in Water by HR-ICPMS(Ultra)	EPA 200.8
Ultra trace metals in water are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS), modified from US EPA 200.8, (Revision 5.5). The detection limits provided can only be met for undigested samples. This procedure is intended for colorless, non-turbid, acid-preserved water samples (i.e. pristine water samples), having turbidity < 1 NTU and no odor. Where turbidity exceeds 1 NTU, and/or the sample is colored and has an odor, results may be biased low compared to true Total Metals concentrations. ALS recommends that turbidity analysis be requested on samples submitted for this test to aid with interpretation of results. Where turbidity is <1NTU, undigested metals are equivalent to total metals concentrations.			
MET-T-NP-U-ICP-VA	Water	Total Metals by ICPOES (Undigested)	EPA SW-846 6010B
Ultra trace metals in water are analyzed by ICPOES, based on US EPA Method 6010B. The detection limits provided can only be met for undigested samples. This procedure is intended for colorless, non-turbid, acid-preserved water samples (i.e. pristine water samples), having turbidity < 1 NTU and no odor. Where turbidity exceeds 1 NTU, and/or the sample is colored and has an odor, results may be biased low compared to true Total Metals concentrations. ALS recommends that turbidity analysis be requested on samples submitted for this test to aid with interpretation of results. Where turbidity is <1NTU, undigested metals are equivalent to total metals concentrations.			
NH3-L-CFA-ED	Water	Ammonia in Water by Colour	APHA 4500 NH3-NITROGEN (AMMONIA)
This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the automated phenate colourimetric method.			
NO2+NO3-L-CFA-ED	Water	Nitrite & Nitrate in Water by Colour	APHA 4500 NO3-F
This analysis is carried out using procedures adapted from APHA Method 4500 NO3-F "Automated Cadmium Reduction Method".			
NO2-L-CFA-ED	Water	Nitrite in Water by Colour	APHA 4500 NO2-A and NO3-F
This analysis is carried out using procedures adapted from APHA Method 4500 NO3-F "Automated Cadmium Reduction Method", omitting the Cu-Cd reduction step to be selective for nitrite.			
NO3-L-CALC-ED	Water	Nitrate in Water (Calculation)	APHA 4500 NO3-F
Nitrate (as N) is a calculated parameter. Nitrate (as N) = [Nitrate and Nitrite (as N)] - Nitrite (as N).			
P-T-L-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH/EC/ALK-ED	Water	pH, Conductivity and Total Alkalinity	APHA 4500-H, 2510, 2320
All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed)			
SO4-L-IC-ED	Water	Sulfate by IC (Low Level)	APHA 4110 B-ION CHROMATOGRAPHY
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
TURBIDITY-ED	Water	Turbidity	APHA 2130 B-Nephelometer

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

10-365287

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

10- 365287

ALS Environmental

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
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Page 1 of 1

Report To	**Report Format / Distribution**	**Service Request**: (Rush subject to availability - Contact ALS to confirm TAT)
Company: Tetra Tech EBA	Standard: ✓ Other (specify):	✓ Regular (Standard Turnaround Times - Business Days)
Contact: Karla Langlois	Select: PDF ✓ Excel ✓ Digital Fax	Priority(2-4 Business Days)-50% surcharge - Contact ALS to confirm TAT
Address: Suite 201, 4916-49 St Yellowknife NT X1A 3X4	Email 1: karla.langlois@tetratech.com	Emergency (1-2 Business Days)-100% Surcharge - Contact ALS to confirm TAT
Phone: 867-445-7761 Fax:	Email 2:	Same Day or Weekend Emergency - Contact ALS to confirm TAT

Invoice To Same as Report ? (circle) Yes or No (if No, provide details)	**Client / Project Information**	**Analysis Request**
Copy of Invoice with Report? (circle) Yes or No	Job #: E14103202	(Indicate Filtered or Preserved, F/P)
Company:	PO / AFE:	
Contact:	LSD:	
Address:		
Phone: Fax:	Quote #: Q46875	
Lab Work Order # (lab use only) L1531192	**ALS Contact:**	**Sampler:**

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Metals - ultra low	Total Mercury - F	Routine - F	Nutrients - F	Number of Containers
	Equipment Blank	10/10/13		Water	✓	✓	✓	✓	4

L1531192-COFC

Special Instructions / Regulation with water or land use (CCME- Freshwater Aquatic Life/BC CSR-Commercial/AB Tier 1-Natural/ETC) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Karla Langlois	10/10/13	10:30	MM	Oct 10/14	10:45 am	16.4 uncorr °C 15.9 corr				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

GENF 18.01 Front

Your P.O. #: E14103202
Your C.O.C. #: A131767, A131768, A131769

Attention:ROBERT ZSCHUPPE

TETRA TECH EBA INC.
14940-123 AVENUE
EDMONTON, AB
CANADA T5V 1B4

Report Date: 2014/09/15
Report #: R1643000
Version: 2

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B477081
Received: 2014/09/01, 11:15

Sample Matrix: Product
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 by HS GC/MS (MeOH extract)	2	2014/09/06	2014/09/08	AB SOP-00039	CCME CWS/EPA 8260C m
TOX as Chlorine - Subcontract	2	N/A	2014/09/10		See Attachment
Metals by Axial ICP - Subcontract (1)	2	N/A	2014/09/15		
CCME Hydrocarbons (F2-F4 in soil)	2	2014/09/11	2014/09/12	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS
Flash Point (Closed Cup), ASTM D93 (2)	2	N/A	2014/09/11	EINDSOP-00082	ASTM D93
Polychlorinated Biphenyls (3)	2	N/A	2014/09/08	CAL SOP-00149	EPA 3580A, EPA 8082A

Sample Matrix: Soil
Samples Received: 12

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 by HS GC/MS (MeOH extract)	12	2014/09/03	2014/09/06	AB SOP-00039	CCME CWS/EPA 8260C m
CCME Hydrocarbons (F2-F4 in soil)	12	2014/09/03	2014/09/06	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS
Moisture	12	N/A	2014/09/04	AB SOP-00002	CCME PHC-CWS

Sample Matrix: Water
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	5	N/A	2014/09/04	AB SOP-00005	SM 22 2320 B m
Alkalinity @25C (pp, total), CO3,HCO3,OH	1	N/A	2014/09/06	AB SOP-00005	SM 22 2320 B m
BTEX/F1 in Water by HS GC/MS	3	N/A	2014/09/08	AB SOP-00039	CCME CWS/EPA 8260C m
Cadmium - low level CCME - Dissolved	1	N/A	2014/09/08	AB SOP-00043	EPA 200.8 R5.4 m
Cadmium - low level CCME - Dissolved	5	N/A	2014/09/09	AB SOP-00043	EPA 200.8 R5.4 m
Cadmium - low level CCME (Total)	5	2014/09/03	2014/09/09	AB SOP-00014 / AB SOP-00043	EPA 200.8 R5.4m
Chloride by Automated Colourimetry	6	N/A	2014/09/07	AB SOP-00020	SM 22 4500-Cl G m
Conductivity @25C	5	N/A	2014/09/04	AB SOP-00005	SM 22 2510 B m
Conductivity @25C	1	N/A	2014/09/06	AB SOP-00005	SM 22 2510 B m

Your P.O. #: E14103202
Your C.O.C. #: A131767, A131768, A131769

Attention:ROBERT ZSCHUPPE

TETRA TECH EBA INC.
14940-123 AVENUE
EDMONTON, AB
CANADA T5V 1B4

Report Date: 2014/09/15
Report #: R1643000
Version: 2

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B477081
Received: 2014/09/01, 11:15

Sample Matrix: Water
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
CCME Hydrocarbons in Water (F2; C10-C16)	3	2014/09/05	2014/09/06	AB SOP-00040 AB SOP-00037	CCME PHC-CWS m
Hardness	2	N/A	2014/09/08	AB WI-00065	SM 2340B
Hardness	4	N/A	2014/09/10	AB WI-00065	SM 2340B
Elements by ICP - Dissolved	4	N/A	2014/09/09	AB SOP-00042	EPA 200.7 CFR 2012 m
Elements by ICP-Dissolved-Lab Filtered	2	N/A	2014/09/08	AB SOP-00042	EPA 200.7
Elements by ICP - Total	3	2014/09/07	2014/09/09	AB SOP-00014 / AB SOP-00042	EPA 200.7 CFR 2012 m
Elements by ICP - Total	2	2014/09/09	2014/09/10	AB SOP-00014 / AB SOP-00042	EPA 200.7 CFR 2012 m
Elements by ICPMS - Dissolved	4	N/A	2014/09/06	AB SOP-00043	EPA 200.8 R5.4 m
Elements by ICPMS-Dissolved-Lab Filtered	2	N/A	2014/09/09	AB SOP-00043	EPA 200.8 R5.4 m
Elements by ICPMS - Total	3	2014/09/07	2014/09/08	AB SOP-00014 / AB SOP-00043	EPA 200.8 R5.4 m
Elements by ICPMS - Total	2	2014/09/09	2014/09/09	AB SOP-00014 / AB SOP-00043	EPA 200.8 R5.4 m
Ion Balance	2	N/A	2014/09/08	AB WI-00065	SM 1030E
Ion Balance	4	N/A	2014/09/10	AB WI-00065	SM 1030E
Sum of cations, anions	2	N/A	2014/09/08	AB WI-00065	SM 1030E
Sum of cations, anions	4	N/A	2014/09/10	AB WI-00065	SM 1030E
Nitrate and Nitrite	6	N/A	2014/09/08	AB SOP-00023	Auto Calc
Nitrate + Nitrite-N (calculated)	6	N/A	2014/09/08	AB SOP-00023	SM 4110-B
Nitrogen, (Nitrite, Nitrate) by IC	6	N/A	2014/09/07	AB SOP-00023	SM 22 4110 B m
pH @25°C (Alkalinity titrator)	5	N/A	2014/09/04	AB SOP-00005	SM 22 4500 H+ B m
pH @25°C (Alkalinity titrator)	1	N/A	2014/09/06	AB SOP-00005	SM 22 4500 H+ B m
Sulphate by Automated Colourimetry	6	N/A	2014/09/07	AB SOP-00018	SM 22 4500-SO4 E m
Total Dissolved Solids (Calculated)	2	N/A	2014/09/08	AB WI-00065	SM 1030E
Total Dissolved Solids (Calculated)	4	N/A	2014/09/10	AB WI-00065	SM 1030E

(1) This test was performed by Maxxam Ontario (From Edmonton)
(2) This test was performed by Maxxam Edmonton Petroleum
(3) This test was performed by Maxxam Calgary Environmental

Your P.O. #: E14103202
Your C.O.C. #: A131767, A131768, A131769

Attention:ROBERT ZSCHUPPE

TETRA TECH EBA INC.
14940-123 AVENUE
EDMONTON, AB
CANADA T5V 1B4

Report Date: 2014/09/15
Report #: R1643000
Version: 2

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B477081
Received: 2014/09/01, 11:15

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Sherlyne Sim, B.Eng, Project Manager
Email: SSim@maxxam.ca
Phone# (780)577-7113

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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 #: B477081
Report Date: 2014/09/15

TETRA TECH EBA INC.
Your P.O. #: E14103202

AT1 BTEX AND F1-F2 (WATER)

Maxxam ID		KM5919	KM5920	KM5926		
Sampling Date		2014/08/31 08:30	2014/08/31 09:00	2014/08/31 08:30		
COC Number		A131769	A131769	A131769		
	Units	**14MW01**	**14MW03**	**MWDUP1**	**RDL**	**QC Batch**
Hydrocarbons						
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	0.10	7624962
Volatiles						
Benzene	mg/L	<0.00040	<0.00040	<0.00040	0.00040	7624939
Toluene	mg/L	<0.00040	0.0020	<0.00040	0.00040	7624939
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	0.00040	7624939
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	0.00080	7624939
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	0.00040	7624939
Xylenes (Total)	mg/L	<0.00080	<0.00080	<0.00080	0.00080	7624939
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	0.10	7624939
(C6-C10)	mg/L	<0.10	<0.10	<0.10	0.10	7624939
Surrogate Recovery (%)						
1,4-Difluorobenzene (sur.)	%	101	98	97	N/A	7624939
4-Bromofluorobenzene (sur.)	%	101	98	97	N/A	7624939
D4-1,2-Dichloroethane (sur.)	%	113	108	101	N/A	7624939
O-TERPHENYL (sur.)	%	85	92	97	N/A	7624962

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B477081
Report Date: 2014/09/15

TETRA TECH EBA INC.
Your P.O. #: E14103202

AT1 BTEX AND F1-F4 IN SOIL (PRODUCT)

Maxxam ID		KM5557	KM5558		
Sampling Date		2014/08/31	2014/08/31		
COC Number		A131767	A131767		
	Units	TANK 2-1	DR 2-1	RDL	QC Batch
Ext. Pet. Hydrocarbon					
F2 (C10-C16 Hydrocarbons)	mg/kg	610000 (1)	590000 (1)	2500	7632799
F3 (C16-C34 Hydrocarbons)	mg/kg	170000 (1)	210000 (1)	13000	7632799
F4 (C34-C50 Hydrocarbons)	mg/kg	<13000 (1)	<13000 (1)	13000	7632799
Reached Baseline at C50	mg/kg	Yes	Yes	N/A	7632799
Volatiles					
Benzene	mg/kg	5.5 (2)	110 (2)	2.5	7625071
Toluene	mg/kg	530 (2)	1100 (2)	10	7625071
Ethylbenzene	mg/kg	770 (2)	880 (2)	5.0	7625071
Xylenes (Total)	mg/kg	5900 (2)	6300 (2)	20	7625071
m & p-Xylene	mg/kg	3700 (2)	4000 (2)	20	7625071
o-Xylene	mg/kg	2200 (2)	2300 (2)	10	7625071
F1 (C6-C10) - BTEX	mg/kg	190000 (2)	270000 (2)	6000	7625071
(C6-C10)	mg/kg	200000 (2)	280000 (2)	6000	7625071
Surrogate Recovery (%)					
1,4-Difluorobenzene (sur.)	%	103	98	N/A	7625071
4-Bromofluorobenzene (sur.)	%	104	110	N/A	7625071
D10-ETHYLBENZENE (sur.)	%	NC (3)	NC (3)	N/A	7625071
D4-1,2-Dichloroethane (sur.)	%	111	108	N/A	7625071

RDL = Reportable Detection Limit

N/A = Not Applicable

(1) Due to the sample matrix, sample required dilution, detection limit was adjusted accordingly.

(2) Detection limit raised based on sample volume used for analysis

(3) surrogate recovery not reported due to matrix interference

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Maxxam Job #: B477081
Report Date: 2014/09/15

TETRA TECH EBA INC.
Your P.O. #: E14103202

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KM5560	KM5562	KM5563	KM5564	KM5566	KM5568		
Sampling Date		2014/08/30	2014/08/30	2014/08/30	2014/08/30	2014/08/30	2014/08/30		
COC Number		A131767	A131767	A131767	A131767	A131767	A131767		
	Units	SS8-30 0-40	SS8-31 20-40	SS8-31 40-70	SS8-32 0-30	SS8-32 50-70	SS8-33 20-40	RDL	QC Batch
Physical Properties									
Moisture	%	3.9	7.7	17	5.6	17	5.4	0.30	7624767
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	<10	<10	820	<10	10	7624935
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	<50	<50	<50	620	<50	50	7624935
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	<50	<50	<50	<50	50	7624935
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	Yes	Yes	N/A	7624935
Volatiles									
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	7624905
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	7624905
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7624905
Xylenes (Total)	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7624905
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7624905
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	7624905
F1 (C6-C10) - BTEX	mg/kg	<12	<12	<12	<12	<12	<12	12	7624905
(C6-C10)	mg/kg	<12	<12	<12	<12	<12	<12	12	7624905
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	100	103	108	100	108	109	N/A	7624905
4-Bromofluorobenzene (sur.)	%	106	99	101	104	103	111	N/A	7624905
D10-ETHYLBENZENE (sur.)	%	99	101	101	99	104	115	N/A	7624905
D4-1,2-Dichloroethane (sur.)	%	103	102	100	103	104	105	N/A	7624905
O-TERPHENYL (sur.)	%	94	97	93	99	98	98	N/A	7624935

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B477081
Report Date: 2014/09/15

TETRA TECH EBA INC.
Your P.O. #: E14103202

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KM5597	KM5599	KM5601	KM5603	KM5605	KM5607		
Sampling Date		2014/08/30	2014/08/30	2014/08/31	2014/08/31	2014/08/31	2014/08/31		
COC Number		A131768	A131768	A131768	A131768	A131768	A131768		
	Units	SS8-34 0-30	SS8-34 50-70	SS8-35 20-40	SS8-36 20-40	SS8-37 50-60	SS8-38 50-60	RDL	QC Batch
Physical Properties									
Moisture	%	4.1	15	5.6	6.4	5.0	5.7	0.30	7624767
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	17	<10	<10	<10	<10	<10	10	7624935
F3 (C16-C34 Hydrocarbons)	mg/kg	57	<50	<50	<50	<50	<50	50	7624935
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	<50	<50	<50	<50	50	7624935
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	Yes	Yes	N/A	7624935
Volatiles									
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	7624905
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	7624905
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7624905
Xylenes (Total)	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7624905
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7624905
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	7624905
F1 (C6-C10) - BTEX	mg/kg	<12	<12	<12	<12	<12	<12	12	7624905
(C6-C10)	mg/kg	<12	<12	<12	<12	<12	<12	12	7624905
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	98	107	101	102	81	102	N/A	7624905
4-Bromofluorobenzene (sur.)	%	105	103	103	101	113	104	N/A	7624905
D10-ETHYLBENZENE (sur.)	%	93	99	100	100	86	100	N/A	7624905
D4-1,2-Dichloroethane (sur.)	%	99	101	103	101	154 (1)	105	N/A	7624905
O-TERPHENYL (sur.)	%	96	95	98	95	96	92	N/A	7624935

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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Maxxam Job #: B477081
Report Date: 2014/09/15

TETRA TECH EBA INC.
Your P.O. #: E14103202

ROUTINE WATER (WATER)

Maxxam ID		KM5921		KM5923		KM5925	KM5927		
Sampling Date		2014/08/31 11:15		2014/08/31 10:40		2014/08/31 11:40	2014/08/31 10:40		
COC Number		A131769		A131769		A131769	A131769		
	Units	14MW04	QC Batch	14MW06	QC Batch	14MWC2	MWDUP2	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	1.6	7624697	0.97	7624697	1.4	1.0	N/A	7624570
Cation Sum	meq/L	1.6	7624697	1.2	7624697	2.1	1.2	N/A	7624570
Hardness (CaCO3)	mg/L	67	7624695	38	7624695	91	39	0.50	7624568
Ion Balance	N/A	1.0	7624696	1.3	7624696	1.5	1.2	0.010	7624569
Dissolved Nitrate (NO3)	mg/L	33	7624698	1.0	7624698	<0.044	1.0	0.044	7624496
Nitrate plus Nitrite (N)	mg/L	7.6	7624699	0.25	7624699	<0.010	0.24	0.010	7624497
Dissolved Nitrite (NO2)	mg/L	0.33	7624698	0.040	7624698	<0.033	0.044	0.033	7624496
Total Dissolved Solids	mg/L	100	7624700	57	7624700	80	58	10	7624571
Misc. Inorganics									
Conductivity	uS/cm	160	7628053	97	7625397	130	98	1.0	7625397
pH	pH	7.43	7628048	6.83	7625390	7.55	6.88	N/A	7625390
Anions									
Alkalinity (PP as CaCO3)	mg/L	<0.50	7628052	<0.50	7625396	<0.50	<0.50	0.50	7625396
Alkalinity (Total as CaCO3)	mg/L	24	7628052	35	7625396	64	36	0.50	7625396
Bicarbonate (HCO3)	mg/L	29	7628052	43	7625396	78	44	0.50	7625396
Carbonate (CO3)	mg/L	<0.50	7628052	<0.50	7625396	<0.50	<0.50	0.50	7625396
Hydroxide (OH)	mg/L	<0.50	7628052	<0.50	7625396	<0.50	<0.50	0.50	7625396
Dissolved Sulphate (SO4)	mg/L	22	7626879	6.6	7626879	3.3	8.0	1.0	7626879
Dissolved Chloride (Cl)	mg/L	2.6	7626858	3.9	7626858	1.1	3.2	1.0	7626858
Nutrients									
Dissolved Nitrite (N)	mg/L	0.10	7625604	0.012	7625604	<0.010	0.013	0.010	7625604
Dissolved Nitrate (N)	mg/L	7.4	7625604	0.24	7625604	<0.010	0.23	0.010	7625604

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B477081
Report Date: 2014/09/15

TETRA TECH EBA INC.
Your P.O. #: E14103202

ROUTINE WATER - FILTERED (WATER)

Maxxam ID		KM5922			KM5924		
Sampling Date		2014/08/31 11:00			2014/08/31 10:03		
COC Number		A131769			A131769		
	Units	14MW05	RDL	QC Batch	14MWC1	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	0.57	N/A	7623772	0.21	N/A	7624570
Cation Sum	meq/L	0.86	N/A	7623772	0.30	N/A	7624570
Hardness (CaCO3)	mg/L	28	0.50	7623770	11	0.50	7624568
Ion Balance	N/A	1.5	0.010	7623771	1.4	0.010	7624569
Dissolved Nitrate (NO3)	mg/L	0.63	0.44	7624496	9.3	0.044	7624496
Nitrate plus Nitrite (N)	mg/L	0.14	0.10	7624497	2.1	0.010	7624497
Dissolved Nitrite (NO2)	mg/L	<0.33	0.33	7624496	<0.033	0.033	7624496
Total Dissolved Solids	mg/L	36	10	7623773	18	10	7624571
Misc. Inorganics							
Conductivity	uS/cm	63	1.0	7625397	33	1.0	7625397
pH	pH	6.60	N/A	7625390	5.04	N/A	7625390
Anions							
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	7625396	<0.50	0.50	7625396
Alkalinity (Total as CaCO3)	mg/L	24	0.50	7625396	<0.50	0.50	7625396
Bicarbonate (HCO3)	mg/L	29	0.50	7625396	<0.50	0.50	7625396
Carbonate (CO3)	mg/L	<0.50	0.50	7625396	<0.50	0.50	7625396
Hydroxide (OH)	mg/L	<0.50	0.50	7625396	<0.50	0.50	7625396
Dissolved Sulphate (SO4)	mg/L	<1.0	1.0	7626879	1.1	1.0	7626879
Dissolved Chloride (Cl)	mg/L	3.1	1.0	7626858	1.3	1.0	7626858
Nutrients							
Dissolved Nitrite (N)	mg/L	<0.10 (1)	0.10	7625604	<0.010	0.010	7625604
Dissolved Nitrate (N)	mg/L	0.14 (1)	0.10	7625604	2.1	0.010	7625604

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to sample matrix.

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B477081
Report Date: 2014/09/15

TETRA TECH EBA INC.
Your P.O. #: E14103202

REGULATED METALS (CCME/AT1) - DISSOLVED

Maxxam ID		KM5921	KM5923	KM5925	KM5927		
Sampling Date		2014/08/31 11:15	2014/08/31 10:40	2014/08/31 11:40	2014/08/31 10:40		
COC Number		A131769	A131769	A131769	A131769		
	Units	14MW04	14MW06	14MWC2	MWDUP2	RDL	QC Batch
Low Level Elements							
Dissolved Cadmium (Cd)	ug/L	0.038	<0.020	0.027	<0.020	0.020	7623347
Elements							
Dissolved Aluminum (Al)	mg/L	0.17	0.34	0.22	0.37	0.0030	7625570
Dissolved Antimony (Sb)	mg/L	<0.00060	<0.00060	<0.00060	<0.00060	0.00060	7625570
Dissolved Arsenic (As)	mg/L	0.00031	0.0021	0.0012	0.0025	0.00020	7625570
Dissolved Barium (Ba)	mg/L	0.023	0.020	0.022	0.020	0.010	7629389
Dissolved Beryllium (Be)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7625570
Dissolved Boron (B)	mg/L	0.039	<0.020 (1)	<0.020	0.020 (1)	0.020	7629389
Dissolved Calcium (Ca)	mg/L	16	8.2	22	8.3	0.30	7629389
Dissolved Chromium (Cr)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7625570
Dissolved Cobalt (Co)	mg/L	0.00085	0.0065	0.0020	0.0070	0.00030	7625570
Dissolved Copper (Cu)	mg/L	0.0046	0.0033	0.0070	0.0031	0.00020	7625570
Dissolved Iron (Fe)	mg/L	0.13	4.1	1.2	4.4	0.060	7629389
Dissolved Lead (Pb)	mg/L	<0.00020	0.00023	0.00028	<0.00020	0.00020	7625570
Dissolved Lithium (Li)	mg/L	<0.020	<0.020	<0.020	<0.020	0.020	7629389
Dissolved Magnesium (Mg)	mg/L	6.9	4.3	8.8	4.3	0.20	7629389
Dissolved Manganese (Mn)	mg/L	0.079	0.33	0.97	0.33	0.0040	7629389
Dissolved Molybdenum (Mo)	mg/L	0.0015	0.00026	0.00084	0.00026	0.00020	7625570
Dissolved Nickel (Ni)	mg/L	0.0014	0.0029	0.0017	0.0031	0.00050	7625570
Dissolved Phosphorus (P)	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	7629389
Dissolved Potassium (K)	mg/L	1.1	1.0	2.5	1.0	0.30	7629389
Dissolved Selenium (Se)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	7625570
Dissolved Silicon (Si)	mg/L	3.6	3.7	5.1	3.7	0.10	7629389
Dissolved Silver (Ag)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	7625570
Dissolved Sodium (Na)	mg/L	5.4	6.1	2.3	6.0	0.50	7629389
Dissolved Strontium (Sr)	mg/L	0.065	0.043	0.035	0.044	0.020	7629389
Dissolved Sulphur (S)	mg/L	6.4	2.7	1.0	2.8	0.20	7629389
Dissolved Thallium (Tl)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	7625570
Dissolved Tin (Sn)	mg/L	0.0020	<0.0010	<0.0010	<0.0010	0.0010	7625570
Dissolved Titanium (Ti)	mg/L	0.012	0.0076	0.0056	0.0086	0.0010	7625570
Dissolved Uranium (U)	mg/L	0.00036	0.00022	0.0053	0.00022	0.00010	7625570
Dissolved Vanadium (V)	mg/L	0.0014	0.0024	0.0017	0.0024	0.0010	7625570
Dissolved Zinc (Zn)	mg/L	0.069	0.082	0.0097	0.087	0.0030	7625570

RDL = Reportable Detection Limit
(1) Dissolved greater than total. Results are within limits of uncertainty(MU).

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Maxxam Job #: B477081
Report Date: 2014/09/15

TETRA TECH EBA INC.
Your P.O. #: E14103202

REGULATED METALS (CCME/AT1) - DISSOLVED

Maxxam ID		KM5922	KM5924		
Sampling Date		2014/08/31 11:00	2014/08/31 10:03		
COC Number		A131769	A131769		
	Units	14MW05	14MWC1	RDL	QC Batch
Low Level Elements					
Dissolved Cadmium (Cd)	ug/L	0.056	0.021	0.020	7623347
Lab Filtered Elements					
Dissolved Aluminum (Al)	mg/L	0.61	0.60	0.0030	7628818
Dissolved Antimony (Sb)	mg/L	<0.00060	<0.00060	0.00060	7628818
Dissolved Arsenic (As)	mg/L	0.0039	0.00034	0.00020	7628818
Dissolved Barium (Ba)	mg/L	0.017	0.020	0.010	7629396
Dissolved Beryllium (Be)	mg/L	<0.0010	<0.0010	0.0010	7628818
Dissolved Boron (B)	mg/L	<0.020	<0.020	0.020	7629396
Dissolved Calcium (Ca)	mg/L	7.5	3.5	0.30	7629396
Dissolved Chromium (Cr)	mg/L	0.0027	<0.0010	0.0010	7628818
Dissolved Cobalt (Co)	mg/L	0.0022	0.0028	0.00030	7628818
Dissolved Copper (Cu)	mg/L	0.048	0.0048	0.00020	7628818
Dissolved Iron (Fe)	mg/L	4.9	0.46	0.060	7629396
Dissolved Lead (Pb)	mg/L	0.00061	<0.00020	0.00020	7628818
Dissolved Lithium (Li)	mg/L	<0.020	<0.020	0.020	7629396
Dissolved Magnesium (Mg)	mg/L	2.1	0.52	0.20	7629396
Dissolved Manganese (Mn)	mg/L	0.096	0.012	0.0040	7629396
Dissolved Molybdenum (Mo)	mg/L	0.0020	<0.00020	0.00020	7628818
Dissolved Nickel (Ni)	mg/L	0.0077	0.0018	0.00050	7628818
Dissolved Phosphorus (P)	mg/L	<0.10	<0.10	0.10	7629396
Dissolved Potassium (K)	mg/L	1.1	<0.30	0.30	7629396
Dissolved Selenium (Se)	mg/L	<0.00020	<0.00020	0.00020	7628818
Dissolved Silicon (Si)	mg/L	12	6.0	0.10	7629396
Dissolved Silver (Ag)	mg/L	<0.00010	<0.00010	0.00010	7628818
Dissolved Sodium (Na)	mg/L	2.5	1.3	0.50	7629396
Dissolved Strontium (Sr)	mg/L	0.024	<0.020	0.020	7629396
Dissolved Sulphur (S)	mg/L	0.97	0.99	0.20	7629396
Dissolved Thallium (Tl)	mg/L	<0.00020	<0.00020	0.00020	7628818
Dissolved Tin (Sn)	mg/L	0.0013	<0.0010	0.0010	7628818
Dissolved Titanium (Ti)	mg/L	0.022	0.014	0.0010	7628818
Dissolved Uranium (U)	mg/L	0.0025	0.00084	0.00010	7628818
Dissolved Vanadium (V)	mg/L	0.014	0.0022	0.0010	7628818
Dissolved Zinc (Zn)	mg/L	0.13	0.041	0.0030	7628818
RDL = Reportable Detection Limit					

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Maxxam Job #: B477081
Report Date: 2014/09/15

TETRA TECH EBA INC.
Your P.O. #: E14103202

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		KM5921			KM5922			KM5923		
Sampling Date		2014/08/31 11:15			2014/08/31 11:00			2014/08/31 10:40		
COC Number		A131769			A131769			A131769		
	Units	14MW04	RDL	QC Batch	14MW05	RDL	QC Batch	14MW06	RDL	QC Batch
Low Level Elements										
Total Cadmium (Cd)	ug/L	0.48	0.020	7623412	5.8	0.40	7623412	0.68	0.020	7623412
Elements										
Total Aluminum (Al)	mg/L	75	0.0030	7628625	590	0.060	7630518	61	0.0030	7628625
Total Antimony (Sb)	mg/L	<0.00060	0.00060	7628625	<0.012	0.012	7630518	<0.00060	0.00060	7628625
Total Arsenic (As)	mg/L	0.024	0.00020	7628625	0.49	0.0040	7630518	0.071	0.00020	7628625
Total Barium (Ba)	mg/L	0.47	0.010	7628627	3.4	0.010	7630532	0.47	0.010	7628627
Total Beryllium (Be)	mg/L	0.0028	0.0010	7628625	0.026	0.020	7630518	0.0024	0.0010	7628625
Total Boron (B)	mg/L	0.045	0.020	7628627	0.064	0.020	7630532	<0.020	0.020	7628627
Total Calcium (Ca)	mg/L	34	0.30	7628627	180	0.30	7630532	45	0.30	7628627
Total Chromium (Cr)	mg/L	0.22	0.0010	7628625	2.2	0.020	7630518	0.16	0.0010	7628625
Total Cobalt (Co)	mg/L	0.046	0.00030	7628625	0.40	0.0060	7630518	0.057	0.00030	7628625
Total Copper (Cu)	mg/L	0.30	0.00020	7628625	3.6	0.0040	7630518	0.22	0.00020	7628625
Total Iron (Fe)	mg/L	79	0.060	7628627	1300 (1)	0.60	7630532	91	0.060	7628627
Total Lead (Pb)	mg/L	0.035	0.00020	7628625	0.24	0.0040	7630518	0.035	0.00020	7628625
Total Lithium (Li)	mg/L	0.16	0.020	7628627	1.6	0.020	7630532	0.14	0.020	7628627
Total Magnesium (Mg)	mg/L	39	0.20	7628627	310	0.20	7630532	31	0.20	7628627
Total Manganese (Mn)	mg/L	0.79	0.0040	7628627	7.4	0.0040	7630532	1.6	0.0040	7628627
Total Molybdenum (Mo)	mg/L	0.0028	0.00020	7628625	0.016	0.0040	7630518	0.0030	0.00020	7628625
Total Nickel (Ni)	mg/L	0.17	0.00050	7628625	1.3	0.010	7630518	0.12	0.00050	7628625
Total Phosphorus (P)	mg/L	6.3	0.10	7628627	50	0.10	7630532	14	0.10	7628627
Total Potassium (K)	mg/L	14	0.30	7628627	89	0.30	7630532	12	0.30	7628627
Total Selenium (Se)	mg/L	0.00081	0.00020	7628625	0.012	0.0040	7630518	0.00072	0.00020	7628625
Total Silicon (Si)	mg/L	58	0.10	7628627	340 (1)	1.0	7630532	55	0.10	7628627
Total Silver (Ag)	mg/L	0.00038	0.00010	7628625	0.0045	0.0020	7630518	0.00028	0.00010	7628625
Total Sodium (Na)	mg/L	7.1	0.50	7628627	15	0.50	7630532	7.9	0.50	7628627
Total Strontium (Sr)	mg/L	0.13	0.020	7628627	0.59	0.020	7630532	0.14	0.020	7628627
Total Sulphur (S)	mg/L	7.9	0.20	7628627	18	0.20	7630532	3.1	0.20	7628627
Total Thallium (Tl)	mg/L	0.0012	0.00020	7628625	0.011	0.0040	7630518	0.00086	0.00020	7628625
Total Tin (Sn)	mg/L	0.014	0.0010	7628625	0.069	0.020	7630518	0.0037	0.0010	7628625
Total Titanium (Ti)	mg/L	3.5	0.0010	7628625	29 (1)	0.10	7630518	2.7	0.0010	7628625
Total Uranium (U)	mg/L	0.042	0.00010	7628625	0.39	0.0020	7630518	0.010	0.00010	7628625
Total Vanadium (V)	mg/L	0.22	0.0010	7628625	2.8	0.020	7630518	0.21	0.0010	7628625
Total Zinc (Zn)	mg/L	0.55	0.0030	7628625	3.0	0.060	7630518	0.67	0.0030	7628625

RDL = Reportable Detection Limit
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

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Maxxam Job #: B477081
Report Date: 2014/09/15

TETRA TECH EBA INC.
Your P.O. #: E14103202

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		KM5924			KM5927		
Sampling Date		2014/08/31 10:03			2014/08/31 10:40		
COC Number		A131769			A131769		
	Units	14MWC1	RDL	QC Batch	MWDUP2	RDL	QC Batch
Low Level Elements							
Total Cadmium (Cd)	ug/L	1.4	0.40	7623412	0.92	0.020	7623412
Elements							
Total Aluminum (Al)	mg/L	210	0.060	7630518	76	0.0030	7628625
Total Antimony (Sb)	mg/L	<0.012	0.012	7630518	<0.00060	0.00060	7628625
Total Arsenic (As)	mg/L	0.047	0.0040	7630518	0.086	0.00020	7628625
Total Barium (Ba)	mg/L	0.91	0.010	7630532	0.59	0.010	7628627
Total Beryllium (Be)	mg/L	<0.020	0.020	7630518	0.0033	0.0010	7628625
Total Boron (B)	mg/L	<0.020	0.020	7630532	<0.020	0.020	7628627
Total Calcium (Ca)	mg/L	54	0.30	7630532	61	0.30	7628627
Total Chromium (Cr)	mg/L	0.29	0.020	7630518	0.20	0.0010	7628625
Total Cobalt (Co)	mg/L	0.087	0.0060	7630518	0.070	0.00030	7628625
Total Copper (Cu)	mg/L	0.75	0.0040	7630518	0.28	0.00020	7628625
Total Iron (Fe)	mg/L	240 (1)	0.60	7630532	110	0.060	7628627
Total Lead (Pb)	mg/L	0.071	0.0040	7630518	0.041	0.00020	7628625
Total Lithium (Li)	mg/L	0.16	0.020	7630532	0.18	0.020	7628627
Total Magnesium (Mg)	mg/L	39	0.20	7630532	38	0.20	7628627
Total Manganese (Mn)	mg/L	0.96	0.0040	7630532	2.0	0.0040	7628627
Total Molybdenum (Mo)	mg/L	<0.0040	0.0040	7630518	0.0035	0.00020	7628625
Total Nickel (Ni)	mg/L	0.23	0.010	7630518	0.16	0.00050	7628625
Total Phosphorus (P)	mg/L	21	0.10	7630532	19	0.10	7628627
Total Potassium (K)	mg/L	7.1	0.30	7630532	15	0.30	7628627
Total Selenium (Se)	mg/L	0.0062	0.0040	7630518	0.00090	0.00020	7628625
Total Silicon (Si)	mg/L	120 (1)	1.0	7630532	61	0.10	7628627
Total Silver (Ag)	mg/L	0.0023	0.0020	7630518	0.00034	0.00010	7628625
Total Sodium (Na)	mg/L	7.2	0.50	7630532	8.2	0.50	7628627
Total Strontium (Sr)	mg/L	0.21	0.020	7630532	0.18	0.020	7628627
Total Sulphur (S)	mg/L	20	0.20	7630532	3.3	0.20	7628627
Total Thallium (Tl)	mg/L	<0.0040	0.0040	7630518	0.0011	0.00020	7628625
Total Tin (Sn)	mg/L	<0.020	0.020	7630518	0.0044	0.0010	7628625
Total Titanium (Ti)	mg/L	3.3	0.020	7630518	3.5	0.0010	7628625
Total Uranium (U)	mg/L	0.23	0.0020	7630518	0.012	0.00010	7628625
Total Vanadium (V)	mg/L	0.41	0.020	7630518	0.26	0.0010	7628625
Total Zinc (Zn)	mg/L	0.75	0.060	7630518	0.82	0.0030	7628625

RDL = Reportable Detection Limit
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

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Maxxam Job #: B477081
Report Date: 2014/09/15

TETRA TECH EBA INC.
Your P.O. #: E14103202

RESULTS OF CHEMICAL ANALYSES OF PRODUCT

Maxxam ID		KM5557	KM5558	KM6007	KM6008	
Sampling Date		2014/08/31	2014/08/31	2014/08/31	2014/08/31	
COC Number		A131767	A131767	A131767	A131767	
	Units	**TANK 2-1**	**DR 2-1**	**TANK 2-1**	**DR 2-1**	**QC Batch**
Parameter						
Subcontract Parameter	n/a	N/A	N/A	ATTACHED	ATTACHED	7634480
Physical Properties						
Closed Cup Flash point	°C	51	50	N/A	N/A	7628948

N/A = Not Applicable

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Maxxam Job #: B477081
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TETRA TECH EBA INC.
Your P.O. #: E14103202

POLYCHLORINATED BIPHENYLS BY GC-ECD (PRODUCT)

Maxxam ID		KM5557	KM5558		
Sampling Date		2014/08/31	2014/08/31		
COC Number		A131767	A131767		
	Units	TANK 2-1	DR 2-1	RDL	QC Batch
Polychlorinated Biphenyls					
Aroclor 1016	mg/kg	<1.0	<1.0	1.0	7629164
Aroclor 1221	mg/kg	<1.0	<1.0	1.0	7629164
Aroclor 1232	mg/kg	<1.0	<1.0	1.0	7629164
Aroclor 1242	mg/kg	<1.0	<1.0	1.0	7629164
Aroclor 1248	mg/kg	<1.0	<1.0	1.0	7629164
Aroclor 1254	mg/kg	<1.0	<1.0	1.0	7629164
Aroclor 1260	mg/kg	<1.0	<1.0	1.0	7629164
Aroclor 1268	mg/kg	<1.0	<1.0	1.0	7629164
Total Aroclors	mg/kg	<1.0	<1.0	1.0	7629164
Surrogate Recovery (%)					
NONACHLOROBIPHENYL (sur.)	%	102	104	N/A	7629164

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B477081
Report Date: 2014/09/15

TETRA TECH EBA INC.
Your P.O. #: E14103202

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	3.7°C
Package 2	6.0°C
Package 3	8.0°C

The CCME Fraction 2 - Fraction 4 chromatograms for samples KM5557 (TANK 2-1) and KM5558 (DR 2-1) were reviewed to determine their consistency with various petroleum hydrocarbon products. Hydrocarbon resemblance was obtained by a simple visual comparison of the sample chromatogram with a library of reference product chromatograms.

Samples KM5557 (TANK 2-1) and KM5558 (DR 2-1) feature chromatographic fingerprints through the CCME Fraction 2 (C10-C16) and Fraction 3 (C16-C34) where petroleum products are expected to elute. The fingerprints present in these samples are consistent with those of a lighter fuel oil. Diesel is an example of a fuel oil.

The fingerprints present in these samples do not appear to be consistent with those of a lighter petroleum hydrocarbon product such as aviation fuel.

Note, however, it is not within the scope of the CCME F2-F4 method, however, to comprehensively investigate any subtleties that exist within the sample chromatogram.

To further investigate the chromatographic fingerprints present in these samples, extended GC/MS analyses targeting analytes such as petroleum biomarkers and alkylated PAH's could be used. The extended GC/MS scan data would be reviewed by senior members of Maxxam's technical services team, who would then generate a project-specific interpretation report that may provide more definitive conclusions.

Maxxam Analytics Disclaimer

HYDROCARBON RESEMBLANCE
The reported hydrocarbon resemblance was obtained by visual comparison of the sample chromatogram with a library of reference product chromatograms. Since variables such as the degree and type of weathering and the presence of non-petrogenic hydrocarbons cannot be duplicated in reference spectra, the resemblance information must be regarded as approximate and qualitative and as such, Maxxam can assume no liability for any conclusions drawn from these data.

CHROMATOGRAM PROVISION
The chromatograms are provided for information purposes only. Any conclusion drawn by the data user from these chromatograms is their sole responsibility. Maxxam can assume no liability for any such 3rd party interpretations and is responsible only for the quality of the quantitative data provided.

Sample KM5922-01 : Cation anion balance exceeds normal acceptance limits due to the low concentrations of ions being measured.
Detection limits raised due to sample matrix. Parameters affected are total Al, Cr, Co, Cu, Pb, Sb, Mo, Ni, Se, Ag, As, Tl, Sn, U, V, Zn, Be, Cd.

Sample KM5923-01 : Cation anion balance exceeds normal acceptance limits due to the low concentrations of ions being measured.

Sample KM5924-01 : Cation anion balance exceeds normal acceptance limits due to the low concentrations of ions being measured.
Detection limits raised due to sample matrix. Parameters affected are total Al, Cr, Co, Cu, Pb, Sb, Mo, Ni, Se, Ag, As, Tl, Sn, Ti, U, V, Zn, Be, Cd.

Sample KM5925-01 : Cation anion balance exceeds normal acceptance limits due to the low concentrations of ions being measured.

Sample KM5927-01 : Cation anion balance exceeds normal acceptance limits due to the low concentrations of ions being measured.

Results relate only to the items tested.

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Maxxam Job #: B477081
Report Date: 2014/09/15

TETRA TECH EBA INC.
Your P.O. #: E14103202

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
7624767	ZZ	Method Blank	Moisture	2014/09/04	<0.30		%	
7624767	ZZ	RPD [KM5603-02]	Moisture	2014/09/04	12		%	20
7624905	NM5	Matrix Spike	1,4-Difluorobenzene (sur.)	2014/09/06		105	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/09/06		105	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/09/06		103	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/06		105	%	60 - 140
			Benzene	2014/09/06		101	%	60 - 140
			Toluene	2014/09/06		97	%	60 - 140
			Ethylbenzene	2014/09/06		102	%	60 - 140
			m & p-Xylene	2014/09/06		101	%	60 - 140
			o-Xylene	2014/09/06		101	%	60 - 140
			(C6-C10)	2014/09/06		101	%	60 - 140
7624905	NM5	Spiked Blank	1,4-Difluorobenzene (sur.)	2014/09/06		98	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/09/06		101	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/09/06		99	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/06		104	%	60 - 140
			Benzene	2014/09/06		100	%	60 - 140
			Toluene	2014/09/06		91	%	60 - 140
			Ethylbenzene	2014/09/06		98	%	60 - 140
			m & p-Xylene	2014/09/06		98	%	60 - 140
			o-Xylene	2014/09/06		95	%	60 - 140
			(C6-C10)	2014/09/06		98	%	60 - 140
7624905	NM5	Method Blank	1,4-Difluorobenzene (sur.)	2014/09/06		100	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/09/06		102	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/09/06		96	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/06		103	%	60 - 140
			Benzene	2014/09/06	<0.0050		mg/kg	
			Toluene	2014/09/06	<0.020		mg/kg	
			Ethylbenzene	2014/09/06	<0.010		mg/kg	
			Xylenes (Total)	2014/09/06	<0.040		mg/kg	
			m & p-Xylene	2014/09/06	<0.040		mg/kg	
			o-Xylene	2014/09/06	<0.020		mg/kg	
			F1 (C6-C10) - BTEX	2014/09/06	<12		mg/kg	
			(C6-C10)	2014/09/06	<12		mg/kg	
7624905	NM5	RPD	Benzene	2014/09/06	NC		%	50
			Toluene	2014/09/06	NC		%	50
			Ethylbenzene	2014/09/06	NC		%	50
			Xylenes (Total)	2014/09/06	NC		%	50
			m & p-Xylene	2014/09/06	NC		%	50
			o-Xylene	2014/09/06	NC		%	50
			F1 (C6-C10) - BTEX	2014/09/06	NC		%	50
			(C6-C10)	2014/09/06	NC		%	50
7624935	KK5	Matrix Spike	O-TERPHENYL (sur.)	2014/09/06		86	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/06		98	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2014/09/06		98	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2014/09/06		96	%	50 - 130
7624935	KK5	Spiked Blank	O-TERPHENYL (sur.)	2014/09/06		93	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/06		106	%	70 - 130
			F3 (C16-C34 Hydrocarbons)	2014/09/06		106	%	70 - 130
			F4 (C34-C50 Hydrocarbons)	2014/09/06		97	%	70 - 130
7624935	KK5	Method Blank	O-TERPHENYL (sur.)	2014/09/06		97	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/06	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2014/09/06	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2014/09/06	<50		mg/kg	

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B477081
Report Date: 2014/09/15

TETRA TECH EBA INC.
Your P.O. #: E14103202

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
7624935	KK5	RPD	F2 (C10-C16 Hydrocarbons)	2014/09/06	NC		%	50
			F3 (C16-C34 Hydrocarbons)	2014/09/06	NC		%	50
			F4 (C34-C50 Hydrocarbons)	2014/09/06	NC		%	50
7624939	RC6	Matrix Spike	1,4-Difluorobenzene (sur.)	2014/09/08		96	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/09/08		92	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/08		98	%	70 - 130
			Benzene	2014/09/08		NC	%	70 - 130
			Toluene	2014/09/08		NC	%	70 - 130
			Ethylbenzene	2014/09/08		NC	%	70 - 130
			m & p-Xylene	2014/09/08		NC	%	70 - 130
			o-Xylene	2014/09/08		87	%	70 - 130
			(C6-C10)	2014/09/08		NC	%	70 - 130
7624939	RC6	Spiked Blank	1,4-Difluorobenzene (sur.)	2014/09/08		94	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/09/08		95	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/08		96	%	70 - 130
			Benzene	2014/09/08		83	%	70 - 130
			Toluene	2014/09/08		80	%	70 - 130
			Ethylbenzene	2014/09/08		85	%	70 - 130
			m & p-Xylene	2014/09/08		84	%	70 - 130
			o-Xylene	2014/09/08		85	%	70 - 130
			(C6-C10)	2014/09/08		111	%	70 - 130
7624939	RC6	Method Blank	1,4-Difluorobenzene (sur.)	2014/09/08		102	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/09/08		96	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/08		104	%	70 - 130
			Benzene	2014/09/08	<0.00040		mg/L	
			Toluene	2014/09/08	<0.00040		mg/L	
			Ethylbenzene	2014/09/08	<0.00040		mg/L	
			m & p-Xylene	2014/09/08	<0.00080		mg/L	
			o-Xylene	2014/09/08	<0.00040		mg/L	
			Xylenes (Total)	2014/09/08	<0.00080		mg/L	
			F1 (C6-C10) - BTEX	2014/09/08	<0.10		mg/L	
			(C6-C10)	2014/09/08	<0.10		mg/L	
7624939	RC6	RPD	Benzene	2014/09/08	6.3		%	40
			Toluene	2014/09/08	1.9		%	40
			Ethylbenzene	2014/09/08	NC		%	40
			m & p-Xylene	2014/09/08	NC		%	40
			o-Xylene	2014/09/08	0.50		%	40
			Xylenes (Total)	2014/09/08	1.3		%	40
			F1 (C6-C10) - BTEX	2014/09/08	NC		%	40
			(C6-C10)	2014/09/08	NC		%	40
7624962	GG3	Matrix Spike	O-TERPHENYL (sur.)	2014/09/06		99	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/06		119	%	50 - 130
7624962	GG3	Spiked Blank	O-TERPHENYL (sur.)	2014/09/06		94	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/06		107	%	70 - 130
7624962	GG3	Method Blank	O-TERPHENYL (sur.)	2014/09/06		88	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/06	<0.10		mg/L	
7624962	GG3	RPD	F2 (C10-C16 Hydrocarbons)	2014/09/06	NC		%	40
7625071	SES	Matrix Spike	1,4-Difluorobenzene (sur.)	2014/09/04		109	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/09/04		101	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/09/04		108	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/04		109	%	60 - 140
			Benzene	2014/09/04		107	%	60 - 140
			Toluene	2014/09/04		105	%	60 - 140
			Ethylbenzene	2014/09/04		107	%	60 - 140

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B477081
Report Date: 2014/09/15

TETRA TECH EBA INC.
Your P.O. #: E14103202

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			m & p-Xylene	2014/09/04		109	%	60 - 140
			o-Xylene	2014/09/04		107	%	60 - 140
			(C6-C10)	2014/09/04		120	%	60 - 140
7625071	SES	Spiked Blank	1,4-Difluorobenzene (sur.)	2014/09/04		100	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/09/04		99	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/09/04		102	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/04		106	%	60 - 140
			Benzene	2014/09/04		98	%	60 - 140
			Toluene	2014/09/04		96	%	60 - 140
			Ethylbenzene	2014/09/04		98	%	60 - 140
			m & p-Xylene	2014/09/04		100	%	60 - 140
			o-Xylene	2014/09/04		96	%	60 - 140
			(C6-C10)	2014/09/04		118	%	60 - 140
7625071	SES	Method Blank	1,4-Difluorobenzene (sur.)	2014/09/04		98	%	60 - 140
			4-Bromofluorobenzene (sur.)	2014/09/04		97	%	60 - 140
			D10-ETHYLBENZENE (sur.)	2014/09/04		102	%	60 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/04		107	%	60 - 140
			Benzene	2014/09/04	<0.0050		mg/kg	
			Toluene	2014/09/04	<0.020		mg/kg	
			Ethylbenzene	2014/09/04	<0.010		mg/kg	
			Xylenes (Total)	2014/09/04	<0.040		mg/kg	
			m & p-Xylene	2014/09/04	<0.040		mg/kg	
			o-Xylene	2014/09/04	<0.020		mg/kg	
			F1 (C6-C10) - BTEX	2014/09/04	<12		mg/kg	
			(C6-C10)	2014/09/04	<12		mg/kg	
7625071	SES	RPD	Benzene	2014/09/04	NC		%	50
			Toluene	2014/09/04	NC		%	50
			Ethylbenzene	2014/09/04	NC		%	50
			Xylenes (Total)	2014/09/04	NC		%	50
			m & p-Xylene	2014/09/04	NC		%	50
			o-Xylene	2014/09/04	NC		%	50
			F1 (C6-C10) - BTEX	2014/09/04	NC		%	50
			(C6-C10)	2014/09/04	NC		%	50
7625390	MA4	Spiked Blank	pH	2014/09/04		100	%	97 - 103
7625390	MA4	RPD	pH	2014/09/04	0.13		%	N/A
7625396	MA4	Spiked Blank	Alkalinity (Total as CaCO3)	2014/09/04		101	%	80 - 120
7625396	MA4	Method Blank	Alkalinity (PP as CaCO3)	2014/09/04	<0.50		mg/L	
			Alkalinity (Total as CaCO3)	2014/09/04	<0.50		mg/L	
			Bicarbonate (HCO3)	2014/09/04	<0.50		mg/L	
			Carbonate (CO3)	2014/09/04	<0.50		mg/L	
			Hydroxide (OH)	2014/09/04	<0.50		mg/L	
7625396	MA4	RPD	Alkalinity (PP as CaCO3)	2014/09/04	NC		%	20
			Alkalinity (Total as CaCO3)	2014/09/04	0.46		%	20
			Bicarbonate (HCO3)	2014/09/04	0.46		%	20
			Carbonate (CO3)	2014/09/04	NC		%	20
			Hydroxide (OH)	2014/09/04	NC		%	20
7625397	MA4	Spiked Blank	Conductivity	2014/09/04		102	%	90 - 110
7625397	MA4	Method Blank	Conductivity	2014/09/04	<1.0		uS/cm	
7625397	MA4	RPD	Conductivity	2014/09/04	0		%	20
7625570	SF3	Matrix Spike [KM5921-03]	Dissolved Aluminum (Al)	2014/09/07		NC	%	80 - 120
			Dissolved Antimony (Sb)	2014/09/07		113	%	80 - 120
			Dissolved Arsenic (As)	2014/09/07		107	%	80 - 120
			Dissolved Beryllium (Be)	2014/09/07		123 (1)	%	80 - 120

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B477081
Report Date: 2014/09/15

TETRA TECH EBA INC.
Your P.O. #: E14103202

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Dissolved Chromium (Cr)	2014/09/07		104	%	80 - 120
			Dissolved Cobalt (Co)	2014/09/07		100	%	80 - 120
			Dissolved Copper (Cu)	2014/09/07		101	%	80 - 120
			Dissolved Lead (Pb)	2014/09/07		102	%	80 - 120
			Dissolved Molybdenum (Mo)	2014/09/07		114	%	80 - 120
			Dissolved Nickel (Ni)	2014/09/07		102	%	80 - 120
			Dissolved Selenium (Se)	2014/09/07		111	%	80 - 120
			Dissolved Silver (Ag)	2014/09/07		97	%	80 - 120
			Dissolved Thallium (Tl)	2014/09/07		112	%	80 - 120
			Dissolved Tin (Sn)	2014/09/07		116	%	80 - 120
			Dissolved Titanium (Ti)	2014/09/07		110	%	80 - 120
			Dissolved Uranium (U)	2014/09/07		100	%	80 - 120
			Dissolved Vanadium (V)	2014/09/07		119	%	80 - 120
			Dissolved Zinc (Zn)	2014/09/07		NC	%	80 - 120
7625570	SF3	Spiked Blank	Dissolved Aluminum (Al)	2014/09/07		98	%	80 - 120
			Dissolved Antimony (Sb)	2014/09/07		80	%	80 - 120
			Dissolved Arsenic (As)	2014/09/07		95	%	80 - 120
			Dissolved Beryllium (Be)	2014/09/07		108	%	80 - 120
			Dissolved Chromium (Cr)	2014/09/07		93	%	80 - 120
			Dissolved Cobalt (Co)	2014/09/07		91	%	80 - 120
			Dissolved Copper (Cu)	2014/09/07		96	%	80 - 120
			Dissolved Lead (Pb)	2014/09/07		90	%	80 - 120
			Dissolved Molybdenum (Mo)	2014/09/07		98	%	80 - 120
			Dissolved Nickel (Ni)	2014/09/07		92	%	80 - 120
			Dissolved Selenium (Se)	2014/09/07		96	%	80 - 120
			Dissolved Silver (Ag)	2014/09/07		89	%	80 - 120
			Dissolved Thallium (Tl)	2014/09/07		99	%	80 - 120
			Dissolved Tin (Sn)	2014/09/07		99	%	80 - 120
			Dissolved Titanium (Ti)	2014/09/07		95	%	80 - 120
			Dissolved Uranium (U)	2014/09/07		96	%	80 - 120
			Dissolved Vanadium (V)	2014/09/07		98	%	80 - 120
			Dissolved Zinc (Zn)	2014/09/07		95	%	80 - 120
7625570	SF3	Method Blank	Dissolved Aluminum (Al)	2014/09/06	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2014/09/06	<0.00060		mg/L	
			Dissolved Arsenic (As)	2014/09/06	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2014/09/06	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2014/09/06	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2014/09/06	<0.00030		mg/L	
			Dissolved Copper (Cu)	2014/09/06	<0.00020		mg/L	
			Dissolved Lead (Pb)	2014/09/06	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2014/09/06	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2014/09/06	<0.00050		mg/L	
			Dissolved Selenium (Se)	2014/09/06	<0.00020		mg/L	
			Dissolved Silver (Ag)	2014/09/06	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2014/09/06	<0.00020		mg/L	
			Dissolved Tin (Sn)	2014/09/06	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2014/09/06	<0.0010		mg/L	
			Dissolved Uranium (U)	2014/09/06	<0.00010		mg/L	
			Dissolved Vanadium (V)	2014/09/06	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2014/09/06	<0.0030		mg/L	
7625570	SF3	RPD [KM5921-03]	Dissolved Aluminum (Al)	2014/09/06	4.1		%	20
			Dissolved Antimony (Sb)	2014/09/06	NC		%	20
			Dissolved Arsenic (As)	2014/09/06	NC		%	20
			Dissolved Beryllium (Be)	2014/09/06	NC		%	20

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B477081
Report Date: 2014/09/15

TETRA TECH EBA INC.
Your P.O. #: E14103202

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Dissolved Chromium (Cr)	2014/09/06	NC		%	20
			Dissolved Cobalt (Co)	2014/09/06	NC		%	20
			Dissolved Copper (Cu)	2014/09/06	0.15		%	20
			Dissolved Lead (Pb)	2014/09/06	NC		%	20
			Dissolved Molybdenum (Mo)	2014/09/06	8.4		%	20
			Dissolved Nickel (Ni)	2014/09/06	NC		%	20
			Dissolved Selenium (Se)	2014/09/06	NC		%	20
			Dissolved Silver (Ag)	2014/09/06	NC		%	20
			Dissolved Thallium (Tl)	2014/09/06	NC		%	20
			Dissolved Tin (Sn)	2014/09/06	NC		%	20
			Dissolved Titanium (Ti)	2014/09/06	3.9		%	20
			Dissolved Uranium (U)	2014/09/06	NC		%	20
			Dissolved Vanadium (V)	2014/09/06	NC		%	20
			Dissolved Zinc (Zn)	2014/09/06	1.5		%	20
7625604	SB8	Matrix Spike	Dissolved Nitrite (N)	2014/09/07		101	%	80 - 120
			Dissolved Nitrate (N)	2014/09/07		103	%	80 - 120
7625604	SB8	Spiked Blank	Dissolved Nitrite (N)	2014/09/07		101	%	80 - 120
			Dissolved Nitrate (N)	2014/09/07		103	%	80 - 120
7625604	SB8	Method Blank	Dissolved Nitrite (N)	2014/09/07	<0.010		mg/L	
			Dissolved Nitrate (N)	2014/09/07	<0.010		mg/L	
7625604	SB8	RPD	Dissolved Nitrite (N)	2014/09/08	NC		%	20
			Dissolved Nitrate (N)	2014/09/08	NC		%	20
7626858	LMD	Matrix Spike [KM5921-01]	Dissolved Chloride (Cl)	2014/09/07		100	%	80 - 120
7626858	LMD	Spiked Blank	Dissolved Chloride (Cl)	2014/09/07		99	%	80 - 120
7626858	LMD	Method Blank	Dissolved Chloride (Cl)	2014/09/07	<1.0		mg/L	
7626858	LMD	RPD [KM5921-01]	Dissolved Chloride (Cl)	2014/09/07	NC		%	20
7626879	LMD	Matrix Spike [KM5921-01]	Dissolved Sulphate (SO4)	2014/09/07		NC	%	80 - 120
7626879	LMD	Spiked Blank	Dissolved Sulphate (SO4)	2014/09/07		99	%	80 - 120
7626879	LMD	Method Blank	Dissolved Sulphate (SO4)	2014/09/07	<1.0		mg/L	
7626879	LMD	RPD [KM5921-01]	Dissolved Sulphate (SO4)	2014/09/07	0.39		%	20
7628048	CCO	Spiked Blank	pH	2014/09/06		100	%	97 - 103
7628048	CCO	RPD	pH	2014/09/06	0.41		%	N/A
7628052	CCO	Spiked Blank	Alkalinity (Total as CaCO3)	2014/09/06		101	%	80 - 120
7628052	CCO	Method Blank	Alkalinity (PP as CaCO3)	2014/09/06	<0.50		mg/L	
			Alkalinity (Total as CaCO3)	2014/09/06	<0.50		mg/L	
			Bicarbonate (HCO3)	2014/09/06	<0.50		mg/L	
			Carbonate (CO3)	2014/09/06	<0.50		mg/L	
			Hydroxide (OH)	2014/09/06	<0.50		mg/L	
7628052	CCO	RPD	Alkalinity (PP as CaCO3)	2014/09/06	NC		%	20
			Alkalinity (Total as CaCO3)	2014/09/06	1.2		%	20
			Bicarbonate (HCO3)	2014/09/06	1.2		%	20
			Carbonate (CO3)	2014/09/06	NC		%	20
			Hydroxide (OH)	2014/09/06	NC		%	20
7628053	CCO	Spiked Blank	Conductivity	2014/09/06		100	%	90 - 110
7628053	CCO	Method Blank	Conductivity	2014/09/06	<1.0		uS/cm	
7628053	CCO	RPD	Conductivity	2014/09/06	0.79		%	20
7628625	SF3	Matrix Spike	Total Aluminum (Al)	2014/09/08		NC	%	80 - 120
			Total Antimony (Sb)	2014/09/08		114	%	80 - 120
			Total Arsenic (As)	2014/09/08		107	%	80 - 120
			Total Beryllium (Be)	2014/09/08		106	%	80 - 120
			Total Chromium (Cr)	2014/09/08		105	%	80 - 120
			Total Cobalt (Co)	2014/09/08		100	%	80 - 120

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Maxxam Job #: B477081
Report Date: 2014/09/15

TETRA TECH EBA INC.
Your P.O. #: E14103202

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Total Copper (Cu)	2014/09/08		97	%	80 - 120
			Total Lead (Pb)	2014/09/08		100	%	80 - 120
			Total Molybdenum (Mo)	2014/09/08		NC	%	80 - 120
			Total Nickel (Ni)	2014/09/08		98	%	80 - 120
			Total Selenium (Se)	2014/09/08		98	%	80 - 120
			Total Silver (Ag)	2014/09/08		102	%	80 - 120
			Total Thallium (Tl)	2014/09/08		99	%	80 - 120
			Total Tin (Sn)	2014/09/08		118	%	80 - 120
			Total Titanium (Ti)	2014/09/08		107	%	80 - 120
			Total Uranium (U)	2014/09/08		105	%	80 - 120
			Total Vanadium (V)	2014/09/08		111	%	80 - 120
			Total Zinc (Zn)	2014/09/08		106	%	80 - 120
7628625	SF3	Spiked Blank	Total Aluminum (Al)	2014/09/08		106	%	80 - 120
			Total Antimony (Sb)	2014/09/08		103	%	80 - 120
			Total Arsenic (As)	2014/09/08		101	%	80 - 120
			Total Beryllium (Be)	2014/09/08		97	%	80 - 120
			Total Chromium (Cr)	2014/09/08		101	%	80 - 120
			Total Cobalt (Co)	2014/09/08		101	%	80 - 120
			Total Copper (Cu)	2014/09/08		102	%	80 - 120
			Total Lead (Pb)	2014/09/08		105	%	80 - 120
			Total Molybdenum (Mo)	2014/09/08		106	%	80 - 120
			Total Nickel (Ni)	2014/09/08		102	%	80 - 120
			Total Selenium (Se)	2014/09/08		100	%	80 - 120
			Total Silver (Ag)	2014/09/08		103	%	80 - 120
			Total Thallium (Tl)	2014/09/08		104	%	80 - 120
			Total Tin (Sn)	2014/09/08		108	%	80 - 120
			Total Titanium (Ti)	2014/09/08		104	%	80 - 120
			Total Uranium (U)	2014/09/08		103	%	80 - 120
			Total Vanadium (V)	2014/09/08		104	%	80 - 120
			Total Zinc (Zn)	2014/09/08		105	%	80 - 120
7628625	SF3	Method Blank	Total Aluminum (Al)	2014/09/08	<0.0030		mg/L	
			Total Antimony (Sb)	2014/09/08	<0.00060		mg/L	
			Total Arsenic (As)	2014/09/08	<0.00020		mg/L	
			Total Beryllium (Be)	2014/09/08	<0.0010		mg/L	
			Total Chromium (Cr)	2014/09/08	<0.0010		mg/L	
			Total Cobalt (Co)	2014/09/08	<0.00030		mg/L	
			Total Copper (Cu)	2014/09/08	<0.00020		mg/L	
			Total Lead (Pb)	2014/09/08	<0.00020		mg/L	
			Total Molybdenum (Mo)	2014/09/08	<0.00020		mg/L	
			Total Nickel (Ni)	2014/09/08	<0.00050		mg/L	
			Total Selenium (Se)	2014/09/08	<0.00020		mg/L	
			Total Silver (Ag)	2014/09/08	<0.00010		mg/L	
			Total Thallium (Tl)	2014/09/08	<0.00020		mg/L	
			Total Tin (Sn)	2014/09/08	<0.0010		mg/L	
			Total Titanium (Ti)	2014/09/08	<0.0010		mg/L	
			Total Uranium (U)	2014/09/08	<0.00010		mg/L	
			Total Vanadium (V)	2014/09/08	<0.0010		mg/L	
			Total Zinc (Zn)	2014/09/08	<0.0030		mg/L	
7628625	SF3	RPD	Total Aluminum (Al)	2014/09/08	0.54		%	20
			Total Antimony (Sb)	2014/09/08	4.5		%	20
			Total Arsenic (As)	2014/09/08	4.0		%	20
			Total Beryllium (Be)	2014/09/08	NC		%	20
			Total Chromium (Cr)	2014/09/08	1.9		%	20
			Total Cobalt (Co)	2014/09/08	6.6		%	20

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Maxxam Job #: B477081
Report Date: 2014/09/15

TETRA TECH EBA INC.
Your P.O. #: E14103202

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Total Copper (Cu)	2014/09/08	1.7		%	20
			Total Lead (Pb)	2014/09/08	3.3		%	20
			Total Molybdenum (Mo)	2014/09/08	0.45		%	20
			Total Nickel (Ni)	2014/09/08	1.5		%	20
			Total Selenium (Se)	2014/09/08	5.1		%	20
			Total Silver (Ag)	2014/09/08	NC		%	20
			Total Thallium (Tl)	2014/09/08	NC		%	20
			Total Tin (Sn)	2014/09/08	NC		%	20
			Total Titanium (Ti)	2014/09/08	NC		%	20
			Total Uranium (U)	2014/09/08	NC		%	20
			Total Vanadium (V)	2014/09/08	7.0		%	20
			Total Zinc (Zn)	2014/09/08	NC		%	20
7628627	LT4	Matrix Spike	Total Barium (Ba)	2014/09/09		87	%	80 - 120
			Total Boron (B)	2014/09/09		100	%	80 - 120
			Total Calcium (Ca)	2014/09/09		NC	%	80 - 120
			Total Iron (Fe)	2014/09/09		94	%	80 - 120
			Total Lithium (Li)	2014/09/09		91	%	80 - 120
			Total Magnesium (Mg)	2014/09/09		98	%	80 - 120
			Total Manganese (Mn)	2014/09/09		88	%	80 - 120
			Total Phosphorus (P)	2014/09/09		97	%	80 - 120
			Total Potassium (K)	2014/09/09		NC	%	80 - 120
			Total Silicon (Si)	2014/09/09		101	%	80 - 120
			Total Sodium (Na)	2014/09/09		NC	%	80 - 120
			Total Strontium (Sr)	2014/09/09		NC	%	80 - 120
7628627	LT4	Spiked Blank	Total Barium (Ba)	2014/09/09		99	%	80 - 120
			Total Boron (B)	2014/09/09		100	%	80 - 120
			Total Calcium (Ca)	2014/09/09		92	%	80 - 120
			Total Iron (Fe)	2014/09/09		100	%	80 - 120
			Total Lithium (Li)	2014/09/09		95	%	80 - 120
			Total Magnesium (Mg)	2014/09/09		103	%	80 - 120
			Total Manganese (Mn)	2014/09/09		92	%	80 - 120
			Total Phosphorus (P)	2014/09/09		95	%	80 - 120
			Total Potassium (K)	2014/09/09		109	%	80 - 120
			Total Silicon (Si)	2014/09/09		97	%	80 - 120
			Total Sodium (Na)	2014/09/09		110	%	80 - 120
			Total Strontium (Sr)	2014/09/09		97	%	80 - 120
			Total Sulphur (S)	2014/09/09		97	%	80 - 120
7628627	LT4	Method Blank	Total Barium (Ba)	2014/09/09	<0.010		mg/L	
			Total Boron (B)	2014/09/09	<0.020		mg/L	
			Total Calcium (Ca)	2014/09/09	<0.30		mg/L	
			Total Iron (Fe)	2014/09/09	<0.060		mg/L	
			Total Lithium (Li)	2014/09/09	<0.020		mg/L	
			Total Magnesium (Mg)	2014/09/09	<0.20		mg/L	
			Total Manganese (Mn)	2014/09/09	<0.0040		mg/L	
			Total Phosphorus (P)	2014/09/09	<0.10		mg/L	
			Total Potassium (K)	2014/09/09	<0.30		mg/L	
			Total Silicon (Si)	2014/09/09	<0.10		mg/L	
			Total Sodium (Na)	2014/09/09	<0.50		mg/L	
			Total Strontium (Sr)	2014/09/09	<0.020		mg/L	
			Total Sulphur (S)	2014/09/09	<0.20		mg/L	
7628627	LT4	RPD	Total Barium (Ba)	2014/09/09	0.28		%	20
			Total Boron (B)	2014/09/09	0.64		%	20
			Total Calcium (Ca)	2014/09/09	0.45		%	20
			Total Iron (Fe)	2014/09/09	NC		%	20

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Maxxam Job #: B477081
Report Date: 2014/09/15

TETRA TECH EBA INC.
Your P.O. #: E14103202

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Total Lithium (Li)	2014/09/09	NC		%	20
			Total Magnesium (Mg)	2014/09/09	NC		%	20
			Total Manganese (Mn)	2014/09/09	NC		%	20
			Total Phosphorus (P)	2014/09/09	NC		%	20
			Total Potassium (K)	2014/09/09	0.37		%	20
			Total Silicon (Si)	2014/09/09	0.24		%	20
			Total Sodium (Na)	2014/09/09	1.4		%	20
			Total Strontium (Sr)	2014/09/09	0.21		%	20
			Total Sulphur (S)	2014/09/09	0.14		%	20
7628818	SF3	Matrix Spike	Dissolved Aluminum (Al)	2014/09/09		102	%	80 - 120
			Dissolved Antimony (Sb)	2014/09/09		96	%	80 - 120
			Dissolved Arsenic (As)	2014/09/09		102	%	80 - 120
			Dissolved Beryllium (Be)	2014/09/09		104	%	80 - 120
			Dissolved Chromium (Cr)	2014/09/09		99	%	80 - 120
			Dissolved Cobalt (Co)	2014/09/09		98	%	80 - 120
			Dissolved Copper (Cu)	2014/09/09		98	%	80 - 120
			Dissolved Lead (Pb)	2014/09/09		97	%	80 - 120
			Dissolved Molybdenum (Mo)	2014/09/09		106	%	80 - 120
			Dissolved Nickel (Ni)	2014/09/09		100	%	80 - 120
			Dissolved Selenium (Se)	2014/09/09		104	%	80 - 120
			Dissolved Silver (Ag)	2014/09/09		93	%	80 - 120
			Dissolved Thallium (Tl)	2014/09/09		99	%	80 - 120
			Dissolved Tin (Sn)	2014/09/09		110	%	80 - 120
			Dissolved Titanium (Ti)	2014/09/09		105	%	80 - 120
			Dissolved Uranium (U)	2014/09/09		102	%	80 - 120
			Dissolved Vanadium (V)	2014/09/09		104	%	80 - 120
			Dissolved Zinc (Zn)	2014/09/09		99	%	80 - 120
7628818	SF3	Spiked Blank	Dissolved Aluminum (Al)	2014/09/09		102	%	80 - 120
			Dissolved Antimony (Sb)	2014/09/09		89	%	80 - 120
			Dissolved Arsenic (As)	2014/09/09		100	%	80 - 120
			Dissolved Beryllium (Be)	2014/09/09		103	%	80 - 120
			Dissolved Chromium (Cr)	2014/09/09		99	%	80 - 120
			Dissolved Cobalt (Co)	2014/09/09		100	%	80 - 120
			Dissolved Copper (Cu)	2014/09/09		101	%	80 - 120
			Dissolved Lead (Pb)	2014/09/09		103	%	80 - 120
			Dissolved Molybdenum (Mo)	2014/09/09		104	%	80 - 120
			Dissolved Nickel (Ni)	2014/09/09		99	%	80 - 120
			Dissolved Selenium (Se)	2014/09/09		102	%	80 - 120
			Dissolved Silver (Ag)	2014/09/09		93	%	80 - 120
			Dissolved Thallium (Tl)	2014/09/09		103	%	80 - 120
			Dissolved Tin (Sn)	2014/09/09		104	%	80 - 120
			Dissolved Titanium (Ti)	2014/09/09		98	%	80 - 120
			Dissolved Uranium (U)	2014/09/09		102	%	80 - 120
			Dissolved Vanadium (V)	2014/09/09		101	%	80 - 120
			Dissolved Zinc (Zn)	2014/09/09		102	%	80 - 120
7628818	SF3	Method Blank	Dissolved Aluminum (Al)	2014/09/09	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2014/09/09	<0.00060		mg/L	
			Dissolved Arsenic (As)	2014/09/09	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2014/09/09	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2014/09/09	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2014/09/09	<0.00030		mg/L	
			Dissolved Copper (Cu)	2014/09/09	<0.00020		mg/L	
			Dissolved Lead (Pb)	2014/09/09	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2014/09/09	<0.00020		mg/L	

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B477081
Report Date: 2014/09/15

TETRA TECH EBA INC.
Your P.O. #: E14103202

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Dissolved Nickel (Ni)	2014/09/09	<0.00050		mg/L	
			Dissolved Selenium (Se)	2014/09/09	<0.00020		mg/L	
			Dissolved Silver (Ag)	2014/09/09	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2014/09/09	<0.00020		mg/L	
			Dissolved Tin (Sn)	2014/09/09	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2014/09/09	<0.0010		mg/L	
			Dissolved Uranium (U)	2014/09/09	<0.00010		mg/L	
			Dissolved Vanadium (V)	2014/09/09	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2014/09/09	<0.0030		mg/L	
7628818	SF3	RPD	Dissolved Aluminum (Al)	2014/09/09	NC		%	20
			Dissolved Antimony (Sb)	2014/09/09	NC		%	20
			Dissolved Arsenic (As)	2014/09/09	NC		%	20
			Dissolved Beryllium (Be)	2014/09/09	NC		%	20
			Dissolved Chromium (Cr)	2014/09/09	NC		%	20
			Dissolved Cobalt (Co)	2014/09/09	NC		%	20
			Dissolved Copper (Cu)	2014/09/09	0.39		%	20
			Dissolved Lead (Pb)	2014/09/09	NC		%	20
			Dissolved Molybdenum (Mo)	2014/09/09	0.57		%	20
			Dissolved Nickel (Ni)	2014/09/09	0.34		%	20
			Dissolved Selenium (Se)	2014/09/09	NC		%	20
			Dissolved Silver (Ag)	2014/09/09	NC		%	20
			Dissolved Thallium (Tl)	2014/09/09	NC		%	20
			Dissolved Tin (Sn)	2014/09/09	NC		%	20
			Dissolved Titanium (Ti)	2014/09/09	NC		%	20
			Dissolved Uranium (U)	2014/09/09	0.18		%	20
			Dissolved Vanadium (V)	2014/09/09	NC		%	20
			Dissolved Zinc (Zn)	2014/09/09	NC		%	20
7629164	LZ3	Matrix Spike [KM5558-04]	Aroclor 1260	2014/09/08		73	%	30 - 130
			NONACHLOROBIPHENYL (sur.)	2014/09/08		126	%	30 - 130
7629164	LZ3	Spiked Blank	Aroclor 1260	2014/09/08		76	%	30 - 130
			NONACHLOROBIPHENYL (sur.)	2014/09/08		120	%	30 - 130
7629164	LZ3	Method Blank	Aroclor 1016	2014/09/08	<1.0		mg/kg	
			Aroclor 1221	2014/09/08	<1.0		mg/kg	
			Aroclor 1232	2014/09/08	<1.0		mg/kg	
			Aroclor 1242	2014/09/08	<1.0		mg/kg	
			Aroclor 1248	2014/09/08	<1.0		mg/kg	
			Aroclor 1254	2014/09/08	<1.0		mg/kg	
			Aroclor 1260	2014/09/08	<1.0		mg/kg	
			Aroclor 1268	2014/09/08	<1.0		mg/kg	
			NONACHLOROBIPHENYL (sur.)	2014/09/08		96	%	30 - 130
			Total Aroclors	2014/09/08	<1.0		mg/kg	
7629164	LZ3	RPD [KM5558-04]	Aroclor 1016	2014/09/08	NC		%	50
			Aroclor 1221	2014/09/08	NC		%	50
			Aroclor 1232	2014/09/08	NC		%	50
			Aroclor 1242	2014/09/08	NC		%	50
			Aroclor 1248	2014/09/08	NC		%	50
			Aroclor 1254	2014/09/08	NC		%	50
			Aroclor 1260	2014/09/08	NC		%	50
			Aroclor 1268	2014/09/08	NC		%	50
			Total Aroclors	2014/09/08	NC		%	50
7629389	SDH	Matrix Spike	Dissolved Barium (Ba)	2014/09/09		96	%	80 - 120
			Dissolved Boron (B)	2014/09/09		104	%	80 - 120
			Dissolved Calcium (Ca)	2014/09/09		NC	%	80 - 120

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Maxxam Job #: B477081
Report Date: 2014/09/15

TETRA TECH EBA INC.
Your P.O. #: E14103202

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Dissolved Iron (Fe)	2014/09/09		NC	%	80 - 120
			Dissolved Lithium (Li)	2014/09/09		94	%	80 - 120
			Dissolved Magnesium (Mg)	2014/09/09		101	%	80 - 120
			Dissolved Manganese (Mn)	2014/09/09		95	%	80 - 120
			Dissolved Phosphorus (P)	2014/09/09		100	%	80 - 120
			Dissolved Potassium (K)	2014/09/09		105	%	80 - 120
			Dissolved Silicon (Si)	2014/09/09		NC	%	80 - 120
			Dissolved Sodium (Na)	2014/09/09		102	%	80 - 120
			Dissolved Strontium (Sr)	2014/09/09		94	%	80 - 120
7629389	SDH	Spiked Blank	Dissolved Barium (Ba)	2014/09/09		95	%	80 - 120
			Dissolved Boron (B)	2014/09/09		102	%	80 - 120
			Dissolved Calcium (Ca)	2014/09/09		96	%	80 - 120
			Dissolved Iron (Fe)	2014/09/09		99	%	80 - 120
			Dissolved Lithium (Li)	2014/09/09		93	%	80 - 120
			Dissolved Magnesium (Mg)	2014/09/09		103	%	80 - 120
			Dissolved Manganese (Mn)	2014/09/09		93	%	80 - 120
			Dissolved Phosphorus (P)	2014/09/09		95	%	80 - 120
			Dissolved Potassium (K)	2014/09/09		105	%	80 - 120
			Dissolved Silicon (Si)	2014/09/09		98	%	80 - 120
			Dissolved Sodium (Na)	2014/09/09		105	%	80 - 120
			Dissolved Strontium (Sr)	2014/09/09		94	%	80 - 120
			Dissolved Sulphur (S)	2014/09/09		96	%	80 - 120
7629389	SDH	Method Blank	Dissolved Barium (Ba)	2014/09/09	<0.010		mg/L	
			Dissolved Boron (B)	2014/09/09	<0.020		mg/L	
			Dissolved Calcium (Ca)	2014/09/09	<0.30		mg/L	
			Dissolved Iron (Fe)	2014/09/09	<0.060		mg/L	
			Dissolved Lithium (Li)	2014/09/09	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2014/09/09	<0.20		mg/L	
			Dissolved Manganese (Mn)	2014/09/09	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2014/09/09	<0.10		mg/L	
			Dissolved Potassium (K)	2014/09/09	<0.30		mg/L	
			Dissolved Silicon (Si)	2014/09/09	<0.10		mg/L	
			Dissolved Sodium (Na)	2014/09/09	<0.50		mg/L	
			Dissolved Strontium (Sr)	2014/09/09	<0.020		mg/L	
			Dissolved Sulphur (S)	2014/09/09	<0.20		mg/L	
7629389	SDH	RPD	Dissolved Barium (Ba)	2014/09/09	0.17		%	20
			Dissolved Boron (B)	2014/09/09	2.7		%	20
			Dissolved Calcium (Ca)	2014/09/09	1.4		%	20
			Dissolved Iron (Fe)	2014/09/09	0.51		%	20
			Dissolved Lithium (Li)	2014/09/09	NC		%	20
			Dissolved Magnesium (Mg)	2014/09/09	0.97		%	20
			Dissolved Manganese (Mn)	2014/09/09	2.1		%	20
			Dissolved Phosphorus (P)	2014/09/09	2.3		%	20
			Dissolved Potassium (K)	2014/09/09	2.1		%	20
			Dissolved Silicon (Si)	2014/09/09	0.40		%	20
			Dissolved Sodium (Na)	2014/09/09	2.2		%	20
			Dissolved Strontium (Sr)	2014/09/09	0.12		%	20
			Dissolved Sulphur (S)	2014/09/09	NC		%	20
7629396	LT4	Matrix Spike	Dissolved Barium (Ba)	2014/09/08		90	%	80 - 120
			Dissolved Boron (B)	2014/09/08		98	%	80 - 120
			Dissolved Calcium (Ca)	2014/09/08		NC	%	80 - 120
			Dissolved Iron (Fe)	2014/09/08		86	%	80 - 120
			Dissolved Lithium (Li)	2014/09/08		94	%	80 - 120
			Dissolved Magnesium (Mg)	2014/09/08		99	%	80 - 120

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Maxxam Job #: B477081
Report Date: 2014/09/15

TETRA TECH EBA INC.
Your P.O. #: E14103202

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Dissolved Manganese (Mn)	2014/09/08		80	%	80 - 120
			Dissolved Phosphorus (P)	2014/09/08		94	%	80 - 120
			Dissolved Potassium (K)	2014/09/08		93	%	80 - 120
			Dissolved Silicon (Si)	2014/09/08		96	%	80 - 120
			Dissolved Sodium (Na)	2014/09/08		91	%	80 - 120
			Dissolved Strontium (Sr)	2014/09/08		83	%	80 - 120
7629396	LT4	Spiked Blank	Dissolved Barium (Ba)	2014/09/08		95	%	80 - 120
			Dissolved Boron (B)	2014/09/08		99	%	80 - 120
			Dissolved Calcium (Ca)	2014/09/08		97	%	80 - 120
			Dissolved Iron (Fe)	2014/09/08		97	%	80 - 120
			Dissolved Lithium (Li)	2014/09/08		95	%	80 - 120
			Dissolved Magnesium (Mg)	2014/09/08		98	%	80 - 120
			Dissolved Manganese (Mn)	2014/09/08		96	%	80 - 120
			Dissolved Phosphorus (P)	2014/09/08		93	%	80 - 120
			Dissolved Potassium (K)	2014/09/08		95	%	80 - 120
			Dissolved Silicon (Si)	2014/09/08		96	%	80 - 120
			Dissolved Sodium (Na)	2014/09/08		94	%	80 - 120
			Dissolved Strontium (Sr)	2014/09/08		94	%	80 - 120
			Dissolved Sulphur (S)	2014/09/08		97	%	80 - 120
7629396	LT4	Method Blank	Dissolved Barium (Ba)	2014/09/08	<0.010		mg/L	
			Dissolved Boron (B)	2014/09/08	<0.020		mg/L	
			Dissolved Calcium (Ca)	2014/09/08	<0.30		mg/L	
			Dissolved Iron (Fe)	2014/09/08	<0.060		mg/L	
			Dissolved Lithium (Li)	2014/09/08	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2014/09/08	<0.20		mg/L	
			Dissolved Manganese (Mn)	2014/09/08	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2014/09/08	<0.10		mg/L	
			Dissolved Potassium (K)	2014/09/08	<0.30		mg/L	
			Dissolved Silicon (Si)	2014/09/08	<0.10		mg/L	
			Dissolved Sodium (Na)	2014/09/08	<0.50		mg/L	
			Dissolved Strontium (Sr)	2014/09/08	<0.020		mg/L	
			Dissolved Sulphur (S)	2014/09/08	<0.20		mg/L	
7629396	LT4	RPD	Dissolved Barium (Ba)	2014/09/08	0.23		%	20
			Dissolved Boron (B)	2014/09/08	NC		%	20
			Dissolved Calcium (Ca)	2014/09/08	1.1		%	20
			Dissolved Iron (Fe)	2014/09/08	NC		%	20
			Dissolved Lithium (Li)	2014/09/08	NC		%	20
			Dissolved Magnesium (Mg)	2014/09/08	0.34		%	20
			Dissolved Manganese (Mn)	2014/09/08	0.81		%	20
			Dissolved Phosphorus (P)	2014/09/08	NC		%	20
			Dissolved Potassium (K)	2014/09/08	0.20		%	20
			Dissolved Silicon (Si)	2014/09/08	0.67		%	20
			Dissolved Sodium (Na)	2014/09/08	3.2		%	20
			Dissolved Strontium (Sr)	2014/09/08	0.52		%	20
			Dissolved Sulphur (S)	2014/09/08	0.54		%	20
7630518	SF3	Matrix Spike	Total Aluminum (Al)	2014/09/09		NC	%	80 - 120
			Total Antimony (Sb)	2014/09/09		113	%	80 - 120
			Total Arsenic (As)	2014/09/09		112	%	80 - 120
			Total Beryllium (Be)	2014/09/09		109	%	80 - 120
			Total Chromium (Cr)	2014/09/09		106	%	80 - 120
			Total Cobalt (Co)	2014/09/09		106	%	80 - 120
			Total Copper (Cu)	2014/09/09		106	%	80 - 120
			Total Lead (Pb)	2014/09/09		108	%	80 - 120
			Total Molybdenum (Mo)	2014/09/09		115	%	80 - 120

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B477081
Report Date: 2014/09/15

TETRA TECH EBA INC.
Your P.O. #: E14103202

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Total Nickel (Ni)	2014/09/09		105	%	80 - 120
			Total Selenium (Se)	2014/09/09		109	%	80 - 120
			Total Silver (Ag)	2014/09/09		111	%	80 - 120
			Total Thallium (Tl)	2014/09/09		111	%	80 - 120
			Total Tin (Sn)	2014/09/09		116	%	80 - 120
			Total Titanium (Ti)	2014/09/09		102	%	80 - 120
			Total Uranium (U)	2014/09/09		110	%	80 - 120
			Total Vanadium (V)	2014/09/09		111	%	80 - 120
			Total Zinc (Zn)	2014/09/09		111	%	80 - 120
7630518	SF3	Spiked Blank	Total Aluminum (Al)	2014/09/09		102	%	80 - 120
			Total Antimony (Sb)	2014/09/09		103	%	80 - 120
			Total Arsenic (As)	2014/09/09		103	%	80 - 120
			Total Beryllium (Be)	2014/09/09		103	%	80 - 120
			Total Chromium (Cr)	2014/09/09		101	%	80 - 120
			Total Cobalt (Co)	2014/09/09		103	%	80 - 120
			Total Copper (Cu)	2014/09/09		104	%	80 - 120
			Total Lead (Pb)	2014/09/09		107	%	80 - 120
			Total Molybdenum (Mo)	2014/09/09		106	%	80 - 120
			Total Nickel (Ni)	2014/09/09		103	%	80 - 120
			Total Selenium (Se)	2014/09/09		102	%	80 - 120
			Total Silver (Ag)	2014/09/09		104	%	80 - 120
			Total Thallium (Tl)	2014/09/09		106	%	80 - 120
			Total Tin (Sn)	2014/09/09		107	%	80 - 120
			Total Titanium (Ti)	2014/09/09		97	%	80 - 120
			Total Uranium (U)	2014/09/09		106	%	80 - 120
			Total Vanadium (V)	2014/09/09		106	%	80 - 120
			Total Zinc (Zn)	2014/09/09		105	%	80 - 120
7630518	SF3	Method Blank	Total Aluminum (Al)	2014/09/09	<0.0030		mg/L	
			Total Antimony (Sb)	2014/09/09	<0.00060		mg/L	
			Total Arsenic (As)	2014/09/09	<0.00020		mg/L	
			Total Beryllium (Be)	2014/09/09	<0.0010		mg/L	
			Total Chromium (Cr)	2014/09/09	<0.0010		mg/L	
			Total Cobalt (Co)	2014/09/09	<0.00030		mg/L	
			Total Copper (Cu)	2014/09/09	<0.00020		mg/L	
			Total Lead (Pb)	2014/09/09	<0.00020		mg/L	
			Total Molybdenum (Mo)	2014/09/09	<0.00020		mg/L	
			Total Nickel (Ni)	2014/09/09	<0.00050		mg/L	
			Total Selenium (Se)	2014/09/09	<0.00020		mg/L	
			Total Silver (Ag)	2014/09/09	<0.00010		mg/L	
			Total Thallium (Tl)	2014/09/09	<0.00020		mg/L	
			Total Tin (Sn)	2014/09/09	<0.0010		mg/L	
			Total Titanium (Ti)	2014/09/09	<0.0010		mg/L	
			Total Uranium (U)	2014/09/09	<0.00010		mg/L	
			Total Vanadium (V)	2014/09/09	<0.0010		mg/L	
			Total Zinc (Zn)	2014/09/09	<0.0030		mg/L	
7630518	SF3	RPD	Total Aluminum (Al)	2014/09/09	7.9		%	20
			Total Antimony (Sb)	2014/09/09	NC		%	20
			Total Arsenic (As)	2014/09/09	3.4		%	20
			Total Beryllium (Be)	2014/09/09	NC		%	20
			Total Chromium (Cr)	2014/09/09	NC		%	20
			Total Cobalt (Co)	2014/09/09	NC		%	20
			Total Copper (Cu)	2014/09/09	NC		%	20
			Total Lead (Pb)	2014/09/09	NC		%	20
			Total Molybdenum (Mo)	2014/09/09	NC		%	20

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Maxxam Job #: B477081
Report Date: 2014/09/15

TETRA TECH EBA INC.
Your P.O. #: E14103202

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Total Nickel (Ni)	2014/09/09	1.5		%	20
			Total Selenium (Se)	2014/09/09	NC		%	20
			Total Silver (Ag)	2014/09/09	NC		%	20
			Total Thallium (Tl)	2014/09/09	NC		%	20
			Total Tin (Sn)	2014/09/09	NC		%	20
			Total Titanium (Ti)	2014/09/09	NC		%	20
			Total Uranium (U)	2014/09/09	0.34		%	20
			Total Vanadium (V)	2014/09/09	NC		%	20
			Total Zinc (Zn)	2014/09/09	NC		%	20
7630532	JK9	Matrix Spike	Total Barium (Ba)	2014/09/09		101	%	80 - 120
			Total Boron (B)	2014/09/09		104	%	80 - 120
			Total Calcium (Ca)	2014/09/09		NC	%	80 - 120
			Total Iron (Fe)	2014/09/09		NC	%	80 - 120
			Total Lithium (Li)	2014/09/09		102	%	80 - 120
			Total Magnesium (Mg)	2014/09/09		NC	%	80 - 120
			Total Manganese (Mn)	2014/09/09		102	%	80 - 120
			Total Phosphorus (P)	2014/09/09		103	%	80 - 120
			Total Potassium (K)	2014/09/09		106	%	80 - 120
			Total Silicon (Si)	2014/09/09		NC	%	80 - 120
			Total Sodium (Na)	2014/09/09		NC	%	80 - 120
			Total Strontium (Sr)	2014/09/09		100	%	80 - 120
7630532	JK9	Spiked Blank	Total Barium (Ba)	2014/09/09		104	%	80 - 120
			Total Boron (B)	2014/09/09		105	%	80 - 120
			Total Calcium (Ca)	2014/09/09		111	%	80 - 120
			Total Iron (Fe)	2014/09/09		109	%	80 - 120
			Total Lithium (Li)	2014/09/09		100	%	80 - 120
			Total Magnesium (Mg)	2014/09/09		106	%	80 - 120
			Total Manganese (Mn)	2014/09/09		107	%	80 - 120
			Total Phosphorus (P)	2014/09/09		103	%	80 - 120
			Total Potassium (K)	2014/09/09		104	%	80 - 120
			Total Silicon (Si)	2014/09/09		106	%	80 - 120
			Total Sodium (Na)	2014/09/09		104	%	80 - 120
			Total Strontium (Sr)	2014/09/09		103	%	80 - 120
			Total Sulphur (S)	2014/09/09		104	%	80 - 120
7630532	JK9	Method Blank	Total Barium (Ba)	2014/09/09	<0.010		mg/L	
			Total Boron (B)	2014/09/09	<0.020		mg/L	
			Total Calcium (Ca)	2014/09/09	<0.30		mg/L	
			Total Iron (Fe)	2014/09/09	<0.060		mg/L	
			Total Lithium (Li)	2014/09/09	<0.020		mg/L	
			Total Magnesium (Mg)	2014/09/09	<0.20		mg/L	
			Total Manganese (Mn)	2014/09/09	<0.0040		mg/L	
			Total Phosphorus (P)	2014/09/09	<0.10		mg/L	
			Total Potassium (K)	2014/09/09	<0.30		mg/L	
			Total Silicon (Si)	2014/09/09	<0.10		mg/L	
			Total Sodium (Na)	2014/09/09	<0.50		mg/L	
			Total Strontium (Sr)	2014/09/09	<0.020		mg/L	
			Total Sulphur (S)	2014/09/09	<0.20		mg/L	
7630532	JK9	RPD	Total Barium (Ba)	2014/09/10	0.42		%	20
			Total Boron (B)	2014/09/10	NC		%	20
			Total Calcium (Ca)	2014/09/10	1.2		%	20
			Total Iron (Fe)	2014/09/10	0.70		%	20
			Total Lithium (Li)	2014/09/10	NC		%	20
			Total Magnesium (Mg)	2014/09/10	0.22		%	20
			Total Manganese (Mn)	2014/09/10	0.49		%	20

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Maxxam Job #: B477081
Report Date: 2014/09/15

TETRA TECH EBA INC.
Your P.O. #: E14103202

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Total Phosphorus (P)	2014/09/10	NC		%	20
			Total Potassium (K)	2014/09/10	0.89		%	20
			Total Silicon (Si)	2014/09/10	0.74		%	20
			Total Sodium (Na)	2014/09/10	0.35		%	20
			Total Strontium (Sr)	2014/09/10	0.47		%	20
			Total Sulphur (S)	2014/09/10	0.99		%	20
7632799	SHM	Matrix Spike	O-TERPHENYL (sur.)	2014/09/10		93	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/10		102	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2014/09/10		107	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2014/09/10		103	%	50 - 130
7632799	SHM	Spiked Blank	O-TERPHENYL (sur.)	2014/09/10		89	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/10		103	%	70 - 130
			F3 (C16-C34 Hydrocarbons)	2014/09/10		108	%	70 - 130
			F4 (C34-C50 Hydrocarbons)	2014/09/10		103	%	70 - 130
7632799	SHM	Method Blank	O-TERPHENYL (sur.)	2014/09/10		95	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/10	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2014/09/10	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2014/09/10	<50		mg/kg	
7632799	SHM	RPD	F2 (C10-C16 Hydrocarbons)	2014/09/10	NC		%	50
			F3 (C16-C34 Hydrocarbons)	2014/09/10	NC		%	50
			F4 (C34-C50 Hydrocarbons)	2014/09/10	NC		%	50

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.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

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 (one or both samples < 5x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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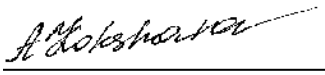
Maxxam Job #: B477081
Report Date: 2014/09/15

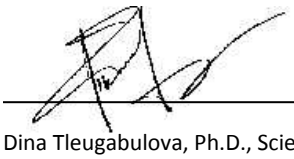
TETRA TECH EBA INC.
Your P.O. #: E14103202

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Anna Koksharova, M.Sc., Senior Analyst



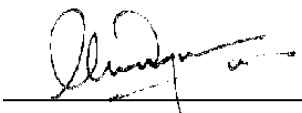
Dina Tleugabulova, Ph.D., Scientific Specialist, Inorganics Department

Kyle Morrison, Supervisor PPLE

Karla Offord, B.Sc., Supervisor, Extractable Hydrocarbons

Luba Shymushovska, Senior Analyst, Organic Department

Pamela Kimmerly, Chem. Tech., Team Lead



Sherlyne Sim, B.Eng, Project Manager

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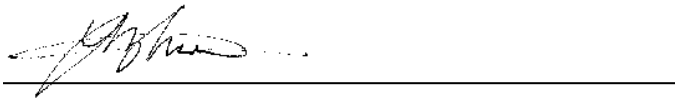
Maxxam Job #: B477081
Report Date: 2014/09/15

TETRA TECH EBA INC.
Your P.O. #: E14103202

VALIDATION SIGNATURE PAGE(CONT'D)

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Sandy Yuan, M.Sc., Scientific Specialist



Yashu Mohan, B.Sc. B.Tech., 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.

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09/017(3) JWP

Chain of Custody

A131767

Page: 1 of 3

	Invoice To:	C/O Report Address ☐	Report To:	Same as Invoice ☑
Company:	Tetra Tech EBA			
Contact:	Rebecca Zschuppe			
Address:	14940123 Ave			
	Prov: AB	PC:	Prov:	PC:
Contact #s:	Ph: 7804512130	Cell:	Ph:	Cell:

Report Distribution (E-Mail):
michele.crawford@tetratech.com
tyrel.renshaw@tetratech.com
robert.zschuppe@tetratech.com

REGULATORY GUIDELINES:
☐ AT1
☒ CCME
☐ Regulated Drinking Water
☐ Other:

All samples are held for 60 calendar days after sample receipt, unless specified otherwise.

PO #: E14103202
Project # / Name:
Site Location:
Quote #:
Sampled By:

SERVICE REQUESTED: ☐ RUSH (Contact lab to reserve) Date Required: ☐ REGULAR (5 to 7 Days)

See reverse for package specifics

	Sample ID	Depth (unit)	Matrix GW / SW Soil	Date/Time Sampled YY/MM/DD 24:00	SOIL: BTEX F1-F4	Sieve (75 micron)	Regulated Metals (CCME / AT1)	Salinity 4	Assessment ICP Metals	Basic Class II Landfill	WATER: ☐BTEX F1 ☐VOCs	☐BTEX F1-F2 ☐BTEX F1-F4	☐ Routine Water ☐ Turb ☐ F	☐ TOC ☐ DOC	Regulated Metals (CCME / AT1) Total	Dissolved	☐ Total ☐ Dissolved Mercury	Other Analysis: Total Metals	Leachable Metals	HOLD - Do not Analyze	# of Containers Submitted
1	TANK 2-1	—	Fuel	14/08/31																X	11
2	DR 2-1	—	fuel	"																X	11
3	Pb1-1	-	paint	"														X	X		1
4	SS8-30	0-40	soil	14/08/30																X	2
5	SS 8-31	0-20																			2
6	"	20-40																			2
7	"	40-70																			2
8	SS8-32	0-30																			2
9	"	30-50																			2
10	"	50-70																			2
11	SS8-33	0-20																			2
12	"	20-40																			2

RECEIVED IN YELLOWKNIFE
By: Jude Michelle Guy 11:15
2014-09-01
4.4-3
Temp: 7-5-6
8-8-8 ADT/DWS

F / P

Please indicate Filtered, Preserved or Both (F, P, F/P)

Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):
Michele Crawford / Michele Crawford	14/08/31	0900
Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):
Special Instructions:	# of Jars Used & Not Submitted	

LAB USE ONLY

Received By:	Date:	Time:	Maxxam Job #: B477081		
Jenna Walter	20140902	0945	Custody Seal	Temperature	Ice
Lab Comments:				See ACTR	

Maxxam

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JWP **Chain of Custody** A131768

Page: 2 of 3

	Invoice To: C/O Report Address ☐	Report To: Same as Invoice ☐	Report Distribution (E-Mail):	REGULATORY GUIDELINES:
Company:	Same as page 1			☐ AT1
Contact:				☒ CCME
Address:				☐ Regulated Drinking Water
	Prov: PC:	Prov: PC:		☐ Other:
Contact #s:	Ph: Cell:	Ph: Cell:		

All samples are held for 60 calendar days after sample receipt, unless specified otherwise.

PO #:	
Project # / Name:	
Site Location:	
Quote #:	
Sampled By:	

SERVICE REQUESTED: ☐ **RUSH** (Contact lab to reserve) **Date Required:** ☐ REGULAR (5 to 7 Days)

See reverse for package specifics

	Sample ID	Depth (unit)	Matrix GW / SW Soil	Date/Time Sampled YY/MM/DD 24:00	SOIL: BTEX F1-F4	Sieve (75 micron)	Regulated Metals (CCME / AT1)	Salinity 4	Assessment ICP Metals	Basic Class II Landfill	WATER: ☐BTEX F1 ☐VOCs	☐BTEX F1-F2 ☐BTEX F1-F4	☐ Routine Water ☐ Turb ☐ F	☐ TOC ☐ DOC	Regulated Metals (CCME / AT1) Total	Dissolved	Mercury	☐ Total ☐ Dissolved	Other Analysis	HOLD - Do not Analyze	# of Containers Submitted
1	SS8-34	0-30	Soil	14/08/30																X	2
2	"	30-50																			2
3	"	50-70																			2
4	SS8-35	0-20		14/08/31																	2
5	"	20-40																			2
6	SS8-36	0-20																			2
7	"	20-40																			2
8	SS8-37	0-50																			2
9	"	50-60																			2
10	SS8-38	0-50																			2
11	"	50-60																			2
12																					2

RECEIVED IN YELLOWKNIFE
By: Michelle Gute Michelle 11:15 Arctic
2014 -09- 01
443
Temp: 7 1 5 6
8 8 8

Please indicate Filtered, Preserved or Both (F, P, F/P) → F/P

Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):
Michael / Michele Crawford	14/08/31	0900
Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):

Special Instructions:	# of Jars Used & Not Submitted

LAB USE ONLY

Received By:	Date:	Time:	Maxxam Job #: B47301
Jenna Walter	20140902	0945	

Lab Comments:	Custody Seal	Temperature	Ice
		See ACR	

AB FCD-00331 Rev3 2010/05

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JHF **Chain of Custody** A131769

Page: 3 of 3

	Invoice To: C/O Report Address ☐	Report To: Same as Invoice ☐	Report Distribution (E-Mail):
Company:			
Contact:	Same as page 1		
Address:	Prov: PC:	Prov: PC:	
Contact #s:	Ph: Cell:	Ph: Cell:	

REGULATORY GUIDELINES:
☐ AT1
☑ CCME
☐ Regulated Drinking Water
☐ Other:

All samples are held for 60 calendar days after sample receipt, unless specified otherwise.

PO #:
Project # / Name:
Site Location:
Quote #:
Sampled By:

SERVICE REQUESTED: ☐ **RUSH** (Contact lab to reserve) **Date Required:** ☐ REGULAR (5 to 7 Days)

See reverse for package specifics

	Sample ID	Depth (unit)	Matrix GW / SW Soil	Date/Time Sampled YY/MM/DD 24:00	SOIL: BTEX F1-F4	SOIL: Sieve (75 micron)	SOIL: Regulated Metals (CCME / AT1)	SOIL: Salinity 4	SOIL: Assessment ICP Metals	SOIL: Basic Class II Landfill	WATER: ☐BTEX F1 ☐VOCs	WATER: ☑BTEX F1-F2 ☐BTEX F1-F4	WATER: ☑Routine Water ☐Turb ☐F	WATER: ☐TOC ☐DOC	WATER: Regulated Metals (CCME / AT1) Total	WATER: Regulated Metals (CCME / AT1) Dissolved	WATER: Mercury ☐Total ☐Dissolved	Other Analysis	HOLD - Do not Analyze	# of Containers Submitted
1	14MW01		GW	14/08/31 8:30								✓								5
2	~~14MW02~~			~~8:23~~																
3	14MW03			9:00								✓								4
4	14MW04			11:15									✓		✓	✓				3
5	14MW05			11:00									✓		✓	✓		Didn't preserve total metals		2
6	14MW06			10:40									✓		✓	✓				3
7	14MWC1			10:05									✓		✓	✓		Didn't preserve total metals		2
8	14MWC2			11:40									✓			✓		RECEIVED IN YELLOWKNIFE		2
9	MW Dup1			08:30								✓			✓			By: Michelle Gwek 11:15		5
10	MW Dup2			10:40									✓		✓	✓		2014-09-01		3
11																		4-43		
12																		756		
															P	F/P		Temp: 8/8/8 Aot, W2	F P	

Please indicate Filtered, Preserved or Both (F, P, F/P)

Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):
Karla Langlois Karla Langlois	14/09/01	09:30
Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):

Special Instructions: Lab to filter to analyze dissolved metals in 14MW05 and 14MWC1

# of Jars Used & Not Submitted

LAB USE ONLY

Received By:	Date:	Time:	Maxxam Job #: B477021
Jena Walter	2014 09 02	0945	

Lab Comments:

Custody Seal	Temperature	Ice
	See ACTR	

Maxxam

ADDITIONAL COOLER TEMPERATURE RECORD

CHAIN-OF-CUSTODY RECORD

CHAIN OF CUSTODY #	
Page 1 of 3	A131767
Page 2 of 3	A131768
Page 3 of 3	A131769
Page ___ of ___	
Page ___ of ___	
Page ___ of ___	
Page ___ of ___	
Page ___ of ___	
Page ___ of ___	
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Page ___ of ___	
Page ___ of ___	
Page ___ of ___	

COOLER OBSERVATIONS:

MAXXAM JOB#:

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT	✓		TEMP	3	7	2
INTACT	✓			1	2	3
ICE PRESENT	✓					

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT	✓		TEMP	4	8	3
INTACT	✓			1	2	3
ICE PRESENT	✓					

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT	✓		TEMP	2	2	1
INTACT	✓			1	2	3
ICE PRESENT	✓					

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

CUSTODY SEAL	YES	NO	COOLER ID			
PRESENT			TEMP			
INTACT				1	2	3
ICE PRESENT						

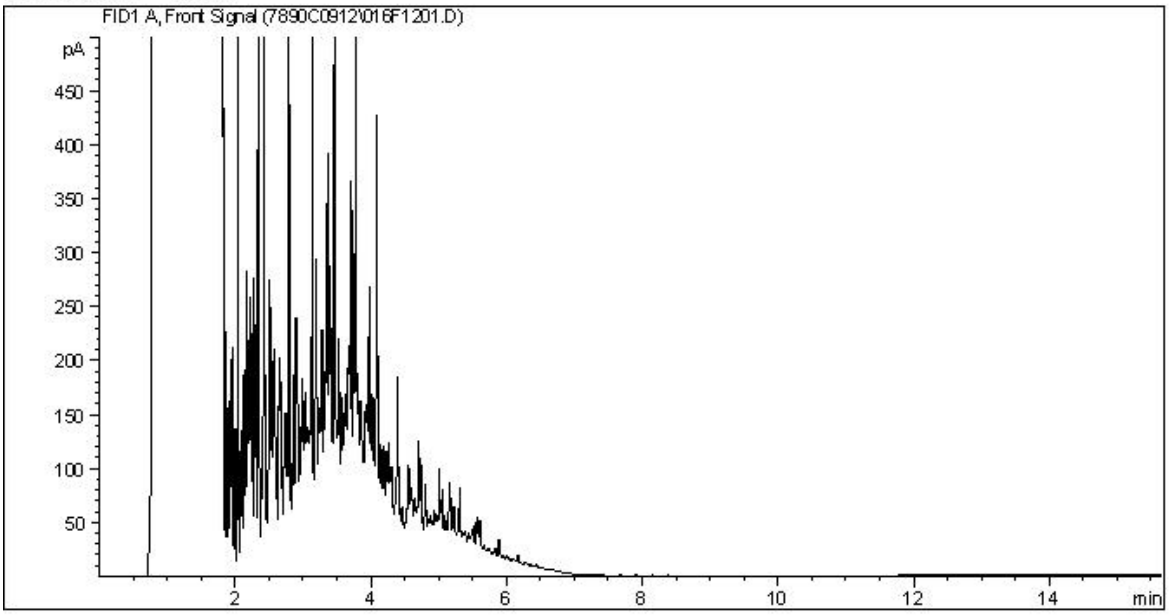
RECEIVED BY (SIGN & PRINT)		DATE (YYYY/MM/DD)	TIME (HH:MM)
	Jenna Walter	20140902	0945

Maxxam Job #: B477081
Report Date: 2014/09/15
Maxxam Sample: KM5557

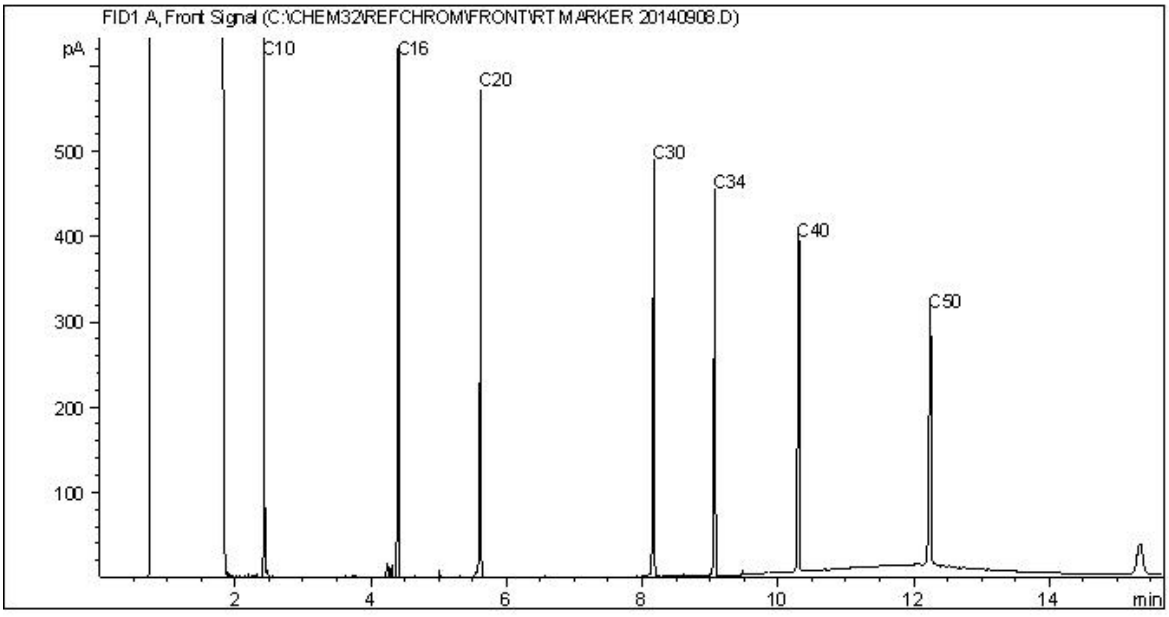
TETRA TECH EBA INC.
Client ID: TANK 2-1

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



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+

Page 1 of 1

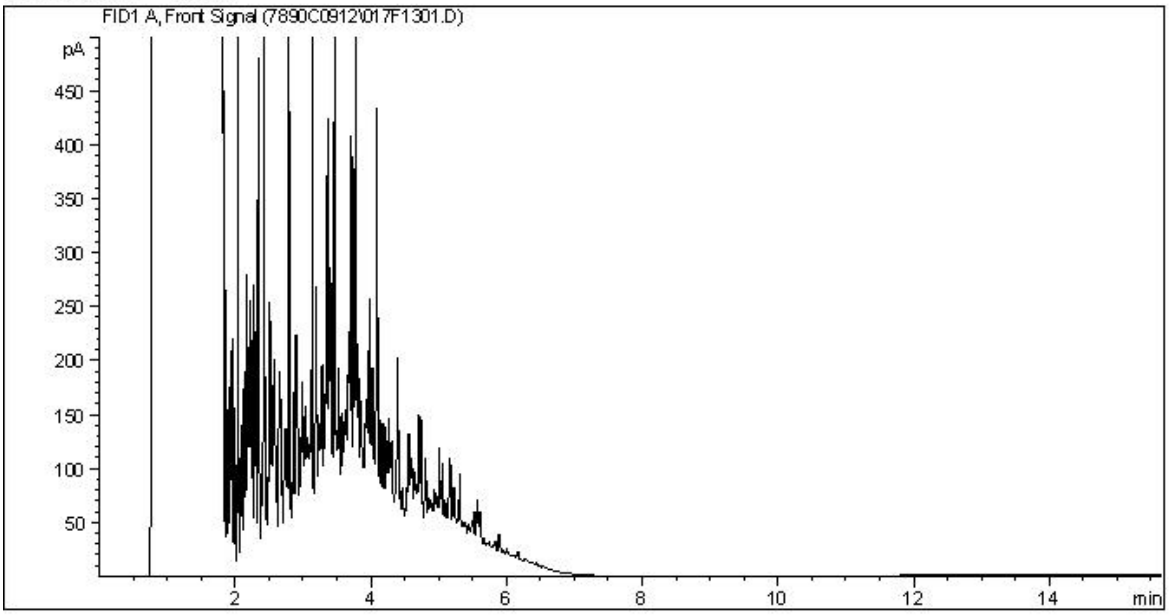
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B477081
Report Date: 2014/09/15
Maxxam Sample: KM5558

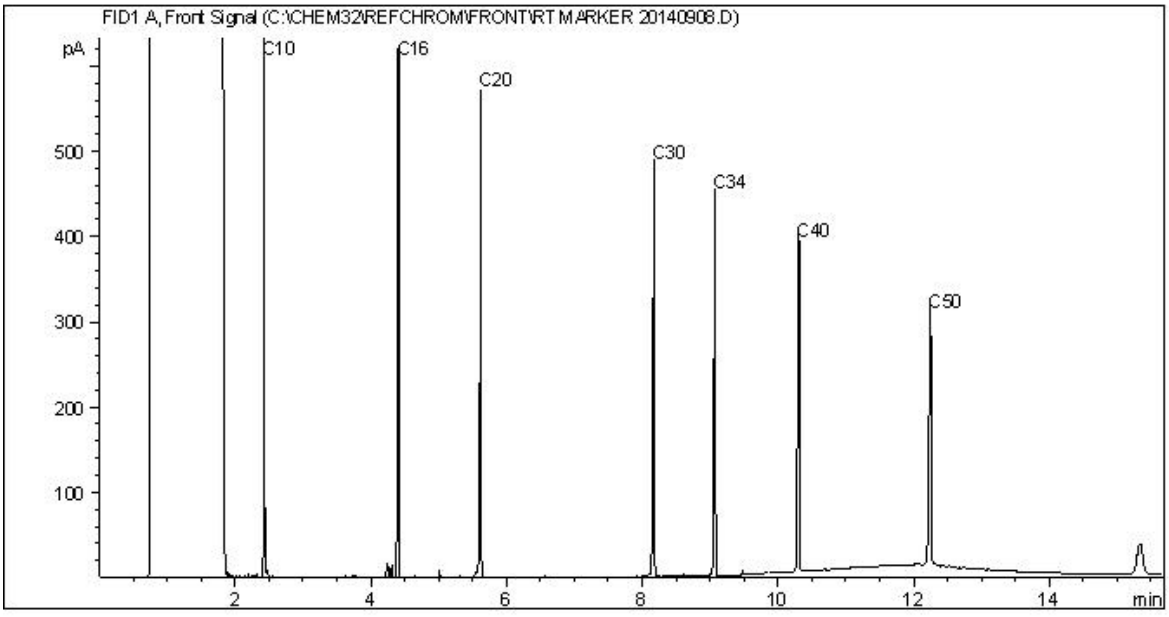
TETRA TECH EBA INC.
Client ID: DR 2-1

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



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+

Page 1 of 1

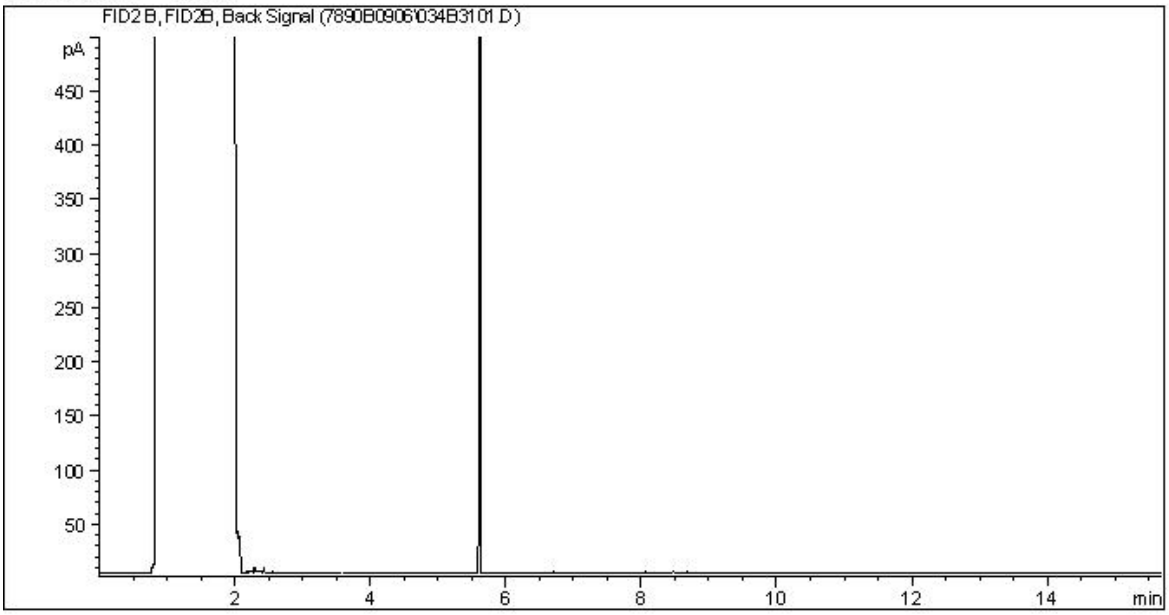
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B477081
Report Date: 2014/09/15
Maxxam Sample: KM5560

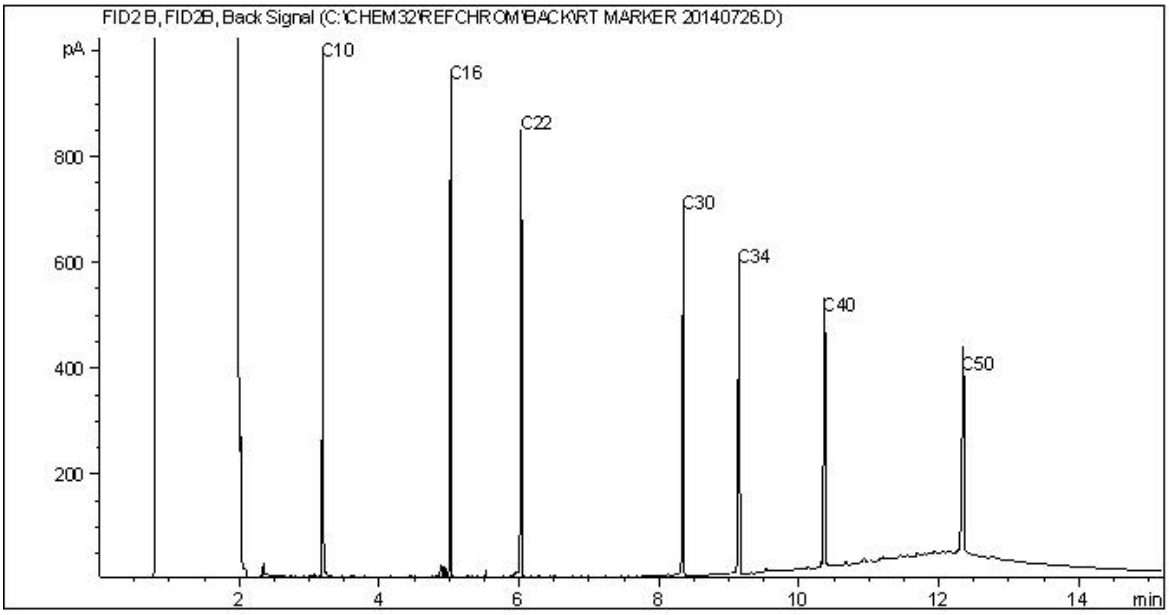
TETRA TECH EBA INC.
Client ID: SS8-30 0-40

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+

Page 1 of 1

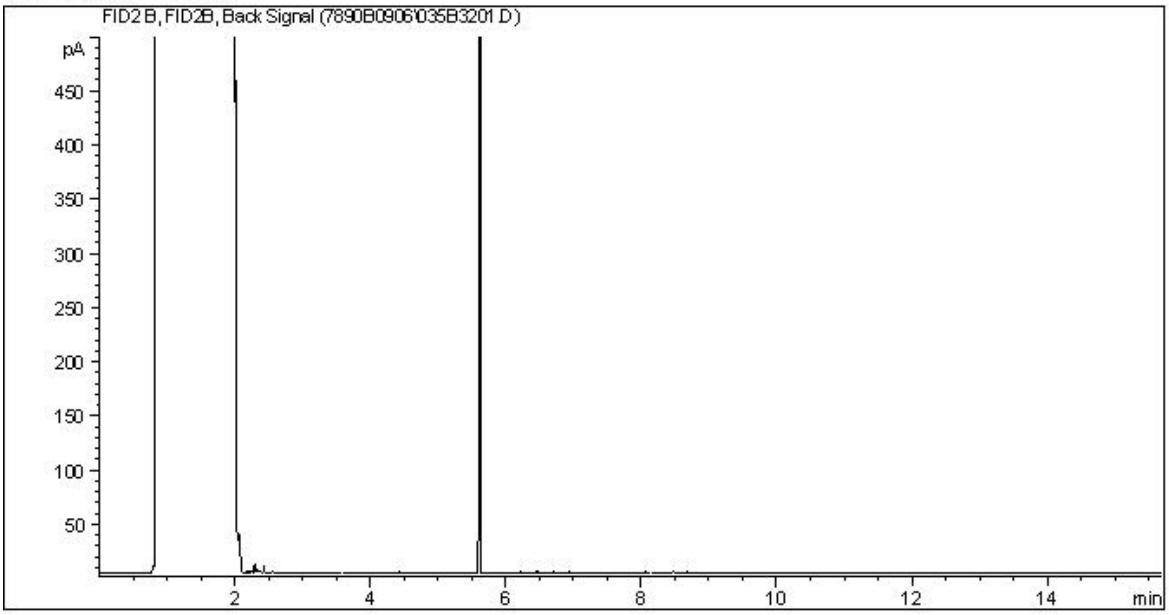
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B477081
Report Date: 2014/09/15
Maxxam Sample: KM5562

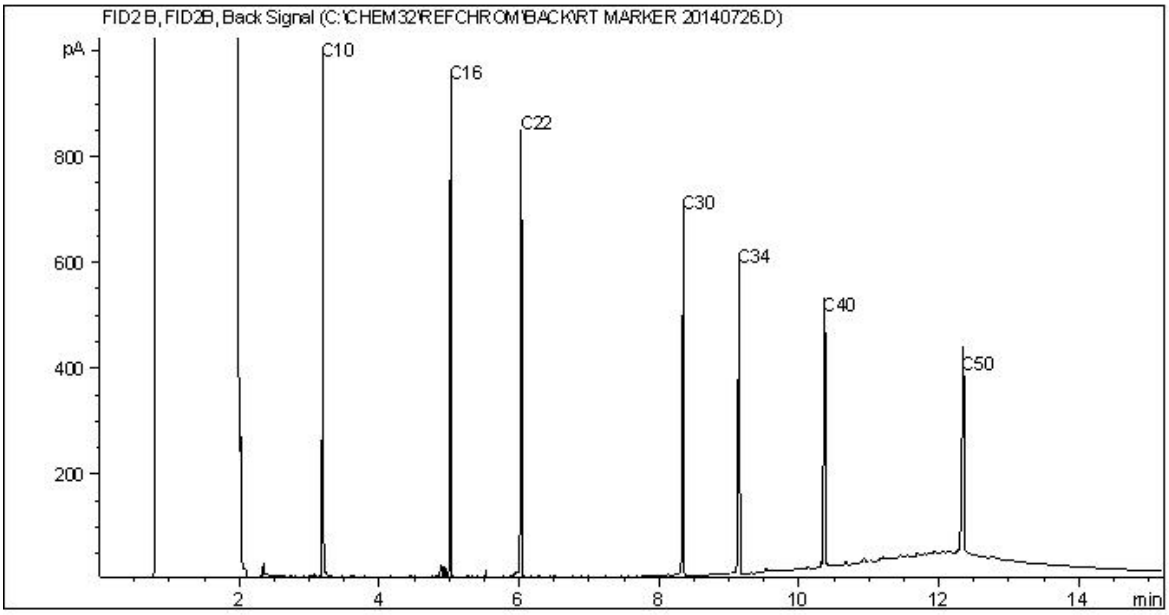
TETRA TECH EBA INC.
Client ID: SS8-31 20-40

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+

Page 1 of 1

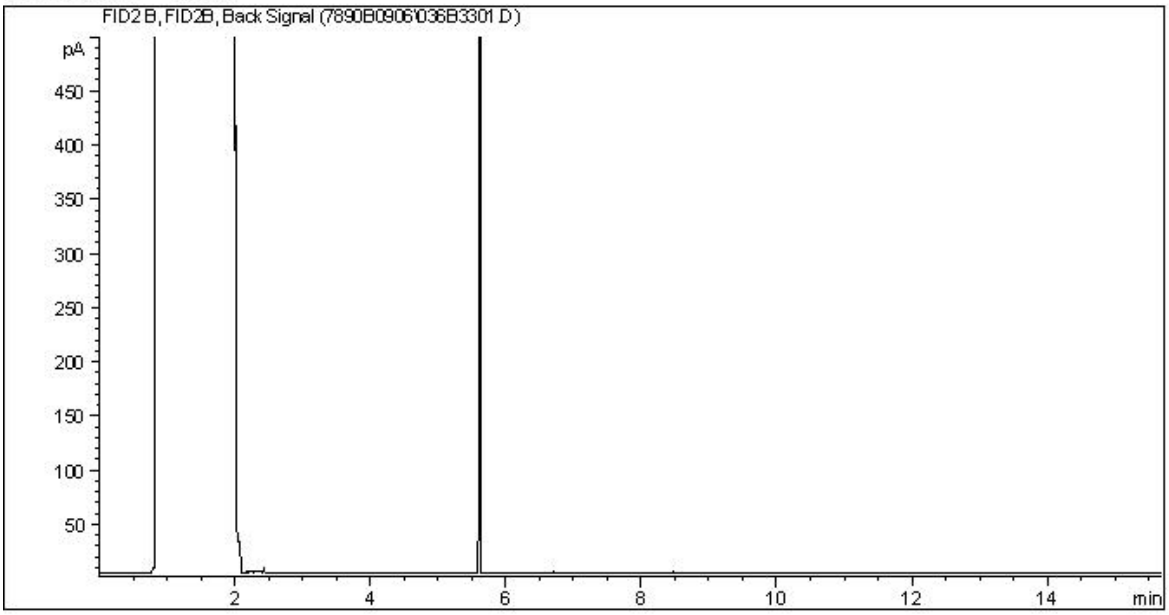
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B477081
Report Date: 2014/09/15
Maxxam Sample: KM5563

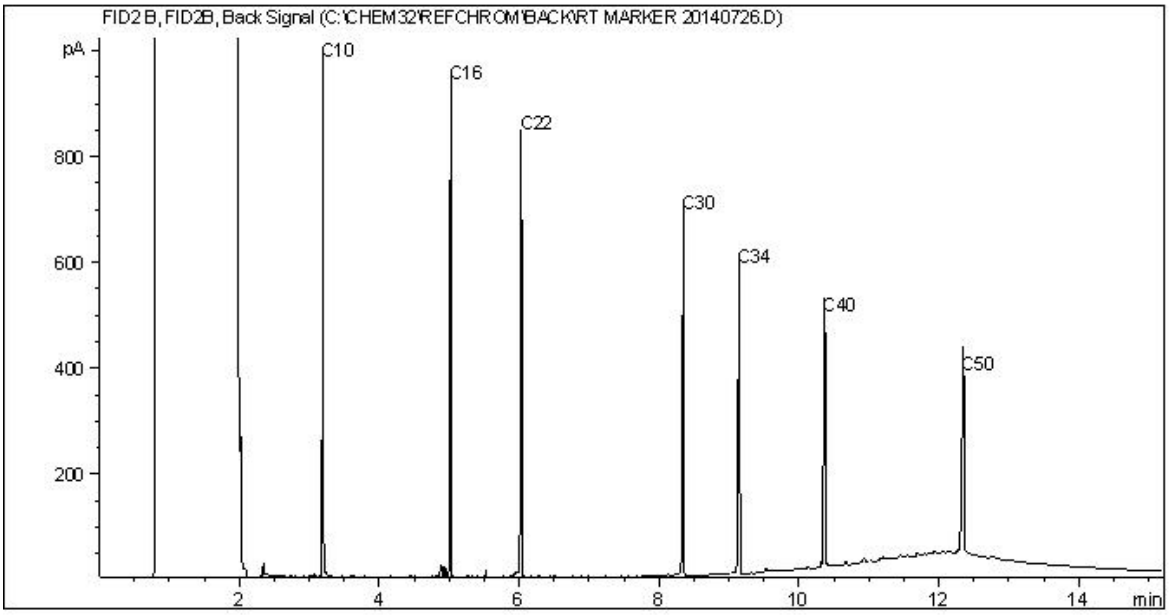
TETRA TECH EBA INC.
Client ID: SS8-31 40-70

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

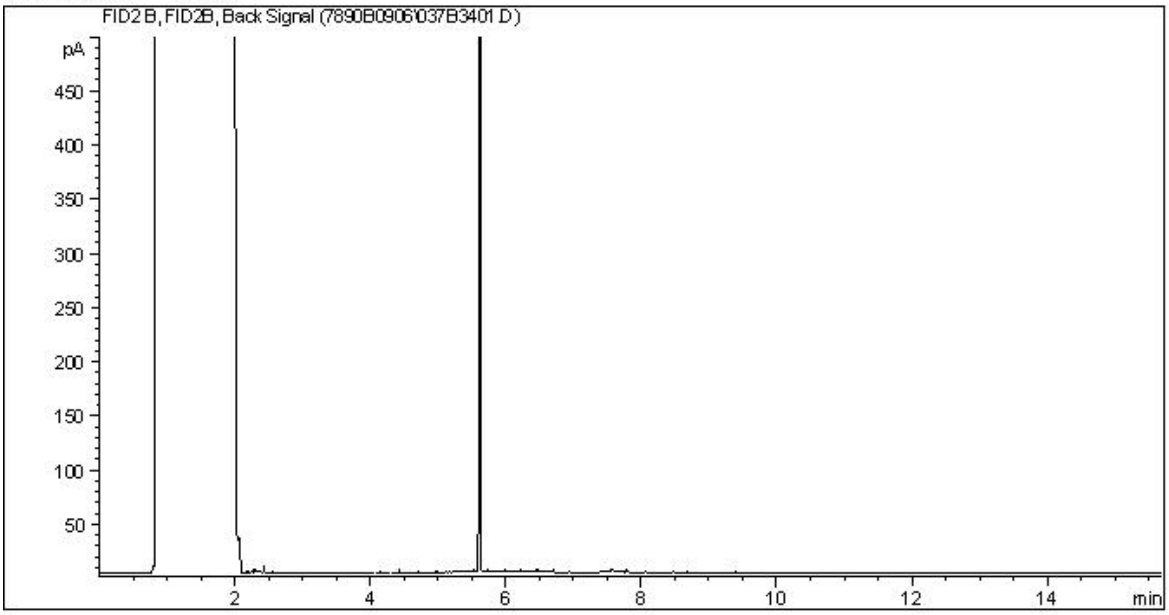
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

Page 1 of 1

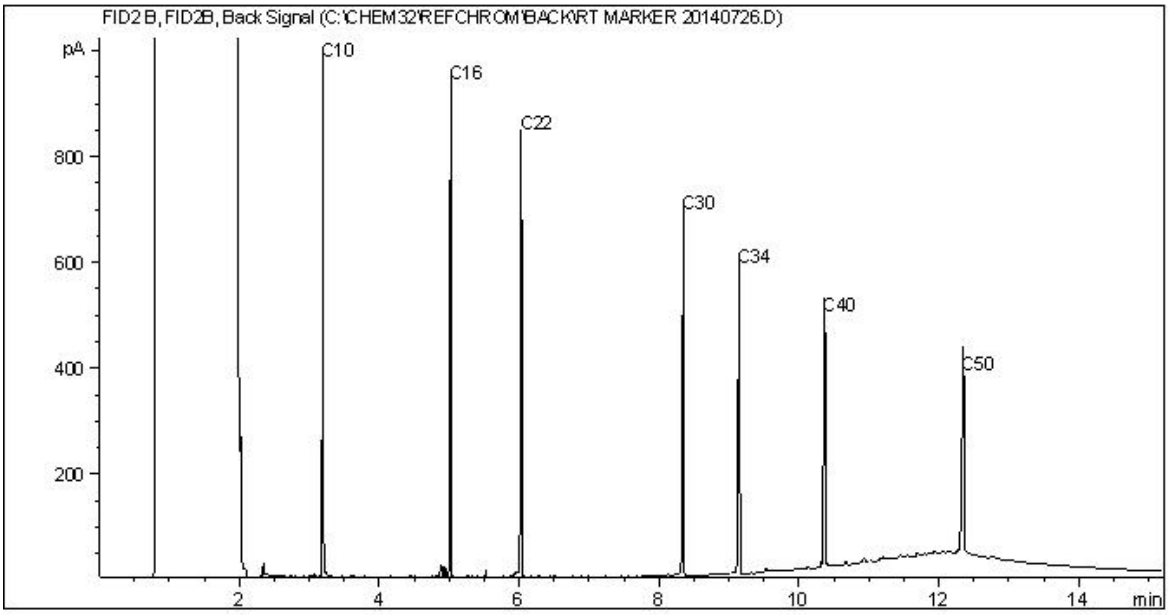
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

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+

Page 1 of 1

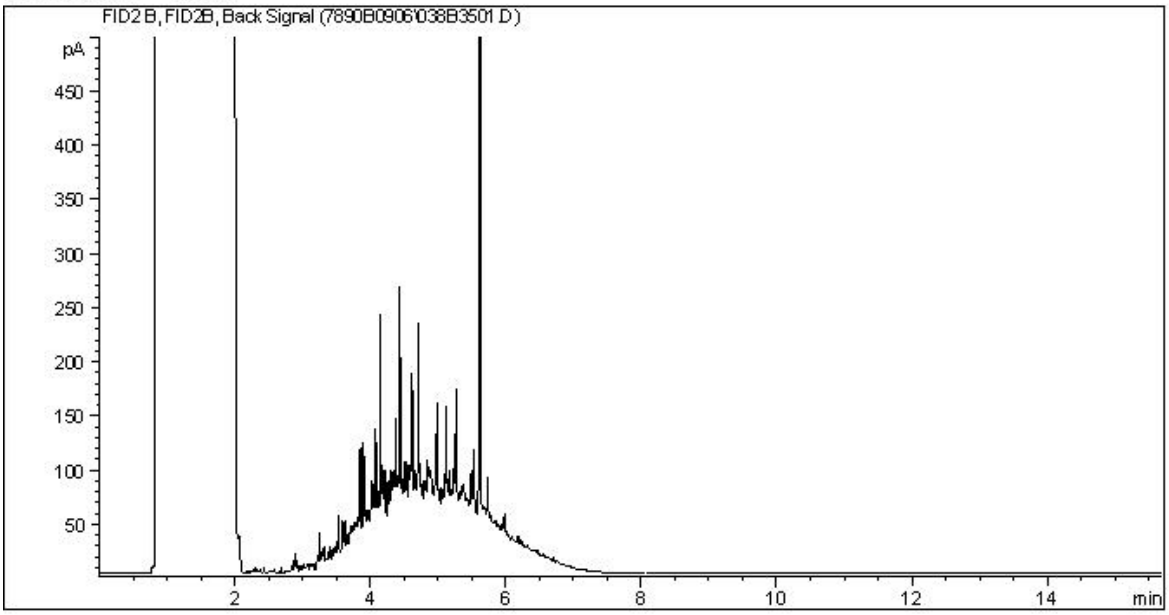
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B477081
Report Date: 2014/09/15
Maxxam Sample: KM5566

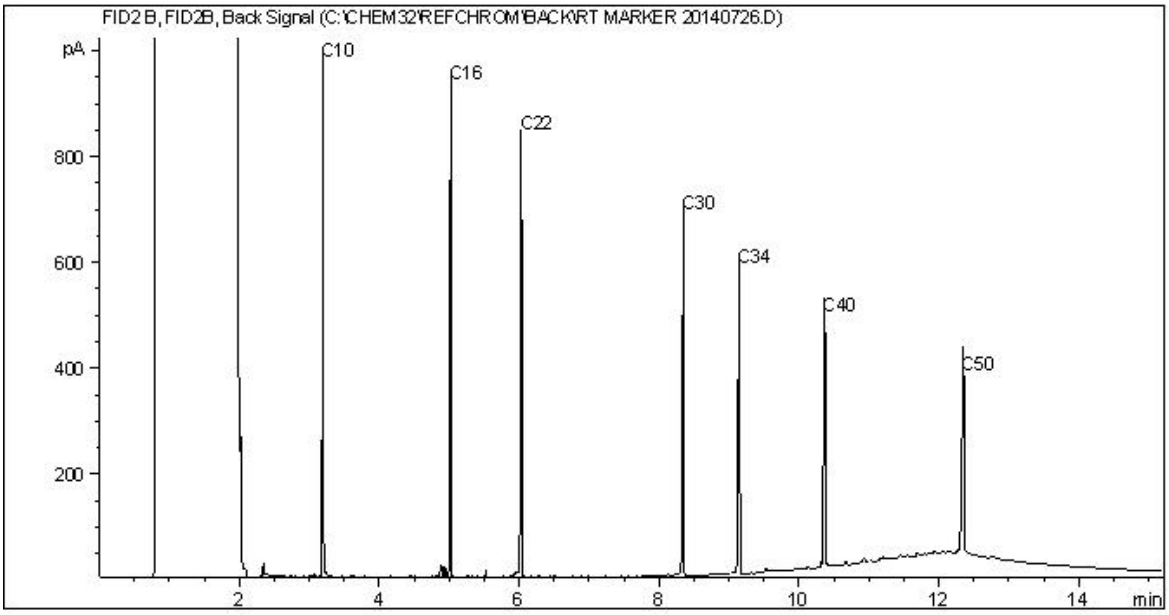
TETRA TECH EBA INC.
Client ID: SS8-32 50-70

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+

Page 1 of 1

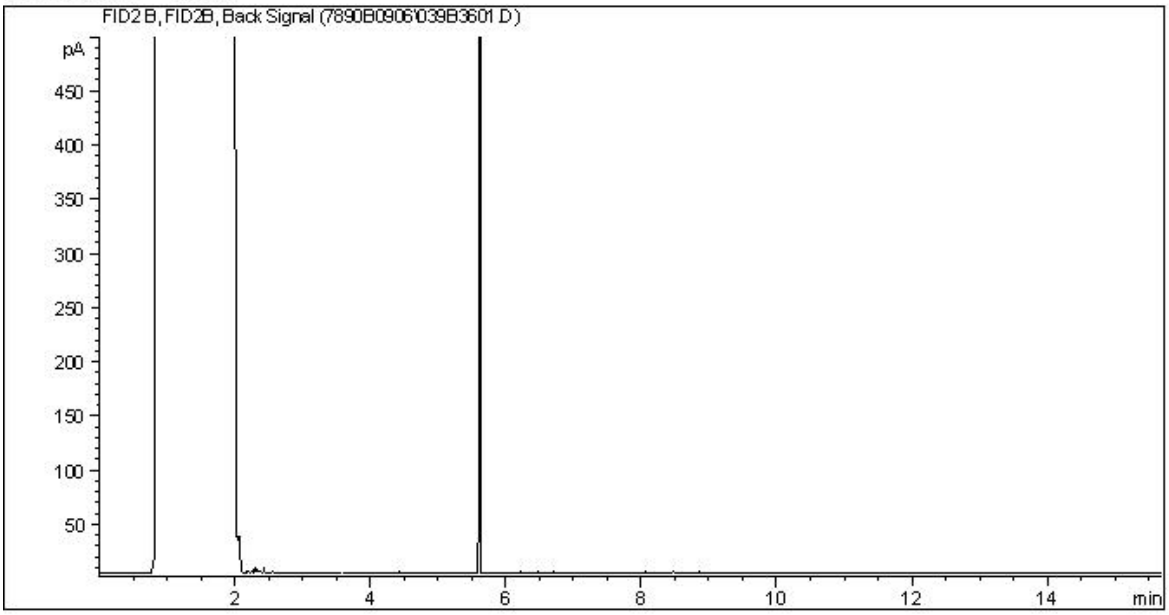
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B477081
Report Date: 2014/09/15
Maxxam Sample: KM5568

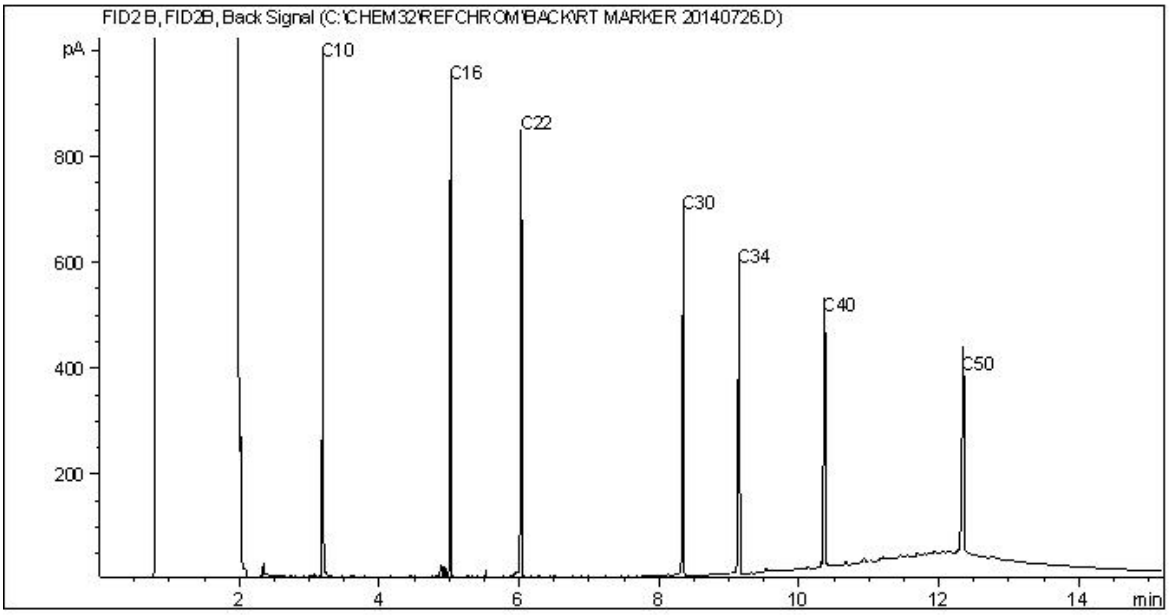
TETRA TECH EBA INC.
Client ID: SS8-33 20-40

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

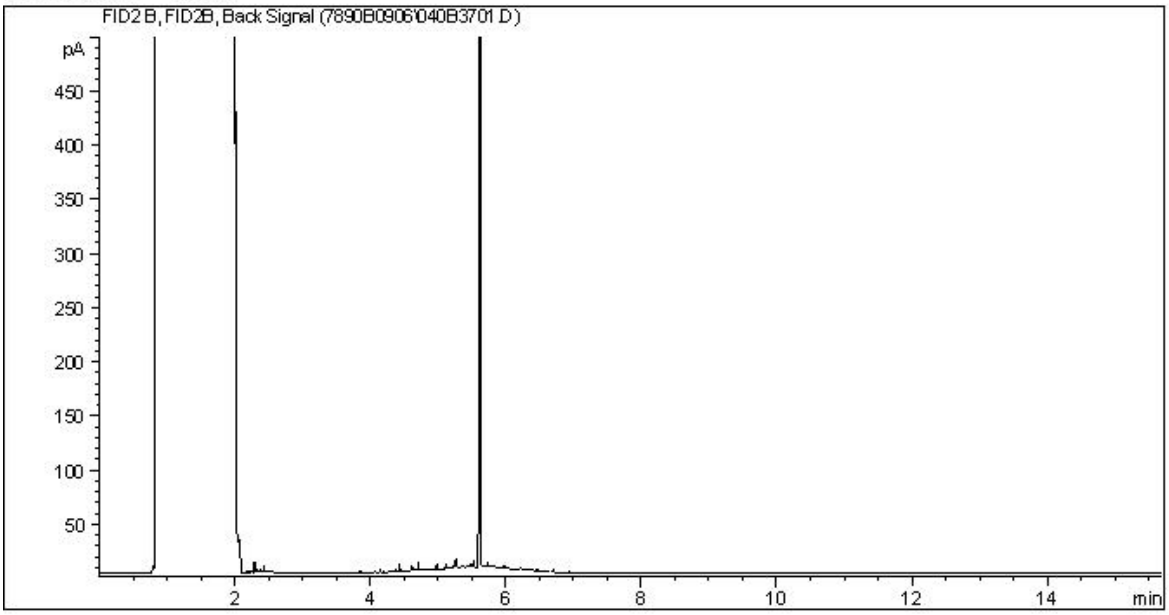
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

Page 1 of 1

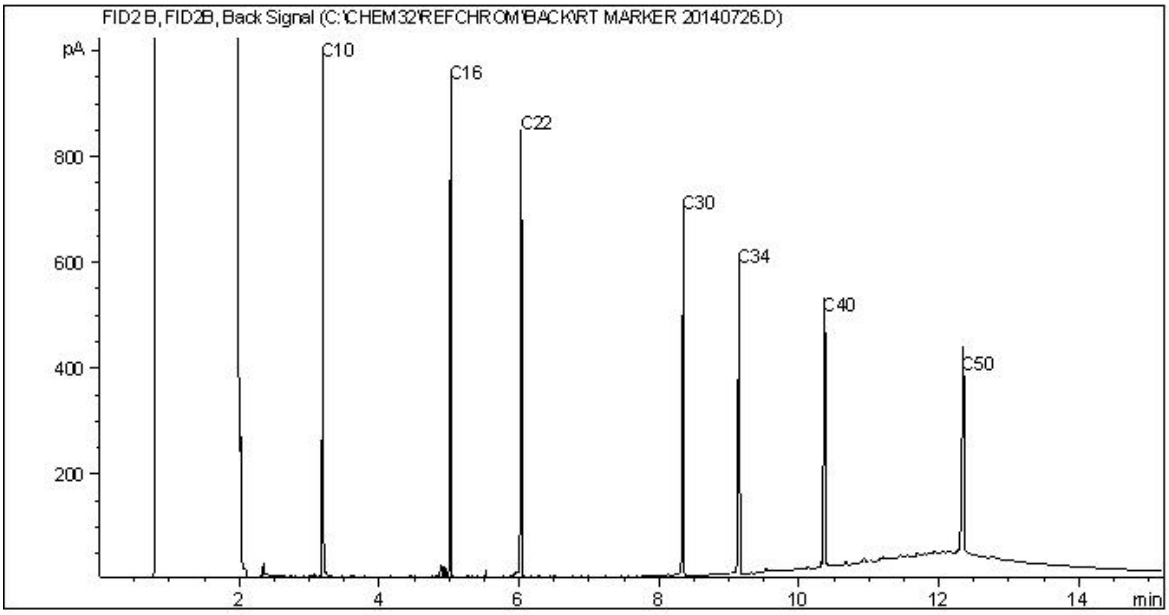
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

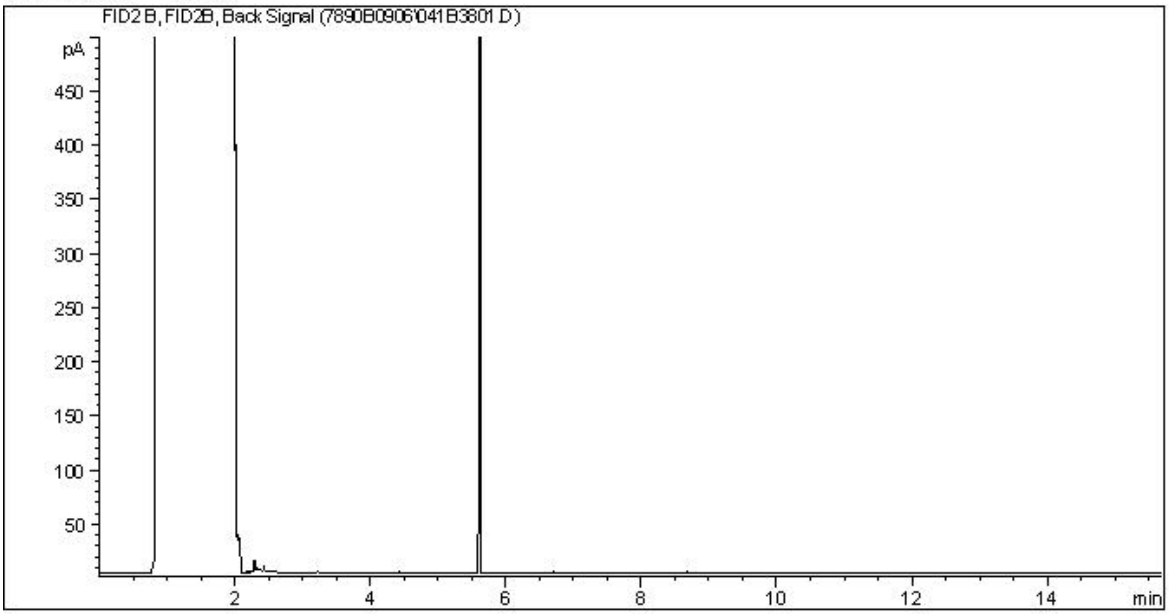
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

Page 1 of 1

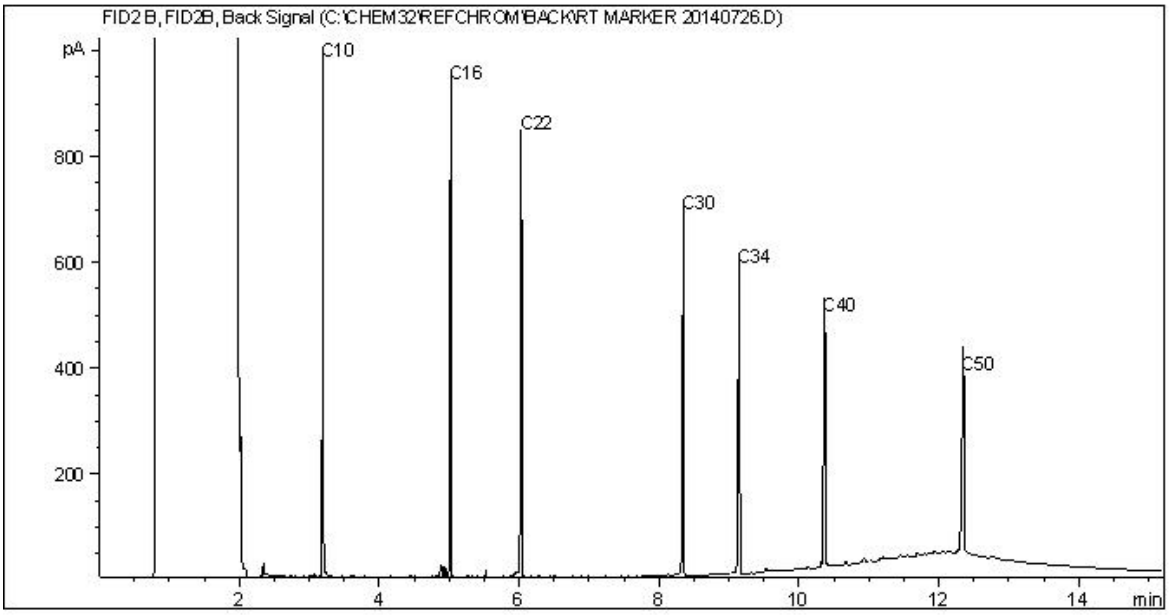
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

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+

Page 1 of 1

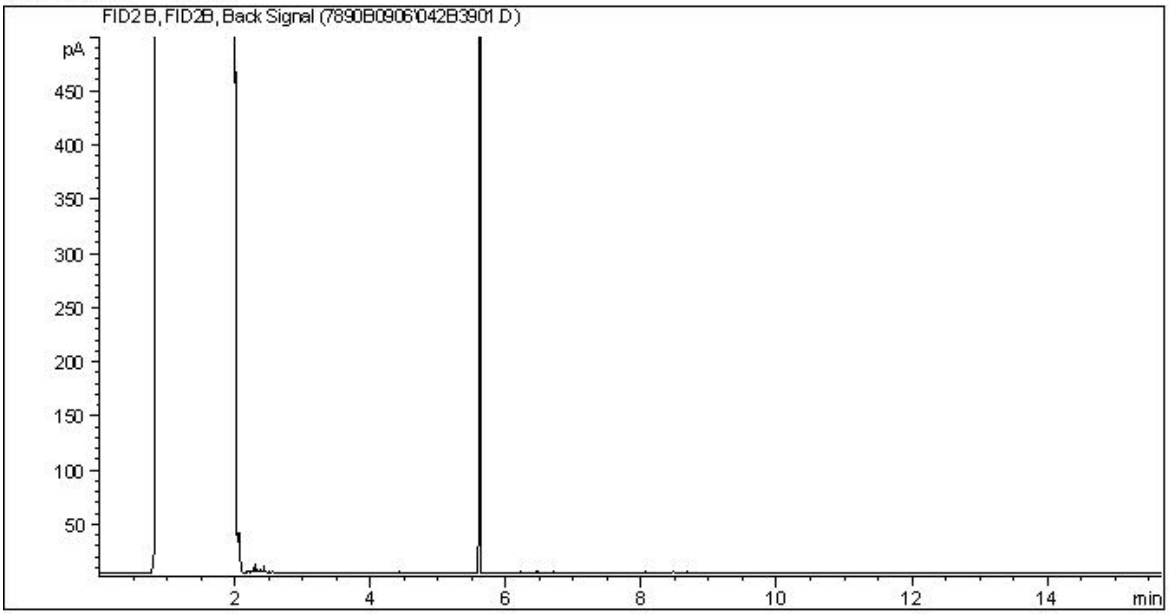
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B477081
Report Date: 2014/09/15
Maxxam Sample: KM5601

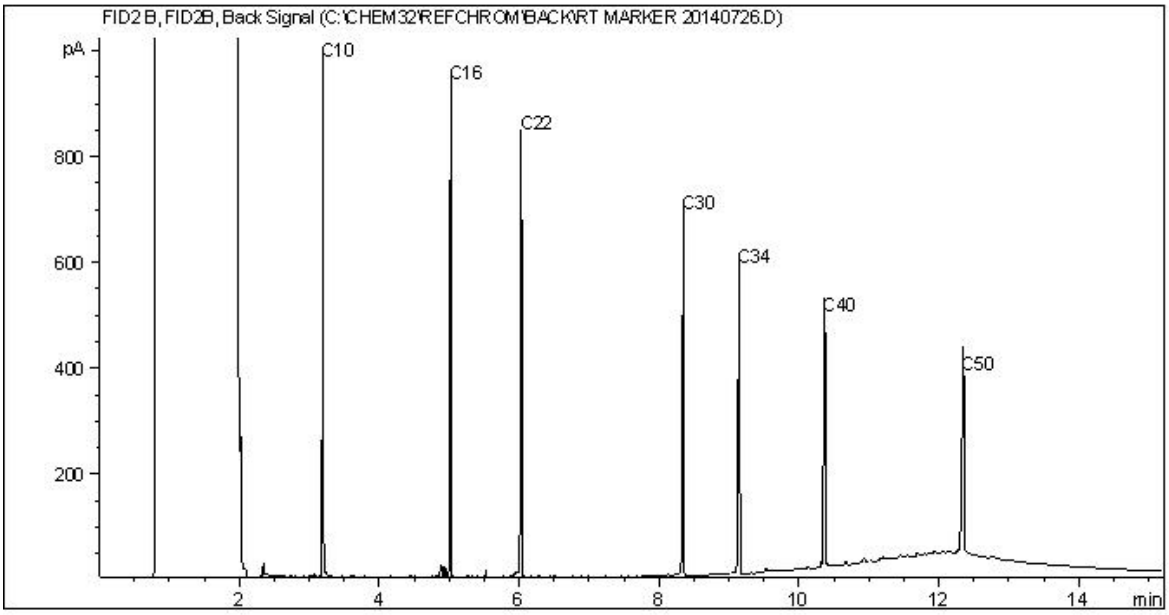
TETRA TECH EBA INC.
Client ID: SS8-35 20-40

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

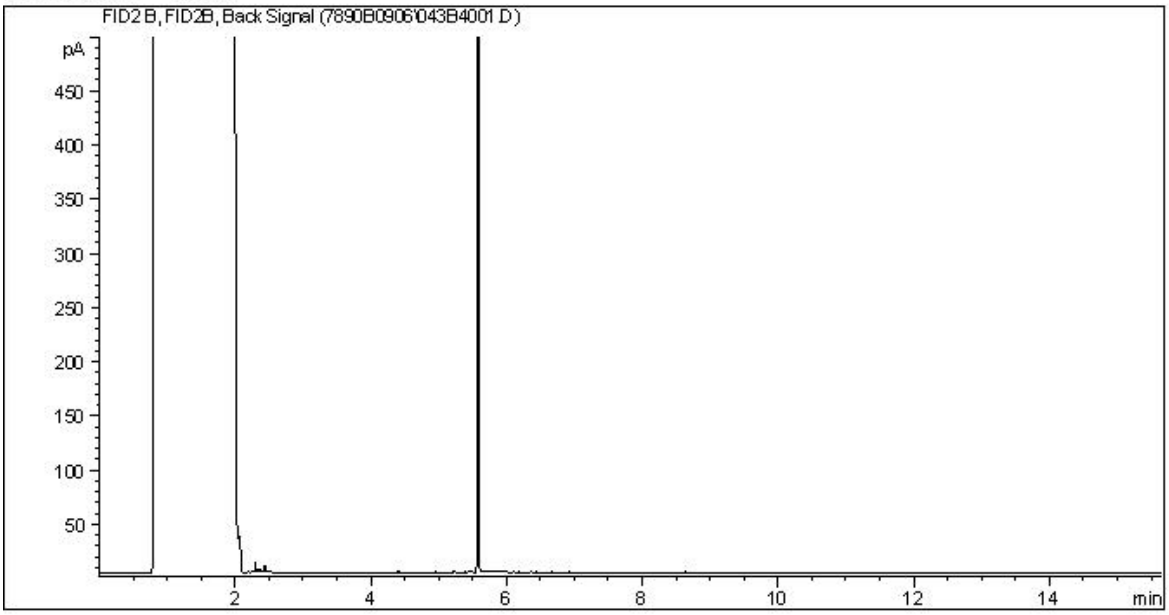
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

Page 1 of 1

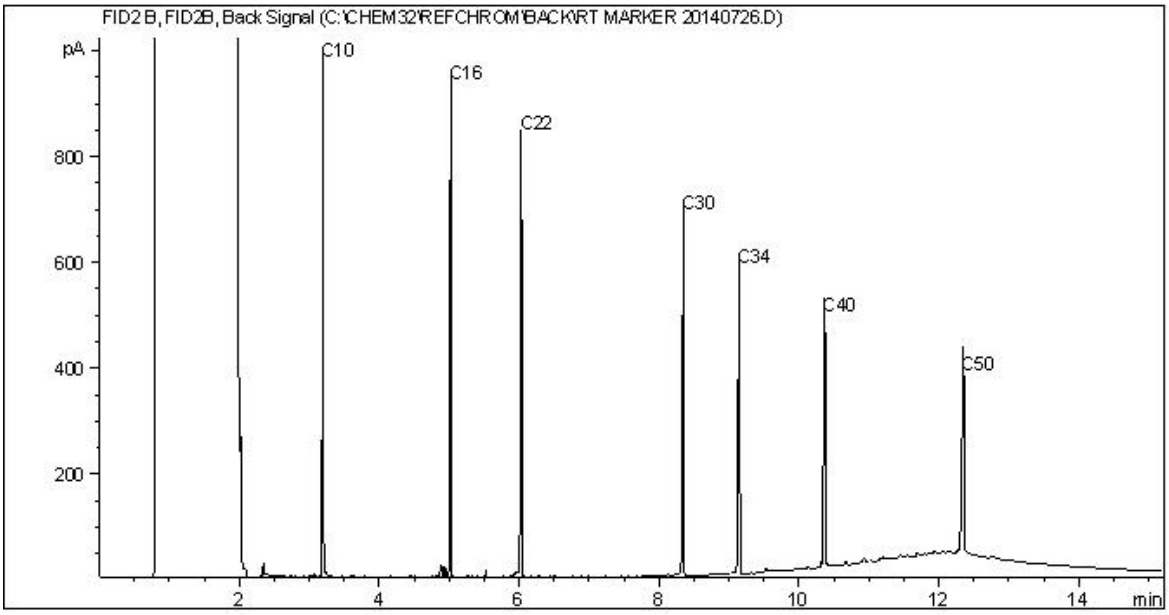
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

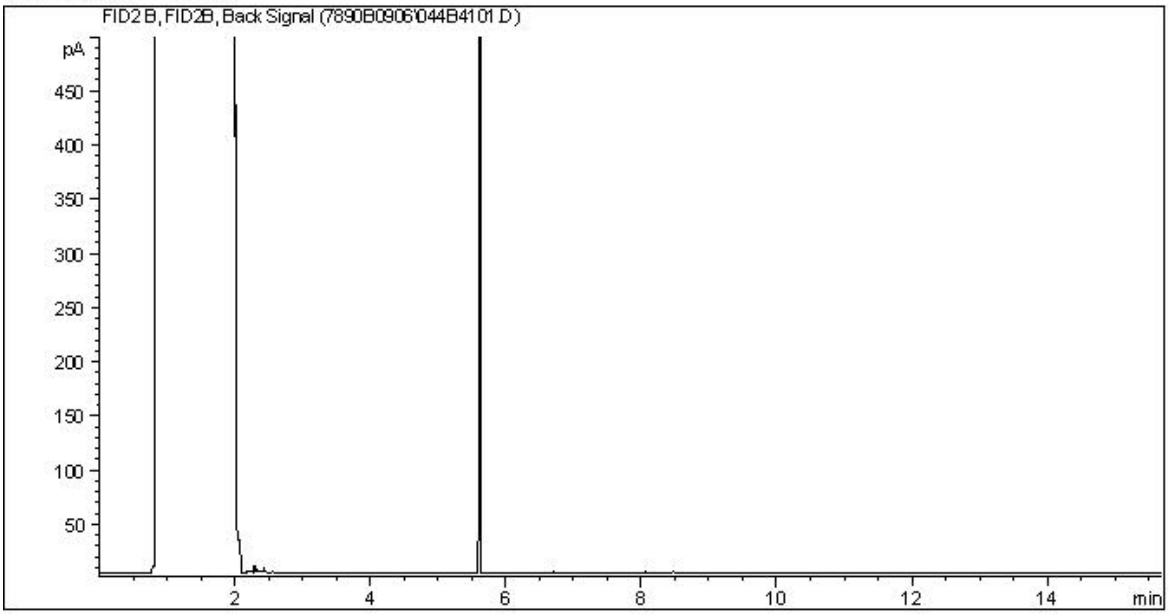
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

Page 1 of 1

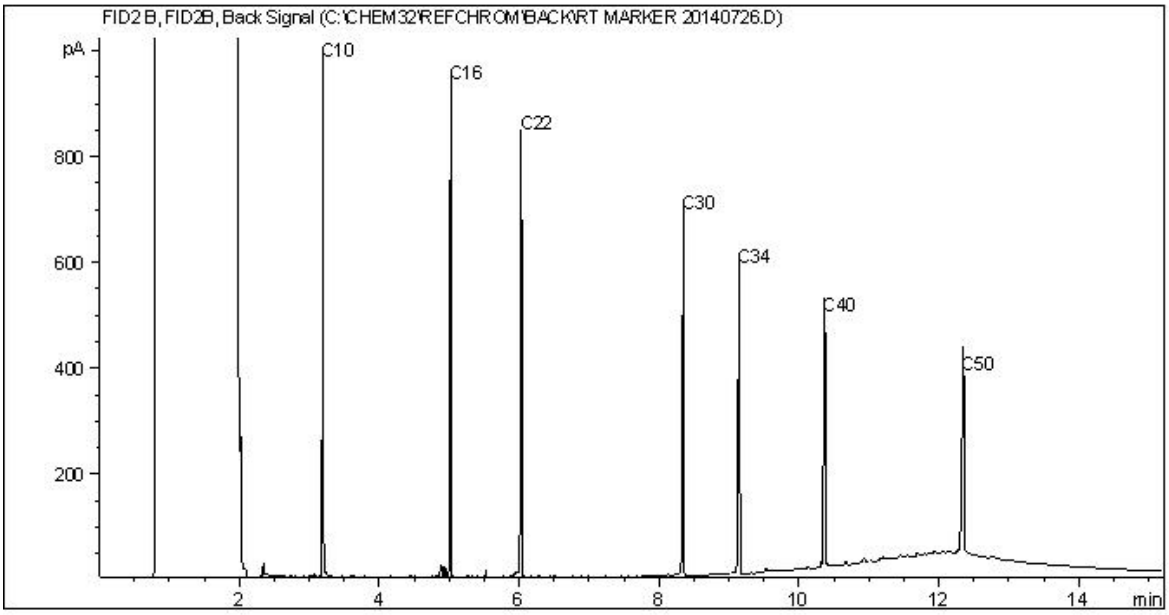
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

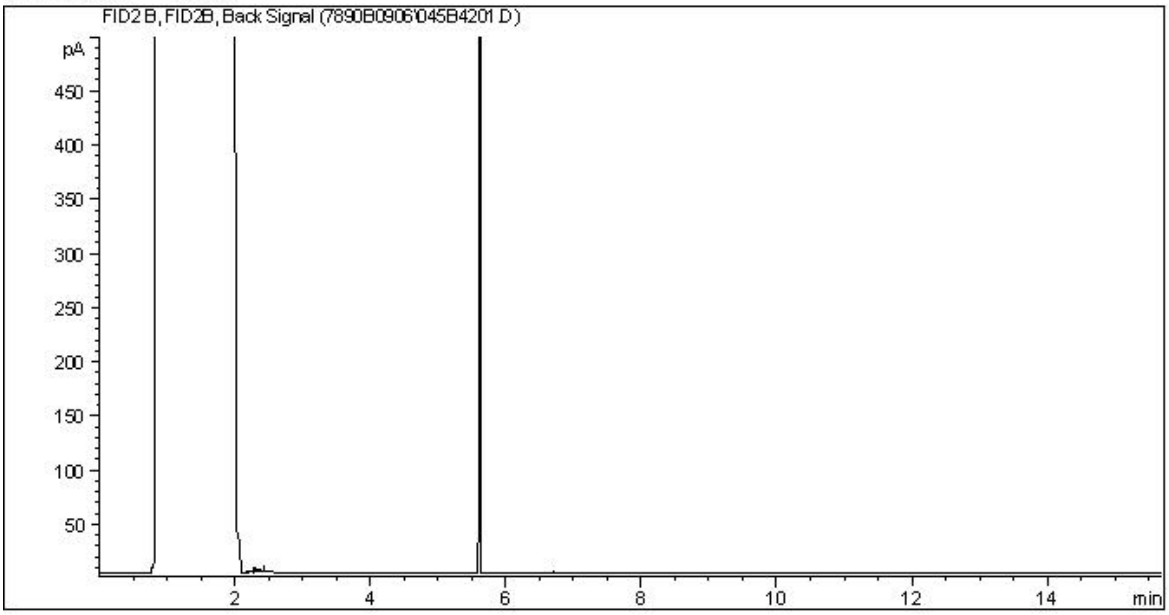
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

Page 1 of 1

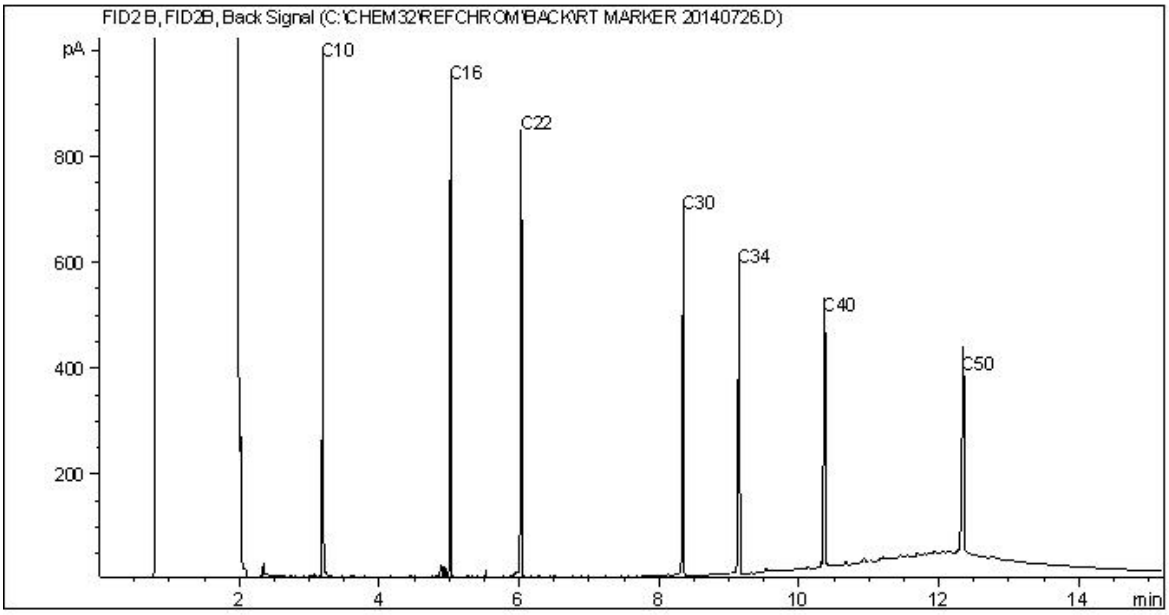
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

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+

Page 1 of 1

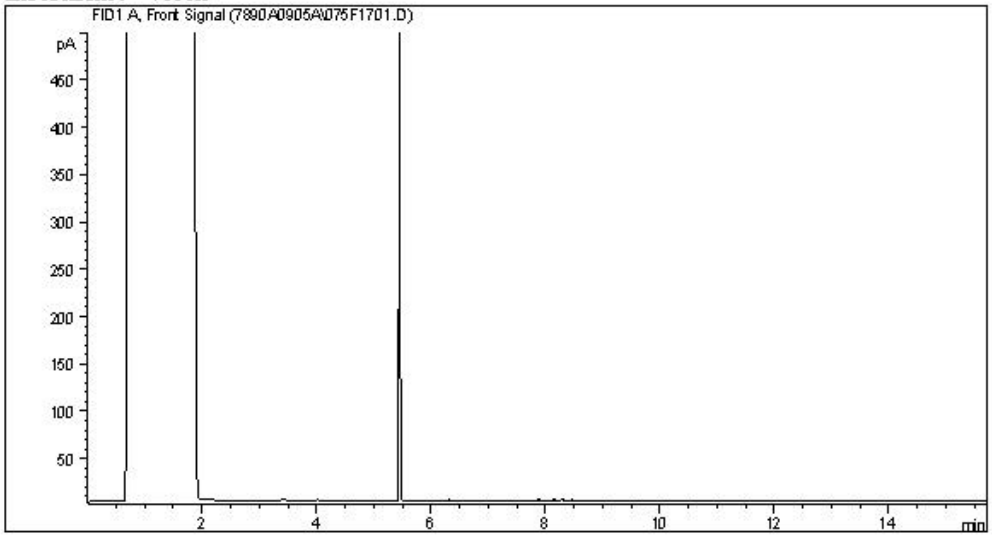
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B477081
Report Date: 2014/09/15
Maxxam Sample: KM5919

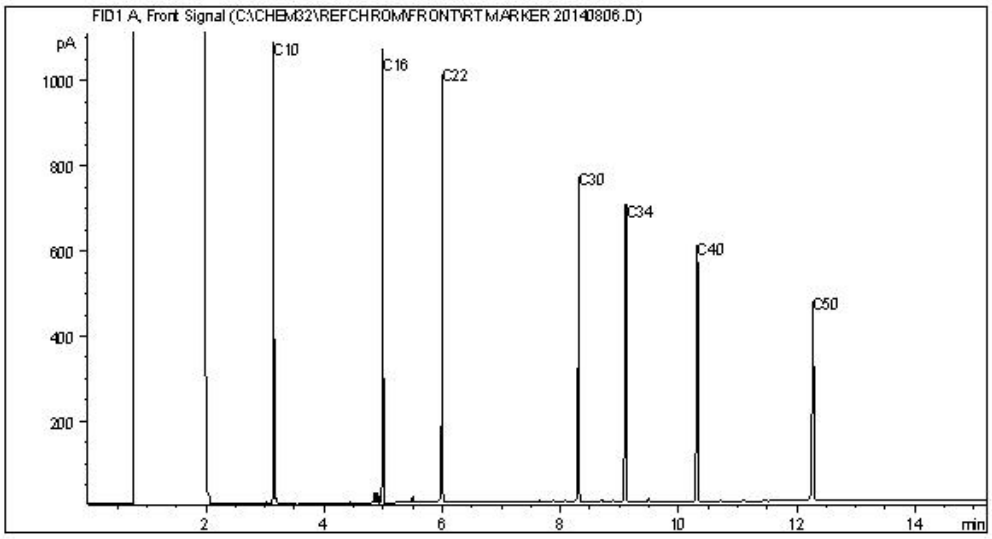
TETRA TECH EBA INC.
Client ID: 14MW01

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890A



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+

Page 1 of 1

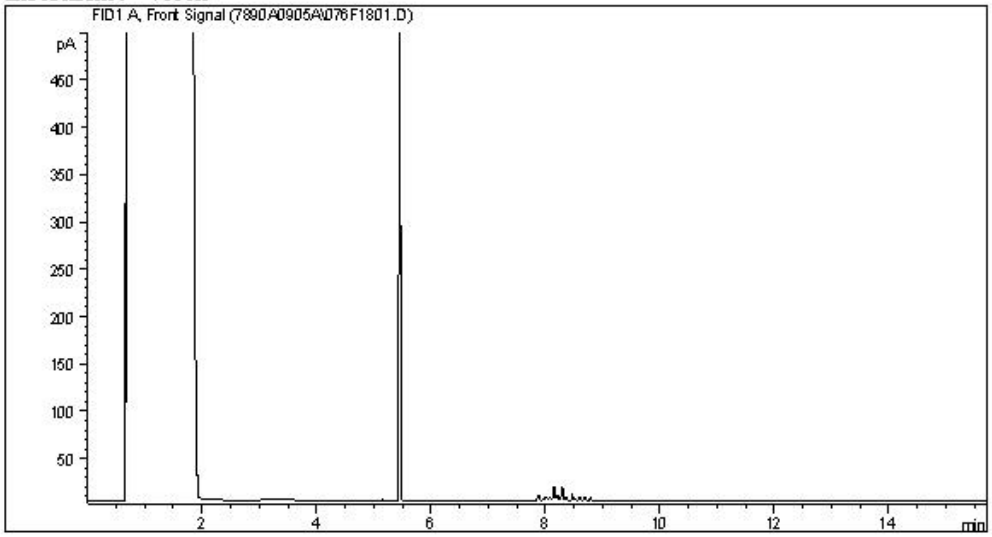
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B477081
Report Date: 2014/09/15
Maxxam Sample: KM5920

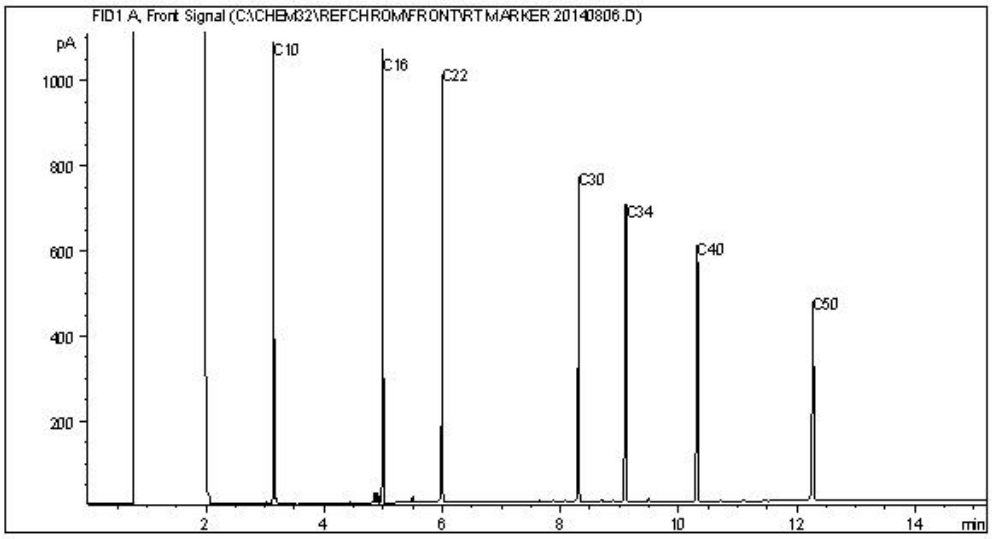
TETRA TECH EBA INC.
Client ID: 14MW03

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890A



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+

Page 1 of 1

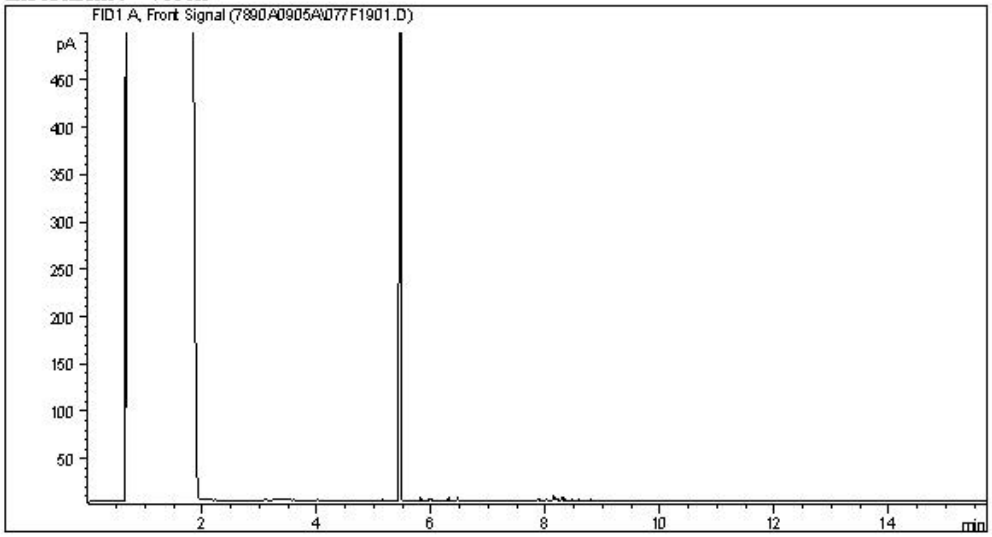
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B477081
Report Date: 2014/09/15
Maxxam Sample: KM5926

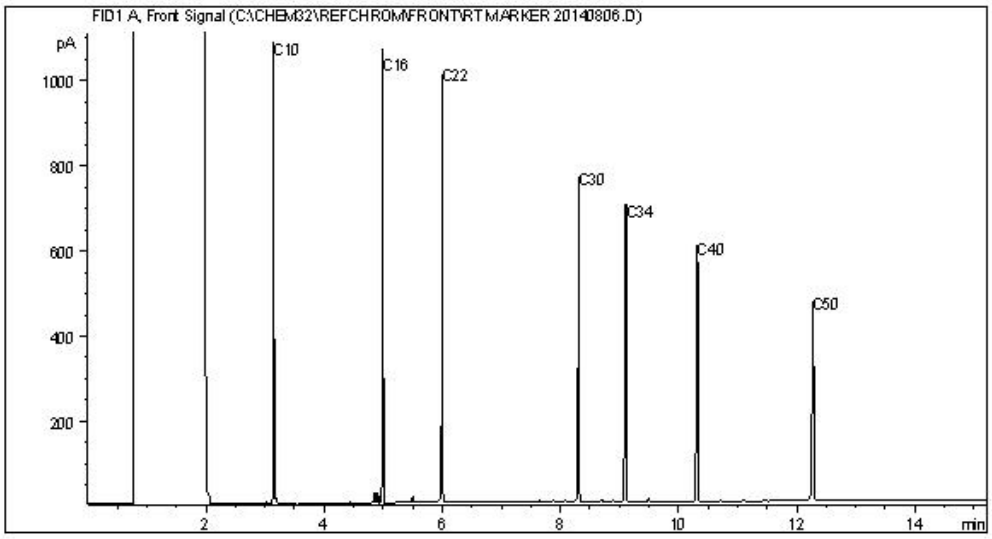
TETRA TECH EBA INC.
Client ID: MWDUP1

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890A



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+

Page 1 of 1

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petro Laboratories Inc.

1295 Matheson Blvd. East, Mississauga, Ontario, L4W 1R1 Tel: (905) 361-2388 Fax: (905) 361-2411
E-mail: petrolab@gmail.com

Laboratory Report

Maxxam Analytics Inc.
9331 - 48th Street
Edmonton, Alberta
T6B 2R4

Lab no.: 9802 - 1,2
Date report: Sept 11, 2014
Sample in : Sept 10, 2014
Job No.: B477081

Attention: Sherlyne Sim

Re: Liquid samples taken on August 31, 2014 for testing.

TEST - 1. Chlorine Content, in mg/l or ppm by ASTM D808, bomb method

Lab No.	Sample ID	Results
9802 - 1	KM6007-TANK2-1	124
9802 - 2	KM6008-DR2-1	480

Method detection limit - 1 ug/g or ppm
Control sample - CONOCO Conostain chlorine standard
Expected Conc., ug/g - 10, Found Conc. - 9, Recovery - 95 %
Expected Conc, ug/g - 150 Found Conc. - 148 Recovery - 95%

Test by: P.S. (Chemist)

Approved by: James Szeto

Member of ASTM
JS:LN

James Szeto, B.Sc.
Chief Chemist

Success Through Science®

Your Project #: B477081
Your C.O.C. #: na

Attention:Sherlyne Sim

Maxxam Analytics
Edmonton - Environmental
9331 48th St
Edmonton, AB
T6B 2R4

Report Date: 2014/09/15
Report #: R3157226
Version: 1

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B4G6077
Received: 2014/09/10, 10:45

Sample Matrix: LIQUID
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Total Metals Analysis by Axial ICP	2	2014/09/12	2014/09/15	CAM SOP-00408	EPA 6010C m

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Shaun Nowickyj, Customer Service
Email: SNowickyj@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.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B4G6077
Report Date: 2014/09/15

Maxxam Analytics
Client Project #: B477081

ELEMENTS BY ATOMIC SPECTROSCOPY (LIQUID)

Maxxam ID		XM6294	XM6295		
Sampling Date		2014/08/31	2014/08/31		
COC Number		na	na		
	Units	KM6007\TANK 2-1	KM6008\DR2-1	RDL	QC Batch
Metals					
Total Cadmium (Cd)	mg/L	<0.02	<0.02	0.02	3746291
Total Chromium (Cr)	mg/L	<0.1	<0.1	0.1	3746291
Total Lead (Pb)	mg/L	<0.1	<0.1	0.1	3746291

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B4G6077
Report Date: 2014/09/15

Maxxam Analytics
Client Project #: B477081

GENERAL COMMENTS

Sample XM6294-01 : Metals: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Sample XM6295-01 : Metals: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B4G6077
Report Date: 2014/09/15

QUALITY ASSURANCE REPORT

Maxxam Analytics
Client Project #: B477081

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	**Parameter**	**Date**	**% Recovery**	**QC Limits**	**% Recovery**	**QC Limits**	**Value**	**Units**	**Value (%)**	**QC Limits**
3746291	Total Cadmium (Cd)	2014/09/15	104	80 - 120	104	80 - 120	<0.002	mg/L	NC	20
3746291	Total Chromium (Cr)	2014/09/15	105	80 - 120	105	80 - 120	<0.01	mg/L	NC	20
3746291	Total Lead (Pb)	2014/09/15	101	80 - 120	104	80 - 120	<0.01	mg/L	NC	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.

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 (one or both samples < 5x RDL).

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B4G6077
Report Date: 2014/09/15

Maxxam Analytics
Client Project #: B477081

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 Services

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.

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MAXXAM ANALYTICS
9331 - 48th Street
Edmonton, Alberta, T6B 2R4
Phone: (780) 577-7100
Fax: (780) 450-4187

Maxxam

SUBCONTRACTING REQUEST FORM

TETRA TECH EBA INC. - EDMONTON
Maxxam PM Sherlyne Sim

To: Maxxam Ontario (From Edmonton)

Job# B477081

☐ 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
KM6007-01R \ TANK 2-1	S	Metals by Axial ICP - Subcontract	2 3(EBTX)	2014/08/31	2014/09/09
KM6008-01R \ DR 2-1	S	Metals by Axial ICP - Subcontract	2 3(EBTX)	2014/08/31	2014/09/09

	Temp. 1	Temp. 2	Temp. 3			
Cooler #1	7	5	6	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

Sched 4X Vial 20140904 JSL

Receiving Maxxam Location: Maxxam Ontario (From Edmonton) JOB # _____

Relinquished by (Sign) Jaime Shumlak (Print) Jaime Shumlak Date and Time 2014/09/09 13:01

Received by (Sign) _____ (Print) _____ Date and Time 2014/09/10 10:45

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 **edmenvirocs@maxxamanalytics.com**

Reporting Requirements:
National:
Regional: * Cadmium, Chromium, Lead.

10-Sep-14 10:45
Shaun Nowickyj
B4G6077

CAUTION
Reason: PRODUCT

JT3 ENV-578

SHIPPING INSTRUCTIONS
☐ Ship Immediately (highlight Yellow)
☐ Requires 9am
☐ Requires Sat. Delivery
☐ Regular Ship next available day
☐ Ship Cold
☐ Ship Room Temp
☐ Ship Frozen
☐ COC Must be Attached
Sender (Print) _____ Initial _____

SHIPPING DEPARTMENT CHECKLIST
☐ Correct Shipping location
☐ Correct Sample Ids (Paperwork vs Bottles)
☐ Yes ☐ No Special-Cooler, Ice, Tape-custody seal, Date&Sign
Date Shipped _____ Number of coolers _____
Shipper (Print) _____ Initial _____

Tetra Tech EBA Inc.
ATTN: Michele Crawford
14940 123 Ave NW
North Bldg.
Edmonton AB T5V 1B4

Date Received: 11-SEP-14
Report Date: 18-SEP-14 14:38 (MT)
Version: FINAL

Client Phone: 780-451-2121

Certificate of Analysis

Lab Work Order #: L1516425

Project P.O. #: E14103202
Job Reference:
C of C Numbers:
Legal Site Desc:

Dana Brown
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1516425-1 PB1 Sampled By: CLIENT Matrix: BULK							
Lead In Paint							
Lead in Paint by ICPOES							
Lead (Pb)	3960		10	mg/kg	15-SEP-14	16-SEP-14	R2949212

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
PB-200.2-ICP-ED	Bulk	Lead in Paint by ICPOES	EPA 200.2/6010B

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Workorder: L1516425 Report Date: 18-SEP-14

Client: Tetra Tech EBA Inc.
14940 123 Ave NW North Bldg.
Edmonton AB T5V 1B4
Contact: Michele Crawford

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PB-200.2-ICP-ED	**Bulk**							
Batch R2949212								
WG1951729-2 CRM		**2582_PAINT**						
Lead (Pb)			93.4		%		80-120	16-SEP-14
WG1951729-1 MB								
Lead (Pb)			<10		mg/kg		10	16-SEP-14

Quality Control Report

Workorder: L1516425 Report Date: 18-SEP-14

Client: Tetra Tech EBA Inc.
14940 123 Ave NW North Bldg.
Edmonton AB T5V 1B4
Contact: Michele Crawford

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

L1516425

Maxxam

Calgary: 4000, 1900 - 9th Ave. NE T2E 8P9 Ph: (403) 291-3077 Fax: (403) 735-2340 Toll free: (800) 386-7247
Edmonton: 9331 - 48 Street T6B 2R4 Ph: (780) 577-7100 Fax: (780) 450-4187 Toll free: (877) 485-8868
www.maxxamanalytics.com

09/017(3)

JNP

Chain of Custody A131757

Page: 1 of 3

	Invoice To:	C/O Report Address ☐	Report To:	Same as Invoice ☒	Report Distribution (E-Mail):	REGULATORY GUIDELINES:
Company:	Tervita Corp				michael.chalifoux@tervita.com	☐ AT1
Contact:	Michael Chalifoux				[illegible]@tervita.com	☒ CCME
Address:	14940 123 Ave				client.services@maxxamanalytics.com	☐ Regulated Drinking Water
	Prov: AB	PC:	Prov:	PC:		☐ Other:
Contact #s:	Ph: 780 451 2130	Cel:	Ph:	Cel:		

All samples are held for 60 calendar days after sample receipt, unless specified otherwise.

PO #:	E14103202
Project # / Name:	
Site Location:	
Quote #:	
Sampled By:	

SERVICE REQUESTED: ☐ RUSH (Contact lab to reserve) Date Required: ☐ REGULAR (5 to 7 Days)

See reverse for package specifics

	Sample ID	Depth (unit)	Matrix GW / SW Soil	Date/Time Sampled YY/MM/DD 24:00	SOIL: BTEX F1-F4	Sieve (75 micron)	Regulated Metals (CCME / AT1)	Salinity 4	Assessment ICP Metals	Basic Class II Landfill	WATER: ☐BTEX F1	☐BTEX F1-F2	☐BTEX F1-F4	☐Routine Water ☐Turb. ☐P	☐TOC	☐DOC	Regulated Metals (Comm./Ind.): Total	Dissolved	☐Total ☐Dissolved: Mercury	Other Analysis: Total Iron / Leachable Iron	HOLD - Do not Analyze	# of Containers Submitted
1	TANK 2-1	–	fuel	14/08/31																	X	11
2	DR 2-1	–	fuel	11																	X	11
3	PB1-1	–	paint	11																XX		1
4	SS8-30	0-40	soil	14/08/30																	X	2
5	SS8-31	0-20	|	|																|	2
6	11	20-40	|	|																	2
7	11	40-70	|	|																	2
8	SS8-32	0-30	|	|																	2
9	11	30-50	|	|																	2
10	11	50-70	|	|																	2
11	SS8-33	0-20	|	|																	2
12	11	20-40	↓	↓																		2

RECEIVED IN YELLOWKNIFE By: Jennifer Mitchell-Hedges 11:45 2014-09-0

4-4-3

7-5-6

Temp

8-8-8

ACR / MW

Please indicate Filtered, Preserved or Both (F, P, F/P) → ↓ F/P

Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):
Jenna Walter / Michael Chalifoux	14/08/31	0900
Relinquished By (Signature/Print):		Time (24:00):

Special Instruc:

# of Jars Used & Not Submitted:

LAB USE ONLY

Received By:	Date:	Time:	Maxxam Job #: B470701
Jenna Walter	20140902	0945	

Lab Comments: See ACR

Custody Seal	Temperature	Ice

AS FCI

; International Corporation o/a Maxxam Analytics

L1516425-COFC

Rmc 2:12
9/11/2014

Maxxam

Calgary: 4000 19st St. NE, T2E 6P8. Ph: (403) 291-3077, Fax: (403) 735-2240, Toll free: (800) 386-7247
Edmonton: 9331 - 48 Street, T6B 2R4. Ph: (780) 577-7100, Fax: (780) 450-4187, Toll free: (877) 465-6889
www.maxxamanalytics.com

JHP Chain of Custody A131768

Page: 2 of 3

	Invoice To: C/O Report Address ☐	Report To: Same as Invoice ☐	Report Distribution (E-Mail):
Company:	Same as page 1		
Contact:			
Address:			
	Prov: PC	Prov PC	
Contact #s:	Ph Cel	Ph. Cel	

REGULATORY GUIDELINES:
- ☐ AT1
- ☒ CCME
- ☐ Regulated Drinking Water
- ☐ Other:

All samples are held for 60 calendar days after sample receipt, unless specified otherwise.

PO #:	
Project # / Name:	
Site Location:	
Quote #:	
Sampled By:	

SERVICE REQUESTED: ☐ RUSH (Contact lab to reserve) Date Required: ☐ REGULAR (5 to 7 Days)

	Sample ID	Depth (unit)	Matrix GW / SW Soil	Date/Time Sampled YY/MM/DD 24:00
1	SS8-34	0-30	Soil	14/08/30
2	"	30-50		
3	"	50-70		
4	SS8-35	0-20		14/08/31
5	"	20-40		
6	SS8-36	0-20		
7	"	20-40		
8	SS8-37	0-50		
9	"	60-60		
10	SS8-38	0-50		
11	"	50-60		
12				

See reverse for package specifics

SOIL: BTEX F1-F4 | Sieve (75 micron) | Regulated Metals (CCME / AT1) | Salinity-4 | Assessment ICP Metals | Basic Class II Landfill

WATER: ☐ VOCs | ☐ BTEX F1-F4 | ☐ BTEX F1-F2 | ☐ Routine Water | ☐ Turb | ☐ F2 | ☐ TOC | ☐ DOC | Regulated Metals (CCME / AT1) | Total | Dissolved | Mercury | ☐ Total ☐ Dissolved

Other Analysis

HOLD - Do not Analyze

# of Containers Submitted

L1516425-COFC

RECEIVED IN YELLOWKNIFE
By: Michelle Lute Michelle
2014-09-01 11:15
443
Temp: 7.1 5.6
8.8 8.6

Please indicate Filtered, Preserved or Both (F, P, F/P)

Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):
Michelle Crawford / Michele Crawford	14/08/31	0900
Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):

Special Instructions:

# of Jars Used & Not Submitted:

LAB USE ONLY

Received By:	Date:	Time:	Maxxam Job #: B470301
Jenna Walter	20140902	0945	

Lab Comments: See ACR

Custody Seal	Temperature	Ice

Maxxam

Calgary: 4000 19st SL NE, T2E 6P8 Ph: (403) 291-3077, Fax: (403) 735-2240, Toll free: (800) 386-7247
Edmonton: 9331 - 48 Street, T6B 2R4 Ph: [illegible]
www.maxxamanalytics.com

JHF Chain of Custody A131769

Page: 3 of 3

	Invoice To:	C/O Report Address ☐
Company:		
Contact:	Same as page 1	
Address:		
	Prov.	PC.
Contact #s:	Ph.	Cell

Report To:

Prov.

Ph.

L1516425-COFC

REGULATORY GUIDELINES:
- ☐ AT1
- ☑ CCME
- ☐ Regulated Drinking Water
- ☐ Other:

All samples are held for 90 calendar days after sample receipt, unless specified otherwise.

PO #:
Project # / Name:
Site Location:
Quote #:
Sampled By:

SERVICE REQUESTED:
- ☐ RUSH (Contact lab to reserve) Date Required:
- ☐ REGULAR (5 to 7 Days)

See reverse for package specifics

	Sample ID	Depth (unit)	Matrix GW / SW Soil	Date/Time Sampled YY/MM/DD 24:00	SOIL: BTEX F1-F4	SOIL: Sieve (75 micron)	SOIL: Regulated Metals (CCME / AT1)	SOIL: Salinity 4	SOIL: Assessment ICP Metals	SOIL: Basic Class II Landfill	WATER: ☐ VOCs	WATER: ☐ BTEX F1-F2	WATER: ☐ BTEX F1-F4	WATER: Routine Water ☐ Turb ☐ F	WATER: ☐ DOC	WATER: Regulated Metals (CCME / AT1) Total	WATER: Regulated Metals (CCME / AT1) Dissolved	WATER: Mercury ☐ Total ☐ Dissolved	Other Analysis	HOLD - Do not Analyze	# of Containers Submitted
1	14MW01		GW	14/08/31 8:30									✓								5
2	14MW02			8:25																	
3	14MW03			9:00									✓								4
4	14MW04			11:15										✓		✓	✓				3
5	14MW05			11:00										✓		✓	✓		Didn't preserve total metals		2
6	14MW06			10:40										✓		✓	✓				3
7	14MWC1			10:05										✓		✓	✓		Didn't preserve total metals		2
8	14MWC2			11:40										✓			✓		RECEIVED IN YELLOWKNIFE		2
9	MW Dup1			08:30									✓						By: [illegible] Michelle Gwik 11:15		5
10	MW Dup2		↓	10:40										✓		✓	✓		2014-09-01		3
11																			4-43		
12																			756		

Please indicate Filtered, Preserved or Both (F, P, F/P) → P F/P

Temp: 8 1 8 18 not yet ok F/P

Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):
Karla Langlois Karla Langlois	14/09/01	09:30
Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):

Special Instructions:
Lab to filter to analyze dissolved metals in 14MW05 and 14MWC1

# of Jars Used & Not Submitted

LAB USE ONLY

Received By:	Date:	Time:	Maxxam Job #: B470??
Jenna Walter	20140902	0945	

Lab Comments:

Custody Seal	Temperature	Ice
	See ACR	

APPENDIX 9

JERICHO SITE STABILIZATION PROJECT TERMS OF REFERENCE

Design-Build Services

Terms of Reference

Jericho Mine Site Stabilization, Nunavut

Public Services and Procurement Canada

July 2016

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TABLE OF CONTENTS

1 PROJECT DESCRIPTION 1
1.1 PROJECT INFORMATION 1
1.2 PROJECT BACKGROUND 1
1.3 PROJECT DELIVERY APPROACH 3
1.4 PROJECT SCHEDULE 4
1.5 SUMMARY OF WORK 5
1.6 SUPPORTING DOCUMENTS 11
1.7 CODES, ACTS, STANDARDS, REGULATIONS & GUIDELINES 11
2 PROJECT ADMINISTRATION AND DESIGN SERVICES 13
2.1 ROLES AND RESPONSIBILITIES 13
2.2 DESIGN SERVICES 13
3 REQUIRED CONSTRUCTION SERVICES 15

ACRONYMS & ABBREVIATIONS

PSPC	Public Services and Procurement Canada
INAC	Indigenous and Northern Affairs Canada
TOR	Terms of Reference
ESA	Environmental Site Assessment
OA	Options Analysis report
AHJ	Authorities Having Jurisdiction
PKCA	Processed Kimberlite Containment Area
NHL	Non-Hazardous Landfill
ASTs	Aboveground Storage Tanks
HWTA	Hazardous Waste Transfer Area
PHC soils	Petroleum Hydrocarbon Impacted Soils
LPB	Lead-Based Paint
APEC	Areas of Potential Environmental Concern
DR	Departmental Representative
IOL	Inuit Owned Land

1 PROJECT DESCRIPTION

1.1 PROJECT INFORMATION

1.1.1 Project Information

Project Information	
Project Title:	Jericho Mine Site Stabilization
Project Location:	The Jericho Mine is located approximately 270 km southeast of Kugluktuk, NU, and 30 km north of the Lupin Mine in the Contwoyto-Itchen Region. At 65°59'50"N, 111°28'30"W, the Jericho Mine is approximately 60 km south of the Arctic Circle.
Public Services and Procurement Services (PSPC) Project Number:	R.083349.001

1.1.2 Departmental Representative

Departmental Representative	
PSPC Project Manager:	Michael Bernardin

1.2 PROJECT BACKGROUND

1.2.1 Introduction

.1 As the custodian of most federal lands in the North, Indigenous and Northern Affairs Canada (INAC) has responsibility, through the Northern Contaminated Sites Program, to manage a number of contaminated properties that are no longer maintained by the original occupant. The Department's portfolio of contaminated sites originated from private sector mining, oil and gas activities and government military activity dating back over half a century.

.2 This Terms of Reference (TOR) has been developed on behalf of INAC to solicit combined engineering and construction/ decommissioning services from a qualified firm or joint venture company.

.3 The scope of work for the site stabilization, consisting of remediation/ decommissioning of select mine components, including the design of said components, combine to form what is going to be referenced as a design-build procurement approach for this project.

1.2.2 Services

.1 The services of a general contractor with engineering capacity, or a joint venture company providing both design and deconstruction services will be consider the "Contractor" in this document. The Contractor will include a multi-disciplinary team of sub-consultants and suppliers as required to undertake the design and provide the deconstruction services necessary for this project.

.2 The selected Contractor will provide a full team including all required expertise in northern logistics, camp operation, earthworks, hazardous materials abatement, etc. as necessary to complete the work.

1.2.3 Site Description and background

.1 The Jericho Mine was opened in 2006 by Tahera Diamond Corporation (Tahera) who went through bankruptcy proceedings in 2008. Shear Diamonds Corp. (Shear) took over the Jericho Mine in 2010 and operated the mine under care and maintenance until September 2012 when Shear suspended operations. INAC has been undertaking basic environmental protection of the Jericho Mine since spring 2013. It is understood that INAC assumed control of the Jericho Mine in January 2014.

.2 The original mine plan was to construct a project with an eight-year life and extract the kimberlite ore by using an open pit and underground mining methods. The mine work did not advance beyond the open pit extraction.

.3 A detailed Environment Site Assessment (ESA) report was prepared by Tetra Tech EBA (EBA) in December 2014. The report presented the results and finding of their August 2014 on-site investigation work, planned following a gap analysis in support of developing of a remedial action plan for the project site. The scope of the ESA included investigation and assessment for both a full remediation of the site, as well as a limited site remediation option. Contaminated soil, water, hazardous and non-hazardous material and infrastructure, and geotechnical information all form part of the ESA document.

.4 Further to the findings of the ESA, remedial options were evaluated and presented in the EBA Options Analysis (OA) report (April 2015). The OA outlined and determined preferred options available for 3 closure scenarios; a full remediation scenario, limited remediation scenario and preservation of site assets scenario. Descriptions of the remedial activities for each scenario were presented in the document.

.5 In consideration to both the overall remediation objectives for the Jericho Mine Site and the specific maximum funding available to the project, this procurement outlines work that will form the basis of the Site Stabilization Project as well as provide the best value to the Crown.

1.2.4 Design and Construction Scope

.1 As the custodian of the Jericho Mine Site, INAC has an overall mandate to protect the environment and undertake activities to make the most efficient use of the securities held by the department.

.2 Further to the remedial options presented in the OA and based on the specific funding available for the project, the Site Stabilization Work will include remedial activities that address the most immediate site concerns.

.3 The scope items are grouped into the following three work categories; Earthworks, Environmental and Demolition. An outline of work items/ remedial activities are described in the Summary of Work section below.

.4 The Contractor shall be responsible for reviewing and understanding the options analysis for each remedial work item and ultimately the design, implementation and verification of all bid work.

1.2.5 Project Constraints

.1 Aircraft or winter-only overland access to the site.

.2 One-Construction-Season project timeframe, 2017.

.3 Maximum Price Contract.

1.3 PROJECT DELIVERY APPROACH

1.3.1 Approach

.1 This project will use a design/ deconstruction procurement approach, more commonly known as a design/ build approach.

.2 The maximum contract award amount is $10.5M without GST.

.3 The Contractor will be required to provide design and deconstruction services for each of the scope requirements outlined in this document.

.4 Payment for each of the scope requirements is as shown in the Basis of Payment Table.

.5 This Terms of Reference, combined with the ESA and OA outline the minimum design and deconstruction requirements for each of the tasks.

1.3.2 Special Conditions/Considerations

.1 Remote access to the site.

.2 Arctic Environment.

.3 Mine Site Hazards.

.4 Health and Safety considerations associated with the Authorities Having Jurisdiction (AHJ).

.5 Work must be compliant with AHJ.

1.4 PROJECT SCHEDULE

1.4.1 General

.1 The project is to be delivered, including design, all *deconstruction* and disposal components and demobilization from site by March 31, 2018.

.2 See the following table for key milestone date.

.3 Contractor is required to submit a detailed schedule with adherence to the milestone dates provided.

1.4.2 Anticipated Milestone Dates

Project Phase		Milestone Date
.1	Contract award	Dec. 12, 2016
.2	Preliminary Design Submission	Jan.16, 2017
.3	Completion of Design	Feb. 28, 2017
.4	Mobilization to site	Mar. 2017
.5	Construction period	May- Oct. 2017
.6	Demobilization from Site	Mar. 2018
.7	Contract Closeout	Mar. 31, 2018

1.5 SUMMARY OF WORK

1.5.1 Project Administration & Design Services and Construction Services

.1 Carry out the Contract Work, as specified, for the following:
- .1 Project Administration and Design Services; and
- .2 Required Construction Services, in accordance with the provided Technical Specifications.

Details of each are provided in the Sections 2 and 3, respectively.

.2 Mobilize and demobilize all personnel, equipment, support facilities and materials required to complete the Work.

1.5.2 Design/ Deconstruction Scope of Work

The following work items form the components of the Scope of Work, grouped by Earthworks, Environmental and Demolition.

Earthworks

Earthworks consist of various excavation, construction and deconstruction items designed to stabilize different structural components of the former mine. The work includes constructing the berms for the non-hazardous landfill as well as the final landfill cover, once all debris materials are in place.

The specific mine components listed below are described in Section 5 of the EBA Options Analysis (2015) and shown in its appended figures.

.1 Breach the C1 Diversion and construct a Pit Overflow;
- .1 The preferred option to expedite pit filling, by restoring the natural flow back into the pit, and remove any questions about long-term performance of the existing Diversion,
- .2 Construct a channel through the C1 Diversion to divert the C1 flow back into the Open Pit,
- .3 Install a plug to prevent flow down the alignment of the existing C1 Diversion,
- .4 Cut a separate channel to breach and divert future flow out of the Open Pit, and
- .5 Design both breaches to ensure their long term performances.

.2 Breach the West Dam;
- .1 Part of the preferred remedial option to manage the Processed Kimberlite Containment Area (PKCA) Surface Water,
- .2 The West Dam is a frozen core dam located at the west end of the PKCA,

.3 Breach the West Dam near the original lake elevation of 514.4 m to allow surface flow out of the containment area while directing water along its original flow path,

.4 Design the breach section to ensure long-term integrity of the bypass, and

.5 Place armouring material along the channel bottom and side slopes to provide erosion resistance.

.3 Notch Divider Dyke A;

.1 Part of the preferred remedial option to manage the Processed Kimberlite Containment Area (PKCA) Surface Water,

.2 Divider Dyke A divides the PKCA into two areas and consists of a sand and gravel filter zone supported by a rock-fill superstructure,

.3 Notch the Dyke to promote flow between Cells A and B/C at a control elevation of 520 m,

.4 Design the section to discourage snow accumulation and to permit vehicle passage to the West Dam,

.5 Design the notch and a transition to manage flow across a 5 m drop in elevation from the upstream to downstream sides, and

.6 Place armouring material along the channel bottom and side slopes to provide erosion resistance.

.4 Construct a Cover over Cell A;

.1 The preferred remedial option for surface stabilization of the PKCA,

.2 The Cell A tailings surface is exposed and localized erosion channels are evident at spigot locations,

.3 Soft ground conditions will be encountered towards the settling pond upstream of Dyke A,

.4 Construct the cover over Cell A to stabilize fine PK deposits and limit the migration of wind-blown tailings, and

.5 Design the cover to provide long-term erosion resistance.

.5 Construct a Non-Hazardous Landfill (NHL);

.1 For management of non-hazardous materials on-site,

.2 Construct a landfill to contain waste material such as wood debris, metal debris, aboveground storage tanks (ASTs), drums, rubber, concrete, plastic and other inert items,

.3 The preferred landfill location is west of the main camp pad, on largely bedrock controlled terrain,

.4 Design the landfill to have appropriate capacity to contain all the debris identified for the Contractor's bid demolition work – specifically the Main Camp Facility, large ASTs and all non-Truck Shop and non-Process Plant ancillary structures and infrastructures, and

.5 Design the landfill cap to be erosion resistant.

.6 Re-grade the Containment Berms;

.1 There are six (6) containment berms on site – two (2) Tank Farm berms, Genset day tank (AST#18) berm, Airstrip tanks berm, truck shop tank berm, and Hazardous Waste Transfer Area (HWTA) berm (east + west),

.2 The containment berms are to be removed, and

.3 Once the debris, contaminated soils, and liner materials are removed, re-grade the berms to match the surrounding natural terrain.

Environmental

The environmental work shall manage the most significant environmental hazards at the site. The work includes treating the Petroleum Hydrocarbon impacted soils (PHC soils), reducing the potential exposure of the lead-based paint (LBP), draining/ cleaning/ incinerating the organic liquid waste/ waste oil and consolidating and shipping all other specified hazardous wastes off-site to a licensed disposal facility. Cleaned and purged pipes, tanks and drums (non-hazardous) shall be landfilled on-site.

.1 Treat the PHC Soils;

.1 PHC soils have been identified in 15 Areas of Potential Environmental Concern (APEC),

.2 The APEC are described in the ESA (EBA, 2014), volume summary of the PHC soils shown in Table 4.2 of the OA (EBA, 2015) and areas shown in Appendix B of the OA,

.3 Excavate, load-haul and consolidated the PHC soils to a single location to mitigate potential environmental exposure, i.e. Phase 1 and Phase 2 Tank Farm areas in the Main Camp Area are available for use, and

.4 Treat the PHC soils on-site using current treatment methods that will be appropriate for the existing and northern site conditions.

.2 Dismantle LBP coated ASTs;

.1 Blue LBP was identified on nine (9) 62,000-L ASTs,

.2 Drain remaining fuels/ fluids from the ASTs,

.3 Decommission the ASTs in accordance with the Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations (SOR/2008-197),

.4 Pressure wash/ clean residual liquids from emptied tanks and piping,

.5 Remove/ strip LBP along cut-lines to allow cutting and dismantling of the tanks, and

.6 Cut and dismantle the ASTs, compacting/ consolidating the sections, and leave staged (for future management) on-site at an area approved by the Departmental Representative (DR).

.3 Consolidate and Incinerate Organic Liquid Wastes or remove off-site for disposal;

.1 Organic liquids waste includes diesel, gasoline, Jet A, Jet B, heating oil, and other organic wastes within drums,

.2 Mobilized an incinerator(s) to site that will meet applicable emissions controls,

.3 The criteria used to determine acceptability of product for on-site incineration are summarized in Table 5.2 of the Abandoned Military Site Remediation Protocol (INAC, 2008),

.4 Develop a process flow diagram to guide testing, characterization and then management of the different types of organic liquid wastes,

.5 Collect and consolidate the different organic liquids from the various drums, pipelines, and tanks to a designated on-site Processing Area,

.6 Test and characterize the liquids in accordance with the process flow diagram,

.7 Decommission the ASTs in accordance with the Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations (SOR/2008-197),

.8 Pressure wash/ clean residual liquids from emptied drums, tanks and piping,

.9 Minimize volume of drums, tanks and piping (i.e. crush, cut, etc.) as needed,

.10 Dismantled and landfill cleaned drums, ASTs and piping (non-hazardous) (also referenced under Demolition work),

.11 Incinerate all organic liquid wastes that meet applicable regulatory incineration guidelines,

.12 Containerize and prepare any liquids, which do not meet applicable regulatory incineration guidelines, for off-site transport, and

.13 Demobilize, ship and dispose off-site all hazardous liquid materials at a designated licensed disposal facility.

.4 Depressurize Gas Cylinders and Fire Extinguishers;

.1 Collect and consolidate all compressed gas cylinders and fire extinguishers,

.2 If the contents are known and suitable for open-air discharge, empty the contents of the cylinder/ fire extinguishers into the ambient atmosphere,

.3 Landfill emptied cylinders and containers (non-hazardous) (also referenced under Demolition work), and

.4 If the contents are not known, or should not be discharged; e.g. chlorofluorocarbons (CFCs), ship the cylinders off-site for disposal at a designated licensed facility.

.5 Remove All Other Hazardous Waste off-site for disposal;

.1 'Other hazardous waste' identified at the Jericho Mine Site include refrigerant-containing items, fluorescent lights, batteries, glycol, light ballasts, paint, cement, paraffin wax, and various containers of chemicals that have not yet been characterized,

.2 Separate and consolidate hazardous materials from the buildings and debris areas that are to be demolished and cleaned up; materials from Process Plant not included,

.3 Haul the materials to a designated on-site processing area,

.4 Containerize and prepare the materials for off-site transport, and

.5 Demobilize, ship and dispose off-site all hazardous materials at a designated licensed disposal facility.

Demolition

The demolition shall include demolishing, dismantling and on-site landfilling of all non-hazardous waste materials for all the on-site structures and debris except the Truck Shop and Process Plant. Hazardous materials shall be removed, as per the Environmental work, prior to demolition.

The emulsion plant (and associated structures and debris) is on Inuit Owned Land (IOL) and is not a part of the project scope of work.

As a part of the contract, the Contractor can make use of all available heavy equipment/ materials and tools. The Contractor will also be entitled to salvage any non-hazardous material that makes up part of the contract demolition and debris consolidation work; however and specifically, no building structure/ process equipment salvage from the Truck Shop or Process Plant will be allowed. Following mobilization and inspection of the buildings, the Contractor shall prepare a Salvage Plan outlining the salvage method, intended materials and back haul plans.

The following table presents a summary of the contract demolition work (locations as referenced in the ESA Appendix E – TableE-1: Hazardous and Non-hazardous Materials Inventory Table).

Location	Demolition Work (Remove all Hazardous Materials first)
Airstrip	Leave structures as is, landfill all outer non-hazardous debris
Hazardous Waste Transfer Area	Demolish and landfill all structures and non-haz debris
Core Box Laydown Area	Leave core and core boxes as is
Water Intake Causeway	Demolish and landfill all structures and non-haz debris
North of Laydown Area	Demolish and landfill all structures and non-haz debris
Phase 1 Tank Farm	Demolish and landfill all structures and non-haz debris
Phase 2 Tank Farm	Demolish and landfill all structures and non-haz debris
Laydown Area	Demolish and landfill all structures and non-haz debris
Truck Shop	Remove Hazardous Materials only
Main Camp Facility Area	Demolish and landfill all structures and non-haz debris
PKCA East Dike Tire Berm	Landfill all tires and non-hazardous debris
Process Plant	Leave structures as it, landfill all outer non-haz debris

Further to the above:

.1 Demolish the Main Camp Facility;

- .1 Of the three listed ‘major site buildings’ (the truck shop, camp facility and process plant), the current decommissioning work will include only demolition of the Main Camp Facility,
- .2 The camp facility is approximately 5,341 m^2, made up of metal clad trailers, and consisting of 3 sleeping quarter wings, connected recreational facilities, a kitchen and dining area, and an office area,
- .3 As a part of project implementation, the existing camp is expected to serve as the Remediation Contractor’s camp, and a staged demolition is anticipated,

.4 Prior to demolishing or dismantling, remove all hazardous materials as descried in the Environmental Work,

.5 Demolish or dismantle the camp facility,

.6 Separate and consolidate the debris, and

.7 Haul and landfill all non-hazardous material debris.

.2 Dismantle and landfill Tanks and debris from the Tank Farm Area;

.1 The work includes dismantling the four (4) cleaned, as part of environmental work, 1,500,000 L ASTs and eight (8) 500,000 L ASTs in Tank Farms 1 and 2.

.3 Demolish and landfill remaining structures (Process Plant, Truck Shop, Terminal Buildings and Core Shack not included);

.1 The emulsion plant is on IOL and is not a part of any project work,

.2 The Process Plant, Truck Shop, Terminal Buildings (camp/ genset/ security building) and Core shack are not a part of the demolition scope of work,

.3 Landfill debris from the Airstrip Area,

.4 Landfill debris from the Hazardous Waste Transfer Area,

.5 The remaining on-site areas include – Core box laydown area, Water Intake Causeway Area, North of Laydown Area, Laydown Area and PKCA East Dike Tire berm,

.6 Demolish or dismantle all other site structures, including: utilidors, wastewater treatment plant, incinerators, storage sheds, shacks,

.7 Separate and consolidate the debris, and

.8 Haul and landfill all non-hazardous material debris.

.4 Collect and Landfill remaining Non-Hazardous material;

.1 The emulsion plant is on IOL and is not a part of any project work,

.2 Non-hazardous debris shall include all wood waste as well as all other solid wastes; e.g metal, metal items, sea cans, miscellaneous inert materials, concrete, machinery, vehicles, empty drums, large ASTs and tented tarp shops,

.3 Clean unpainted wood may be burnt on-site if approved by local AHJs,

.4 Drain and clean any hazardous liquids from the debris materials prior to landfill as per Environmental work,

.5 Separate any hazardous solid materials from the non-hazardous debris as per Environmental work,

.6 Haul and place all non-hazardous material debris into the landfill,

.7 Place debris in compacted lifts,

.8 Place intermediate fill as required to fill waste voids,

.9 Cap the landfill after completing the on-site disposal, and

.10 Grade the cap to promote positive drainage.

1.6 SUPPORTING DOCUMENTS

1.6.1 Available Documents

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

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

.3 Interim Closure and Reclamation Plan – Jericho Diamond Mine, Nunavut (Tetra Tech EBA, 2011).

.4 Jericho Project – Mine Reclamation Plan (Tahera Corporation, 2003).

1.6.2 Disclaimer

.1 Reference information will be available in the language in which it is written.

1.7 CODES, ACTS, STANDARDS, REGULATIONS & GUIDELINES

1.7.1 Codes and Acts

.1 In addition to all applicable codes and acts, the documents listed below apply to this project:
- .1 National Building Code (NBC);
- .2 Canada Labour Code (including latest revisions of all regulations);
- .3 Canadian Environmental Protection Act (CEPA);
- .4 Canada Oil and Gas Operations Act;
- .5 Other applicable codes, acts, standards and regulations;
- .6 Local and/or municipal codes and bylaws;
  - .1 In the event of a conflict between codes, the more stringent shall take precedence,
- .7 All work to comply with hazardous location requirements of relevant Codes and Standards.

The latest versions of these codes and acts will apply.

1.7.2 Standards, Regulations and Guidelines

.1 In addition to all applicable standards, regulations and guidelines, the documents listed below apply to this project:
- .1 Guideline: Used Oil and Waste Fuel (Government of Nunavut [GN], 2012);
- .2 Guideline: Management of Contaminated Sites (GN, 2014); and

.3 Guideline: Waste Lead and Lead Paint (GN, 2014).

The latest versions of these guidelines will apply.

2 PROJECT ADMINISTRATION AND DESIGN SERVICES

2.1 ROLES AND RESPONSIBILITIES

2.1.1 Contractor' Design Engineer

.1 The Contractor's design engineer must be licensed as a professional engineer in Nunavut:
    .1 Attend meetings, as required, and provide site inspection services.

.2 The Contractor's design engineer shall ensure that design submissions are provided as outlined in this Scope of Work.

2.1.2 Federal Government

.1 Federal authorities having jurisdiction over this project are:
    .1 Public Services and Procurement Canada (PSPC);
        .1 Contracting authority and project delivery, and
        .2 For technical and quality assurance.

2.2 DESIGN SERVICES

2.2.1 Summary of Services

.1 For this project, provide:
    .1 Regulatory Support;
    .2 Documents for Design and Construction;
    .3 Site review services including surveys/ site drawings before and during the Construction Phase; and
    .4 Construction.

2.2.2 Delivery

.1 Deliver the project utilizing best engineering practices in support of the Client Department's requirements, respecting the approved scope, quality, financial budget and schedule.

.2 Ensure the application of sound engineering science, life cycle cost effectiveness, general ease of maintenance and best workmanship possible within the approved budget with minimal environmental impact.

2.2.3 Design and Construction Document Phases

.1 The Contractor will consult with PSPC and the INAC and deliver a comprehensive Preliminary Design Report:

- .1 Section 01 31 19 of the Technical Specifications outlines requirements for Preliminary Shop Drawings, i.e. Preliminary Design Report.

.2 The Contractor's Design Engineer shall:

- .1 Conduct an Analysis of existing conditions and background documentation;
- .2 Analyse scope, budget, schedule and risk and identify any conflicts;
- .3 Analyse project requirements and identify any additional work, indicating the impact on project scope, schedule and costs;
- .4 Visit the project site, analyze site conditions, document any conditions that will impact project delivery and design, and report the results to the Departmental Representative;
- .5 Review and acknowledge all existing reports and documents relating to this project and compare with actual site conditions;
- .6 Confirm availability of all necessary pre-design information;
  - .1 Verify that all information is correct and notify Departmental Representative about any missing information, and
- .7 Identify the applicable codes, regulations and standards.

.3 Prepare a Final Design Report that addresses the project objectives and resolves the issues outlined in the Scope of Work.

3 REQUIRED CONSTRUCTION SERVICES

The following Technical Specifications were developed for the Project Work.

APPENDIX 10

TIBBITT TO CONTWOYTO JOINT VENTURE WINTER ROAD GROUP- ROAD MAPS

Tibbitt to Contwoyto Winter Road Map Book

Notes:

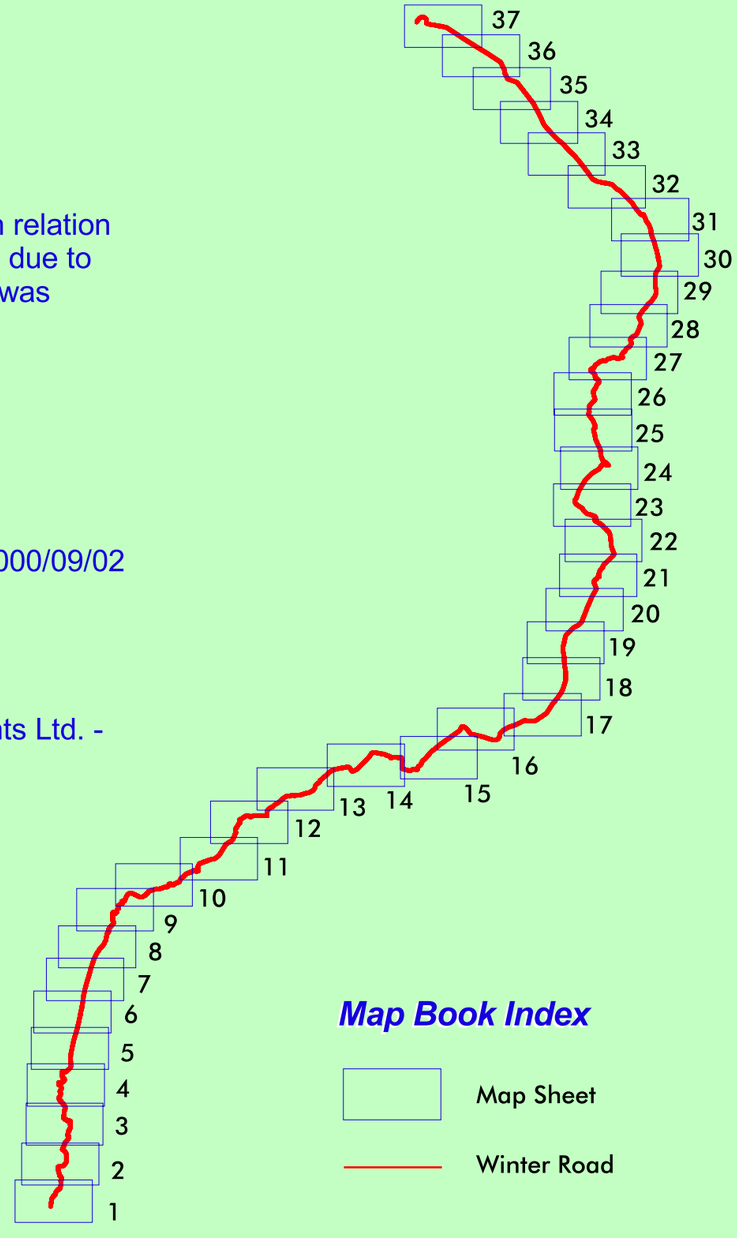
The positioning of the satellite imagery in relation to the road is misaligned in certain areas due to inaccuracies of the scanned base that it was georeferenced against.

Data:

Road Route based on a GPS centreline survey March, 2001

Satellite Imagery - Landsat-7 acquired 2000/09/02
Landsat TM Bands 5,4,2 (RGB)
Datum - NAD83, UTM Zone 12

Prepared by EBA Engineering Consultants Ltd. - September, 2001

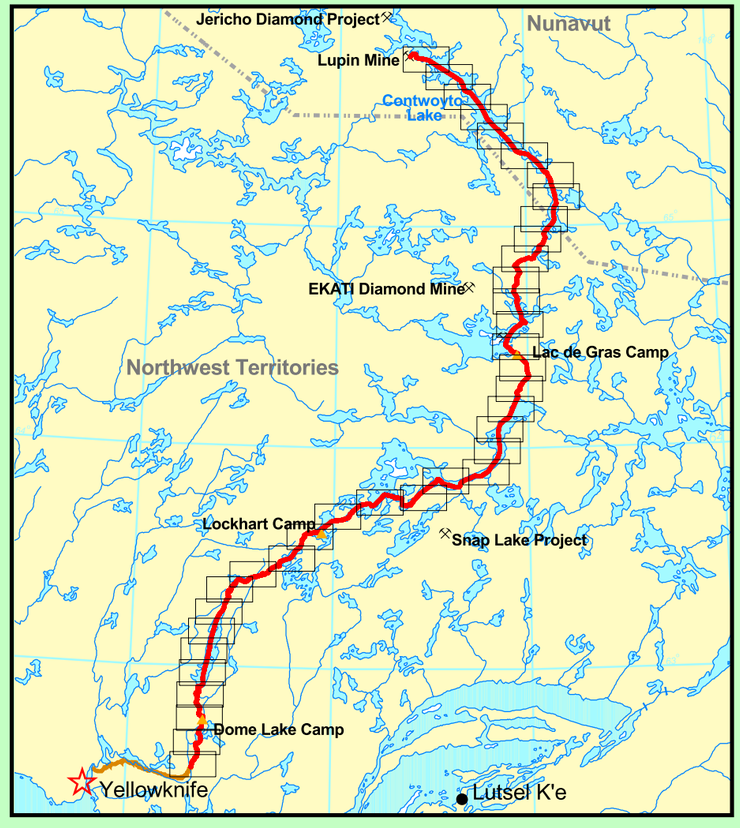


Map Book Index

Map Sheet

Winter Road

Index Map



TIBBITT TO CONTWOYTO WINTER ROAD JOINT VENTURE

EBA Engineering Consultants Ltd.

534000 536000 538000 540000 542000 544000 546000 548000 550000 552000 554000 556000

7164000 7162000 7160000 7158000 7156000 7154000

64.60, -110.08

Portage 56

64.51, -110.17

Winter Road

Road Kilometer Mark

Camp Location

Reference Point Location (Latitude°, Longitude°)

N

Scale 1 : 60,000

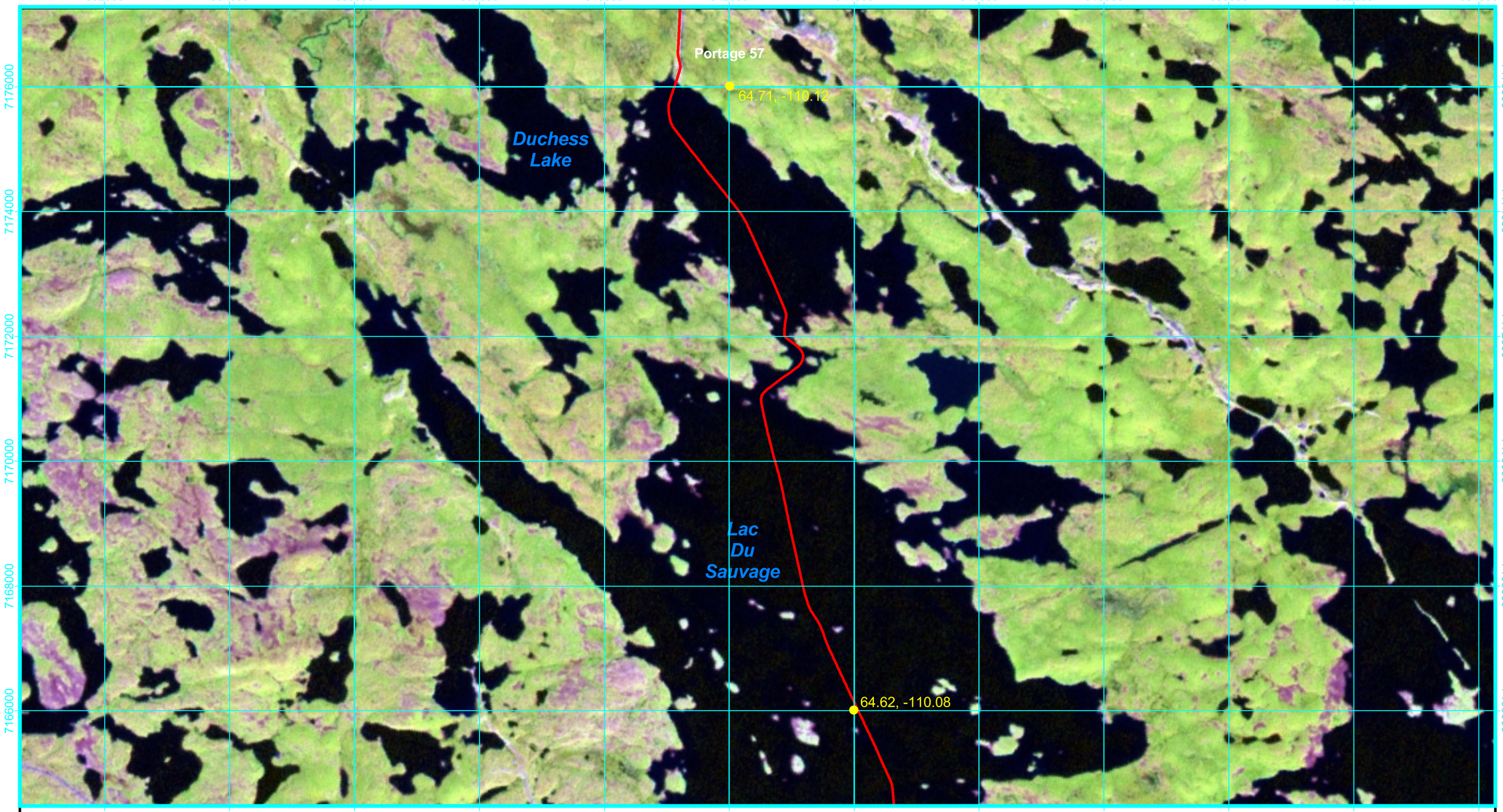
1 0 1 2 3 4 5 Kilometers

Tibbitt to Contwoyto Winter Road Route

September, 2001

Map 24 of 37

EBA Engineering Consultants Ltd.



Winter Road

Road Kilometer Mark

Camp Location

Reference Point Location (Latitude°, Longitude°)

N

Scale 1 : 60,000

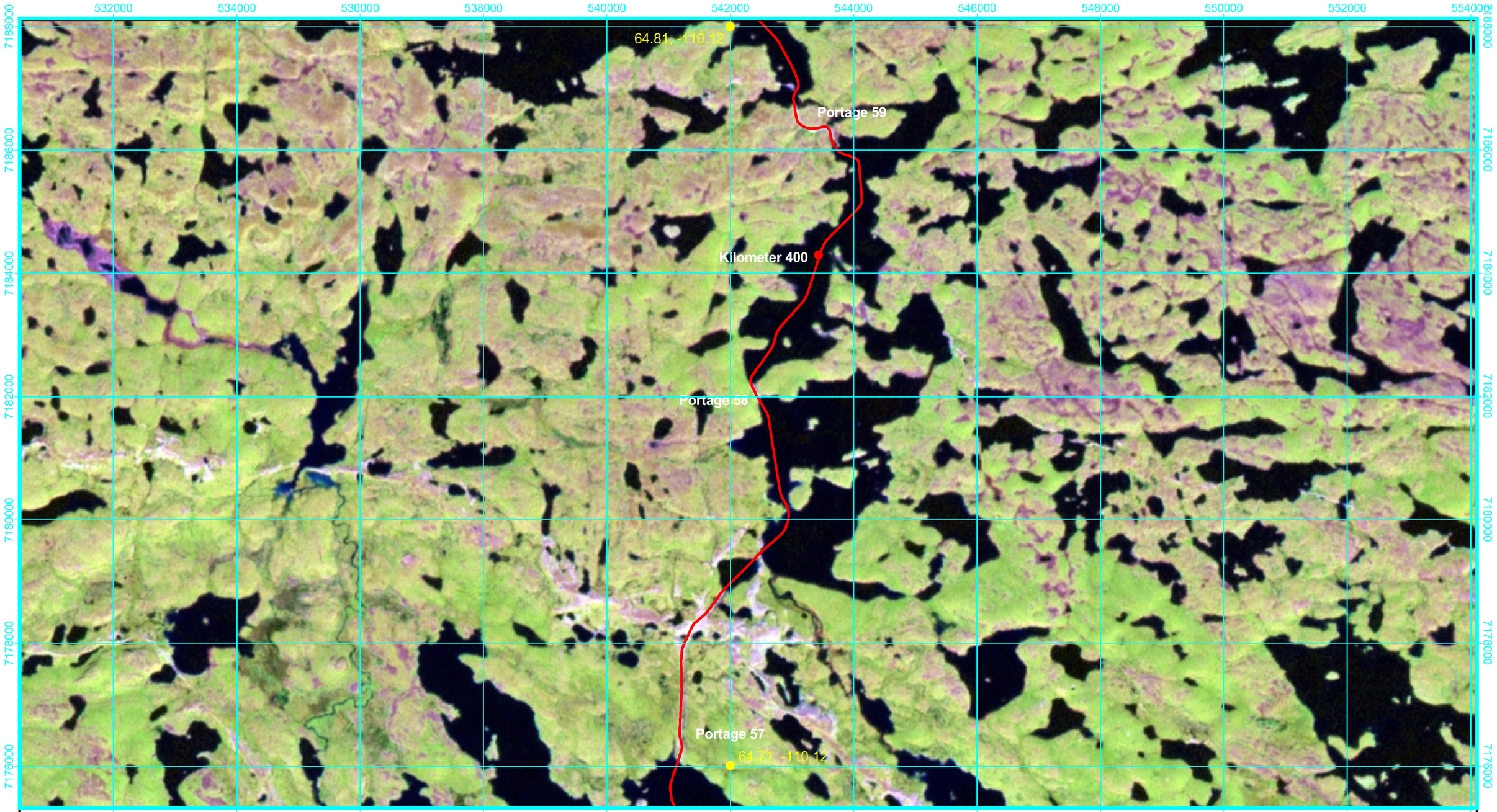
1 0 1 2 3 4 5 Kilometers

Tibbitt to Contwoyto Winter Road Route

September, 2001

Map 25 of 37

EBA Engineering Consultants Ltd.



Winter Road

Road Kilometer Mark

Camp Location

Reference Point Location (Latitude°, Longitude°)

N

Scale 1 : 60,000

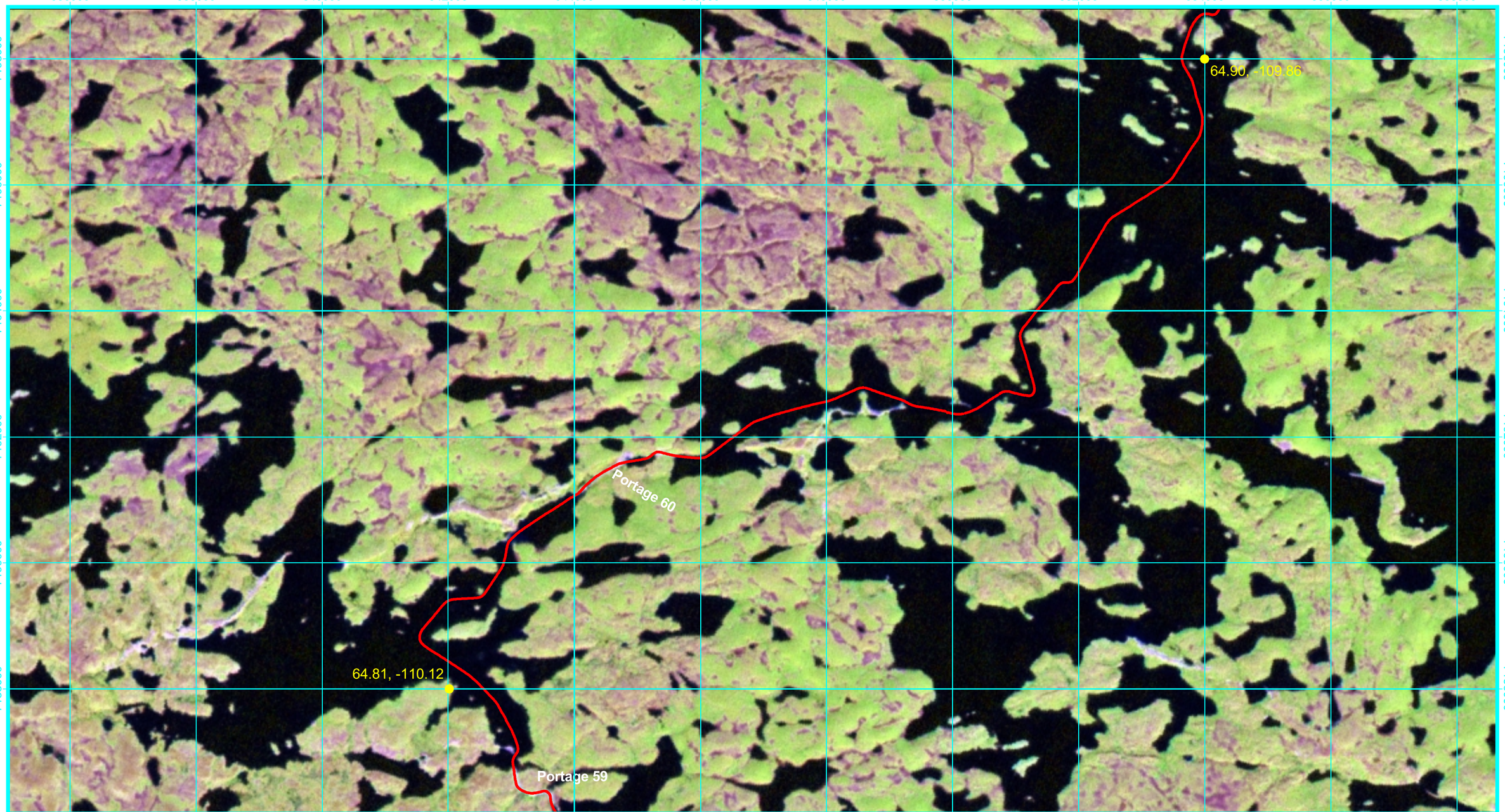
1 0 1 2 3 4 5 Kilometers

Tibbitt to Contwoyto Winter Road Route

September, 2001

Map 26 of 37

EBA Engineering Consultants Ltd.



Winter Road

Road Kilometer Mark

Camp Location

Reference Point Location (Latitude°, Longitude°)

N

Scale 1 : 60,000

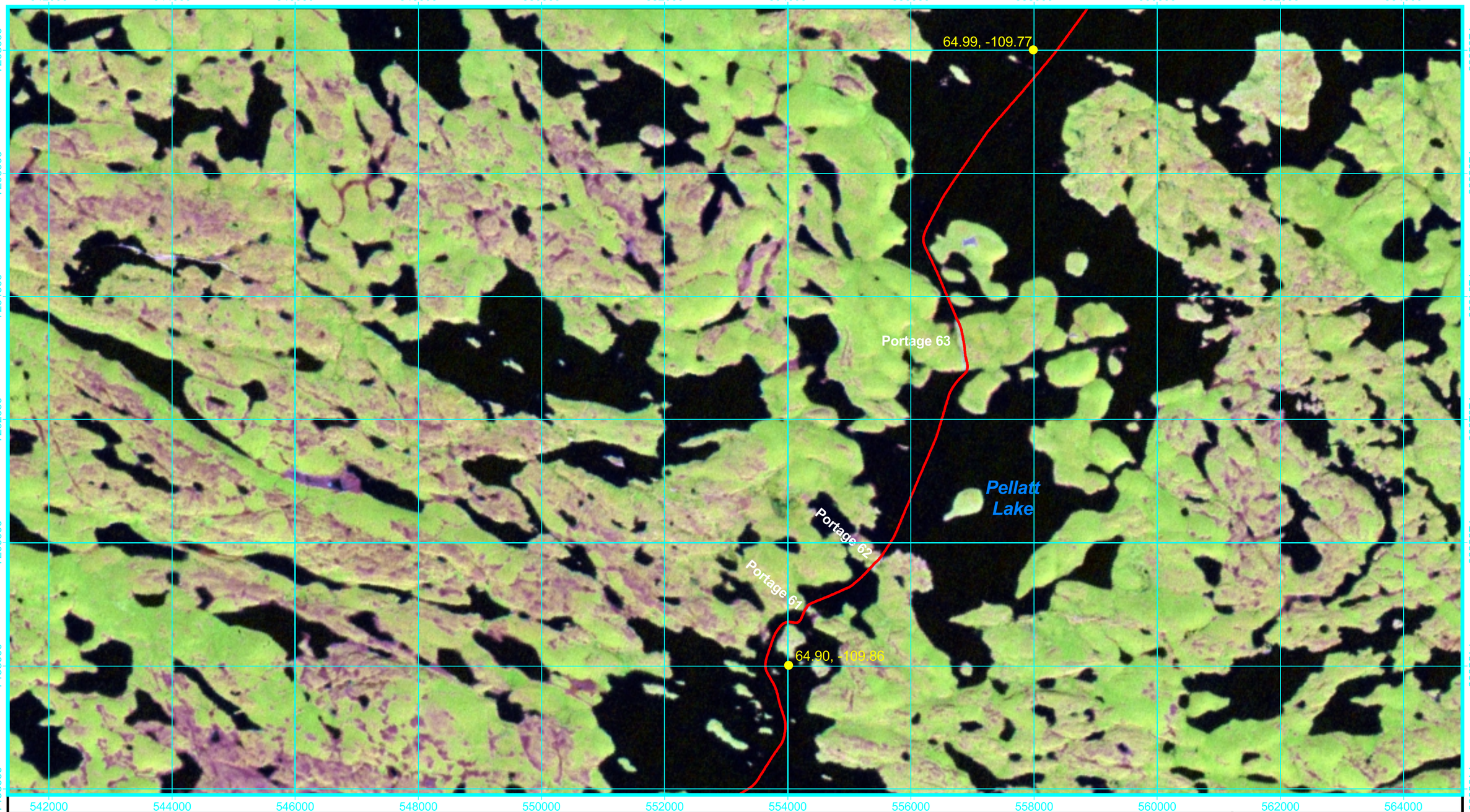
1 0 1 2 3 4 5 Kilometers

Tibbitt to Contwoyto Winter Road Route

September, 2001

Map 27 of 37

EBA Engineering Consultants Ltd.



Winter Road

Road Kilometer Mark

Camp Location

Reference Point Location (Latitude°, Longitude°)

N

Scale 1 : 60,000

1 0 1 2 3 4 5 Kilometers

Tibbitt to Contwoyto Winter Road Route

September, 2001

Map 28 of 37

EBA Engineering Consultants Ltd.

546000 548000 550000 552000 554000 556000 558000 560000 562000 564000 566000 568000

7218000 7216000 7214000 7212000 7210000 7208000 7206000

65.08, -109.68

Pellatt Lake

64.99, -109.77

- Winter Road
- Road Kilometer Mark
- Camp Location
- Reference Point Location (Latitude°, Longitude°)

N

Scale 1 : 60,000

1 0 1 2 3 4 5 Kilometers

Tibbitt to Contwoyto Winter Road Route

September, 2001

Map 29 of 37

EBA Engineering Consultants Ltd.

552000 554000 556000 558000 560000 562000 564000 566000 568000 570000 572000 574000

7230000 7228000 7226000 7224000 7222000 7220000 7218000

65.19, -109.72

Kilometer 450

65.08, -109.68

552000 554000 556000 558000 560000 562000 564000 566000 568000 570000 572000 574000

Winter Road

Road Kilometer Mark

Camp Location

Reference Point Location (Latitude°, Longitude°)

N

Scale 1 : 60,000

1 0 1 2 3 4 5 Kilometers

Tibbitt to Contwoyto Winter Road Route

September, 2001

Map 30 of 37

EBA Engineering Consultants Ltd.

548000 550000 552000 554000 556000 558000 560000 562000 564000 566000 568000 570000

7240000 7238000 7236000 7234000 7232000 7230000 7228000

65.28, -109.84

Portage 64

65.19, -109.72

548000 550000 552000 554000 556000 558000 560000 562000 564000 566000 568000 570000

Winter Road

Road Kilometer Mark

Camp Location

Reference Point Location (Latitude°, Longitude°)

N

Scale 1 : 60,000

1 0 1 2 3 4 5 Kilometers

Tibbitt to Contwoyto Winter Road Route

September, 2001

Map 31 of 37

EBA Engineering Consultants Ltd.

536000 538000 540000 542000 544000 546000 548000 550000 552000 554000 556000 558000

7250000 7248000 7246000 7244000 7242000 7240000 7238000

65.37, -110.14

65.26, -109.84

Winter Road

Road Kilometer Mark

Camp Location

Reference Point Location (Latitude°, Longitude°)

N

Scale 1 : 60,000

1 0 1 2 3 4 5 Kilometers

Tibbitt to Contwoyto Winter Road Route

September, 2001

Map 32 of 37

EBA Engineering Consultants Ltd.

524000 526000 528000 530000 532000 534000 536000 538000 540000 542000 544000 546000

7260000 7258000 7256000 7254000 7252000 7250000 7248000

65.46, -110.35

Kilometer 500

65.35, -110.10

524000 526000 528000 530000 532000 534000 536000 538000 540000 542000 544000 546000

Winter Road

Road Kilometer Mark

Camp Location

Reference Point Location (Latitude°, Longitude°)

N

Scale 1 : 60,000

1 0 1 2 3 4 5 Kilometers

Tibbitt to Contwoyto Winter Road Route

September, 2001

Map 33 of 37

EBA Engineering Consultants Ltd.

516000 518000 520000 522000 524000 526000 528000 530000 532000 534000 536000

7270000 7268000 7266000 7264000 7262000 7260000 7258000

65.55, -110.48

65.44, -110.31

Winter Road

Road Kilometer Mark

Camp Location

Reference Point Location (Latitude°, Longitude°)

N

Scale 1 : 60,000

1 0 1 2 3 4 5 Kilometers

Tibbitt to Contwoyto Winter Road Route

September, 2001

Map 34 of 37

EBA Engineering Consultants Ltd.

508000 510000 512000 514000 516000 518000 520000 522000 524000 526000 528000

7280000 7278000 7276000 7274000 7272000 7270000 7268000

65.64, -110.65

65.53, -110.48

Winter Road

Road Kilometer Mark

Camp Location

Reference Point Location (Latitude°, Longitude°)

N

Scale 1 : 60,000

1 0 1 2 3 4 5 Kilometers

Tibbitt to Contwoyto Winter Road Route

September, 2001

Map 35 of 37

EBA Engineering Consultants Ltd.

498000 500000 502000 504000 506000 508000 510000 512000 514000 516000 518000 520000

7290000 7288000 7286000 7284000 7282000 7280000 7278000

65.73, -110.96

Kilometer 550

65.62, -110.65

Winter Road

Road Kilometer Mark

Camp Location

Reference Point Location (Latitude°, Longitude°)

N

Scale 1 : 60,000

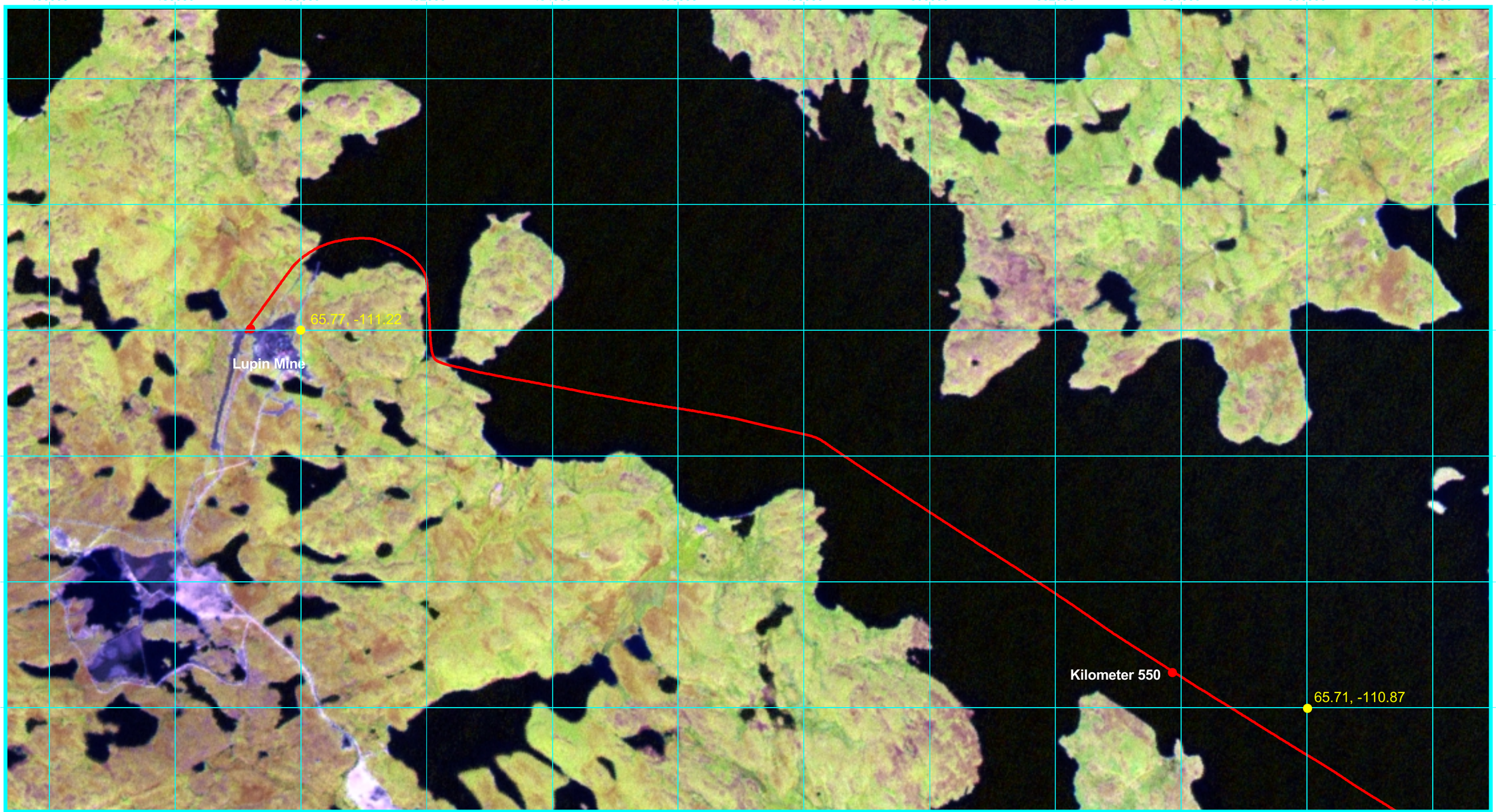
1 0 1 2 3 4 5 Kilometers

Tibbitt to Contwoyto Winter Road Route

September, 2001

Map 36 of 37

EBA Engineering Consultants Ltd.



Winter Road

Road Kilometer Mark

Camp Location

Reference Point Location (Latitude°, Longitude°)

N

Scale 1 : 60,000

1 0 1 2 3 4 5 Kilometers

Tibbitt to Contwoyto Winter Road Route

September, 2001

Map 37 of 37

EBA Engineering Consultants Ltd.

APPENDIX 11

PROPOSED LUPIN TO JERICHO WINTER ROAD MAP

Legend
Existing Permitted JV W
Proposed Lupin to Jeric
Jericho
Lupin Mine

APPENDIX 12

JERICHO WASTE WATER TREATMENT PLANT OPERATIONS PLAN

DILLON CONSULTING

January 30, 2006

Dillon File: 05-5605-0100

Tahera Diamond Corporation - Jericho Project
Box 2341
Yellowknife, NT X1A 2P7

Attention: Mr. Mike Tanguay and Ms. Cheryl Wray

Dear Sir and Madam:

Jericho Mine Wastewater Treatment Plant Design Plan - Addendum

Attached please find the final report for the above-noted project.

This report was prepared for the Tahera Diamond Corporation (Tahera) in order to fulfill certain requirements of Nunavut Water Board (NWB) Water Licence Number NWB1JER0410. The report represents an addendum prepared to address deficiencies identified by NWB and INAC during their reviews of the Jericho Diamond Mine Waste Water Treatment Plant Design Plan, (Tahera; April, 2005).

We conclude that – together with previous reports, and Tahera's commitment to update the Operation and Maintenance Manual for the wastewater treatment plant and to conduct influent and effluent monitoring – this present report:

- Corrects inconsistencies in design parameters, and addresses INAC and NWB queries and concerns relating to Design Plan deficiencies.
- Fulfills requirements of Schedule D Item 8 of the Licence.
- Confirms, under a valid NAPEGG stamp, that the Jericho Mine sewage wastewater treatment plant is designed to handle and treat the sewage from the camp to levels compliant with the Licence requirements.

We hope that the attached report meets your present needs. It has been a pleasure to work with Tahera on this present assignment, and we look forward to now turning our attention to the WWTP Operation and Maintenance Manual update.

Please contact the undersigned if you have any questions or require further information.

Sincerely,
Dillon Consulting Limited

John Hart, P.Eng.
Associate, Project Manager

G. STRONG

Gary Strong, P.Eng.
Partner, Technical Reviewer

Dillon Consulting Limited

Jericho Mine Wastewater Treatment Plant Design Plan - Addendum
Tahera Diamond Corporation

January 30, 2006

Our File: 05-5605-0100

Submitted to:

Tahera Diamond Corporation
Jericho Project
Box 2341
Yellowknife, NT
X1A 2P7

Submitted by:

Dillon Consulting Limited
303 – 4920 47th Street
Yellowknife, NWT
X1A 2P1

TABLE OF CONTENTS

1.0 Introduction 1
1.1 Background 1
2.0 Wastewater Treatment 3
2.1 Wastewater Sources 3
2.2 Estimated Flows and Loadings 3
2.3 Effluent Requirements 4
3.0 Treatment Process Description 7
3.1 Pretreatment 7
3.2 Rotating Biological Contactor Secondary Treatment 7
3.3 Effluent Solids Separation and Disinfection 8
3.4 Plant Upset Conditions 9
4.0 Wastewater Treatment Plant Design 10
4.1 Wastewater Treatment Plant and Building Layout 10
4.2 Influent and Effluent Drainage 10
4.3 Plant Operation and Maintenance 10
4.4 Instrumentation and Control 11
4.5 Plant Contingency Plan 11
5.0 References 12

FIGURES (attached in Appendix A)

Figure 1: Site Map (AMEC "Environmental Site Map" Figure No.1)
Figure 2: Site Plan (Shanco Sheet No.F-440A)
Figure 3: WWTP Schematic (P.J. Hannah Drawing No.A1-K17550-10455)

APPENDICES

Appendix A: Figures
Appendix B: Dillon Process Design Calculations

1.0 Introduction

This report was prepared for the Tahera Diamond Corporation (Tahera) in order to fulfill the requirements of Nunavut Water Board (NWB) Water Licence Number NWB1JER0410. Part D Item 8 of NWB Licence states that:

> *The Licensee shall submit to the Board for approval, a detailed Waste Water Treatment Plant Design Plan (…) including drawings stamped by an Engineer. The plan shall be developed in accordance with Schedule D, Item 8.*

Schedule D Item 8 of the NWB Licence refers to essential items to be included in the wastewater treatment plant (WWTP) design plan, and Tahera submitted to the NWB the Jericho Diamond Mine Waste Water Treatment Plant Design Plan, (Tahera, April 2005).

Following the Indian and Northern Affairs Canada (INAC) May 25, 2005 review, NWB requested in their July 28, 2005 correspondence that Tahera prepare a re-submission, and confirm within it the following items:

- That identified deficient items from Schedule D Item 9 have been satisfied, namely:
  b. Design criteria/parameters.
  e. Treatment efficiency expectations.
- Corrections to any inconsistencies in design parameters and expectancies already raised by the parties and/or Board's Technical Advisor.
- Include a thorough understanding of flow and waste constituent loading to the plant.
- Treatment mechanics of the RBC.
- Verification that treatment efficiency will meet requirements of Licence Part G Item 6(a)(i).

Thus, this present report is an addendum to the Jericho Diamond Mine Waste Water Treatment Plant Design Plan, (Tahera, April 2005), prepared in order to address the above-noted re-submission requirements. As such, and for clarity's sake, some limited information has been restated in this present report regarding the mine and the WWTP in question. For additional details regarding this WWTP, refer to the Jericho Diamond Mine Waste Water Treatment Plant Design Plan, (Tahera, April 2005).

1.1 Background

Benachee Resources Inc., a wholly owned subsidiary of Tahera, has constructed and operates the Jericho Diamond Project near the north end of Contwoyto Lake in Nunavut Territory (NT), 65°59'50" N Latitude, 111°28'30" W Longitude.

Operations will commence with an open pit mine at the north end of Contwoyto Lake in West Kitikmeot. Ore will be mined and processed year round. With current resources the mine and processing plant will have an 8-year life and employ a total of approximately 105 to 175 people (including employees and contractors), with approximately half that number on site at any rotation. The camp is designed to accommodate 100 people in a single occupancy arrangement. However, if required to run at double occupancy the camp could hold 192.

A WWTP package system was installed at the mine site in the early construction phase, at the same time as the camp. It is housed in a stand alone, metal clad, insulated building located next to the accommodations complex at the mine site (refer to Figures 1 and 2). The WWTP building was founded on a prepared pad of crushed rock under rig mats for ground insulation, and is supplied heat from baseboard electrical heaters. The WWTP is sized to service 200 people, and will be operated by site maintenance personnel.

2.0 Wastewater Treatment

2.1 Wastewater Sources

The WWTP was designed to treat domestic sewage and grey water originating at the camp. Wastewater sources include the following:

- Laundry facilities.
- Washroom/shower facilities.
- Kitchen (equipped with grease trap).
- Two 1000 L sewage holding tanks: one located at the Emulsion building; and one in the construction office trailers (to be decommissioned shortly).

Note that the contents of the floor drainage sump within the Emulsion building will be trucked via vacuum truck to the main mill site, and drained into the plant process water system. The WWTP design is incapable of handling either the volume (~16 m^3/week) or expected elevated ammonia and nitrate concentrations from the Emulsion building sump water.

2.2 Estimated Flows and Loadings

Design parameters for the plant were estimated using 200 people as the maximum camp occupancy. A per-capita daily wastewater generation rate of 227 L/person-day was selected to estimate the average daily flowrate to the plant. This value was obtained from the BC Sewerage System Standard Practice Manual, and is the value provided for a work camp. The Harmon Equation was used to estimate peak flow. Design flowrates are summarized in Table 1 below, and process calculations are presented in Worksheet #1 in Appendix A.

Table 1: Theoretical Flowrates

Parameter	Value
Design Average Daily Flowrate (184 persons)	45.4 m^3/day
Theoretical Peak Hourly Flowrate	7.85 m^3/hr

Flows through the treatment system are equilibrated, so the flowrate into the RBC is equal to the flowrate out of the RBC.

In their May 25, 2005 correspondence to NWB, INAC queried regarding the "impacts of operating the WWTP at 50% (or less) of design capacity." Since RBC technology is typically well-suited in applications with dilute flows, and per discussion in sections 3.1 and 3.2 regarding loadings to this WWTP, we do not anticipate any negative impacts from dilute sewage or reduced flowrates.

Referring to early monitoring data from Jan.13 to 15, 2006 (refer to Worksheet #2 in Appendix B), note that the current metered flowrates to the WWTP (current occupancy 180 people) are roughly half of the anticipated flows at full camp occupancy (192 people). Because of this, and since the camp population will drop to approximately 100 occupants within the coming months, we have utilized the maximum Design Average Daily Flowrate, and not peak flows, in calculating the design capacity of this WWTP. Given the current body of meter data, we believe that utilizing the maximum Design Average Daily Flowrate is appropriate for the present exercise.

Wastewater composition was estimated using typical industry parameters. Refer to Worksheet #1 in Appendix B, and the summary in Table 2 below.

Table 2: Wastewater Influent Composition

Parameter	Concentration
BOD_5	375 mg/L
Total Suspended Solids (TSS)	400 mg/L
Total Nitrogen	40 mg/L
Total Phosphorous	8 mg/L
Fats, oils, grease	150 mg/L
Faecal Coliform	1,000,000 to 10,000,000 units/100 mL
Wastewater Temperature	13^{o}C minimum

There are two grease traps installed in the camp kitchen; Tahera cleans these traps weekly and ships the grease off site for disposal. Information was not available regarding whether the grease traps were installed per the P.J. Hannah's specifications in section 1.2.3 of the Operation and Maintenance Instructions manual. P.J. Hannah was provided with the "Nishi-Khon/SNC Lavalin Specifications" that cites an influent O&G loading of 175 mg/L (refer to Worksheet #1 in Appendix B) and, therefore, was aware that the WWTP should be designed to handle such loadings. Notwithstanding the above, Tahera will monitor WWTP influent and effluent O&G; refer to section 4.3 below.

2.3 Effluent Requirements

Refer to section 3 of this present report for additional details regarding the wastewater treatment process; from the design review herein, we generally conclude that this WWTP is properly designed and adequately sized to handle the expected loadings from the sewage sources identified.

Given the expected loadings to this WWTP during normal operation (refer to Tables 1 and 2), we expect that the WWTP's design specifications (refer to Appendix B) will result in an effluent with a quality as summarized in Table 3 below.

Table 3: Average Wastewater Effluent Composition

Parameter	Concentration
BOD_5	<10 mg/L
Total Suspended Solids (TSS)	<10 mg/L
Total Nitrogen	20 mg/L
NH_3 – N	20 mg/L
Total Phosphorous (without precipitation)	6 mg/L
Oil and Grease	<15 mg/L
Faecal Coliform	<100 units/100 mL
Clarifier Sludge Production (1-2% solids m/m)	2.1 m^3/day

Calculating the anticipated WWTP effluent concentrations for O&G and coliforms with certainty is difficult; the values stated in Table 3 are reasonable estimates. Note that the environment in the PKCA is inhospitable for faecal coliform growth due to the low temperature, sun light during summer months, and lack of organics growth substrate. Consequently, and in addition to dilution, there will be further decay of the bacterial count prior to PKCA discharge to Stream C3.

The WWTP discharge is directed to the PKCA. Part G 6(a)i of the Jericho Diamond Mine Water Licence NWB1JER0410 requires that the main PKCA discharge to Stream C3 meets the effluent quality requirements summarized in Table 4 below.

Table 4: Effluent Quality Requirements, Stream C3 when WWTP in Operation

Parameter	Maximum Average Concentration	Maximum Concentration of any Grab Sample
BOD_5	15.0 mg/L	25.0 mg/L
Oil and Grease	3.0 mg/L	5.0 mg/L
Faecal Coliforms	10 CFU/100 ml	20 CFU/100 ml

The WWTP discharge is a relatively small component of the total flows to the PKCA; notwithstanding that the concentrations in the WWTP discharge exceed the values stipulated in Part G 6(a)(i) of the Licence, we think it unlikely that the Licence requirements will be exceeded for these values at the point of sampling (PKCA discharge to Stream C3). Monitoring shall confirm this; refer to section 4.3 below.

The Table 4 requirements are in addition to the requirements of Part G 6(a) of the water licence, which specifies effluent quality requirements for all PKCA discharges to Stream C3. Several of the parameters cited in Part G 6(a) may also be influenced by discharges from the WWTP; these are summarized in Table 5 below.

Table 5: Effluent Quality Requirements, Stream C3, General

Parameter	Maximum Average Concentration	Maximum Concentration of any Grab Sample
Total Ammonia - N	6 mg/L	12 mg/L
Nitrate - N	28 mg/L	56 mg/L
Nitrite - N	2.5 mg/L	5.0 mg/L
Phosphorous - P	0.2 mg/L	0.4 mg/L
TSS	15.0 mg/L	25.0 mg/L

Predicted phosphorous loadings from the WWTP effluent to the PKCA, when phosphorous removal is not used, could be sufficiently high that discharges from the PKCA to stream C3 may exceed the maximum concentrations specified in the water licence. This speculation is based upon the water balance data provided to Dillon by Tahera; additional monitoring is required in order to confirm this (refer to section 4.3 of this report).

Tahera will conduct monitoring of other discharges to the PKCA to ensure that the discharges from the WWTP (refer to Table 3), combined with other mine discharges (refer to worksheet #5 in Appendix B), will not result in any exceedences of the NWB Licence requirements (refer to Tables 4 and 5).

3.0 Treatment Process Description

Refer to the Jericho Diamond Mine Waste Water Treatment Plant Design Plan, (Tahera, April 2005) for a detailed description of the nature and mechanics of waste treatment within Rotating Biological Contactor technology and the associated appurtenances in this WWTP. Utilizing RBC and secondary clarifier technology for the biological and physical treatment of sewage is well understood and accepted within this industry sector. Similarly, dual media filtration and UV disinfection are also widely accepted methods for effluent polishing.

3.1 Pretreatment

Raw wastewater from the camp is collected in a sump and fed to the WWTP using a level activated submersible solids grinding pump. The raw wastewater is pumped into an aerated Equalization Tank.

Refer to the sewage loading and Equalization Tank design calculations within worksheets #1 and #2, respectively, in Appendix A. Calculations in these worksheets confirm that the Equalization Tank is designed to provide adequate volume storage to buffer the WWTP against hydraulic shocks. The Equalization Tank is also expected to buffer the treatment system against variations in influent quality.

3.2 Rotating Biological Contactor Secondary Treatment

A rotating biological contactor (RBC) provides secondary treatment for the wastewater generated at the Tahera camp; a PJ Hannah Model D10BFP RBC package plan was installed.

The RBC is equipped with three rotating discs arranged in two stages: a single disc first stage and a two disc second stage. The discs consist of rigid polypropylene media supported on galvanized steel frames and are rotated using a direct mechanical drive system (3/4 hp motor).

An underflow line from the Equalization Tank feeds wastewater into the first stage of the RBC. A bucket wheel pump assembly connected to the discharge side of the first disc is used to deliver a measured dose of wastewater to the second stage of treatment system.

Refer to the RBC design calculations within worksheet #3 in Appendix B. Note that, in preparing the design calculation and to err on the side of conservatism, Dillon assumed that negligible soluble BOD reduction occurs in the Equalization Tank.

Calculations in worksheet #3 confirm that the RBC units are designed to handle the expected hydraulic, organic, and solids loadings from the sewage. The calculations also confirm that the WWTP design effluent quality – at this stage of the treatment process and given the

associated downstream appurtenances – is consistent with the overall treatment requirements in order to meet the relevant requirements of the Licence.

3.3 Effluent Solids Separation and Disinfection

Effluent from the RBCs overflows into a four-hopper clarifier for solids removal. A timer activated pump transfers settled sludge to the aerobic digestor every three hours, with the pump run time currently set to 3 minutes. Clarified effluent overflows to the Wescan filter feed tank.

The plant drawing includes a provision for optional phosphorous removal using alum injection into the RBC's discharge to the secondary clarifiers. This equipment is not present at the Tahera WWTP.

Calculations in worksheet #4 confirm that the clarifier are adequately sized to handle the expected hydraulic and solids loading from the RBCs.

Decant water from the clarifier overflows to a filter feed tank, and is then pumped through a Wescan dual media (sand/gravel) filter for final solids removal. Performance specifications for this unit were unavailable; however, under normal clarifier and filter operating conditions and due to dilution and residence time within the PKCA, we do not expect TSS loadings from the WWTP effluent to pose a problem to the quality of the PKCA discharge to Stream C3.

Effluent from the filter is discharged to the backwash feed tank where it undergoes UV disinfection prior to discharge to the PKCA. Manufacturer performance specifications for this UV unit provide for a minimum 4-log reduction in faecal coliforms.

Filter effluent is also used to backwash the filter, and the backwash effluent from the filter is directed into the Equalization Tank.

Filtered and UV disinfected water is gravity fed to the PKCA when the water level in the backwash tank reaches a pre-determined level.

Digestor aeration is periodically ceased, and decanted digestor water is manually recycled to the Equalization Tank using an airlift pump. The digestor can also overflow into the Equalization Tank during normal operation. Tahera is currently removing approximately 6,000 L per week of settled/digested sludge; this fits well with the calculated values in Table 3 given anticipated solids reduction in the digestor. This sludge is transported to the Waste Rock Dump for disposal via vacuum truck.

A decant line transfers liquid from the top of the aerobic digestor to the Equalization Tank as required to accommodate sludge transfers from the secondary clarifier. An overflow line connects the aerobic digestor with the Equalization Tank in the event that the aerobic digestor is overfilled.

Design calculations for the solids separation processes are summarized in Appendix B.

3.4 Plant Upset Conditions

In the event of a plant upset, untreated wastewater will be discharged via vacuum truck directly to the east end of the PKCA; Tahera will consider installing a WWTP bypass in spring 2006.

Tahera reports that the discharge to Stream C3 is located at the west end of the PKCA. Discharges of untreated wastewater will be diluted with natural lake water and process plant effluent, and flow through the intermediate filter dyke before reaching the discharge point at the west side of the PKCA. Potential impacts of untreated wastewater on Stream C3 water quality should be minor in the event of a WWTP upset, provided the plant is brought back into operation with minimum delay.

Wastewater temperatures lower than 13^{o}C reduce the treatment efficiency of RBCs. Current operating experience indicates that January wastewater temperatures are on the order of 20^{o}C, which are adequate for plant operation.

Additional discussion regarding plant upset conditions is contained within the Operating and Maintenance Instructions (P.J. Hannah), and Dillon will provide to Tahera an update and expansion to this document. Refer also to sections 4.3 and 4.5 below.

4.0 Wastewater Treatment Plant Design

4.1 Wastewater Treatment Plant and Building Layout

The WWTP is located at the south side of the camp, between the camp residential area and the diamond plant (refer to Figures 1 and 2). No WWTP building layout drawing is available. Refer to Figure 3 for the actual WWTP equipment layout.

The building is equipped with 3 dehumidifiers, which drain back into the Equalization Tank, clarifier, and aerobic digestor.

Measured January temperatures were 15°C air temperature in the WWTP building, and 20°C in the process water. Note that these are acceptable temperatures since RBC technology generally requires that process water temperatures remain above 13°C. Tahera will install a make-up air unit with a heater to increase the ambient air temperature in the building during the winter months.

4.2 Influent and Effluent Drainage

Wastewater is transferred from the first stage of the RBC to the second stage using a bucket pump. Flow through the remainder of the system is via gravity, until the clarified effluent is pumped through the tertiary filter. If the tertiary filter pump fails, clarified water overflows into the backwash water tank and to the WWTP effluent, bypassing the sand filter and the UV disinfection.

An overflow weir located several centimeters above the high level mark in the RBC first stage allows wastewater to overflow into the RBC second stage if the water level in the plant exceeds the design high-water level.

The plant is not currently equipped with a by-pass system.

4.3 Plant Operation and Maintenance

The Operating and Maintenance Instructions (P.J. Hannah) discusses the generic operation and control of the WWTP. Dillon will review this document and provide an updated version to Tahera.

We noted in Tahera's correspondence that the Western Canada Waste and Wastewater Association provided a training course for the WWTP operators.

Dillon will recommend a WWTP influent and effluent monitoring regime within the Operation and Maintenance Manual update.

4.4 Instrumentation and Control

The Operating and Maintenance Instructions (P.J. Hannah) contains several drawings related to the configuration of the electrical control panels. Dillon received this manual with insufficient time to incorporate meaningful discussion within this present report; thus, additional discussion regarding the instrumentation and control of the WWTP will be incorporated into the Operation and Maintenance Manual update.

4.5 Plant Contingency Plan

Various contingency planning is discussed above, and in P.J. Hannah and Tahera documentation. As this issues is germane to the Operation and Maintenance Manual, this subject shall also be discussed more at length in Dillon's update to that document.

5.0 References

AMEC Earth and Environmental, 2004. *Wastewater Treatment Plant Operations Plan, Jericho Diamond Mine, Nunavut*, May 2004.

British Columbia Ministry of Health Services, 2005. *Sewerage System Standard Practice Manual*, June 7, 2005.

Metcalfe & Eddy, Inc., 1991. *Wastewater Engineering: Treatment, Disposal and Reuse*, McGraw-Hill Inc., Toronto.

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Nunavut Water Board, 2005. *Letter Re: Tahera Diamond Corporation; Wastewater Treatment Plant Design Plan; NWB1JER0410*, July 28, 2005.

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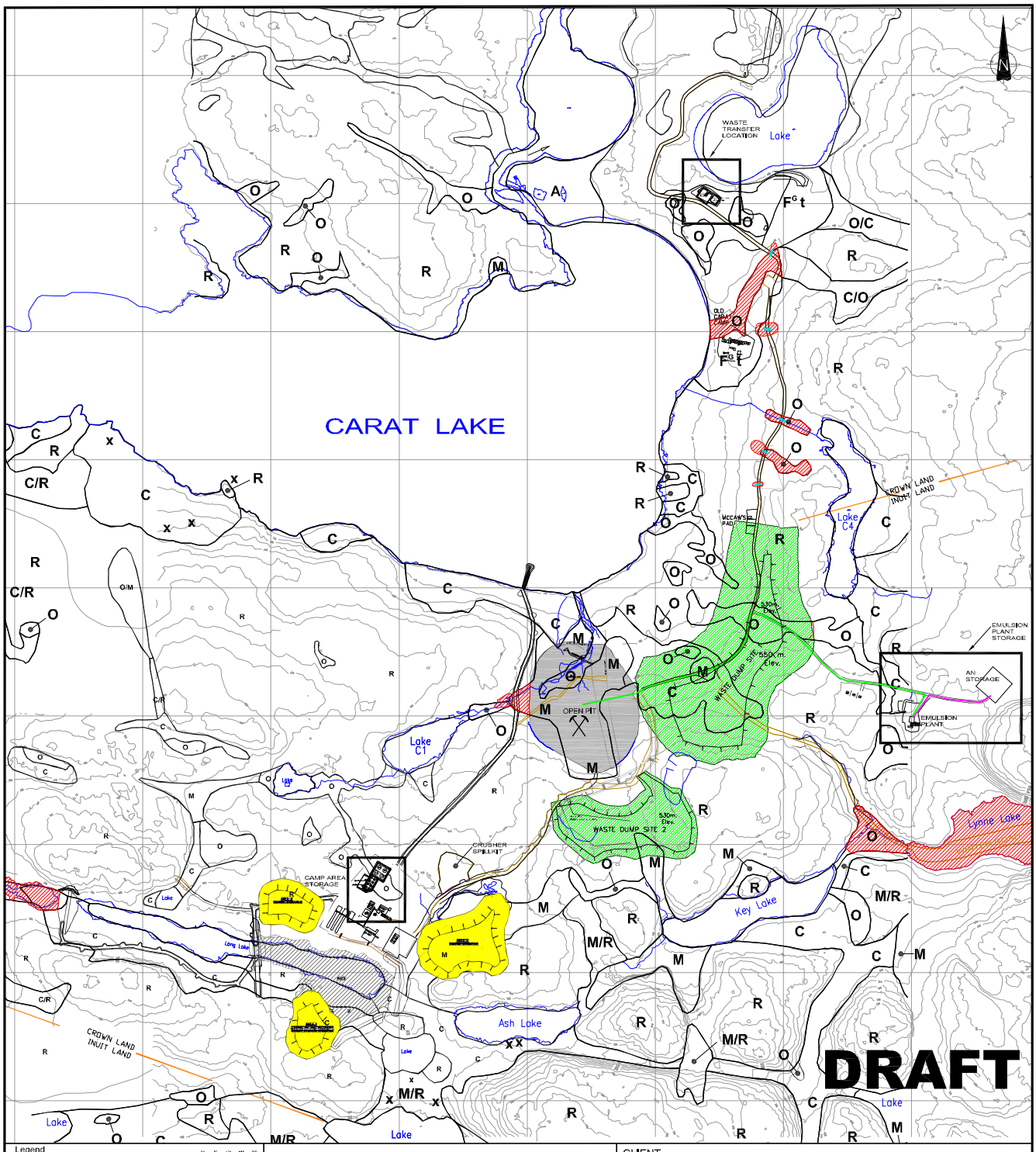
Appendix A:
Figures

Figure 1:
Site Map (AMEC "Environmental Site Map" Figure No.1)



Legend

Quaternary Holocene Deposits
A. River and creek deposits.
C. Colluvium.
D. Organic deposits.
F. Quaternary Pleistocene Deposits

Fluvioglacial sediment.
M. Till, silt, sand, gravel, cobbles and boulders.

Pre-Cambrian Bedrock.
R. Undifferentiated metamorphic and volcanic bedrock.

- Spill Sensitive Area
- Stockpile
- AN truck route
- Explosives truck route
- Culvert
- Waste Dump
- PKCA
- Open Pit

NOTE:
Base map provided by Tahera. Stockpiles and PKCA boundary provided by SRK Consulting.

AMEC Earth & Environmental

2227 Douglas Road, Burnaby, B.C. V5C 5A9
Tel. (604) 294-3811 Fax. (604) 294-4664

CLIENT

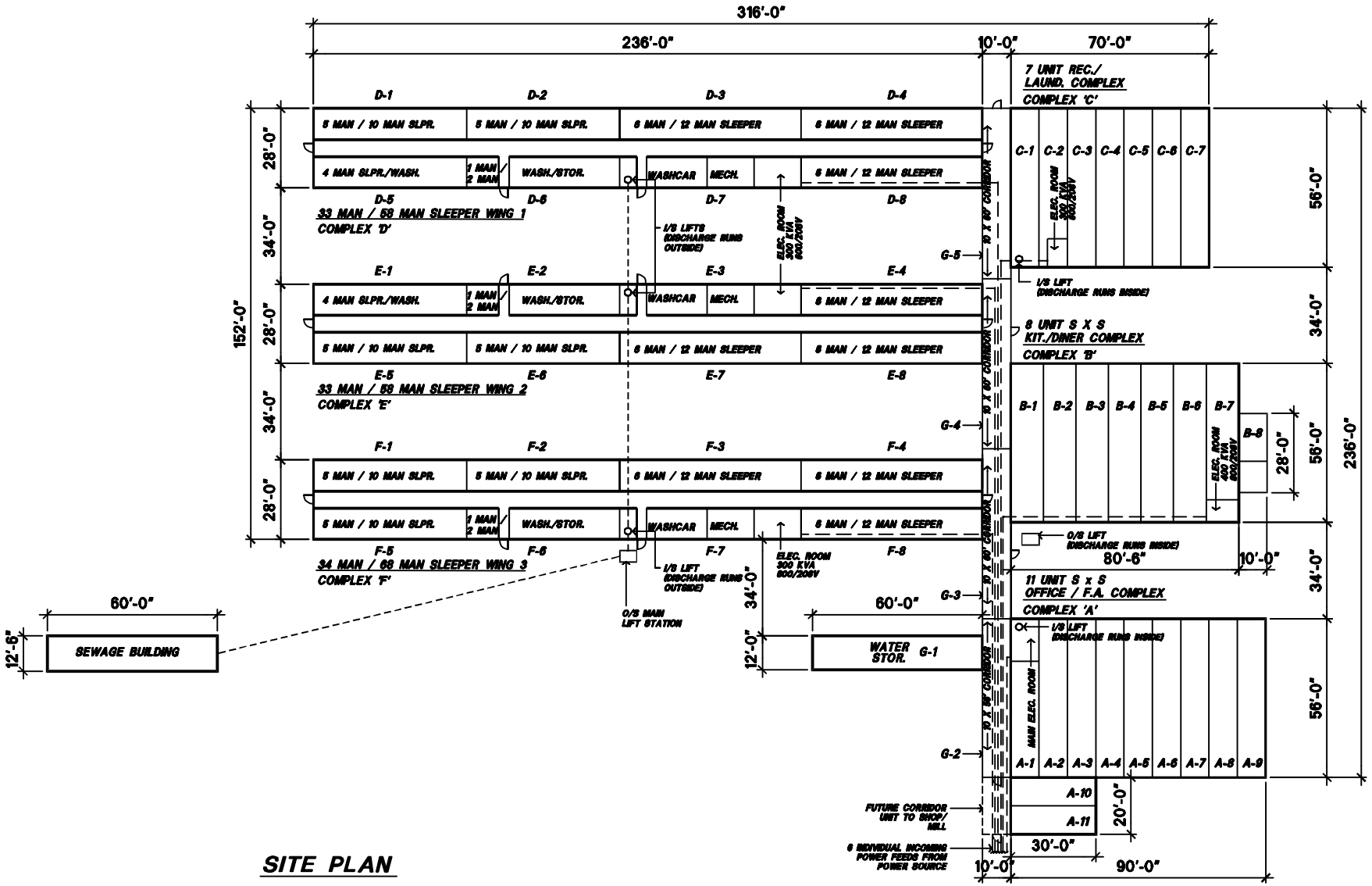
PROJECT: JERICHO DIAMOND PROJECT

TITLE: ENVIRONMENTAL SITE MAP

DWN BY:	DATUM:	DATE:
BWS	NAD27	JANUARY 2006
CHK'D BY:	REV. NO.:	PROJECT NO:
BO	A	VE51295
PROJECTION:	SCALE:	FIGURE No.
UTM Zone 12	AS SHOWN	FIGURE 1

C:\DOCUME~1\ADMINI~1\LOCALS~1\Temp\Jericho_EnvSiteMap.dwg - Environmental Site Map - Jan. 16, 2006 11:33am - Administrator

Figure 2:
Site Plan (Shanco Sheet No.F-440A)



SITE PLAN

SCALE: 1"=50'-0"

SHANCO CAMP SERVICES LTD. "Simply the Best"	by VIC	date 03-12-2004
	scale 1"=50'-0"	sheet number F-440A

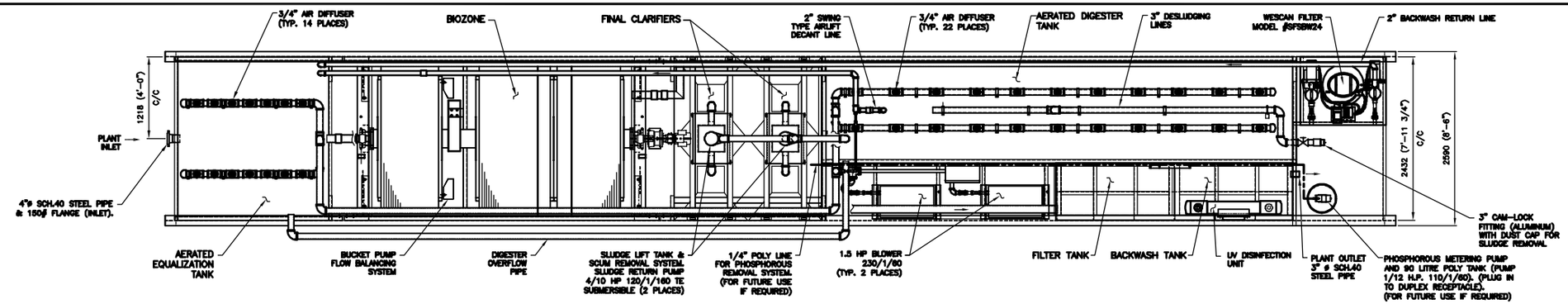
project

NUNA LOGISTICS - TAHERA CAMP

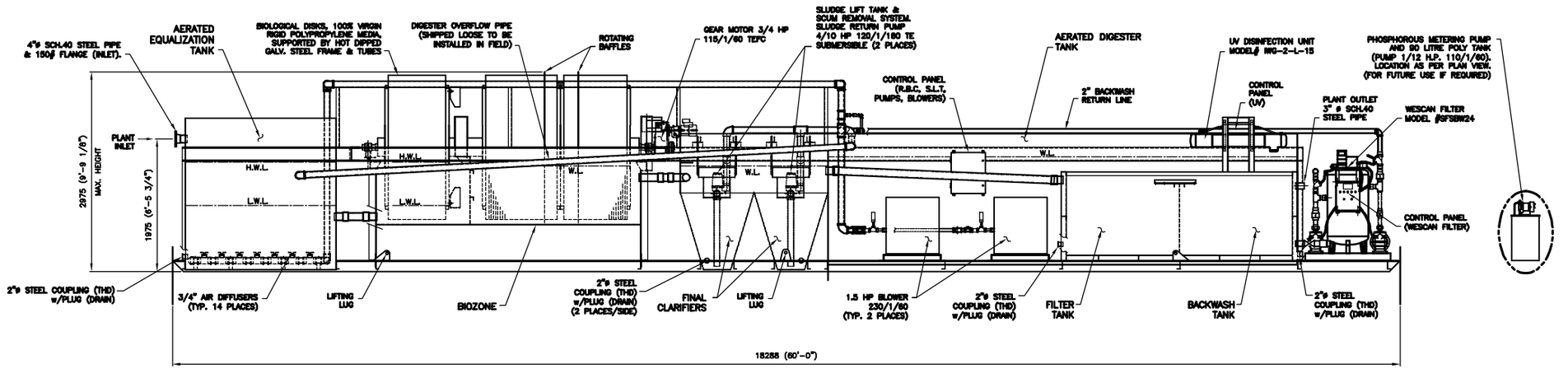
drawing

SITE PLAN

Figure 3:
WWTP Schematic (P.J. Hannah Drawing No.A1-K17550-10455)



PLAN VIEW



ELEVATION VIEW

CRITERIES DE CONCEPION	DESIGN CRITERIA		UNITS	
DEBIT JOURNALIER MOYEN	AVERAGE DAILY FLOW	46.5	M³/day	
SOURCE: EGOUT DOMESTIQUE	SOURCE: DOMESTIC SEWAGE			
DEBIT DE POINTE	PEAK FLOW	5.7	M³/H	
DÉ'ETRE DEBIT BALANCER PAR	TO BE FLOW BALANCED TO	2.18	M³/H	
AFFLUENT DBO TOTALE: ETE / HIVER	INFLUENT BOD TOTAL: SUMMER / WINTER	17.06	KG/day	
AFFLUENT DBO SEDIMENTE	INFLUENT BOD SETTLED	11.94	KG/day	
AFFLUENT SOLIDES EN SUSPENSION	INFLUENT SUSPENDED SOLIDS	20.48	KG/day	
EFFLUENT DBO	EFFLUENT BOD (AVERAGE)	10	mg/l	
EFFLUENT SOLIDES EN SUSPENSION	EFFLUENT SUSPENDED SOLIDS (AVERAGE)	20	mg/l	AFTER FILTER
PHOSPHORE	PHOSPHORUS	1.0	mg/l	AFTER FILTER
COLIFORME FÉCALE	FECAL COLIFORM	10	CFU	
TEMPÉRATURE	TEMPERATURE	11°	°C MIN	
		21°	°C MAX	
INFORMATIONS TECHNIQUES	**TECHNICAL INFORMATION**			
DIAMETRE DU DISQUE BIOLOGIQUE	BIO SUPPORTED MEDIA DIAMETER	2.15	M	
SURFACE DU DISQUE BIOLOGIQUE	BIO SUPPORTED MEDIA AREA	1327	M²	
CHARGE APPLIQUEE SUR LES DISQUES: ETE / HIVER	DISC LOADING: SUMMER / WINTER	9.0	GM/M²	
GRANDEUR MINIMUM COMME REQUIS SUR DEBIT QUOTIDIEN MOYEN AU EAUX D'EGOUT BRUTES DE 375 mg/l.	MINIMUM SIZES AS REQUIRED BY AVERAGE DAILY FLOW AT RAW SEWAGE STRENGTHS OF 375 mg/l.			

REV.	DESCRIPTION	DATE
1	PHOSPHOROUS REMOVAL SYSTEM ADDED.	04/04/05

DONNÉE DE PROPRIÉTÉ

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DATE	02/18/2005
SCALE	1:30
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APPROVED	
PLOT	1:30

P.J. HANNAH EQUIPMENT SALES CORP.
VANCOUVER, TORONTO

NORTH AMERICAN LICENSEE OF KEE PROCESS (FORMERLY KLARGESTER)
•CANADIAN LICENSEE OF BLY INC.

Specialists in pollution control since 1973

CLIENT SHANCO CAMP SERVICES

CONSULTANT

PROJECT TAHERA DIAMOND CORP.

TITLE **GENERAL ARRANGEMENT OF 200 MAN CAMP SEWAGE TREATMENT PLANT MODEL D10BFP**

OUR REF. # 17550

YOUR REF. #

DRAWING NO. **A1-K17550-10455**

REV. 1

Appendix B:
Dillon Process Design Calculations

1.0 Design Parameters

1.1 Hydraulic Load

Design Maximum Camp Occupancy:	200 Persons
Wastewater Generation Rate:	227 L/day-person
Average Wastewater Flowrate:	45.4 m^3/day
Harmon Peaking Factor:	4.1
Peak Flow:	7.85 m^3/hr

1.2 Contaminant Load

Plant Wastewater:

$BOD_{5:}$	375 mg/L
TSS:	400 mg/L
NH_3:	30 mg/L
TKN:	40 mg/L
Total N:	40 mg/L
Total P:	8 mg/L
Oil and Grease:	50 mg/L

1.3 Effluent Quality

$BOD_{5:}$	10 mg/L
TSS:	10 mg/L
Total N:	20 mg/L
Total P:	6 mg/L

2.0 Treatment Process

2.1 Equalization Tank

Equalization Volume (includes RBC first Stage):	8.28 m^3
Average Hydraulic Retention Time:	4.38 hr
Aeration Rate:	0.4 m^3/min

2.2 Rotating Biological Contactor:

Media Area:	1327 m^2
Tank Volume/Media Area Ratio:	0.0071 m^3/m^2
Tank Volume:	9.48 m^3
Hydraulic Loading:	0.034 m^3/m^2-day
Hydraulic Retention Time:	5.01 hr

Organic Loading (total BOD_5): 0.013 kg/m^2-day

2.3 Clarifiers

Average Overflow Rate:	8.42 m^3/m^2-day
Surface Area:	5.39 m^2
Surface Solids Load @ Average Flow:	0.034 lb/ft^2-hr
Volume:	4.23 m^3
Hydraulic Retention Time:	2.24 hr
Underflow Rate:	1.02 m^3 once every three hours

2.4 Aerobic Digester

Volume:	21.47 m^3
Solids Loading Rate (@ 1% solids):	2.09 m^3/d
Aeration Rate:	0.62 m^3/min

2.5 Tertiary Filter

Media Type:	Sand/gravel
Filter Bed Area:	0.29 m^2
Backwash Trigger:	Pressure differential

2.6 Ultraviolet Disinfection

Lamp Type:	Low pressure, standard output
UV Dose (@ 2,000 L/hr, 90% UV transmission):	90 mJ/cm^2

Flowrate Estimation

Typical Camp Occupancy =	92	persons
Max Camp Occupancy =	**194**	**persons**
Design Value =	**200**	**persons**

Wastewater generation rates - estimates:

Facility	Unit	BC Sewerage System Standard Practice Manual, June 7, 05,	Metcalfe and Eddy, 1991 - typical values
Construction Camp cw flush toilets	L/day*person	189	
Work Camp	L/day*bed	227	
Motel - full housekeeping	L/day*person	180	
Resort Apartment	L/day*person		227
Special Care Home	L/day*resident	136	
Senior Citizen Home	L/day*resident	227	322
Boarding School	L/day*student	136	284

Work Camp figure = Design Generation Rate = 227 L/day-bed

Use work camp value:

Design Flowrate = # of beds * generation rate/bed
= 45400 L/day
= 45.4 m^3/day

Peak Flowrate:

Harmon Peaking Factor PF = 1 + 14/[4+sqrt(Population/1000)]
PF = 4.1

Peak Hourly Flow = PF * Design Flowrate
= 188 m^3/day
= 7.85 m^3/hour

Rate of discharge of pumper trucks (two holding tanks pumped out to STP as required) may be controlling factor in ***peak flow*** :

Tank Volume: 16 m^3 weekly in one pumper truck load
Pumper Truck Discharge Duration 2 Time (hr) to discharge pumper truck to equalization basin (Assumed)
Pumping Rate: 8 m^3/hr Assumed; **UNACCEPTABLE**, thefore, not used in theoretical loading calculations.

Loading Rate Estimation

Parameter	Guide for Communal WWT System Selection, Dillon, circa 1995	Metcalfe and Eddy, 1991 - typical values	Metcalfe and Eddy, 1991 - typical values	Metcalfe and Eddy, 1991 - typical values	Nishi-Khon/SNC Lavalin Specifications	Nishi-Khon/SNC Lavalin Specifications	Nishi-Khon/SNC Lavalin Specifications	PJ Hannah Design Loadings: dwg K-17550-10455	PJ Hannah Basic Design Criteria - Tahera WWTP, 2005-04-04	**Theoretical Loading Values Utilized for Design**			
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	kg/m^3	kg/hr_{avg}	kg/day
		Weak	Medium	Strong	Min	Max	Avg						
BOD_5	220	110	220	400	237	379	247	375	375	**375**	0.375	1.42	17.03
SS	260	100	220	350	237	454	247	450	375	**400**	0.40	1.51	18.16
NH_3	25	12	25	50	ns	ns	ns	ns	ns	**30**	0.030	0.11	1.36
TKN	40	ns	ns	ns	ns	ns	ns	ns	ns	**40**	0.040	0.15	1.82
Total N	40	20	40	85	ns	ns	33	ns	ns	**40**	0.040	0.15	1.82
Total P	8	4	8	15	ns	ns	17	ns	ns	**8**	0.008	0.030	0.36
Oil and Grease		50	100	150	ns	ns	175	ns	50*	**50**	0.05	0.19	2.27

*: P.J. Hannah design max. loading that this WWTP can handle. Must be confirmed through influent monitoring.

Effluent Standard Confirmation:

	Influent (mg/L)	Effluent (mg/L)	
BOD_5	375	10	**OK - this level is achievable using RBCs with this plants hydraulic and organic loading rate.**
TSS	400	10	**OK - this level is achievable using RBCs with this plants hydraulic and organic loading rate.**
Total N	40	20	
Total P	8	6	

VSS Generated from $BOD_{5,sol}$ reduction: 110 mg/L
= 4971300 mg/day
= 4.97 kg/day

NItrogen Confirmation:

Typical nitrogen content in cell biomass = 0.14
Nitrogen removed in sludge = 0.70 kg/day
Nitrogen remaining in effluent = 1.12 kg/day
= 24.67 mg/L

Phosphorous Confirmation:

Typical phosphrous content in cell biomass = 0.03
Phosphorous removed in sludge = 0.15 kg/day
Phosphorous remaining in effluent = 0.21 kg/day
= 4.72 mg/L

Equlaization Tank Design

Time	Mean Flow	Cum Flow	Avg Flow	Cum Flow	X Marker
0:00		0	0		0
1:00	140	140	836	836	1
2:00	140	280	836	1671	2
3:00	400	680	836	2507	3
4:00	1400	2080	836	3343	4
5:00	1400	3480	836	4178	5
6:00	1400	4880	836	5014	6
7:00	1437	6317	836	5849	7
8:00	1591	7907	836	6685	8
9:00	1489	9396	836	7521	9
10:00	1210	10605	836	8356	10
11:00	1058	11663	836	9192	11
12:00	272	11935	836	10028	12
13:00	434	12369	836	10863	13
14:00	923	13291	836	11699	14
15:00	418	13709	836	12534	15
16:00	536	14245	836	13370	16
17:00	1103	15348	836	14206	17
18:00	506	15855	836	15041	18
19:00	1206	17061	836	15877	19
20:00	1018	18079	836	16713	20
21:00	876	18955	836	17548	21
22:00	500	19455	836	18384	22
23:00	300	19755	836	19219	23
0:00	300	20055	836	20055	24

Time	Mean Flow	Scaled Mean F	Cum Flow	Avg Flow	Cum Flow	X Marker
0:00			0	0		0
1:00	140	280	280	1671	1671	1
2:00	140	280	560	1671	3343	2
3:00	400	800	1360	1671	5014	3
4:00	1400	2800	4160	1671	6685	4
5:00	1400	2800	6960	1671	8356	5
6:00	1400	2800	9760	1671	10028	6
7:00	1437	2873	12633	1671	11699	7
8:00	1591	3181	15814	1671	13370	8
9:00	1489	2977	18791	1671	15041	9
10:00	1210	2419	21210	1671	16713	10
11:00	1058	2116	23326	1671	18384	11
12:00	272	543	23869	1671	20055	12
13:00	434	868	24737	1671	21726	13
14:00	923	1845	26583	1671	23398	14
15:00	418	835	27418	1671	25069	15
16:00	536	1072	28490	1671	26740	16
17:00	1103	2207	30697	1671	28411	17
18:00	506	1013	31709	1671	30083	18
19:00	1206	2413	34122	1671	31754	19
20:00	1018	2036	36158	1671	33425	20
21:00	876	1753	37911	1671	35096	21
22:00	500	1000	38911	1671	36768	22
23:00	300	600	39511	1671	38439	23
0:00	300	600	40111	1671	40110	24

At observed flowrate - equilization tank to be: 5.4 m3

At scaled flowrate - equilization tank to be: **8.7** m3

Assumes plant operating at upper limit of hydraulic capacity. Not the case with this WWTP; refer to RBC worksheet.

Equlization Tank Residence Time:

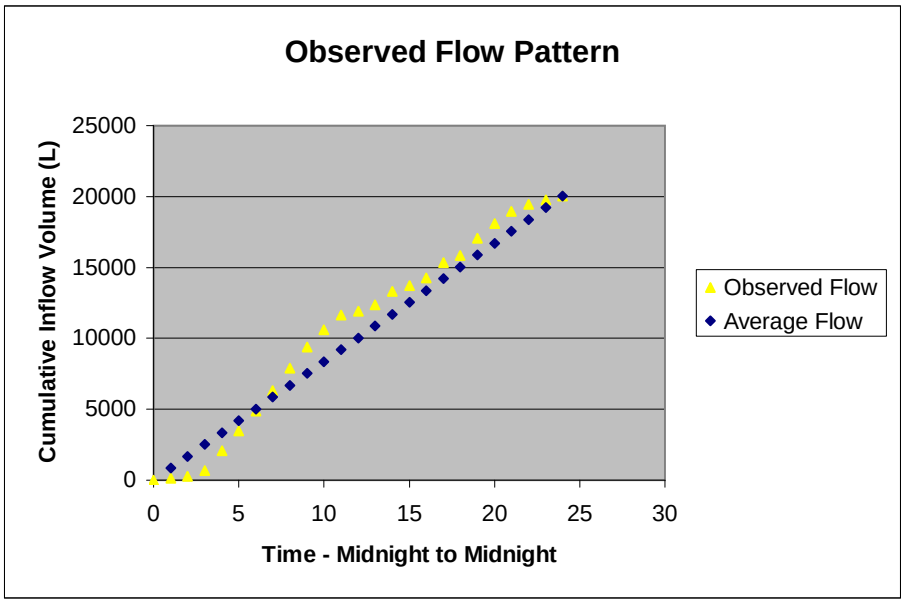
Residence time in Equalization Tank = Tank volume / flowrate
= 0.182 days
= 4.38 hrs

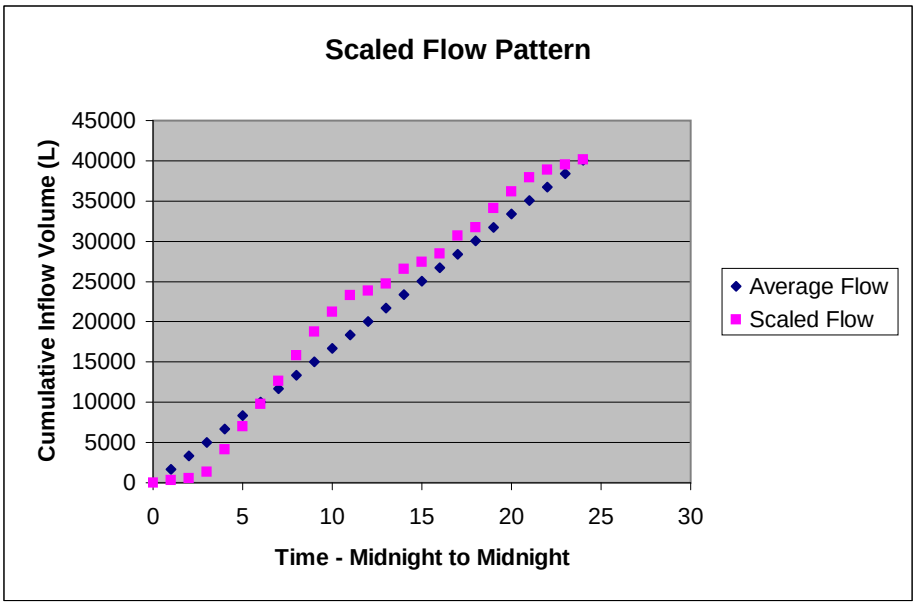
Asssume Tank is full; Q = 2m^3/hr; neglects RBC1 Vessel.

Aeration Rate:

Typical design factors:

Air supply rate =	0.01 to 0.015	m^3/m^3-min	
Assume minimum air supply =	0.015	m^3/m^3-min.	
Actual Aeration Rate =	14.0	cfm	
=	0.4	m^3/min	
Equalization Tank volume =	8.28	m^3	**Excluding RBC1 Vessel**
Actual air supply/volume =	0.048	m^3/m^3-min	**CHECK OK**


Observed Flow Pattern
Cumulative Inflow Volume (L)
25000
20000
15000
10000
5000
0
0
5
10
15
20
25
30
Time - Midnight to Midnight
Observed Flow
Average Flow


Scaled Flow Pattern
Cumulative Inflow Volume (L)
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
0
5
10
15
20
25
30
Time - Midnight to Midnight
Average Flow
Scaled Flow

RBC Design

Typical loading factors:

Hydraulic Loading =	3	gal/ft^2-day	
HRT =	1.1	hr	
Organic Loading			
SBOD =	1.4	$lb/10^3ft^2$-d	
TBOD =	2.75	$lb/10^3ft^2$-d	
Max. First Stage Loading			
SBOD =	5	$lb/10^3ft^2$-d	
TBOD =	10	$lb/10^3ft^2$-d	

Typical Design Factors:

Tank/media area ratio =	0.0049	m^3/m^2	
Optimum peripheral velocity =	0.3	m/s	

Design factors for Tahera RBC WWTP:

Average Daily Flowrate =	45.4	m^3/day	
=	11994.72	USG/day	
Media surface area =	1327.00	m^2	
=	14276.40	ft^2	
Hydraulic Loading =	0.84	gal/ft^2-day	**CHECK OK**
RBC1 and RBC2 vessel volume =	9.48	m^3	**Assumes RBC disks occupy negligible volume and excludes Equalization Tank volume**
HRT =	5.01	hr	**CHECK OK**
Tank Volume/Media Area Ratio =	0.0071	m^3/m^2	**CHECK OK**

Organic Loading:

SBOD =	1.31	$lb/10^3ft^2$-d	**CHECK OK**
TBOD =	2.62	$lb/10^3ft^2$-d	**CHECK OK**
Max. First Stage Loading:			
First Stage Media surface area =	442.33	m^2	**Assumes 1/3 of total RBC media area**
=	4758.80	ft^2	
SBOD =	4.08	$lb/10^3ft^2$-d	**CHECK OK, Using 700mg/L peak organic loads forecast by Tahera**
TBOD =	8.15	$lb/10^3ft^2$-d	**CHECK OK**

Solids Outflow from RBC:

Total:Soluble BOD Ratio	0.5		
RBC Influent $BOD_{5, sol}$ =	188	mg/L	
=	0.19	kg/m^3	
=	8.51	kg/day	
=	18.73	lb/day	
Peak RBC Influent $BOD_{5, sol}$ =	350	mg/L	**Using 700mg/L peak organic loads forecast by Tahera occur for 1 hr**
=	$0.35	kg/m^3	
=	$0.66	kg/hr	
=	$8.82	kg/day	
=	$19.40	lb/day	
Effluent BOD_5 = 10 mg/L	10	Assumed	
Effluent $BOD_{5,sol}$ = 10 mg/L	5		
Soluble BOD Removed	183	mg/L	**Assuming negligible BOD removal in Equalization Tank**
BOD:TSS Conversion ration	0.6		
VSS Generated from $BOD_{5,sol}$ reduction:	110	mg/L	
TSS Influent	400	mg/L	
TSS from Clarifier o/f	40		
Total Clarifier Solids Loading	470	mg/L	

Clarifier Design

Typical Clarifier design values:

Hydraulic Loading Rate =	400 to 600	gal/ft^2-day	
=	16.28 to 24.42	m^3/m^2-d	
Solids Loading Rate =	1	lb/ft2-h	
=	4.88	kg/m^2-h	

Clarifier hydraulic loading rate:

Design settling area =	5.39	m^2	
Design Hydraulic Loading Rate =	8.42	m^3/m^2-day	**CHECK OK**
Clarifier Volume:	4.23	m^3	
TSS from RBC =	470	mg/L	
Flow through RBC =	1.89	m^3/hr	
=	1891.67	L/hr	
HRT =	2.24	hr	

Clarifier solids loading rate:

Sludge to Clarifier (solids) = TSS * Flowrate

=	888137.50	mg/hr
=	0.89	kg/hr
=	1.95	lb/hr
=	46.89	lb/day dry basis
=	21.29	kg/day dry basis

Design loading rate of Tahera RBC clarifiers = 0.034 lb/ft^2-hr **CHECK OK**

Verification of clarifier volume occupied by sludge blanket:

Assume 1% solids

sludge volume = weight of dry solids/(density of water * specific gravity of sludge* decimal percent solids)

after 1.5 hours:

sludge volume =	4.60	ft^3	
=	0.13	m^3	
=	130.32	L	

After 3 hours:

sludge volume =	0.26	m^3	
=	260.63	L	

Daily sludge generation:

sludge volume =	2.09	m^3	**Note, this value corroborates PJ Hannah estimate**
Clarifier sludge pump capacity =	90	USGPM	
=	340.65	L/min	
Pump cycle =	3	min "ON" every 3 hrs	
Volume removed every 3hrs =	1021.95	L	**Conclusion: Useable volume of clarifiers is not compromised by sludge blanket build-up**
=	1.02	m^3	

PKCA Partial Water Balance

		Concentration (mg/L)								Mass Loading (kg/yr)						
Source	Annual Flowrate (m^3/yr)	BOD5	Total P	Total N	NH3 - N	TSS	NO2 - N	NO3 - N	O&G	BOD5	Total P	Total N	NH3 - N	TSS	NO2 - N	NO3 - N
Precipiation + Runoff - Evaporation	94340	un	un	un	un	un	un	un	un	nc	nc	nc	nc	nc	nc	nc
Slurry + Grey Water from Plant Area	271429	un	un	un	un	un	un	un	un	nc	nc	nc	nc	nc	nc	nc
Pump from Mine Pit to East Sump	61000	un	0.14	un	4.2	24	0.85	18.1	un	nc	8.54	nc	256.2	1464	51.85	1104.1
WWTP Effluent @ 45.4 m^3/day	16571	10	6	20	un	10	un	20	un	165.71	99.426	331.42	nc	165.71	nc	331.42
Permit Requirements for Release to C3 (mg/L)		15	0.2		6	15	2.5	28	3							
Average concentration of Parameters in C3 Discharge (mg/L)		0.37	0.24	0.75	0.58	3.68	0.12	3.24	nc							

Notes:
un = unavailable
nc = not calculated

APPENDIX 13

JERICHO SITE STABILIZATION PROJECT SPILL CONTINGENCY PLAN

JERICHO MINE SITE STABILIZATION

-INTERIM SPILL CONTINGENCY PLAN-

Prepared by: Indigenous and Northern Affairs Canada

July, 2016

Disclaimer

This Interim *Spill Contingency Plan* is being produced by Indigenous and Northern Affairs Canada (INAC) to satisfy the regulatory requirements for the site stabilization of the Jericho Mine. It is the expectations of INAC that once a contractor is hired for this remediation work they will update this plan in whatever way they see fit and submit it to the necessary regulatory bodies as a “Final Plan”.

1. INTRODUCTION/SITE OVERVIEW

Indigenous and Northern Affairs Canada (INAC) has secured funds under the Government of Canada’s 2016 Federal Infrastructure Initiative to conduct site stabilization activities at the abandoned Jericho Mine. The Site is located approximately 260 km southeast of Kugluktuk, NU and 30 km north of the Lupin Mine in the Contwoyto-Itchen Region. The site is accessible by air and the Tibbitt to Contwoyto Winter Road. The winter road was opened to the Jericho Mine during the Tahera operation and construction years. An extension to the winter road will have to be built again to facilitate the proposed site stabilization work. The Jericho Mine is located partially on Crown land and partially on IOL. Figure 1 below shows the division between the two (IOL in yellow).

Figure 1: IOL/Crown Land Division Jericho Mine

The Jericho Mine was opened in 2006 by Tahera Diamond Corporation (Tahera) who went through bankruptcy proceedings in 2008. Shear Diamonds Corp. (Shear) took over the Jericho Mine in 2010 and operated the mine under care and maintenance until September 2012 when Shear suspended operations. INAC has been undertaking basic environmental protection of the Jericho Mine since spring 2013, and assumed control of the Jericho Mine in January 2014.

The original mine plan was to construct a project with an eight-year life and extract the Kimberlite ore by using an open pit and underground mining methods. The mine work did not advance beyond the open pit extraction.

A detailed Environment Site Assessment (ESA) report was prepared by Tetra Tech EBA (EBA) in December 2014. The report presented the results and finding of their August 2014 on-site investigation work, planned following a gap analysis in support of developing of a remedial action plan for the project site. Contaminated soil, water, hazardous and non-hazardous material and infrastructure, and geotechnical information all form part of the ESA document.

In consideration to the overall remediation objectives for the Jericho Mine site, the tight timelines to complete the proposed work and the amount of funding available to the project through the Government of Canada's 2016 Federal Infrastructure Initiative, a Site Stabilization Plan has been developed. Such activities are necessary to:

- restore the site to an environmentally safe condition;

- prevent environmental migration of contaminants into the surrounding ecosystem

These tasks include:

- Breach the C1 Diversion and construct a Pit Overflow;
- Breach the West Dam (figure 2);
- Notch Divider Dyke A (figure 2);
- Construct a Cover over Cell A (figure 2);
- Construct a Non-Hazardous Landfill (NHL);
- Re-grade the Containment Berms;
- Treat the PHC Soils;
- Dismantle Lead Based Paint coated ASTs;
- Consolidate and Incinerate Organic Liquid Wastes or remove off-site for disposal;
- Depressurize Gas Cylinders and Fire Extinguishers;
- Remove All Other Hazardous Waste off-site for disposal;
- Demolish and landfill structures (ex. Main camp, tank farms, etc.);
- Collect and Landfill remaining Non-Hazardous material.

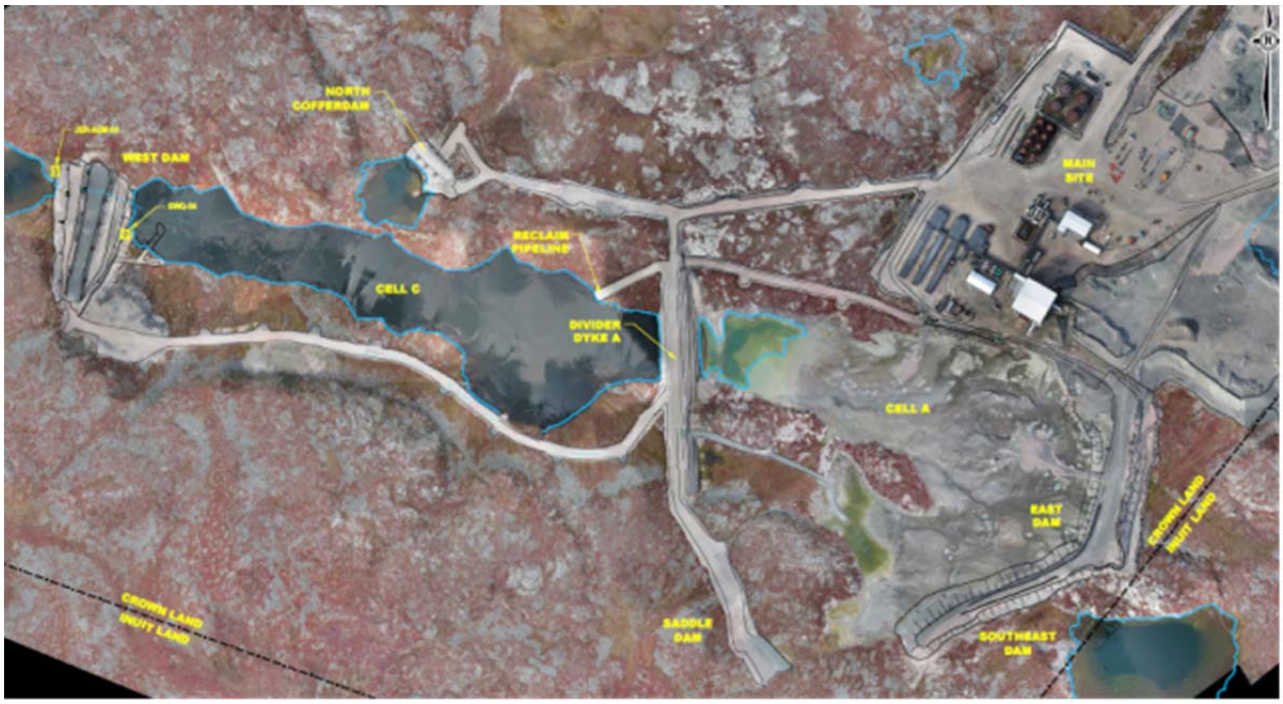


Figure 2

2. FUEL AND HAZARDOUS MATERIAL SPILLS - GENERAL INFORMATION

This Spill Contingency Plan presents the prescribed course of action to be followed in the case of unanticipated *fuel or chemical spills* during the site stabilization of the abandoned Jericho Mine Site, Nunavut. The plan will enable persons in a particular spill emergency situation to maximize the effectiveness of the environmental response and meet all regulatory requirements for reporting to the appropriate authorities. The plan also describes the locations where hydrocarbons (fuel) and spill response equipment will be stored at the site.

This current plan follows the standard procedure adopted by PWGSC / AANDC on Crown lands to address unanticipated spills. The procedure has been customized and made specific to the Jericho Mine Site Stabilization project and made available for regulatory approvals pre-contract award. After the selection of a contractor for the project, the successful contractor will develop a more detailed Spill Contingency Plan which will be included as a component of the Site Specific Health and Safety Plan (SSHSP). The SSHSP is always prepared prior to the commencement of site construction (remediation) activities and it will be posted on-site during the remediation activities. Also, a copy of the SSHSP will be submitted to Nunavut Water Board (NWB) as soon as it is completed. The following information will be included in the SSHSP:

1. A description of pre-emergency planning;
2. Personnel roles, lines of authority and communication;
3. Emergency alerting and response procedures;
4. Evacuation routes and procedures, safe distances and places of refuge;
5. Emergency alerting and response procedures;
6. Directions/methods of getting to the nearest medical facility;
7. Emergency decontamination procedure;
8. Emergency medical treatment and first aid;
9. Emergency equipment and materials;
10. Emergency protective equipment;
11. Procedures for reporting incidents; and
12. Spill response and containment plans for all materials that could potentially be spilled.

3. TYPES AND QUANTITIES OF MATERIALS THAT WILL BE STORED ON-SITE

The types and approximate quantities of fuels that will be stored on-site are based off our experiences in the remediation of similar sites. The actual amount of fuels and their types will be verified by the hired contractor. We approximate these to be:

Gasoline: Approximately 5125 L stored in 205 L barrels;
Diesel: Approximately 300,000 L stored in large fuel tanks;
Oil: Approximately 80 L of hydraulic oil (four 20 L pails) and 80 L of motor oil (four 20 L pails);
Propane: sixteen (16) 45 kg tanks; and
Grease*:* Approximately 20 tubes stored within two 4 kg cases.

Method of Storage & MSDS Sheets:

All liquid fuels will be stored in barrels on pallets or in the case of the diesel, in a large fuel storage tank within a containment area surrounded by a 0.5 m berm and lined with hydrocarbon resistant material. Refueling activities will occur directly from the barrels or large diesel fuel tank into the respective vehicle. The containment area will be located on flat, even ground at a distance of no less than 31 m away from the camp and the “High Water Mark” of any natural drainage area or water body.

Propane will be stored in 45 kg (100 lb) certified tanks near the kitchen trailer. The above quantities are estimates. Upon award of contract, the successful contractor will provide more specific information on the types and actual quantities of all fuels and chemicals on site.

Contractor will comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding employee training, use, handling, storage and disposal of hazardous materials.

Under the Crown’s contracting procedure, the provision of Material Safety Data Sheets (MSDS), as required by WHMIS, is the responsibility of the successful contractor. Upon the award of contract for the site stabilization of the Jericho Mine, the successful contractor will prepare the MSDS sheets for all fuels and chemicals they are bringing to site and include the MSDS sheets in the SSHSP which will be submitted to NWB before work can start on the site.

4. FUEL AND HAZARDOUS MATERIAL SPILLS CONTINGENCY PLAN

The objective of the fuel-related contingency plan is to protect the environment and human health by minimizing the impacts of spill events through clear and concise instructions to all personnel.

A variety of fuels (diesel, gasoline and lubricating oils) will be used during the site stabilization of the Jericho Mine site. Fuels will be stored in either barrels of 205 liters or in double walled tanks. For either storage option, it is anticipated that any spill quantity would likely be small.

Transportation of fuels must comply with the *Transportation of Dangerous Goods Act and Regulations.*

The most common pollution incidents would probably involve spills of diesel or gasoline onto land resulting from: human error during transfer, rupture of barrels from deterioration or damage, seepage from fittings or valves, or equipment failure. Daily checking of equipment and preventative maintenance would identify damage to the fuel system and reduce the risk of spills or leaks.

In the event of a spill, protection of human health and safety is paramount. Contamination of personnel involved in clean up is a real possibility as is contamination of the surrounding workplace and environment. The individual responding to a spill shall:

i. Ensure personnel are appropriately trained.

- All employees working on the Project, including contractors and sub-contractors, will be trained in the safe operation of all machinery and tools, as well as in the handling of materials to help prevent and respond to hazardous material spills in a timely and effective manner. All employees on site will also be trained for initial spill response in the event of a spill. The recommended training for these purposes consists initially of the 40-Hour Hazardous Waste Operations and Emergency Response (HAZWOPER) course offered by various environmental firms and the 8-Hour HAZWOPER refresher course every two (2) years thereafter.

ii. Make use of materials and equipment available for adequate response to fuel spills, such as excavators for creating earthen dykes and hydrocarbon absorbent booms.
iii. Warn people in the immediate vicinity and evacuate the area if necessary.
iv. Wear protective clothing as required for handling spills.
v. Isolate and eliminate all ignition sources.

vi. Identify the spilled material if possible, and take all safety precautions before approaching it.
vii. Attempt to immediately stop the leakage and contain the spill, if safe to do so, by implementing the Spill Response Actions summarized below.
viii. Report to the Field Team Leader on the spill location, type of material, volume and extent, status of spill (direction of movement), and prevailing meteorological conditions.
ix. Follow all applicable federal/territorial regulations and guidelines or the disposal of spill materials.
x. Document all events and actions taken. Include information required by applicable regulations and guidelines.
xi. Notify appropriate government agencies using the contact list below. Report spills immediately on the 24-Hour Spill Report Line (867) 920-8130.

Spill Response Actions on Different Media

On Land:

- Do not flush into ditches or drainage systems.
- Block entry into waterways and contain with earth, snow or other barrier.
- Remove small spills with sorbent pads.
- On tundra use peat moss and leave in place to degrade, if practical.

On Snow & Ice:

- Block entry into waterways and contain with snow or other barrier.
- Remove minor spills with sorbent pads and/or snow.
- Use ice augers and pump to recover diesel under ice.
- Slots in ice can be cut over slow moving water to contain oil.
- Burn accumulated diesel from the surface using Tiger Torches if feasible and safe to do so.

On Muskeg:

- Do not deploy personnel and equipment on marsh or vegetation.
- Remove pooled diesel with pumps and skimmers.
- Flush with low pressure water to herd diesel to collection point.
- Burn only in localized areas, e.g., trenches, piles or windrows.
- Do not burn if root systems can be damaged (low water table).
- Minimize damage caused by equipment and excavation.

On Water:

- Contain spill as close to release point as possible.
- Use spill containment boom to concentrate slicks for recovery.
- On small spills, use sorbent pads to pick up contained oil.
- On larger spills, use skimmer on contained slicks.
- Do not deploy personnel and equipment onto mudflats or into wetlands

Rivers & Streams:

- Prevent entry into water, if possible, by building berm or trench.
- Intercept moving slicks in quiet areas using (sorbent) booms.
- Do not use sorbent booms/pads in fast currents and turbulent water.

Contractor will supply information in regards to the contents of the following:

1) Drum Spill Kits

2) Equipment Spill Kits

5. NOTIFICATION & REPORTING PROCEDURE FOR JERICHO MINE

1. Report to the Project Manager / Site Supervisor, the spill location, type of material, volume and extent of spill, status of spill (direction of movement), and prevailing meteorological conditions.
2. A person shall immediately report the spill, where there is a spill, or where there is areas of likelihood of a spill, in an amount equal to or greater than the amount set out in Schedule B of the NWT / Nunavut *Spill Contingency Planning and Reporting Regulations.*
3. Notify appropriate government agencies using the contact list provided below.
4. When reporting a spill, a person shall give as much of the following information as possible:

   i. date and time of spill;
   ii. location of spill;
   iii. direction spill is moving;
   iv. name and phone number of a contact person close to the location of spill;
   v. type of hazardous product/material spilled and quantity spilled;
   vi. cause of spill;
   vii. whether spill is continuing or has stopped;

viii. description of existing containment;
ix. action taken to contain, recover, clean up and dispose of spilled material;
x. name, address and phone number of person reporting spill; and
xi. name of owner or person in charge, management or control of hazardous materials at the time of the spill.

6. TRAINING

Site personnel will be trained on refueling procedures and on spill response. Spill response training will include:

- site layout and identification of storage areas
- how to initiate the spill response system
- safety concerns related to spills including fire and explosion
- personal exposure risks to potentially hazardous materials
- protocol for handling spills
- environmental risks to both ground and waterways
- approaches and options to containment and cleanup utilizing the various materials and equipment available onsite
- the use of spill kits and their contents including the use of plugs and plugging compounds
- reporting requirements

7. CONTACT NUMBERS

INAC Water Resources Inspector	867-975-4295
NWT/NU Spill Line	867-920-8130 (Fax) 867-873-6924
GN, Environmental Protection	867-975-6000 (Fax) 867-975-6099
Nunavut Water Board	867-360-6338 (Fax) 867-360-6369
INAC Project Manager (Mark Yetman)	(819) 934-1188
INAC Manager of Field Ops	867-975-4295
Kitikmeot Inuit Association	867) 983-2458
DFO	867-979-8000
Environment Canada	867-945-4644

8. NT- NU Spill Report Form

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR	REPORT TIME	☐ ORIGINAL SPILL REPORT, OR ☐ UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER ____-_____
B	OCCURRENCE DATE: MONTH – DAY – YEAR	OCCURRENCE TIME		

C	LAND USE PERMIT NUMBER (IF APPLICABLE)	WATER LICENCE NUMBER (IF APPLICABLE)
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION	REGION ☐ NWT ☐ NUNAVUT ☐ ADJACENT JURISDICTION OR OCEAN
E	LATITUDE DEGREES MINUTES SECONDS	LONGITUDE DEGREES MINUTES SECONDS

F	RESPONSIBLE PARTY OR VESSEL NAME	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION	
G	ANY CONTRACTOR INVOLVED	CONTRACTOR ADDRESS OR OFFICE LOCATION	
H	PRODUCT SPILLED	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER
	SECOND PRODUCT SPILLED (IF APPLICABLE)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER
I	SPILL SOURCE	SPILL CAUSE	AREA OF CONTAMINATION IN SQUARE METRES
J	FACTORS AFFECTING SPILL OR RECOVERY	DESCRIBE ANY ASSISTANCE REQUIRED	HAZARDS TO PERSONS, PROPERTY OR ENVIRONMENT
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS		

L	REPORTED TO SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLING FROM	TELEPHONE
M	ANY ALTERNATE CONTACT	POSITION	EMPLOYER	ALTERNATE CONTACT LOCATION	ALTERNATE TELEPHONE

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC | SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN | FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

9. Site Location Maps

(Please Note: Information surrounding the location of spill response equipment, the location of hazardous materials, as well as any other relevant details, is not know at this point as a contractor has not been hired yet)

APPENDIX 14

JERICHO SITE STABILIZATION PROJECT- KUGLUKTUK COMMUNITY MEETING NOTES

Jericho Diamond Mine Site Stabilization Plan
- Community Consultation Summary -

DATE:	August 3, 2016
TIME:	1200-1330
LOCATION:	Kugluktuk Community Hall
REPRESENTATIVES:	Mark Yetman (INAC) Michael Bernardin (PSPC)
ATTENDANCE:	25
NOTES:	There were 25 people in attendance that signed in, a few of them were children.

QUESTIONS & ANSWERS	
Q1) Nothing was said about taking out the building debris.	A1) Hazardous materials will be removed from the building and shipped south for disposal. Building will be demolished and landfilled onsite.
Comment) Owners of the mine only hired 10 people from Kugluktuk. It was a breach of contract. Too few employees.	
Comment) There used to be a lot of Caribou in that area.	
Q2) Who owns the site now?	A2) Tahera was the original owner, they went bankrupt and abandoned the site after 2 years of operation. Shear Diamonds took it over, but abandoned the site soon after. The site is now owned by the Crown.
Q3) Where did all the profits go?	A3) Given that two companies went bankrupt/out of business operating this site I don't think anybody profited.
Q4) Can the existing fuel tanks be used for fuel storage during the remediation?	A4) It is possible but they would need to be re-certified, and ultimately demolished as part of the work.
Q5) Is there enough fuel onsite to complete the work?	A5) No, the main fuel tanks are empty, with some fuel/sludge below the level of the bottom valves.

Jericho Diamond Mine Site Stabilization Plan
- Community Consultation Summary -

QUESTIONS & ANSWERS	
Q6) What about forest fires – is there equipment to fight fires onsite?	A6) The site is located above the tree line, so there is no threat of forest fires, a tundra fire is possible. There is firefighting equipment at the site should something catch fire during the work.
Q7) If the mill and truck shop are remaining, what about the contents of those buildings?	Q8) The contents of the truck shop will be removed, including the vehicles, parts and hazardous materials. The contents of the mill such as vehicles and hazardous materials will be removed. The process plant itself will remain.
Q8) In the presentation there was an orange thing, what is it? (Slide 14 and Slide 21)	A8) That is the six inch water pump that we use to pump water from the PKCA over the West Dam.
FOLLOW UP ACTIONS:	None
MEDIA INQUIRIES:	None

* A copy of the Presentation and the Attendance Sheet is attached

Indigenous and Northern Affairs Canada | Affaires autochtones et du Nord Canada

JERICHO MINE SITE STABILIZATION PLAN

#	NAME (Please Print)	SIGNATURE
1	Grant Newman	
2	DIANA EVAGLOK	
3	BABA PEDERSEN	
4	LINDA PEDERSEN	Linda Pedersen
5	CLIFTON	
6	Avalak Atutahak	
7	Steven Anaktak	
8	Bobby Konak	Bobby Konak
9	Cynthia Kukiluk	Cynthia Kukiluk
10	Shirley Kilgik	Shirley Kilgik
11	Joseph Kokak	Joseph Kokak
12	Faith Kokak	Faith Kokak
13	Sophie Kokak	Sophie Kokak
14	Roy Kokak	Roy Kokak
15		
16	Glen Okheena	Glen Okheena
17	Sylvia Kilgik	Sylvia Kilgik
18	Ben HIKHAITOK	Ben HIKHAITOK
19	Ivan ETOKTOK	Ivan ETOKTOK
20	Helen Hala	Helen Hala
21	Ida Okheena	Ida Okheena
22	Mona Ishalak	M. Ishalak
23	Gordon Kokak	G Kokak
24	Jared tom	
25	Arnold Angivang	

Indigenous and Northern Affairs Canada | Affaires autochtones et du Nord Canada

Indigenous and Northern Affairs Canada will be holding a Public Consultation on the

Jericho Diamond Mine

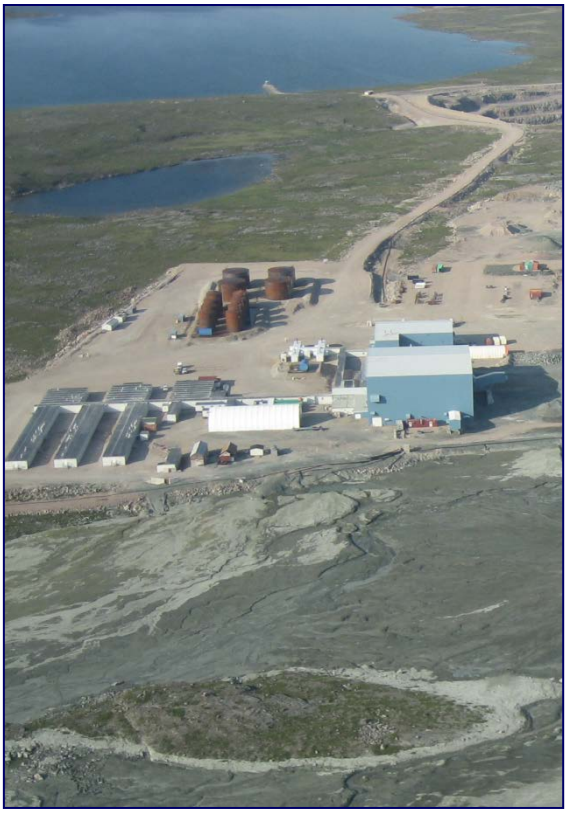
Site Stabilization Plan

Date:
Wednesday, August 3rd

Time:
12:00-14:00

Location:
Community Hall

Lunch to be provided



For further information contact:
Mark Yetman
(819) 934-1188
mark.yetman@aandc-aadnc.gc.ca

Canada

Indigenous and Northern Affairs Canada | Affaires autochtones et du Nord Canada

Jericho Diamond Mine

Site Stabilization Plan

Kugluktuk, Nunavut
August 3, 2016

Canada

Introductions

Mark Yetman

- Indigenous and Northern Affairs Canada (INAC)
- Project Role: Project owner, funding

Michael Bernardin

- Public Service and Procurement Canada (PSPC)
- Project Role: Project and contract management

Presentation Outline

1. Why Are We Here?
2. Project Objectives
3. Project Location
4. Site Overview
5. Site History & Project Plan
6. Current Site Conditions
7. Site Stabilization Plan
8. Project Procurement
9. Wrap-Up

1. Why Are We Here?

– **Share** information

– **Learn** what you know about the Jericho Diamond Mine

– **Communicate** our plans to stabilize the Jericho Diamond Mine site

– **Seek community input** so we can produce a better plan

2. Project Objectives

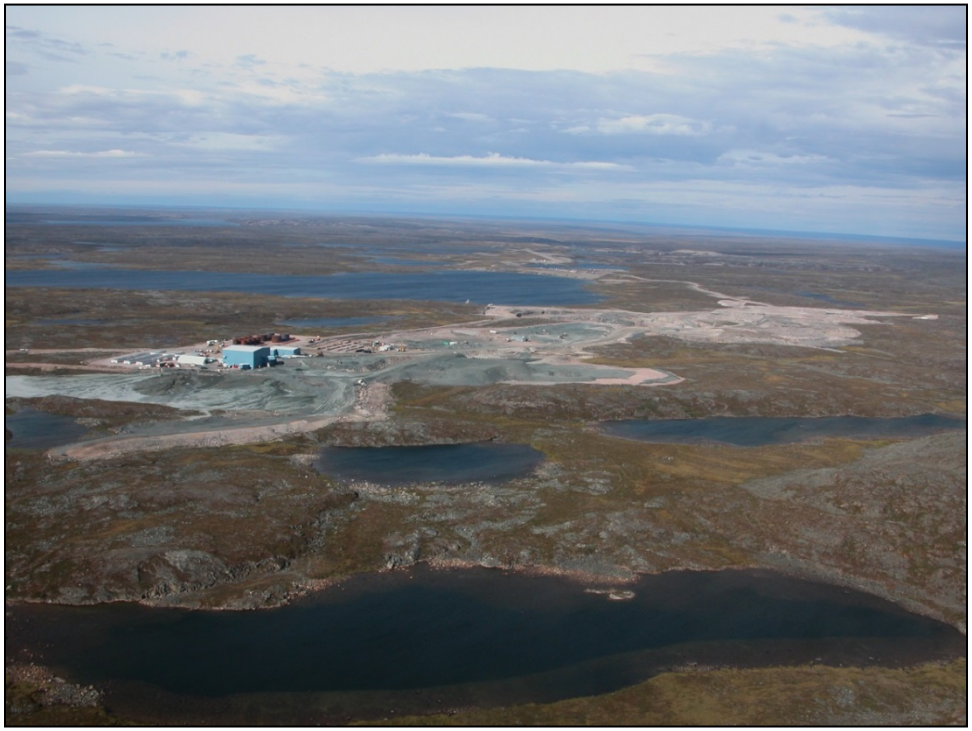
– Minimize environmental impacts to humans and wildlife

– Ensure the project complies with all legal requirements

– Ensure the project follows all Federal and Departmental policies

– Increase public awareness about clean up activities

– Provide employment opportunities for the local workforce



3. Project Location

Note: Jericho Mine is located ~260 km Southeast of Kugluktuk

4. Site Overview

Note: Yellow shaded area is Inuit Owned Land

4. Site Overview – North End – Hazardous Material Storage Area

4. Site Overview – Open Pit Area

Note: Yellow shaded area is Inuit Owned Land

4. Site Overview – Process Plant & Camp

4. Site Overview – Processed Kimberlite Containment Area (PKCA)

5. Site History & Project Plan

2006 - Tahera Diamond Corporation opened and operated the Mine

2008 - Tahera granted bankruptcy court protection

- Care & Maintenance (INAC)

2009 - Care & Maintenance (INAC)

2010 - Shear Diamonds (Nunavut) acquired the property

2011 - Property under care and control of Shear Diamonds

2012 - Shear Diamonds initiated limited diamond recovery

2013 - Shear Diamonds abandoned the Mine

- Care & Maintenance (INAC)

5. Site History & Project Plan (continued)

2014 - Care & Maintenance (INAC)

- Phase III Environmental Site Assessment (Tetra Tech EBA)

2015 - Remedial Options Analysis

- Care & Maintenance (INAC)
- Commercial Viability Assessment (Deloitte)

2016 - Care & Maintenance (INAC)

- Federal Infrastructure Initiative Funding Approved
- Statement of Work for Site Stabilization developed
- Community Meeting (Kugluktuk)
- Request for Proposal/Tender (Design Build)

5. Site History & Project Plan (continued)

2016 - Permit Applications (Nunavut Planning Commission (NPC), Nunavut Impact Review Board (NIRB), Nunavut Water Board (NWB), INAC, Kitikmeot Inuit Association)

- Award Contract

2017 - Mobilize to site

- Complete Site Stabilization Work

2018 - Demobilize from site

- Closeout Community Meeting (Kugluktuk)

2019 - Initiate Monitoring Program

6. Current Site Conditions

1) Open Pit
   - Rain and snow are filling the pit with water (~44+ years)
   - Uranium (naturally occurring – from rock) levels above CCME* 0.015 mg/L (~8x)
     – Trending downwards

2) Processed Kimberlite Containment Area (PKCA)
   - PKCA fine tailings dispersion via wind
     – Encapsulated in ice
   - Cell B/C water levels need to be managed
     – Pumping over West Dam

*Canadian Council of Ministers of the Environment

6. Current Site Conditions (continued)

3) Airstrip & Roads
   - Airstrip condition deteriorating
     – Soft spots (packed as part of Care & Maintenance activity)
   - Roads are deteriorating but mostly usable

4) Buildings & Debris
   - Truck Shop & Process Plant
     – Deteriorating slowly
   - Camp
     – Water leaks, mould, etc.
   - Debris throughout site
     – Vehicles, equipment, etc.

6. Current Site Conditions (continued)

5) Fuel Tanks & Berm

- All tanks are essentially empty but do contain residual fuel and/or sludge
  - – Tank farm berms retain water and require management as part of Care & Maintenance activities

6. Current Site Conditions (continued)

6) Contaminated Soils

- Metal contaminated soils ~64 m^3
- Fuel contaminated soils ~7,854 m^3
- Some fuels on-site (risk of additional contamination)

7) Hazardous Materials

- ~1,816 m^3 of hazardous materials (lead paint on Above Ground Storage Tanks, organics in drums/tanks)
- ~2,855 hazardous items (florescent lights, cylinders, fire extinguishers, batteries)

7. Site Stabilization Plan (SSP) Considerations

- Environmental Hazards at the Site
  - Assessment (address the highest risk items)
- Input from Stakeholders
  - Regulators (INAC, NIRB, NWB, NPC)
  - Land Owners
    - Kitikmeot Inuit Association
    - INAC - Jericho Working Group
  - Local Communities
  - Industry
    - Commercial Viability Assessment
- Budget
  - Security and 2016 Federal Infrastructure Initiative
- Timeframe
  - Must be Finished Work by March 2018

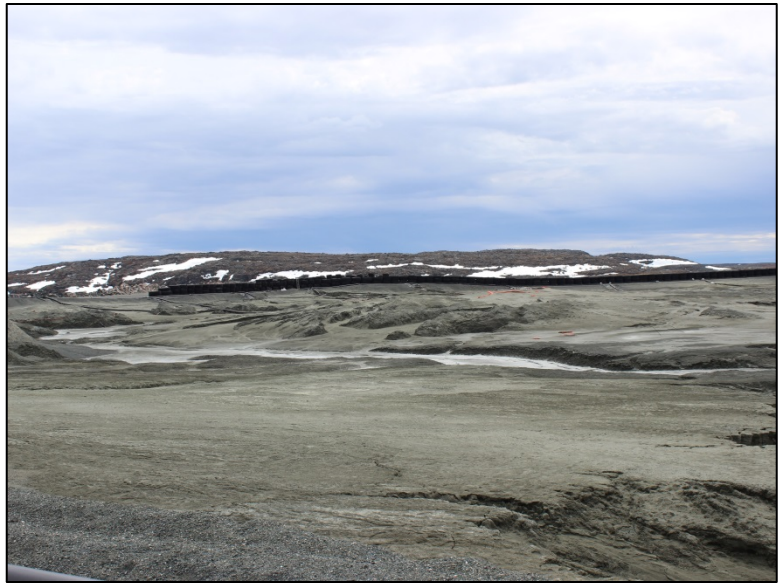
7. Site Stabilization Plan

1) Open Pit
   - Create a Pit Lake
     - Increase the amount of water entering the pit by re-establishing the natural drainage path (remove the C1 Diversion)
       - The Pit should fill with water in ~15 years
     - Construct a channel for future water flow out of the pit
     - Monitor the Uranium levels in the water
       - Treat if required

7. Site Stabilization Plan (continued)

2) Processed Kimberlite Containment Area (PKCA)

- Prevent fine tailings dispersion via wind
  - Cover the fine tailings in Cell A with coarse tailings
- Prevent the build-up of water
  - Breach Divider Dyke A
  - Breach the West Dam



7. Site Stabilization Plan (continued)

3) Airstrip & Roads
   - No work planned other than minor maintenance during use

4) Buildings & Debris
   - Truck Shop & Process Plant
     – These buildings will be left in place
   - Camp & Other Small Buildings
     – Demolished and landfilled
     – Except the Airstrip Camp (left for use during monitoring)
   - Miscellaneous Debris (vehicles, equipment, etc.)
     – Will be collected and landfilled

7. Site Stabilization Plan (continued)

5) Fuel Tanks & Berms

- All tanks to be cleaned, dismantled and landfilled
- Except for the Blue painted tanks (contain lead paint)
  – Cleaned, dismantled and stored on-site for future disposal
- Fuel berms
  – Fuel contaminated soil will be removed and treated, berms graded

7. Site Stabilization Plan (continued)

6) Contaminated Soils
   - Metal contaminated soils
     – Landfill
     – Ship off-site for disposal
   - Fuel contaminated soils
     – Treated on-site

7) Hazardous Materials
   - Organic liquids: oil & fuel
     – Incinerate and/or ship off-site for disposal
   - Other hazmat: batteries, cylinders, florescent lights
     – Sorted, packaged and shipped off-site for disposal

7. Site Stabilization Plan Schedule

August-September 2016

– Apply for Permits

– Tender Project Work

– Bidder's Site Tour

November-December 2016

– Award Contract

January-February 2017

– Complete Design/Engineering

March 2017

– Mobilize to Site

May-October 2017

– Complete Site Work

February-March 2018

– Demobilize from Site

8. Project Procurement

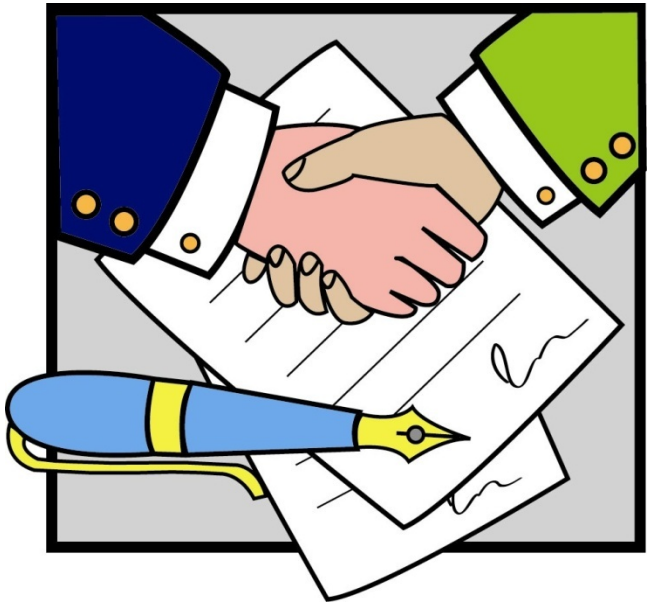
Use a Request for Proposal (RFP) process

Project will be posted on the Government of Canada's website:

www.buyandsell.gc.ca

Proposals will be evaluated based on the following components:

- Technical
- Management
- Inuit Opportunity Considerations
  - Socioeconomic benefits for the community:
    - Subcontracting (goods, services, etc.)
    - Employment
    - Training
- Cost



Source: Public Services and Procurement Canada / Services publics et Approvisionnement Canada

9. Wrap-Up

To date we have:

1. Managed Environmental Protection/Care & Maintenance at the Site
2. Assessed the site (Environmental Assessment, Waste Inventory)
3. Reviewed Remedial Options & the Commercial Viability
4. Obtained Funding
5. Developed a Site Stabilization Plan (SSP)

Now we want:

6. Community Input – Discussion and Questions?

(The SSP has been developed but the engineering design for the work has not been completed – opportunity for input)

Then we will:

7. Finalize the Site Stabilization Plan & Design for the project
8. Do the Work

Thank you
Matna
Qujannamiik
Koana
Merci
ᖁᐻᖅᓇᒥᒃ

Contact Information:
Mark Yetman
Project Manager,
Lands & Contaminated Sites
INAC Nunavut Regional Office
E-mail: mark.yetman@aandc.gc.ca

APPENDIX 15

JERICHO SITE STABILIZATION PROJECT- KUGLUKTUK ATTENDANCE SHEET

Indigenous and Northern Affairs Canada | Affaires autochtones et du Nord Canada

JERICHO MINE SITE STABILIZATION PLAN

#	NAME (Please Print)	SIGNATURE
1	Grant Newman	
2	DIANA EVAGLOK	
3	BABA PEDERSEN	
4	LINDA PEDERSEN	Linda Pedersen
5	CLIFTON	
6	Avalak Atutahak	
7	Steven Anaktak	
8	Bobby Konak	Bobby Konak
9	Cynthia Kukiluk	Cynthia Kukiluk
10	Shirley Kilgik	Shirley Kilgik
11	Joseph Kokak	Joseph Kokak
12	Faith Kokak	Faith Kokak
13	Sophie Kokak	Sophie Kokak
14	Roy Kokak	Roy Kokak
15		
16	Glen Okheena	Glen Okheena
17	Sylvia Kilgik	Sylvia Kilgik
18	Ben HIKHAITOK	Ben HIKHAITOK
19	Ivan ETOKTOK	Ivan ETOKTOK
20	Helen Hala	Helen Hala
21	Ida Okheena	Ida Okheena
22	Mona Ishalak	M. Ishalak
23	Gordon Kokak	G Kokak
24	Jared tom	
25	Arnold Angivang	

APPENDIX 16

LETTER FROM KITIKMEOT INUIT ASSOCIATION

P.O. Box 360
Kugluktuk, NU X0B 0E0
Telephone: (867) 982-3310
Fax: (867) 982-3311
www.kitia.ca

Kugluktuk
ᖁᑦᓗᖅᑐᖅ

Bathurst Inlet
Kingaok
ᖃᖏᓚᐅᓂ

Bay Chimo
Umingmaktok
ᐅᒥᖕᓚᒃᑐᖅ

Cambridge Bay
Ikaluktutiak
ᐃᖅᓗᒃᑐᑎᑎᐊᖅ

Gjoa Haven
Okhoktok
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Taloyoak
ᑕᓗᕐᕿᐊᖅ

Kugaaruk
ᑰᑌᕐᕿᒃ

September 2, 2016

Indigenous and Northern Affairs Canada
Attn: Mark Yetman
15 Eddy Street, 10th Floor
Gatineau QC K1A 0H4

Sent via email: mark.yetman@aadnc-aandc.gc.ca

Re: Site Stabilization Plan for the Jericho Site

Dear Mr. Yetman,

The Kitikmeot Inuit Association has reviewed and discussed the Site Stabilization Plan (SSP) for the Jericho Site and we have no remaining questions with the process or concerns with the final outcome. As landowners for some components of the Jericho project footprint we appreciate inclusion throughout the process. We look forward to working with you during the implementation of the SSP.

Regards,

Tannis Bolt
Project Officer
Kitikmeot Inuit Association

Cc: Wynter Kuliktana - Senior Lands Officer
Geoff Clark – Director, Lands and Environment

APPENDIX 17

AMEC WINTER ROAD WATER WITHDRAWAL ESTIMATE

4 August 2004
VE51295

Tahera Diamond Corporation
Suite 803, 181 Richmond Street West
Toronto, Ontario M5H 2K1

Attention: Mr. Greg Missal, VP Nunavut Affairs

Re: Environmental Impacts From Winter Road Water Withdrawal

Dear Greg,

Pursuant to a request from Nunavut Water Board (20 July 2004 Guidelines for Applicant, Tahera Corporation Limited – Jericho Diamond Project) Section 4.1.e.iii which states:

1. Impacts to water

a. Provide additional information on the sources, volumes, timing, and duration of water pumping and the associated impacts to water including lake drawdown, drainage changes, monitoring and mitigation, and thresholds to implement mitigation, and/or cessation of water use;

2. Contingency measures for spills

Water Withdrawal

AMEC Earth & Environmental contacted the proposed road contractor, Nuna Logistics, for an estimate of the amount of water that will be withdrawn each winter season when the winter road from Contwoyto Lake to the Jericho site is built. The road will take off from the bay in Contwoyto Lake, follow up Lynne Creek to Lynne Lake, across Lynne Lake and overland again from the end of Lynne Lake to Jericho. Map A from the Jericho Final EIS shows the approximate route and is attached for reference. As you are aware, some details of the mine general arrangement have changed resulting in a shorter Lynne Lake – Jericho segment than shown on Map A principally due to the arrangement of minesite all weather roads. AMEC understands that the final alignment will be field fit, but that physical constraints fairly tightly restrict where the winter road can be placed. AMEC also understands that an identical winter road was constructed for the bulk sample obtained in 1997.

A summary of AMEC's finding is that there will be no measurable effects on either Contwoyto or Lynne Lake water levels from winter road construction. The reasoning behind this conclusion is detailed below.

Nuna Logistics informed AMEC that a total of 5700 m^3 of water would be required to construct and improve the road surface on land portions of the route. Land portions of the route are from Contwoyto Lake to Lynne Lake west shore and from Lynne Lake east shore to the mine site. Most of the water will be required to make snow for the portion of the road up Lynne Creek as the upper segment is in an open swale where snow naturally accumulates. The land segments are the following lengths:

AMEC Earth & Environmental
2227 Douglas Road, Burnaby, BC
Canada V5C 5A9
Tel +1 (604) 294-3811
Fax +1 (604) 294-4664
www.amec.com

Contwoyto Lake to Lynne Lake	1,050 m
Lynne Lake to the minesite roads	750 m

The volume of Contwoyto Lake was not measured but will be tens of millions of cubic metres. The volume of Lynne Lake, based on an unpublished bathymetric survey conducted by Canamera in1996 using a recording echosounder with one metre resolution and a differential GPS is 1,070,000 m^3. Assuming half the water required comes from Contwoyto Lake (conservative since the first segment of the road will require the majority of the water to make snow), results in an estimated 2850 m^3 being required from Contwoyto Lake and an equal amount from Lynne Lake. The effect of this much water withdrawal on Contwoyto Lake would be miniscule. An estimated 0.27% of the volume of Lynne Lake would be withdrawn. From this it can be readily determined that no measurable effects on lake levels would result from water withdrawal for winter road use.

Spill Contingency
Spill response is covered in the Spill and Emergency Response Plan provided as part of the application for the Water Licence (which see).

I trust this information meets your immediate requirements. Please contact me if you have any questions or require additional information.

Yours truly,

Bruce Ott
Senior Environmental Scientist
Direct Tel.: 604-473-5315
E-mail: bruce.ott@amec.com

/bso

476000 mE
478000 mE
480000 mE
7323000 mN
7321000 mN
7319000 mN

Jericho Project
Site Arrangement

Approved By:	**MAP A**
Date:24/6/2000	
Drafted By: M.J.	TAHERA CORPORATION
Scale: 1:10,000	Projection: UTM Zone 12 (NAD 27 for Canada)

0 125 250 500
METRES

CORE AREA CONTOUR LINES REPRESENT 1m
OUTLYING CONTOUR LINES REPRESENT 10m

N
W E
S

CARAT LAKE
LAKE C3
LONG LAKE
KEY LAKE
LYNNE LAKE
CONTWOYTO LAKE
C1
C2
C4

EXTENTION
EXISTING AIRSTRIP
BORROW AREA D
EXISTING BORROW AREA C
EXISTING AIRSTRIP TERMINAL BUILDING
EXISTING AIRSTRIP LAYDOWN
EXISTING TANK FARM
EXISTING BORROW AREA A
EXISTING LAYDOWN AREA
EXISTING AIRSTRIP ROAD
EXISTING CARAT CAMP
CROWN LAND
INUIT SURFACE RIGHTS
OUTFLOW DIFFUSER (OPTIONAL)
INDUSTRIAL LANDFILL
SEDIMENT BERM
WATER INTAKE
SEDIMENT CONTROL POND
CAUSEWAY
PUMP HOUSE
AIRSTRIP ROAD
WASTE DUMP SITE 1 6.9 MT
ENERGY DISSIPATION POND
PIT SEDIMENT COLLECTION POND
CONTWOYTO LAKE ROAD
EXPLOSIVES MAGAZINE
AMMONIUM NITRATE STORAGE
WINTER ACCESS ROAD
C1 DIVERSION
C1 DIKE
OVERBURDEN STOCKPILE 1.6MT
PIT
WATER PIPELINE
SEDIMENT COLLECTION POND
EXPLOSIVES TRUCK WASH
SEDIMENT COLLECTION POND
PIT CAMP ROAD
WATER MANAGEMENT DITCH
WINTER ACCESS ROAD (CONSTRUCTION)
FUEL FARM
POWER STATION
POLISHING POND
PKCA ROAD
CENTRAL LOBE ORE STOCKPILE 500,000T
MINING LAYDOWN
MINING SHOP
PROCESSING PLANT
LOW GRADE STOCKPILE 1.7MT
WASTE DUMP SITE 2 6.0 MT
ACCOMMODATION
NORTHERN LOBE STOCKPILE 500,000T
COARSE PK STOCKPILE 2.2MT
SEDIMENT BERMS AND COLLECTION PONDS
PK CELL 2
PROCESSING LAYDOWN
RECOVERY PK
PK CELL 1
BERM AND COLLECTION POND (PUMPED TO PKCA)
LONG LAKE PKCA

APPENDIX 18

JERICHO SITE STABILIZATION PROJECT – ENVIRONMENTAL SCREENING REPORT

Matrix Solutions Inc.
ENVIRONMENT & ENGINEERING

ENVIRONMENTAL SCREENING REPORT
JERICHO MINE SITE STABILIZATION PLAN

Report Prepared for:
PUBLIC SERVICE AND PROCUREMENT CANADA

Prepared by:
MATRIX SOLUTIONS INC.

August 2016
Calgary, Alberta

Suite 600, 214 - 11 Ave. SW
Calgary, AB T2R 0K1
P 403.237.0606 F 403.263.2493
www.matrix-solutions.com

ENVIRONMENTAL SCREENING REPORT

JERICHO MINE SITE STABILIZATION PLAN

Report prepared for Public Service and Procurement Canada, August 2016

Elaine Lee-Ho, M.Sc., P.Biol., P.Ag.
Ecologist

reviewed by
Kelly Ostermann, M.Sc., P.Ag.
Principal Environmental Scientist

DISCLAIMER

We certify that this report is accurate and complete and accords with the information available during the site investigation. Information obtained during the site investigation or provided by third parties is believed to be accurate but is not guaranteed. We have exercised reasonable skill, care, and diligence in assessing the information obtained during the preparation of this report.

This report was prepared for Public Service and Procurement Canada. The report may not be relied upon by any other person or entity without our written consent and that of Public Service and Procurement Canada. Any uses of this report by a third party, or any reliance on decisions made based on it, are the responsibility of that party. We are not responsible for damages or injuries incurred by any third party, as a result of decisions made or actions taken based on this report.

EXECUTIVE SUMMARY

Forward

Matrix Solutions Inc. was retained by Public Service and Procurement Canada (PSPC) on behalf of Indigenous and Northern Affairs Canada (INAC) to complete an Environmental Screening Report (ESR) related to the Site Stabilization Plan (SSP) for the Jericho Mine (the Project). The ESR is part of the application process for regulatory permitting and is required as part of the regulatory package needed to complete site stabilization activities at the mine site.

The Project 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 took over the mine site in 2010. The mine ceased operation in September 2012 when Shear suspended operations. Since the spring of 2013, INAC has been undertaking basic environmental protection of the site. The Jericho Mine site consists of an open pit, a causeway, processed kimberlite containment area (PKCA), tank farm, pads, roads, contaminated soil, and hazardous and non-hazardous materials from equipment, infrastructure, and fuels. Significant site stabilization efforts include:

- expediting pit filling by re-aligning the current diversion (called the C1 diversion) back to the natural drainage pattern and allowing flow back into the pit
- breaching the West Dam and Divider Dyke A containing the PKCA to allow surface water flow out of the PKCA
- covering the PKCA
- grading pads and borrow areas
- excavating contaminated soil
- building demolition
- landfill construction
- disposal of non-hazardous material
- offsite disposal of hazardous waste
- land treatment for the remediation of hydrocarbon contaminated soils

The SSP will accomplish the following:

- stabilize the site to prevent water accumulation
- restore the site to an environmentally safe condition and
- prevent environmental migration of contaminants into the surrounding ecosystem

Existing and Pre-development Conditions

The current baseline conditions of the Jericho Mine consists of an open pit, causeway, PKCA, tank farm, pads, roads, contaminated soil, and hazardous and non-hazardous materials from equipment, infrastructure, and fuels (Appendix A, Figures 1 to 7). The primary developed areas include the airstrip, a

camp and main processing area (Tetra Tech EBA 2014). Roughly 161 ha have been developed for the Project as summarized below.

Jericho Mine Existing Facilities and Infrastructure

Component	Approximate Area (ha)[1]	Description
Open Pit	16	Current pit is roughly 450 m wide and 80 m deep (Figure 5)
Waste Rock Pile	30	Waste rock generated from open pit (Figure 5)
Low Grade Stockpiles	12	Overburden storage area (Figure 4)
Coarse Kimberlite Stockpile	6	Coarse processed kimberlite (PK) from the process plant (Figure 3)
Roads	16	Includes haul, access, and airport roads (Figures 2 to 7)
Airstrip and Associated Areas	17	Airstrip is 1,374 m long by 30 m wide, terminal, and adjacent disturbed areas (Figure 7)
PKCA	32	Cells A and C, various containment dykes and dams (Figure 2)
Main Processing Area (Main Site)	17	Includes process plant, camp facility, truck stop, waste water treatment, tank farms, helipad, laydown area, shed (Figure 3)
East Sump	2	Sedimentation pond (Figure 3)
Borrow Area A	5	Borrow material used for construction of the airport road (Figure 6)
Other Areas	8	Carat Lake laydown, hazardous waste transfer area, other miscellaneous areas
Total	**161**	

1. Estimated based on Tetra Tech EBA figures (Appendix A).

The Jericho Mine is located within the Takijuq Lake Upland Ecoregion of the Southern Arctic Ecozone (CCEA 2016a). The dominant surface water features in the area include Jericho River, Carat Lake, small watercourses, and shallow, single-basin lakes with low shoreline development. The Jericho River, which drains the Project area, flows north via Kathawachaga Lake and Burnside River before discharging into the Arctic Ocean. Five species of fish were documented in the water bodies and watercourses within the Project area. These included Arctic Char (*Salvelinus alpinus* [Linnaeus]), Burbot (*Lota lota*), Lake Trout (*Salvelinus namaycush* [Walbaum]), Round Whitefish (*Prosopium cylindraceum*), and Slimy Sculpin (*Cottus cognatus*).

The Jericho Mine is located in a region where the permafrost is present everywhere except beneath large lakes, rivers, and some streams that do not freeze to the bottom (EBA 2013). Soils of the Cryosolic order are the dominant permafrost soils in the Southern Arctic Ecozone, with Brunisols and Regosols commonly occurring on sandy eskers and above the permafrost zone. Turbic Cryosolic mineral soils are common in permafrost sites, with Organic Cryosols typical of the lowland soils. Most of the upland surface within this ecoregion is composed of unvegetated rock outcrops that are common on the Canadian Shield. Vegetation cover is generally characterized by shrub tundra, consisting of dwarf birch, willow, northern Labrador tea, avens (*Dryas* spp.), and *Vaccinium* spp. (CCEA 2016a). Depressional sites are dominated by willow, peatmoss (*Spaghnum spp.*), and sedge tussocks. Vegetation communities

identified at the site include sedge community, birch communities, heath tundra community, snowbank community, avens association, lichen-rock communities, ridge complex, and transition associations.

The location of the Project is particularly noteworthy because it is located along the migration path of the Bathurst Caribou Herd. Numerous mammals and birds have been observed at the site or have the potential to be at the site. Species of special concern observed or with potential to be at the site include grizzly bear, wolverine, dolphin, union caribou, peregrine falcon, red-necked phalaropes, and short-eared owls.

The Project site is located in an area where local people have traditionally used the land for hunting and camping. Twenty-five archaeological sites were identified and documented in the Project during the pre-development assessment (including artefact scatters, habitation sites, and quarries; Tahera 2003b). None of the sites were identified as having sufficient significance to require avoidance by development (Tahera 2003a). While the Project site has provided employment during its operation, the remediation of the site is an important land use planning objective for the people of the Kitikmeot region.

Site Stabilization Activities

Summary of the proposed SSP activities is provided in the table below.

Summary of Site Stabilization

Activity	Facility or Waste Stream	Comments
Re-establish the natural drainage pattern by removing the C1 diversion; construct pit overflow channel	Open pit	Re-route water into the open pit to enhance the filling time; pit lake will be created in approximately 15 years; develop outflow for the open pit once it fills with water.
Breaching the West Dam and Divider Dyke A	PKCA	The PKCA consists of two cells (Cells A and C) that are contained by a number of different dams. Breaching the West Dam (located on Cell C) and Divider Dyke A (located between the two cells) will allow surface flow out of the PKCA. Stabilization of Cell A is also required and will be completed using coarse PK.
Cover Cell A	PKCA	Covering Cell A of the PKCA will stabilize the fine PK deposits and limit the movement of PK via wind or by erosion; coarse PK will be used as cover.
Build non-hazardous landfill onsite	Non-hazardous materials	Non-hazardous landfill will be constructed primarily on bedrock-controlled terrain, designed to contain all debris from demolition works, and have an erosion resistant cap.
Grade to meet existing landscape	Berms	There are numerous berms throughout the site; berms will be graded to promote positive drainage and for aesthetics.
Operate land treatment area	Petroleum hydrocarbon (PHC) impacted soil	One or more of the lined bermed areas will be used as a treatment area; methods for treatment will be appropriate for northern conditions

Activity	Facility or Waste Stream	Comments
Remediation of metal-impacted soils	Metal-impacted soil	Metal-impacted soils will be handled as per the *Abandoned Military Site Remediation Protocol* (AMSRP), Tier 1 soils to be land treated, and Tier 2 soils to be removed offsite to a designated licensed disposal facility.
Prevent lead-based paints (LBPs) from entering the environment	LBP on above ground storage tanks (ASTs)	Blue LBP was identified on nine 62,000 L ASTs; remove residual liquids and clean tanks; cut up tanks, and leave staged for future management.
Incinerate or remove organic liquid wastes	Diesel, gasoline, Jet A, Jet B, heating oil, and other organic wastes	Incinerator to meet applicable emissions controls; containers holding organic liquid waste to be cleaned and volumes reduced for disposal; follow the AMSRP Barrel Protocol to determine if organic liquid wastes can be incinerated onsite; waste not meeting AMSRP Barrel Protocol for incineration will be transported offsite.
Depressurize gas cylinders and fire extinguishers	Pressured contents	If the contents are known and suitable for discharge, empty the contents of the cylinder/fire extinguishers into the ambient atmosphere, landfill non-hazardous containers; unknown contents will be removed offsite.
Remove hazardous waste offsite for disposal	Refrigerant, fluorescent lights, batteries, glycol, light ballasts, paint, cement, paraffin wax, and other wastes	Containerize and prepare the materials for offsite transport; ship and dispose all hazardous materials at an offsite designated licensed disposal facility.
Demolition of infrastructure	Non-hazardous materials	All hazardous materials will be removed before demolition; demolition works do not include the truck shop, process plant or facilities on IOL.

Summary

The mitigation strategies outlined for the Jericho Mine Site Stabilization Project are predicted to result in no negative residual impacts and overall the site stabilization activities of the Project will have a positive effect on the environment by restoring the site to an environmentally safe condition, preventing environmental migration of contaminants into the surrounding ecosystem, and removing the majority of the physical hazards for the protection of human health and safety.

TABLE OF CONTENTS

EXECUTIVE SUMMARY iii
1 INTRODUCTION 1
2 PROJECT DESCRIPTION 1
2.1 Scope of the Jericho Site Stabilization Project 1
2.1.1 Mobilization and Site Access 2
2.1.2 Equipment Needs 3
2.1.3 Camp Development 3
2.1.4 Site Stabilization Activities 3
2.2 Details of the Site Stabilization Plan 5
2.2.1 Schedule 5
2.2.2 Open Pit Remediation 5
2.2.3 Processed Kimberlite Containment Area 5
2.2.4 Berms 6
2.2.5 Roads 6
2.2.6 Airstrip 6
2.2.7 Contaminated Soil 6
2.2.8 Non-hazardous Materials 7
2.2.9 Hazardous Materials 8
3 ENVIRONMENTAL SETTING 9
3.1 Existing Conditions 9
3.2 Pre-development Conditions 10
3.2.1 Hydrology and Hydrogeology 10
3.2.2 Aquatics 11
3.2.3 Soils and Terrain 13
3.2.4 Vegetation 14
3.2.5 Wildlife 17
3.2.6 Culture 24
3.2.7 Socio-economics 26
4 PROJECT/ENVIRONMENTAL INTERACTIONS 28
4.1 Identification of Valued Environmental and Socio-economic Components 28
4.2 Identification of Project Impacts and Mitigations 29
4.3 Potential Impacts and Mitigations 31
4.3.1 Air Quality 32
4.3.2 Hydrology and Hydrogeology 33
4.3.3 Aquatic Ecology 35
4.3.4 Soils and Terrain 37
4.3.5 Vegetation 40
4.3.6 Wildlife 41

4.3.7 Culture 43
4.3.8 Socio-economics 44
5 MONITORING PROGRAM RECOMMENDATIONS 44
6 KNOWLEDGE DEFICIENCIES 45
7 PUBLIC CONCERNS 46
8 CONCLUSION 46
9 REFERENCES 46

LIST OF TABLES

Table 1 Summary of Site Stabilization 4
Table 2 Summary of Metal-impacted Soil 6
Table 3 Summary of Hydrocarbon-impacted Soil 7
Table 4 Summary of Non-Hazardous Waste Onsite 8
Table 5 Summary of Hazardous Waste Onsite 9
Table 6 Jericho Mine Existing Facilities and Infrastructure 9
Table 7 Observed Fish Species and Conservation Status 13
Table 8 Observed Wildlife Species and Conservation Status 18
Table 9 List of the Selection Rationale for VEC and VSEC 29
Table 10 Identification of Interaction between Project Remedial Activities and VECs or VSECs 30
Table 11 Impact Rating Criteria 31
Table 12 Assessment of Impacts on Air Quality 32
Table 13 Assessment of Impacts on Hydrology and Hydrogeology 33
Table 14 Assessment of Impacts on Aquatic Ecology 35
Table 15 Assessment of Impacts on Terrain 37
Table 16 Assessment of Impacts on Soils 38
Table 17 Assessment of Impacts on Vegetation 40
Table 18 Assessment of Impacts on Wildlife 41

APPENDICES

APPENDIX A Figures Completed by Tetra Tech EBA
APPENDIX B Nunavut Impact Review Board Project-specific Information Requirement Forms

1 INTRODUCTION

Indigenous and Northern Affairs Canada (INAC) is the custodian of most federal lands in northern Canada and has responsibility, through the Contaminated Sites Program, of managing a number of contaminated properties that are no longer maintained by the original occupant. INAC's portfolio of contaminated sites in Nunavut originated from private sector mining, oil and gas activities, and government military activity dating back over half a century, many years before the environmental impacts of such activities were adequately understood.

The INAC Nunavut Regional Office is managing the site stabilization of the Jericho Mine site (the Project). Since 1999, the Treasury Board of Canada Secretariat has approved a management framework of policies and best practices including the *Policy on Management of Real Property* (TBS 2013. Under this policy, INAC is responsible for managing the contaminated sites within their jurisdiction. Public Works Government Services Canada (PWGSC), Northern Contaminated Sites Office is managing this Project on behalf of INAC.

Matrix Solutions Inc. was retained by PWGSC on behalf of INAC to complete an Environmental Screening Report (ESR) related to site stabilization at the Project.

The Project is located approximately 250 km southeast of Kugluktuk, Nunavut (Appendix A, Figure 1). Initially opened in 2006 by Tahera Diamond Corporation (Tahera), the mine went through bankruptcy proceedings and Shear Diamonds took over the mine site in 2010. Shear did not actively mine, but reprocessed kimberlite stockpiles to recover diamonds from existing stockpiles established during Tahera's tenure. The mine ceased operation in September 2012 when Shear suspended operations. Since the spring of 2013, INAC has been undertaking basic environmental protection of the site.

The ESR is part of the application process for regulatory permitting and is required as part of the regulatory package needed to complete site stabilization activities at the mine site.

2 PROJECT DESCRIPTION

The project description section provides the objectives for the Project, and a scope and description of activities that will be completed during the Project. It provides a summary of the work that will be completed onsite that is sufficient to understand the interactions, mitigations, and impacts that will occur due to project activities. The summary of work to be completed is based on the Jericho Mine SSP (PSPC 2016) and the *Remedial Options Analysis Rev 02* report (Tetra Tech EBA 2015).

2.1 Scope of the Jericho Site Stabilization Project

The objectives of the Project are to reduce environmental and financial liabilities, provide benefits to the local community and Inuit, and ensure value to the people of Canada.

More specifically, the SSP will accomplish the following:

- stabilize the site to prevent water accumulation
- restore the site to an environmentally safe condition, and
- prevent environmental migration of contaminants into the surrounding ecosystem

Implementation of the SSP may create economic and social benefits for the Inuit community of Kugluktuk and potentially other communities in Nunavut. The Project could provide direct employment for community members who work on the Project, and spin-off employment and economic benefits for any northern persons or businesses that are directly or indirectly involved in the Project.

The Project site consists of an open pit, causeway, processed kimberlite containment area (PKCA), tank farm, pads, roads, contaminated soil, and hazardous and non-hazardous materials from equipment, infrastructure, and fuels. Significant site stabilization efforts include:

- expediting pit filling by re-aligning the current diversion (called the C1 diversion) back to the natural drainage pattern and allowing water flow back into the pit
- breaching the West Dam and Divider Dyke A containing the PKCA to allow surface water flow out of the PKCA
- covering the PKCA
- grading pads and borrow areas
- excavating contaminated soil
- building demolition
- landfill construction
- disposal of non-hazardous material
- offsite disposal of hazardous waste
- land treatment for the remediation of hydrocarbon contaminated soils

Detailed figures of the onsite facilities from the *Remedial Options Analysis Rev 02* report (Tetra Tech EBA 2015) are provided in Appendix A (Figures 1 to 7).

2.1.1 Mobilization and Site Access

Equipment required for remediation will be mobilized via winter road. The road will be built to Ekati by the Joint Venture Winter Road Group (approximately 400 km) and the Project contractor will be responsible for building the road from Ekati to the Project (approximately 200 km). Of the Ekati to Jericho section, approximately 180 km is ice road and 20 km is on land. There is an existing road network at the site that will be used to complete the SSP.

It is estimated that 20 to 25 truckloads of equipment and supplies will be required for the work and will mobilize on the winter road. Approximately five truckloads of hazardous waste are expected to be transported offsite.

2.1.2 Equipment Needs

The SSP anticipates the following equipment needs for this Project:

- excavators to improve roads, move contaminated soils for treatment, and contour the site
- dozers for landfill construction and road improvements
- front end loaders to consolidate materials and for trail and/or road improvements
- haul trucks to move materials to staging and treatment areas
- water truck to haul water to camp, if required, or for dust suppression
- waste incinerators (both for the camp waste and for incineration of certain materials currently located onsite such as organic liquids)
- aqueous liquid waste treatment system to treat aqueous liquids for onsite disposal
- waste compactor
- drum crusher
- packer to ensure compaction is appropriate with natural terrain, and for landfill construction and operation
- generators
- ATVs with trailers
- other miscellaneous equipment determined necessary by the Contractor

2.1.3 Camp Development

There are camp facilities onsite, but they have started to deteriorate and are not currently considered appropriate for housing work crews. Restoration work on the existing camp will be completed before remediation work starts and work crews will stay in the existing camp facilities.

2.1.4 Site Stabilization Activities

The SSP is broken into three main components of work: earth works, environmental, and demolition. The ESR follows the work descriptions as provided in the SSP. Table 1 contains a summary of the remedial activities proposed for the Project. Section 2.2 provides additional details for the activities and associated waste streams.

Table 1 Summary of Site Stabilization

Activity	Facility or Waste Stream	Comments
Re-establish natural drainage pattern by removing the C1 diversion; construct pit overflow channel	Open pit	Re-route water into the open pit to enhance the filling time; pit lake will be created in approximately 15 years; develop outflow for the open pit once it fills with water.
Breaching the West Dam and Divider Dyke A	PKCA	The PKCA consists of two cells (Cells A and C) that are contained by a number of different dams. Breaching the West Dam (located on Cell C) and Divider Dyke A (located between the two cells) will allow surface flow out of the PKCA. Stabilization of Cell A is also required and will be completed using coarse processed kimberlite (PK).
Cover Cell A	PKCA	Covering Cell A of the PKCA will stabilize the fine PK deposits and limit the movement of PK via wind or by erosion; coarse PK will be used as cover.
Build non-hazardous landfill onsite	Non-hazardous materials	Non-hazardous landfill will be constructed primarily on bedrock-controlled terrain, designed to contain all debris from demolition works, and have an erosion resistant cap.
Grade to meet existing landscape	Berms	There are numerous berms throughout the site; berms will be graded to promote positive drainage and for aesthetics.
Build land treatment area	PHC-impacted soil	One of the lined bermed areas will be used as a treatment area; methods for treatment will be appropriate for northern conditions.
Remediation of metal impacted soils	Metal-impacted soil	Metal-impacted soils will be handled as per the *Abandoned Military Site Remediation Protocol* (AMSRP); Tier 1 soils to be land treated and Tier 2 soils to be removed offsite to a designated licensed disposal facility
Prevent lead based-paint (LBP) from entering the environment	LBP on above ground storage tanks (ASTs)	Blue LBP was identified on nine 62,000 L ASTs; remove residual liquids and clean tanks; cut up tanks and leave staged for future for future management.
Incinerate or remove organic liquid wastes	Diesel, gasoline, Jet A, Jet B, heating oil, and other organic wastes	Incinerator to meet applicable emissions controls; containers holding organic liquid waste to be cleaned and volumes reduced for disposal; follow the AMSRP Barrel Protocol to determine if organic liquid wastes can be incinerated onsite; waste not meeting AMSRP Barrel Protocol for incineration will be transported offsite.
Depressurize gas cylinders and fire extinguishers	Pressured contents	If the contents are known and suitable for discharge, empty the contents of the cylinder/fire extinguishers into the ambient atmosphere, landfill non-hazardous containers; unknown contents will be removed offsite.
Remove hazardous waste offsite for disposal	Refrigerant, fluorescent lights, batteries, glycol, light ballasts, paint, cement, paraffin wax, and other wastes	Containerize and prepare the materials for offsite transport; ship and dispose all hazardous materials at an offsite designated licensed disposal facility.
Demolition of infrastructure	Non-hazardous materials	All hazardous materials will be removed before demolition; works do not include the truck shop or the process plant or facilities on IOL.

2.2 Details of the Site Stabilization Plan

Section 2.2 provides additional detail on the remedial activities that were presented in Section 2.1.4.

2.2.1 Schedule

Equipment will be mobilized to site during February/March 2017. Site stabilization activities will be completed May to October 2017, and then equipment mobilized offsite in February/March of 2018.

2.2.2 Open Pit Remediation

Establishing the natural surface water flow patterns by removing C1 diversion (Appendix A, Figure 5) will expedite pit filling and provide a fresh source of recharge for the pit lake. Diverting the C1 stream back to the pit is a necessary site stabilization measure because it restores the natural flow path through the pit area and provides a consistent source of inflow for the pit lake. It also removes any question about long-term performance of the C1 diversion and significantly reduces pit filling times.

Rerouting the C1 diversion to fill the pit will temporarily suspend concentrated flow downstream of the C1 diversion Reach C. This will not have an impact on Carat Lake, but will impact any potential fish habitat along the flow path. In addition, the pit is expected to need an outflow pathway to Carat Lake that will prevent erosion of the intervening tundra.

Pit lake water quality modelling will be completed as part of a detailed closure design, and regular water quality testing will be completed on pit water to identify loading trends and pit infill rates. The nominal pit lake water elevation of 479 m will leave a portion of the southern pit high wall exposed.

2.2.3 Processed Kimberlite Containment Area

The PKCA consists of two cells (Cells A and C) that are contained by a number of different dams (Appendix A, Figure 2). Breaching the West Dam (located on Cell C) and Divider Dyke A (located between the two cells) will allow surface flow out of the PKCA. Stabilization and capping of Cell A is also required and will be completed using coarse PK.

The long-term closure strategy for the PKCA needs to address two major items:

- surface water management – how to handle the existing water-impounding structures, which include the West Dam, Divider Dyke A, and North Cofferdam
- stability – this includes surface stability of exposed PK as well as long-term stability of the water retention structures

Water quality in the PKCA meets discharge criteria and is not expected to deteriorate in the long-term; therefore, there is no specific requirement to capture and treat contact water as part of reclamation activities.

The chosen site stabilization option for the PKCA is to breach the West Dam and Divider Dyke A to allow surface flow out of the area. The West Dam would be breached near the original lake elevation of 514.4 m to direct water along the original flow path. The dam would be breached along the north abutment exposing the natural contact along the north side of the dam alignment, and sloping the remaining dam structure back at a 3H:1V slope. Armouring would be placed along the channel bottom and sideslopes. Breaching the West Dam will lower the water levels to a point where the North Cofferdam no longer holds water and therefore no stabilization action is required on the North Cofferdam. To promote flow between Cells A and C, Divider Dyke A would be notched at its north. The design section would have a 6H:1V sideslope to discourage snow accumulation and to permit vehicle passage to the West Dam. The channel bottom and sideslopes would be armoured with coarse PK to prevent erosion damage. The coarse PK will also be used as a cover for Cell A. Additional details are provided in Tetra Tech EBA (2015).

2.2.4 Berms

There are numerous berms around pads and laydown areas throughout the site that will be graded to promote positive drainage and to improve aesthetics.

2.2.5 Roads

The road network will be left in place to facilitate long-term monitoring at the site.

2.2.6 Airstrip

The airstrip (Appendix A, Figure 7) is necessary for long-term monitoring at the site so no remediation is planned. In addition, the established northern precedent is to leave airstrips in place. A small amount of supporting infrastructure, such as the terminal building, will be left intact to support future transport at the airstrip, for long-term monitoring needs, and as an emergency shelter. All non-hazardous debris that is located outside the airstrip and terminal building will be landfilled.

2.2.7 Contaminated Soil

Approximately 64 m^3 of metal-impacted soil is onsite in three locations (Table 2). Metal-impacted soil will be excavated and handled as per the *Abandoned Military Site Remediation Protocols* (INAC 2008).

Table 2 Summary of Metal-impacted Soil

Location	Metal Exceedance	Volume (m^3)
Contaminated Soils Storage Area	Chromium, nickel, zinc	2
Truck Shop and Laydown Area	Chromium, molybdenum, nickel	25
Carat Lake Laydown Area	Zinc	37
	Total	**64**

Approximately 7,854 m^3 of PHC-impacted soil is onsite (Table 3). PHC-impacted soils will be landfarmed onsite. The landfarm will be constructed within the existing tank berms. PHC soils are typically landfarmed in 0.3 m lifts and this corresponds to a floor area of 26,000 m^2. The generalized landfarm design consists of a bermed enclosure graded to direct runoff to a sump area at one corner. The area is lined to prevent contaminant migration and the berms are sized to accommodate runoff from a 1:10 24-hour storm event. The liner system comprises a high density polyethylene liner, sandwiched between layers of non-woven geotextile for protection. Contaminated soil is spread in a thin layer over the landfill base and tilled to encourage biodegradation of the hydrocarbon-impacted soils. It is expected that the PHC soils can be remediated even though they contain heavy-end hydrocarbons. However, amendments to the PHC contaminated soil, such as oxidizers, may be required to effectively treat the soil within the Project schedule.

Table 3 Summary of Hydrocarbon-impacted Soil

Location	Metal Exceedance	Area (m^2)	Volume (m^3)
Airstrip	Benzene, ethylbenzene, PHC F2 to F4[1]	415	300
Contaminated Soils Storage Area	PHC F2 to F4, benzo(b+j)fluoranthene, benzo(k)fluoranthene, fluorene, phenanthreene, and pyrene	2,495	3,076
Hazardous Waste Transfer Area (HWTA)	PHC F2 to F3	550	275
Waste Rock Pile	PHC F2 to F3	7	3.5
Phase 2 Tank Farm	PHC F2 to F4	3,376	1,688
Phase 1 Tank Farm	PHC F2 and F3, acenaphthene, fluorene, phenanthrene, and pyrene	2,533	1,267
Genset and Fuel Berm	PHC F1 to F3	277	388
Truck Shop and Laydown Area	PHC F2 to F4	887	546
Carat Lake Laydown Area	PHC F2 to F4	192	155
Process Plant	PHC F2 to F4	130	130
Reclaimed Carat Camp	PHC F1 to F3	10	25
		Total	**7,854**

1. Fraction 2 (F2; $C_{>10}$-C_{16}), fraction 3 (F3; $C_{>16}$-C_{34}), and fraction 4 (F4; $C_{>34}$)

2.2.8 Non-hazardous Materials

Non-hazardous waste includes materials such as wood, metal, ASTs, drums, rubber, concrete, plastic, and other inert items. It also includes major structures such as the truck shop, process plant, and camp facility. The non-hazardous materials have been divided into three waste streams: wood, other non-hazardous waste, and major structures.

A description of the non-hazardous material found onsite is provided in Table 4. This material will be landfilled onsite. Non-hazardous materials will be separated from hazardous materials and all buildings, with the exception of the truck shop and the process plant, will be demolished. Containers containing liquid organic wastes will be emptied and cleaned. Fuels and liquids will be removed from machinery.

Metals, drums, machinery, and other materials will be crushed. The landfill will be built as per details in the *Remedial Options Analysis Rev 02* report (Tetra Tech EBA 2015).

Table 4 Summary of Non-Hazardous Waste Onsite

Material	Units and/or Volume Uncrushed (m^3)	Description[1]	Volume Crushed (m^3)
Wood	980 m^3	This includes all wood buildings	980
Wood Items	702 units	Desks, shelves, beds, and tables	351
Metal	15,722 m^3	This includes trailers and metal buildings	11,791
Metal Items	204 units	Furnaces, washers/dryers, kitchen sinks, kitchen washer, TV's, electrical equipment, filing cabinets, stove, water tanks, computers, and wall heaters	51
Sea Cans	1,174 units	Scattered throughout site	294
Miscellaneous Inert Materials	596 m^3	Canvas, plastic, rubber, empty containers, clean spill pads, tarps, crates, etc.	596
Miscellaneous Inert Materials	494 units	Chairs, porcelain sinks, toilets, smoke detectors, etc.	124
Concrete	154 m^3	Blocks, floors, etc.	154
Vehicles/Machine Items	28 units	Trucks, construction equipment, and machines	280
Drums, Empty	587 m^3	Intact drums throughout site	76
Tarp Tented Shops	6,186 m^3	Three tented shops onsite	619
Major Structures - Camp Facility	18,694 m^3	Exterior dimensions of the structure (5,341 m^2 area and 3.5 m height)	7,477
ASTs	12 units	Four 1,500,000 L and eight 500,000 L ASTs in Tank Farms 1 and 2 (emptied and cleaned before disposal)	6,200
Total			**28,993**

1. Amounts do not include the truck shop, process plant, or the metal from the tanks painted with LBP.

2.2.9 Hazardous Materials

Hazardous materials onsite include fluorescent lights; fire extinguishers; compressed gas, refrigerants, organic liquids, contaminated soil, batteries, and other miscellaneous wastes (Table 5). Waste that cannot be properly identified or classified will be classified as hazardous.

Organic liquid waste in drums, tanks, and pipelines that meet incineration guidelines will be incinerated onsite, otherwise it will be removed and disposed offsite at an approved waste facility. Compressed gas cylinders and fire extinguishers will be depressurized to atmosphere if acceptable, crushed and landfilled. Known or unknown contents that cannot be safely depressurized onsite will be transported offsite for disposal. Miscellaneous hazardous waste (e.g., batteries, mercury vapour in fluorescent lights, paint, oil absorbent, oils, lubricants, glycol, paraffin wax, bentonite, cement, preservatives, biomedical, and pharmaceutical waste) will be packaged and transported to an approved waste facility. Other hazardous materials will be transported offsite. ASTs painted with LBP will be cut and stored onsite for future management.

Table 5 Summary of Hazardous Waste Onsite

Material	Units and/or Volume (m^3) s	Description
LBP on ASTS	28 m^3	Paint only stripped in areas to allow for safe cutting of the tanks; volume includes paint and sand required for stripping
Fluorescent Lights	1,674 units/2 m^3	Mostly located in the major structures
Fire Extinguishers	284 units/1 m^3	Mostly located in the major structures
Compressed Gas Cylinders	380 units/13 m^3	Oxygen, propane, etc.
Refrigerant Items	20 units/10 m^3	Fridges, freezers, air conditioning units, and refrigerant
Soil in Drums and Containers	100 m^3	Unknown contaminants in soil
Organic Content in Drums, ASTs, Tanks, Containers, Pails (Fluid Volume Only)	888 m^3	Eight 50,000 L tanks (#1-8), volumes unknown, some diesel in the bottom observed and some in pipes; includes miscellaneous organic liquids in drums
Materials in ASTs, Tanks, Containers, Flammable Cabinets	270 m^3	Includes glycol, powder, liquid, solid hazardous chemicals, and other materials
Batteries	109 units/3 m^3	Mostly vehicle lead acid batteries
Total	**1,315 m^3**	n/a

3 ENVIRONMENTAL SETTING

3.1 Existing Conditions

The mine ceased operation in September 2012. The current baseline conditions of the Jericho Mine consists of an open pit, causeway, PKCA, tank farm, pads, roads, contaminated soil, and hazardous and non-hazardous materials from equipment, infrastructure, and fuels (Appendix A, Figures 1 to 7).

The primary developed areas include the airstrip, which is located on the north portion of the mine, and a camp and main processing area (main site) that are located in the south portion of the site (Tetra Tech EBA 2014). Roughly 161 ha have been developed for the Project (Table 6).

Table 6 Jericho Mine Existing Facilities and Infrastructure

Component	Approximate Area (ha)[1]	Description
Open Pit	16	Current pit is roughly 450 m wide and 80 m deep (Figure 5)
Waste Rock Pile	30	Waste rock generated from open pit (Figure 5)
Low Grade Stockpiles	12	Overburden storage area (Figure 4)
Coarse Kimberlite Stockpile	6	Coarse PK from the process plant (Figure 3)
Roads	16	Includes haul, access, and airport roads (Figures 2-7)
Airstrip and Associated Areas	17	Airstrip is 1,374 m long by 30 m wide, terminal, and adjacent disturbed areas (Figure 7)
PKCA	32	Cells A and C, various containment dykes and dams (Figure 2)

Component	Approximate Area (ha)[1]	Description
Main Processing Area (Main Site)	17	Includes process plant, camp facility, truck stop, waste water treatment, tank farms, helipad, laydown area, and shed (Figure 3)
East Sump	2	Sedimentation pond (Figure 3)
Borrow Area A	5	Borrow material used for construction of the airport road (Figure 6)
Other Areas	8	Carat Lake laydown, HWTA, other miscellaneous areas
Total	**161**	

1. Estimated based on Tetra Tech EBA figures (Appendix A, Figures 2 to 7)

3.2 Pre-development Conditions

The following sections provide pre-development information for the Project. Much of the pre-development information was taken from the original *Environmental Impact Statement* produced by Tahera (2003a). This pre-development information will aid in the final reclamation plan targeted for the Project; however, the SSP's objective is to restore the site to an environmentally safe condition from the current existing conditions and have positive impact to the site.

3.2.1 Hydrology and Hydrogeology

The summary information provided in this section is mainly based on the environmental baseline studies for the Project (Tahera 2003b). The Project lies within the low Artic region with a climate characterized by short, relatively cool summers and cold winters. The difference between summer and winter mean temperatures is 40°C. The average annual precipitation is approximately 300 mm with almost equal proportions of rain and snow. Evapotranspiration takes place mainly during the four snow-free months of the year resulting in fairly high proportion of precipitation ending up as runoff to lakes and streams. The mean annual runoff is approximately 190 mm.

The dominant surface water features in the area include Jericho River, Carat Lake, small watercourses and shallow, single basin lakes with low shoreline development. The Jericho River, which drains the Project area, has a catchment area of about 227 km^2. The river flows north via Kathawachaga Lake and the Burnside River before discharging into the Arctic Ocean. At its outlet, Carat Lake accounts for approximately 65% of the total area draining to the Jericho River. The other smaller lakes are shallow and interconnected by creeks through low-lying marshlands, all of which typically freeze to the bottom during winter. The hydrologic conditions are governed by coarse esker material on the highland area and permafrost underlying the entire area, except beneath the Jericho River and Carat Lake that do not freeze to the bottom in winter.

Seasonal runoff trends reflect the cold climate of the region and could also be influenced by storage provided by several lakes and marshlands. Prolonged period of sub-zero temperatures during winter causes the flow in smaller creeks to cease completely for a period up to 8 months. Even some of the larger watercourses can completely freeze to the bottom, unless their flows are sustained by releases

from large lake storage or by a significant groundwater discharge. Generally, snowmelt arrives in June and sometimes produces very high peak hydrographs for the small creeks that do not have large upstream storage. However, lake storage tends to attenuate the runoff response in the larger catchments. For some rivers in the region, lake storage is large enough to delay the annual runoff peak into July.

Lakes within the Jericho watershed are oligotrophic with phosphorus as the nutrient limiting primary productivity (Tahera 2003b). The pH is neutral to slightly acidic with very low concentrations of total dissolved solids (<20 mg/L) and little to no suspended solids (<20 mg/L and typically below 6 mg/L). Within the Project area, total suspended solids (TSS) were below 20 mg/L and typically less than 6 mg/L. Water is very soft (hardness <25 mg/L) and very low alkalinity (<25 mg/L). Other physical parameters are also very low in concentration. Water is very close to distilled water and has nearly no buffering or metal absorption capacity. Most total and dissolved metals and nutrient concentrations are below analytical detection limits. Aluminum, calcium, magnesium, silicon, strontium, iron, and zinc as well as nutrient species (ammonia, nitrate, nitrite, and total dissolved phosphorus) that are detectable in some samples are below the Canadian Council of Ministers of the Environment (CCME) freshwater aquatic life guidelines. There are no appreciable spatial trends in water quality within the Jericho watershed; however, temporal trends exist for water temperature and dissolved oxygen concentrations, reflective of open water and ice cover conditions, and seasonal climate variations in air temperature and solar radiation. The deeper lakes in the watershed normally stratify during summer, but no significant change in metal concentrations with depth has been observed. Dissolved oxygen concentrations typically decrease with depth in both stratified and non-stratified lakes due to oxygen demand from bottom sediment. Sediment quality could be variable, and reflect the local geology of the watercourses and water bodies.

Groundwater was not detected in drill holes in the Project area nor in the underground bulk sample collected during the Project baseline study (Tahera 2003b). The presence of permafrost to depths of 540 m is expected to prevent or appreciably limit groundwater flow. The permafrost acts as a barrier to the movement of groundwater and infiltrating surface water would be expected to follow the local contours of any permafrost (and/or bedrock in areas of shallow overburden) toward low-lying areas. Analysis of one ice sample, found to be infilling joints in the rock, during the Project baseline study indicates that aluminum, chromium, copper, iron, lead, nickel, silver, and zinc exceed the CCME freshwater aquatic life guidelines.

3.2.2 Aquatics

The Project is located within the Jericho River watershed that drains into the Queen Maud Gulf. A discussion on the hydrology and drainage patterns is presented in Section 3.2.1 (Hydrology and Hydrogeology). The Project area drains into several small water bodies and watercourses and then into Carat Lake (north of the Project area), Control Lake (west of the Project area), and Contwoyto Lake (east of the Project area). The Jericho River, which drains the Project area, has a catchment area of about

227 km^2. The river flows north via Kathawachaga Lake and the Burnside River before discharging into the Arctic Ocean. At its outlet, Carat Lake accounts for approximately 65% of the total area draining to the Jericho River. The other smaller lakes are shallow and interconnected by creeks through low-lying marshlands, all of which typically freeze to the bottom during winter. The hydrologic conditions are governed by coarse esker material on the highland area and permafrost underlying the entire area, except beneath the Jericho River and Carat Lake that do not freeze to the bottom in winter.

A baseline aquatic ecology study was conducted in the Jericho study area by RL&L Environmental Services Ltd. in 2000 (RL&L 2000). Water bodies sampled included Carat Lake, Control Lake, Contwoyto Lake, and two unnamed water bodies to the east and southwest of the Project area. Four watercourses that drain into these water bodies also had aquatic ecology assessments conducted.

Five species of fish were documented in the water bodies and watercourses within the study area. These included Arctic Char (*Salvelinus alpinus* [Linnaeus]), Burbot (*Lota lota*), Lake Trout (*Salvelinus namaycush* [Walbaum]), Round Whitefish (*Prosopium cylindraceum*), and Slimy Sculpin (*Cottus cognatus*) (Table 7).

A tagging program was conducted from 1995 to 2000 to determine movement of Arctic Char and Lake Trout between water bodies in the Project area (RL&L 2000). Results indicated that movement occurred between Carat Lake and Jericho Lake. Movement between other water bodies in the Project area was determined to be limited to high flow events, as the connections between lakes were shallow and dominated by large boulder substrates that could inhibit fish migration. Results also indicated that Lake Trout remained relatively stationary in each water body, with minimal movement to other systems.

Water bodies in the Project area were assessed for habitat suitability by RL&L (2000). Most shorelines consisted of coarse substrates of cobble and boulder, and varying slopes. These areas were determined to provide suitable spawning habitats for lake dwelling species including Arctic Char, Lake Trout, and Round Whitefish. In contrast, RL&L (2000) found that these same lakes had very limited suitable rearing habitats for these same species. Sampled water bodies were also described as having significantly low annual fish yield due to low nutrient levels, cold water temperature regime, and a short open water period. Although these conclusions indicated that these water bodies had relatively low productive capacity, it could be suggested that these fish populations and fish habitat are highly sensitive to anthropogenic changes to the aquatic ecology. Fish populations with slow growth rates, limited rearing habitat, and low overall productivity could display a greater response and longer recovery time to a negative anthropogenic effect such as an accidental release.

Watercourses draining from the Project area were considered to be ephemeral with limited fish habitat potential for resident fish species (RL&L 2000). All watercourses assessed had nil potential for spawning and adult feeding habitats, while three watercourses had low potential for rearing habitat. All watercourses were observed to freeze to substrate during the winter months with limited flows in open water seasons (RL&L 2000).

Fisheries and Oceans Canada (DFO) describes Nunavut restricted activity timing windows for the protection of fish and fish habitat (DFO 2013a). Restricted activity timing windows have been identified for Nunavut water bodies and watercourses to protect fish during spawning and incubation periods when spawning fish, eggs, and fry are vulnerable to disturbance or sediment (DFO 2013a). Watercourses and water bodies in the Project area are located in Zone 2. Due to the presence of both spring and fall spawning fish species, instream work should be avoided from August 15 to July 15 of every year.

Table 7 Observed Fish Species and Conservation Status

Common Name	Scientific Name	Spawning Season	COSEWIC Status[1]	SARA Status[1]	SARA Schedule[1]
Arctic Char	*Salvelinus alpinus* (Linnaeus)	Fall	Group 3- low priority candidate	n/a	n/a
Burbot	*Lota Lota*	Late fall/winter	Not listed	n/a	n/a
Lake Trout	*Salvelinus namaycush* (Walbaum)	Fall	Group 3- low priority candidate	n/a	n/a
Round Whitefish	*Prosopium cylindraceum*	Fall	Group 3- low priority candidate	n/a	n/a
Slimy Sculpin	*Cottus cognatus*	Spring	Group 2- medium priority candidate	n/a	n/a

1. Based on federal database as of July 2016.

3.2.3 Soils and Terrain

Local topography in the Project area is mainly the result of previous glaciations. The water surface in Carat Lake is approximately 470 m above mean sea level (amsl). The topographic highs in the areas surrounding the project facilities range from approximately 500 to 550 m amsl (SRK 2003). At the central mine facilities and the stockpile areas, the topography is relatively flat and gently slopes to the north. Beyond the Project, the topography is gently rolling to hilly. South and east of the Project includes an increase in elevation of approximately 100 m over a distance of 500 m (AMEC 2007).

Post-glacial processes have caused weathering of glacial deposits and near-surface rock in the tundra. The Project is located in a region where the permafrost is present everywhere except beneath large lakes, rivers, and some streams that do not freeze to the bottom (EBA 2013). Permafrost is nearly continuous and has low to medium ice content (CCEA 2016b). Soils of the Cryosolic order are the dominant permafrost soils in the Southern Arctic Ecozone, with Brunisols and Regosols commonly occurring on sandy eskers and above the permafrost zone. Turbic Cryosolic mineral soils are common in permafrost sites, with Organic Cryosols typical of the lowland soils. The mineral soils exhibit discontinuous or distorted soil horizon development (EBA 2013).

The baseline soils for the Project were not inventoried or described in the environmental impact study (EIS), and impacts of the Project on soils and landforms were not assessed. Although not documented, mineral A horizon topsoil is assumed to have been minimal, where present beneath thin LFH (leaf-litter-

humic) horizons. The LFH (organics) in boreholes advanced north of the HWTA and east of the open pit was reported to have a thickness of less than 2 to 15 cm (Tetra Tech EBA 2014). Thicknesses for other soil horizons were not presented. AMEC (2004) reported surficial deposits were comprised mainly of sand and gravel, with some areas/zones of silt and till, with cobbles and, occasionally, boulders in the overburden. As initially proposed, the majority of the land that was proposed to be disturbed by the Project (Tahera 2003a) was identified as upland including birch community (Moist Birch Meadow ecological zone), heath tundra (Dry Barren Land ecological zone), and Lichen-rock communities (Dry Rocky Tundra ecological zone). The Project was also planned to be developed on a small amount of lowlands sedge community (Wet Grass/Sedge/Birch Meadow ecological zone) and some ridge complex (Esker/Kame Delta ecological zone).

3.2.4 Vegetation

The Project is located within the Takijuq Lake Upland Ecoregion of the Southern Arctic Ecozone (CCEA 2016a). Most of the upland surface within this ecoregion is composed of unvegetated rock outcrops that are common on the Canadian Shield. Vegetation cover is generally characterized by shrub tundra, consisting of dwarf birch, willow, northern Labrador tea, avens (*Dryas* spp.), and *Vaccinium* spp. (CCEA 2016a). Depressional sites are dominated by willow, peatmoss (*Spaghnum* spp.), and sedge tussocks. Scattered stands of spruce also occur along the southern boundary. Plant communities within the Project area are representative of the surrounding tundra biome (CCEA 2016a).

The low areas within the Project area are inhabited by sedge communities, including non-tussock and tussock sedge associations. The major sedge communities occur between open pit and Carat Lake, where a well-defined stream drains down from Carat Lake and other small ponds. In the channels of these larger streams, birches and willows grow together, creating low riparian forests (Tahera 2003b).

Sedge basins blend into hummock communities, which in turn blend into heath tundra, which covers a larger portion of the uplands. Heath tundra crowns most hills, where there are no bedrock outcrops, and occurs on many slopes. Bedrock outcrops, such as those on the hill to the southwest of the open pit, in the proposed plant site, characteristically bear few rooted plants, but are covered by a varied flora of crustose lichens. Boulder fields and felsenmeer form a mosaic across the land, and are occupied mostly by crustose lichens and a web of fruticose and foliose lichens between the boulders. At the edges of many boulder fields, birch seeps indicate reliable sources of water (Tahera 2003b).

A large esker system (or kame delta) extends from the reclaimed Carat Camp north (Appendix A, Figure 6). It exhibits typical esker complex communities; crests with patches of blueberry, bearberry, and prickly saxifrage; windward slopes with heath tundra; and leeward slopes with a fringe of dwarf birches along the slope, ponds, and sedge communities in the low areas (Tahera 2003b).

Snowdrifts collect in the ravines, and last into mid-summer, creating snowbank communities. These include areas with bog laurel, mountain heather, violets, and other species normally found in the

treeline and northern part of the taiga (Tahera 2003b). The valley at the west end of Long Lake and the south-facing slopes on the north side of Long Lake had snowbank communities (Appendix A, Figure 1).

Vegetation surveys were completed in 1995 and 1999 (Burt 1999) to delineate ecological zones. The plant communities identified at the Jericho site include the sedge community, birch community, heath tundra community, snowbank community, avens association, lichen-rock communities, ridge complex, transition associations and disturbed sites. Each vegetation community is described briefly below.

Sedge Community

Sedge communities typically occur in drainage basins, depressions, or at the edges of water bodies such as lakes and ponds. They are typically wetlands, with standing or slowly flowing water during most of the growing season where the soil are saturated with water. Sedges (*Carex* spp.) or arctic cotton, also known as cottongrass (*Eriophorum* spp.), make up the dominant vegetation in these communities (Burt 1999). The sedge communities typically occur in the Wet Grass/Sedge Meadow ecological zone. The sedge community also has three associations including emergent association, sedge association non-tussock, and sedge association tussock.

Birch Community

Birch communities occur where there is a consistent and reliable supply of water throughout the growing season, but where water does not pool or stand on the ground. They are characterized by the fact that the dwarf birch (*Betula glandulosa*) is the dominant species (Burt 1999). They vary in their location due to the amount of water available throughout the growing season. The birch community is also known as the Moist Birch Meadow ecological zone.The birch community has two associates including birch riparian and birch seeps.

Heath Tundra Community

The heath tundra is the climax community in the Contwoyto Lake area and covers most of the upland where the soil is stable or deep enough to support rooted plants. The term “heath” refers to plants of the Ericaceae family and is used as a general term to describe this group of plants, which often grow in association with each other in the Dry Barren Tundra ecological zone. The heath tundra community is characterized by a mixture of heaths, forbs, small xeric sedges, and grasses. The composition of the vegetation of the heath tundra community is governed by the amount of water in the soil, soil amount and type, and exposure to wind (Burt 1999).

Terrain features are the most important cause of variations in the heath tundra community, especially those that affect the amount of water available to plant roots or those that cause the soil to be more exposed to winds in winter than in surrounding areas. Heath tundra community has three associations including upland heath tundra, heath tundra on frost scars, and heath tundra on solifluction slopes.

Snowbank Community

The Snowbank Community is the result of deep snowbanks of south or east facing slopes where the snow does not melt before July, which results in a shortened growing season. Snowbank communities are composed of willow (*Salix herbacea*), Labrador tea, and the white arctic heather. Mountain sorrel (*Oxyria digyna*), saxifrage (*Saxifraga punctata* and *S. nivalis*), and pussytoes (*Antennaria eckmaniana*) are often also present (Burt 1999).

Avens Association

Avens Association is a fairly uncommon plant association occurring in "saddles" and on slopes with little soil cover with gravel ranging in size from 5 mm to 1 cm. This association is dominated by mountain avens (*Dryas integrifolia*) with reticulated willow (*Salix reticulata*), Lapland rosebay, alpine milkvetch (*Astragalus alpinus*), and arctic oxytrope (*Oxytropis arctica*) (Burt 1999). Arctic bluegrass (*Poa arctica*), tufted hari grass (*Deschampsia caespitos*a), and northern single spike sedge (*Carex scirpoidea*) are also present (Burt 1999).

Several species of small willows (*Salix reticulata*, *S. herbacea*, *S. glauca*, and *S. arbusculoides*) *occur here*. Black bearberry (*Arctostaphylos alpina*), purple mountain saxifrage (*Saxifraga oppositifolia*), star chickweed (*Stellaria* sp.), and false asphodel (*Tofieldia pusilla* and *T. coccinea*) are sometimes present in small numbers (Burt 1999). Frost boils are also common in this association and are often found with legumes, small sedges, and Lapland rosebay, heaths, and avens on the surrounding ridges (Burt 1999).

Lichen-Rock Community

In the Project area, most rocks are about 80% covered with crustose lichens. In areas where there are lots of boulders or fractured bedrock in the substrate, rooted vascular plants are uncommon, and the plant association is made up of lichens growing on and around the rocks in the Dry Rocky Tundra ecological zone. The species of lichen inhabiting the rock usually depends on the chemical composition of the rock, the amount of weathering or fracturing, and the exposure to wind abrasion. The lichen flora of rocks in the Project area is generally a flora typical of acidic rocks rather than calcareous rocks (Burt 1999).

The typical lichen flora found on boulders, felsenmeer, and on bedrock outcrops include rock tripe (*Umbilicaria* sp.), map lichen (*Rhizocarpon geographicum*, *R. geminatum*), sunburst (*Arctoparmelia centrifuga, A. incurvata*), bloodspot (*Haematomma lapponicum*), *Pseudophebe minuscula* and *P. pubescens* (called brush-cut lichens), *Tremolecia atrata* (Halloween lichen), and grey and black crustose lichens.

The orange jewel lichen (*Xanthoria elegans*) occurs where siksiks use the boulders for lookouts; it is characteristic of calcareous rocks and places high in nitrogen, growing on the urine and feces of the ground squirrels. This association also has three associations including boulders in heath tundra, boulder field associations, and bedrock associations.

Ridge Complex

The ridge complex has two associations including ridge crest communities and ridge slope communities. The location on the ridge greatly affects what plants are located in the Esker/Kame Delta ecological zone. The ridge crest community is exposed to high winds and occupies unstable sand or gravel material. The ridge crest community typically consist of mats of blueberry, crowberry, black bearberry, Labrador tea, and mountain avens. There is also the presence of semi-succulent plants (*Antennaria* sp., prickly saxifrage, *Draba glabella* and *D. lactea*), deeply rooted cushion plants like moss campion (*Silene acaulis*), or clumps of grass (*Poa* spp., *Arctagrostis latifolia*, *Festuca brachyphylla*, or *Arctophila* sp.). The tiny sandwort (*Minuartia rubella)* can also be found in some of these very dry, very unstable sites. A few legumes were also found including *Oxytropis arctica* and *Astragalus alpinus* (Burt 1999).

The ridge slope communities can have varying exposure, orientation, and steepness. Slopes facing away from the prevailing winds may support a fringe of dwarf birches with an understory of crowberry, blueberry, Labrador tea, arctic heather, mountain cranberry, and occasionally large-flowered wintergreen and pussytoes (Burt 1999).

Transitional Associations; Hummock Zone

Transitional associations are where two communities meet with a gradual blending of the two communities across a broad area. An example of this is the hummock zone, which occurs in the transition between the sedge community and heath tundra. This association is classified as its own association due to its diverse microclimates, complex mosaic with a high number of plant species (Burt 1999).

Disturbed Sites

Disturbed sites are caused by geological, animal, or human disturbances that affect plant communities.

3.2.5 Wildlife

The Project is located in the Southern Arctic Ecozone, where short growing seasons and long winters create a landscape that is both spatially and temporally variable. Many large mammal and bird species migrate into tundra ecosystems during the growing season when food sources peak, only to leave when conditions deteriorate. Similarly, many resident wildlife species tend to exhibit population cycles. The location of the Project is particularly noteworthy because it is located along the migration path of the Bathurst Caribou Herd.

Wildlife surveys have been conducted in the Project area since the mid-1990s. Wildlife programs associated with the Project have largely concentrated on species that have ecological, cultural, or socio-economic significance. This section focuses on observations made during the following programs:

- Baseline wildlife surveys, historical survey data, and territorial data collected from 1995 to 2000 (Hubert and Associates 2002). This report includes information collected using a combination of

ground reconnaissance surveys, aerial surveys, small mammal trapping, and caribou satellite telemetry data collected as part of the West Kitikmeot/Slave Study.

- Wildlife monitoring conducted in 2005 (Golder 2006). This report includes information collected using a combination of aerial ungulate surveys, falcon nest surveys, bird point counts, and ground reconnaissance surveys.

- Wildlife monitoring conducted in 2006 (Golder 2007). This report includes information collected using a combination of aerial ungulate surveys, raptor nest surveys, bird point counts, grizzly bear activity surveys, aerial waterfowl surveys, and wolverine snow track counts.

- Wildlife monitoring conducted in 2007 (Golder 2008). This report includes information collected using a combination of aerial ungulate surveys, raptor nest surveys, bird point counts, grizzly bear activity surveys, aerial waterfowl surveys, wolverine snow track counts and hair-snagging, and shorebird monitoring conducted in cooperation with Environment Canada.

Birds and mammal species that were observed during the wildlife surveys listed above or have special conservation status and may occur in the area are listed in Table 8.

Table 8 Observed Wildlife Species and Conservation Status

Common Name	Scientific Name	Observed	COSEWIC Status[1]	SARA Status[1]	SARA Schedule[1]
Mammals					
Masked shrew	*Sorex cinereus*	a	-	-	-
Arctic hare	*Lepus arcticus*	a,b,d	-	-	-
Arctic ground squirrel	*Urocitellus parryii*	a,d	-	-	-
Northern redback vole	*Myodes rutilus*	a	-	-	-
Nearctic collared lemming	*Dicrostonyx groenlandicus*	a	-	-	-
Muskrat	*Ondatra zibethicus*	d	-	-	-
Grey wolf	*Canis lupus*	a,b,d	-	-	-
Arctic fox	*Vulpes lagopus*	a	-	-	-
Red fox	*Vulpes vulpes*	a,b	-	-	-
Grizzly bear	*Ursus arctos*	a,b,c,d	Special Concern	-	-
Ermine	*Mustela erminea*	d	-	-	-
Wolverine	*Gulo gulo*	a,b,c,d	Special Concern	-	-
Barren-ground caribou	*Rangifer tarandus*	a,b,c,d	-	-	-
Dolphin and Union caribou	*Rangifer tarandus*	[3]	Special Concern	Special Concern	Schedule 1
Muskox	*Ovibos moschatus*	a,b,c,d	-	-	-

Common Name	Scientific Name	Observed	COSEWIC Status[1]	SARA Status[1]	SARA Schedule[1]
Birds					
Red-throated loon	*Gavia stellata*	a,c	-	-	-
Arctic loon	*Gavia pacifica*	a	-	-	-
Yellow-billed loon	*Gavia adamsii*	a,c	Not at Risk	-	-
White-fronted goose	*Anser albifrons*	a,d	-	-	-
Snow goose	*Chen caerulescens*	d	-	-	-
Canada goose	*Branta canadensis*	a,c,d	-	-	-
Tundra swan	*Cygnus columbianus*	a,d	-	-	-
Mallard	*Anas platyrhynchos*	a,d	-	-	-
Pintail	*Anas acuta*	a,d	-	-	-
Green-winged teal	*Anas crecca*	a	-	-	-
Greater scaup[2]	*Aythya marila*	a	-	-	-
White-winged scoter	*Melanitta fusca*	a,d	-	-	-
Black scoter	*Melanitta Americana*	a	-	-	-
Long-tailed duck	*Clangula hyemalis*	a,c	-	-	-
Red-breasted merganser	*Mergus serrator*	a,c	-	-	-
Common merganser	*Mergus merganser*	a,c	-	-	-
Golden eagle	*Aquila chrysaetos*	a,d	Not at Risk	-	-
Bald eagle[2]	*Haliaeetus leucocephalus*	a	Not at Risk	-	-
Northern harrier[2]	*Circus cyaneus*	a	Not at Risk	-	-
Gyrfalcon	*Falco rusticolus*	a,d	Not at Risk	-	-
Peregrine falcon	*Falco peregrinus*	a,b,c,d	Special Concern	Special Concern	Schedule 1
Rough-legged hawk	*Buteo lagopus*	a,b,c,d	Not at Risk	-	-
Willow ptarmigan	*Lagopus lagopus*	a	-	-	-
Rock ptarmigan	*Lagopus muta*	a	-	-	-
Sandhill crane	*Grus canadensis*	d	-	-	-
Golden plover	*Pluvialis dominica*	a,c,d	-	-	-
Semipalmated plover	*Charadrius semipalmatus*	a,d	-	-	-
Semipalmated sandpiper	*Calidris pusilla*	a	-	-	-
White-rumped sandpiper	*Calidris fuscicollis*	a	-	-	-
Baird's sandpiper	*Calidris bairdii*	a	-	-	-
Least sandpiper	*Calidris minutilla*	a,d	-	-	-
Red-necked phalarope	*Phalaropus lobatus*	a,d	Special Concern	-	-
Parasitic jaeger	*Stercorarius parasiticus*	a	-	-	-
Long-tailed jaeger	*Stercorarius longicaudus*	a	-	-	-
Herring gull	*Larus argentatus*	a	-	-	-
Arctic tern	*Sterna paradisaea*	a	-	-	-
Short-eared owl	*Asio flammeus*	[4]	Special Concern	Special Concern	Schedule 1

Common Name	Scientific Name	Observed	COSEWIC Status[1]	SARA Status[1]	SARA Schedule[1]
Snowy owl	*Bubo scandiacus*	a,d	Not at Risk	-	-
Horned lark	*Eremophila alpestris*	a,b,c,d	-	-	-
Cliff swallow	*Petrochelidon pyrrhonota*	a[5]	-	-	-
Common raven	*Corvus corax*	a,b,c,d	-	-	-
Gray-cheeked thrush	*Catharus minimus*	a,c,d	-	-	-
American robin	*Turdus migratorius*	a,b,c,d	-	-	-
American pipit	*Anthus rubescens*	a,b,c,d	-	-	-
Yellow warbler	*Setophaga petechia*	a	-	-	-
American tree sparrow	*Spizelloides arborea*	a,b,c,d	-	-	-
Savannah sparrow	*Passerculus sandwichensis*	a,b,c,d	-	-	-
Harris's sparrow	*Zonotrichia querula*	a,b,c,d	-	-	-
White-crowned sparrow	*Zonotrichia leucophrys*	a,b,c,d	-	-	-
Lapland longspur	*Calcarius lapponicus*	a,b,c,d	-	-	-
Snow bunting	*Plectrophenax nivalis*	a,d	-	-	-
Common redpoll	*Acanthis flammea*	a,b,c,d	-	-	-

1. Based on federal database as of July 2016.
2. These species were identified as transients as observations occurred outside their known breeding range (Hubert and Associates 2002).
3. Golder (2008) reported that Dolphin and Union caribou have been observed in the Project area; occurrences are rare.
4. Not observed but may occur based on range and habitat conditions.
5. Hubert and Associates (2002) reports several sightings near the airport; however, the Project area is outside its typical range.

a = Hubert and Associates 2002, b = Golder 2006, c = Golder 2007, d = Golder 2008

Relevant wildlife information and traditional ecological knowledge from the West Kitikmeot region were reviewed to provide additional context on wide-ranging wildlife species (SENES 2008; Thorpe et al. 2001). A synthesis of wildlife conditions around the Project are provided in the following sections.

Mammals

Vegetation communities provide mammals with different habitats. Eskers and kame deltas have been identified as the primary denning habitat for large and small mammals, including bears, wolves, foxes, and ground squirrels (Hubert and Associates 2002). Carnivore dens have been observed across much of the Project area, but appear to be concentrated along a major esker over 4 km north of the Mine. Grizzly bear dens are primarily concentrated along this esker, whereas wolf dens have been observed to the north and east of the mine (Hubert and Associates 2002). Cliffs along the snowbank vegetation community have been observed providing arctic hares and ptarmigans with shelter during harsh weather (Burt 1999).

Small mammals provide foraging opportunities for several predator species within the area including raptors, foxes, and grizzly bears. Hubert and Associates (2002) reported that ground squirrels were the most commonly observed mammal within the Project area. They occurred wherever ground conditions permitted burrowing and were common in birch-heath communities, rocky uplands, and sandy plans. Red-backed voles and lemmings were less common than ground squirrels during 2 years of study;

however, the relative abundance of these three species likely changes across time as lemming and vole populations cycle over time.

The Project area supports two ungulate species: muskox and barren-ground caribou. Muskoxen have been observed in low numbers within 10 km of the Project during all years where wildlife monitoring data were reported. Regional studies suggest that muskoxen tend to be distributed closer to the coast and that the abundance around the Project area has declined since 1991 (Dumond 2007a). In contrast, barren-ground caribou are seasonally common within the Project area.

The Project is located within the center of the Bathurst caribou range and along the western edge of the Beverly caribou range (Nagy et al. 2011). Most caribou that use the Project area have been linked to the Bathurst Caribou Herd, which migrates from wintering grounds near Great Slave Lake to summer calving grounds near Bathurst Inlet (Thorpe et al. 2001). The Beverly herd primarily located to the east of the region but individuals may occasionally use the Project area during post-calving, winter and spring. The Dolphin and Union caribou population of barren-ground caribou have been reported in the area (Golder 2008) but primarily occur well north of the Project (Gunn et al. 1997). Hubert and Associates (2002) and Gunn et al. (2001) summarized Bathurst caribou telemetry data collected as part of the West Kitikmeot/Slave Study from 1996 to 2000. This summary showed that:

- in winter caribou were spread across the boreal forest north and east of Great Slave Lake
- caribou moved north around Contwoyto Lake during migration
- calving primarily occurred north of the Project between the Burnside and Hood rivers
- caribou spread out between Hood River and Aylmer (overlapping the Project area) during post-calving
- caribou started to shift south toward the boreal forest in late summer
- caribou primarily occurred between Lac de Gras and the boreal forest during the rut

The mine intersects an identified migration corridor and associated late summer range (Nunavut Planning Commission 2016a). Historical data show that caribou use of the Project area was fairly low from the rut to April. Caribou use peaked in late-April and May during the spring migration, and then declined when the herd calved close to Bathurst Inlet. Survey data indicates there is a network of trails throughout Project area, indicating that large concentrations of caribou have pass through area before wildlife monitoring programs (Hubert and Associates 2002). Caribou use around the Project area increased again when cows and calves moved south in the summer foraging grounds. Use during the summer months remained variable as caribou were spread across a wider area during this post-calving foraging period (Hubert and Associates 2002). Caribou use immediately around the Project can vary across years. Historically, caribou moved through the area in a steady stream of small herds (i.e., hundreds of animals per herd; Hubert and Associates 2002); however, there was one report of 50,000 animals spending 12 to 18 hours in the area during post-calving (Tahera 2003a). Bathurst caribou have declined from in recent decades (Adamczewski et al. 2009; Boulanger et al. 2011; Vors and Boyce 2009)

during which time the late summer distribution of the herd has contracted toward the calving ground (Klaczek et al. 2016). It is unknown to what extend this may increase or decrease caribou use of the Project area in the future.

Caribou have cultural and socio-economic significance to the residents of the Kitikmeot region (Thorpe et al. 2001), and are ecologically significant for predator populations. Wolf abundance within the Bathurst Caribou Herd area has declined concomitant with the caribou herd (Klaczek et al. 2016) due to lower reproduction (Frame et al. 2008). Wolf use of Project area is somewhat limited and may be variable as caribou migrations change over time. Dens have been observed to the north and east of the mine site (Hubert and Associates 2002).

Caribou are also important to wolverines, which have been observed throughout the Project area (Golder 2007, 2008). Caribou remains have been found in 62% of stomachs of winter-trapped wolverines in the Kitikmeot region (Mulders 2000). Wolverine locations in the southern arctic tend to be associated with caribou, wolves, and grizzly bears (Mulders 2000); perhaps because of the availability of ungulate prey or because other carnivores provide ungulate carrion. Wolverines will also consume muskox, ground squirrels, voles, and lemmings. As a result of these variable associations, the distribution of wolverines within the Project area is likely variable in both space and time.

Grizzly bears are wide-ranging omnivores within the southern arctic (McLoughlin et al. 1999). Research conducted south of the Project area near Lac de Gras indicates that grizzly bears primarily foraged on green vegetation (i.e., *Carex, Equisetum, Eriophorum*) in early summer but focused on caribou and ericaceous berries during the spring, mid-summer, and fall (Gau et al. 2002). The importance of ground squirrels appears to be variable within the Kitikmoet Region. In the Lac de Gras area, ground squirrels represented a small portion of bears' diet. In contrast, grizzly bear sign in the Project area was strongly associated with ground squirrels. A total of 69% of observed bear sign were digs associated with ground squirrel dens on esker (Golder 2008).

Birds

Waterfowl are reportedly uncommon in the Project area (Hubert and Associates 2002, Golder 2008). Aquatic habitats are abundant both regionally and within the Project area. These habitats provide breeding habitat for waterfowl and other water birds and, in spring and fall, are used as staging areas by migratory birds. Shorelines of these aquatic habitats also provide shorebirds with summer breeding and foraging areas. Most waterfowl and shorebird surveys conducted within the Project area focused on breeding populations and may therefore underestimate the value of aquatic habitats and shorelines for migrating birds.

The presence of ground squirrels and other small mammals provides foraging opportunities for several ground- and cliff-nesting raptor species. Hubert and Associates (2002) identified that the Willingham Hills and the Peacock Hills to the east of Contwoyto Lake provided more nesting habitat than the rolling topography adjacent to most of Contwoyto Lake and the area west toward Rockinghorse Lake.

Nevertheless, several raptor territories have been identified near the Project. Raptor surveys indicate that rough-legged hawks are the most common raptor species to nest within the area (Hubert and Associates 2002; Golder 2007, 2008). During the 2007 raptor survey 45% of identified territories were held by rough-legged hawks (Golder 2008). Other species that nest in the area include peregrine falcons, golden eagles, and gyrfalcons.

Songbird diversity is fairly low within the Project area. A summary of 451 point count survey locations indicates that five passerine species make up 89% of all songbird observations within about 2 km of the mine (Golder 2008):

- lapland longspur (18.1%)
- savannah sparrow (22.4%)
- horned lark (20.5%)
- common redpoll (14.7%)

Birch and heath communities provide nesting habitat for songbirds and shelter for roosting ptarmigans (Burt 1999). Vegetation communities that contain graminoid and shrub cover are expected to support more songbirds by providing a combination of foraging and nesting opportunities; however, monitoring data have not revealed any obvious patterns in songbird species richness or diversity across habitat types (Golder 2008).

Species of Conservation Concern

Some wildlife species located in the Project area require special attention due to their conservation status designated by the Committee on the Status of Endangered Wildlife in Canada, and the *Species At Risk Act*. Of the bird and mammals species within the Project area (Table 3), there are six wildlife species of conservation concern.

- Grizzly bears have been observed within the Project area during all years where wildlife monitoring data were reported. Within Nunavut, there is evidence that populations are increasing and expanding north into the arctic (COSEWIC 2012). The primary threat to grizzlies is an increase in the number of human-bear conflicts.

- Wolverines have been observed within the Project area during all years where wildlife monitoring data were reported. Populations within Nunavut occur at low density and there is some evidence that populations are stable or increasing (COSEWIC 2014a). Threats to this species can include over-harvesting, loss of spring snow due to climate change, loss of prey/carrion, and increases in predators.

- Dolphin and Union caribou have occasionally been observed in the Project area (Golder 2008). This barren-ground caribou population summers on Victoria Island and winters north of Bathurst Inlet (Gunn et al. 1997). There is concern that changing sea-ice formations and other effects of climate

change may threaten this population; harvesting pressure, predation, and industrial development may also threaten the population (COSEWIC 2004; Species at Risk Committee 2013). Given the location of the Project relative to the Dolphin and Union caribou population, it is unlikely that the Project has a significant interaction with this caribou population.

- Peregrine falcons have been observed within the Project area during all years where wildlife monitoring data were reported. Falcons tend to nest on rocky bluffs or cliff ledges (Court et al. 1988; COSEWIC 2007). Wildlife monitoring data indicate that there are several raptor territories within the Project area that may be occupied by peregrine falcons or other raptor species in any given year (Hubert and Associates 2002; Golder 2008).

- Red-necked phalaropes breed across much of the arctic and have been observed within the Project area. This species tends to nest in tufts of grasses or shrubs in communities dominated by grasses, sedges, or emergent aquatic vegetation (COSEWIC 2014b). As a result of their breeding and foraging behaviour, they mostly likely occur in wetlands and shorelines within the Project area.

- Short-eared owls have not been observed within the Project area, but their breeding range extends across much of Nunavut including the West Kitikmeot region (COSEWIC 2008). This species nests in open tundra habitats such as those vegetation communities found within the Project area. Habitat conversion is believed to be the primary threat to short-eared owls in the southern portion of their range (COSEWIC 2008); small mammal populations may be important further north where habitat is more abundant.

In addition, most bird species observed within the area (Table 3) are protected under the *Migratory Birds Convention Act*. The act and associated regulations prohibit harming a migratory bird, its nest, or eggs unless authorized by the federal government.

3.2.6 Culture

The Project site is located in an area where local people have traditionally used the land for hunting and camping. While the Project site has provided employment during its operation, the remediation of the site is an important land use planning objective for the people of the Kitikmeot region, as detailed in the following sections.

Historical Land Use

An inventory and preliminary impact assessment of the archaeological and historical resources was conducted in 1996 and 1999 before the mine construction. Twenty-five archaeological sites were identified and documented in the Project during the field study (including artefact scatters, habitation sites, and quarries) identifying historical and traditional use of the area (Tahera 2003b). None of the sites were identified as having sufficient significance to require avoidance by development (Tahera 2003b).

Current Land Use

The Project is located in the administrative region of Kitikmeot, one of three regions in Nunavut. The Nunavut Planning Commission is undertaking land use planning for the territory of Nunavut. The project is located in an area that is designated as a special management area for high mineral potential (Nunavut Planning Commission 2016b). In this management area the development of incompatible land uses (i.e., tourism facilities, parks and conservation areas) are prohibited (Nunavut Planning Commission 2016a); however, community values and priorities identified in this management area during the land use planning process include (Nunavut Planning Commission 2016b):

- Jericho diamond mine site remediation
- artefacts
- fishing and camping areas
- caribou migration

There are no parks or conservation sites that overlap with the Project area.

Traditional Land Use and Knowledge

The Project lies within or near the traditional use areas of three native groups: Kitikmeot, Dogrib, and Yellowknife Dene (Tahera 2003b). The Project also lies within the southern boundary of the area of influence of the communities of Bathurst Inlet, Umingmaktok, and Kugluktuk implying that hunters and fishers from these communities travel to this region to conduct traditional activities (Tahera 2003b).

The land is important to people of the communities with approximately 68% of residents active in hunting and fishing, and 13% of residents active in trapping (Tahera 2003b). Hunting is generally a part-time activity for residents, combining income from traditional pursuits with other sources of income; however, the average hunting production is high with approximately 1,000 to 1,500 kg (estimated at a value of $10,000 to $15,000 in 2003) of meat and fish annually (Tahera 2003b). There is a heavy reliance on the traditional economy for clothes and food; however, traditional activities also contribute to cultural well-being (GoN 2013; Tahera 2003a). There is an important connection between health and well-being of individuals and communities, and reliable sources of country food (Tahera 2003a).

Traditional knowledge was obtained for the Project from Inuit elder site visits, elder comments from community meetings and published regional studies (Tahera 2003a). The focus of traditional use from each of these sources was on caribou and water quality (Tahera 2003a). Traditional knowledge information, particularly with respect to caribou, was intended to be used in the management approach for the Project to prevent impacts to caribou herds (Tahera 2003a).

3.2.7 Socio-economics

The population in the Kitikmeot region in 2011 was 6,012, an increase of approximately 650 people from 2006 (Statistics Canada 2011). The closest permanent community to the Project is the hamlet of Kulgluktuk, located 250 km northwest of the Project. Kugluktuk has a population of approximately 1,450 people, an increase of approximately 150 people from 2006 (Statistics Canada 2011). Other nearby communities in the Kitikmeot region include the hamlet of Cambridge Bay with a population of 1,585 and the unincorporated settlements of Umingmaktok and Bathurst Inlet. Both unincorporated settlements have populations with five or less people (Statistics Canada 2011).

The median age of the population of the Kitikmeot region is 23 with 34% of the population under the age of 15 (Statistics Canada 2011). The population is primarily Inuit (Statistics Canada 2011). There are 1,710 private dwellings in the region, with 448 located in the hamlet of Kugluktuk (Statistics Canada 2011).

Communities in the region are accessed primarily by air and snowmobile, with boat access during the summer. Daily flights are available from the Kugluktuk Airport to Yellowknife and other Nunavut communities. There are no rail or road connections between Nunavut communities, nor are they connected to any southern Canadian cities.

Tourism and recreation activities are based on outdoor pursuits including canoeing, kayaking and rafting, hiking, fishing, hunting and photography and wildlife viewing (GoN 2013). The Coppermine River and Bloody Falls Territorial Historic Park are primary tourism and recreation attractions to the region (GoN 2013).

Economy and Employment

The Kitikmeot economy is comprised of the wage economy, traditional activities, and government transfer payments (Tahera 2003b). Many residents combine these sources to contribute to their income and each of these elements is important to the regional economy at different times due to seasonal harvesting activities and the availability of wage employment (Tahera 2003b). There is a heavy reliance on the economic benefit from hunting, trapping, and fishing to provide clothes and food, particularly reducing the need for expensive store-bought foods (GoN 2013; Tahera 2003b). There is optimism by community residents that the tourism and mining sectors will contribute to economic growth and increase economic development of Kuglutuk, alongside the traditional economy (GoN 2013).

Mining and mineral exploration, particularly gold, silver, and diamonds is an important contributor to the Nunavut economy (GoN 2014). The Kitikmeot region in particular is likely to see continual economic benefit from mineral exploration and extraction as approximately half of all mineral projects in Nunavut are located in the region (Tahera 2003a). Increasingly, tourism and non-resident hunting are contributing to the economy of Nunavut (Tahera 2003a).

In 2001, the labour force of Kugluktuk was 615 people with a 64% participation rate (Statistics Canada 2011). The employment rate in Kugluktuk was 44% and the unemployment rate was 31% (Statistics Canada 2011). The primary industry in Kugluktuk is public administration, employing 30% of the labour force. Other significant industries include retail trade (11%); educational services (9%); construction (8%); health care and social assistance; transportation and warehousing; and mining, quarrying, and oil and gas extraction each employing 7% of the labour force (Statistics Canada 2011).

The community has residents with experience working on the Project, as well as other resource developments including oil and gas development and mining projects. In Nunavut, there is an emphasis to hire first from the local labour force with impact benefit agreements often including employment targets negotiated with the community (GoN 2014). However, a fly-in/fly-out strategy is still used to meet the labour needs for many large projects (GoN 2014). The community is also familiar with fly-in/fly-out employment, and although there are concerns about the stress that it puts on families, community leaders identified that economic benefit is important (Tahera 2003a). Employment opportunities have been identified as beneficial to the overall well-being of the community and community members have identified the advantages of relying on more than one source of income (Tahera 2003a).

Census data identifies that approximately 32% of residents have received some post-secondary education and approximately 10% have completed high school education (Statistics Canada 2011). Based on this information, a number of Kugluktuk people may be suited to work on this project.

Businesses in Kugluktuk include accommodation and restaurants, retail stores, transportation and shipping services, contracting and equipment supply, outfitting, and artists (GoN 2013). Kugluktuk opened the Kulguktuk Visitor Heritage Centre in 2014 including a museum, conference rooms, and an art gallery.

Kugluktuk Community Services

The hamlet of Kugluktuk contains a variety of community services. The community has two schools providing education from kindergarten to grade 12 for approximately 420 students. Early childhood education includes preschool and a day care (GoN 2013). Post-secondary education is available through the Kitikmeot campus of Nunavut Arctic College, which offers a number of programs including employment readiness, high school upgrading, apprenticeship programs, environmental technology, and other specialty courses (Nunavut Arctic College 2016). Training, related to industrial activity, has often been provided by employers and outside agencies in the areas of geological sciences and kimberlite processing, construction trades and heavy equipment mechanics, and Inuit culture and language.

Infrastructure and services in the hamlet include electrical power generation, internet, cable and radio services, post office, and library. Community facilities include a recreation centre, youth centre, and community library. Emergency response services are provided through the Kugluktuk Royal Canadian Mounted Police detachment, and fire and emergency response. Health and wellness services include a

health centre staffed with nurses and social services personnel, the Awareness Centre offering a wide range of counselling services, Brighter Futures offering a community-based health promotion program, and a pre-natal centre. There are no doctors or dentists located in the community, but traveling doctors visit the community to provide services on a regular basis. Cultural services include a hunter and trapper's organization, the Kulguktuk Visitor Heritage Centre, and an Elder's Centre.

4 PROJECT/ENVIRONMENTAL INTERACTIONS

To determine project and environment interactions, it is necessary to identify relevant ecosystem components, both natural and man-made, determine potential impacts based on the scope of work, and the possible mitigation strategies to reduce or eliminate those impacts. The sections below outline the process to identify and determine the interactions, the possible mitigation strategies, and potential residual impacts.

4.1 Identification of Valued Environmental and Socio-economic Components

The Nunavut Impact Review Board (NIRB) defines valued ecosystem components (VECs) as "those aspects of the environment considered to be of vital importance to a particular region or community, including resources that are legally, politically, publicly, or professionally recognized as important, such as parks, land selections, and historical sites; resources that have ecological importance; and resources that have social importance."

Valued Socio-economic Components (VSECs) are defined by the NIRB (NIRB 2007) as "those aspects of the socio-economic environment considered to be of vital importance to a particular region or community, including components relating to the local economy, health, demographics, traditional way of life, cultural well-being, social life, archaeological resources, existing services and infrastructure, and community and local government organizations."

Potential VECs and VSECs were identified in a three-stage process. Initially, a review of the regulatory responsibilities of applicable Nunavut and other government agencies was completed, including the NIRB. Also, VECs and VSECs identified in other projects in Nunavut such as remediation of the Hope Lake mineral exploration sites, the Contwoyto Lake former weather station, and the Ennadai Lake weather station. Once these VECs and VSECs are identified, they are confirmed during the field work and public consultation process and in discussions with local government. Finally, based on the activities in the proposed SSP, professional judgment of environmental practitioners and remediation specialists identified any potential gaps in the VECs and VSECs previously identified. Matrix reviewed historical and existing information on the Project to familiarize ourselves with the Project. As a result of this process, a comprehensive list and selection rationale was developed and is outlined below in Table 9.

Table 9 List of the Selection Rationale for VEC and VSEC

VEC or VSEC	VEC/VSEC Selection Process			
	Regulatory Requirement	Identified in Other ESRs	Public/Inuit Input	Professional Judgment
Climate and Air Quality	√	√		
Terrain		√		√
Hydrology and Hydrogeology	√	√		√
Soils	√	√		√
Vegetation	√	√		√
Wildlife (Terrestrial)	√	√	√	√
Wildlife (Aquatic)	√	√		√
Cultural Features and Special Places	√	√	√	√
Job Opportunities	√	√		√
Traditional Land Use	√	√	√	√
Community Impacts	√	√		√
Aesthetics	√	√		

4.2 Identification of Project Impacts and Mitigations

To determine the potential impacts to the various VECs or VSECs, baseline information along with specific project activities outlined in the SSP were reviewed. Using professional judgment, project activities that would impact/interact with a specific VEC or VSEC were identified. As recommended by the *NIRB Screening Part 2 Form Project Specific Information Requirements (PSIR)* (NIRB 2010) this process was completed using a matrix of project activities versus VECs and VSECs. This matrix and the results of the process are included in Table 10 and the impact ranking criteria is provided in Table 11.

Table 10 Identification of Interaction between Project Remedial Activities and VECs or VSECs

VEC or VSEC	Project Activities													
	Site Preparation and Camp Operations		Site Stabilization									Closure		
	Winter Construction, Mobilization, Transportation of Equipment	Camp Operation Including Water Use, Waste Water Treatment, Waste Incineration	Open Pit Infilling and Stabilization	PKCA Management	Structure Demolition and Debris Handling	Onsite Construction of Non-hazardous Landfill	Onsite Incineration of Liquid Organic Waste	Onsite Handling and Consolidation of Hazardous Waste	Excavation of Impacted Soils	Landfarm Area Operation	Offsite Removal of Hazardous Waste and Tier 2 Metal-impacted Soil	Site Contouring	Demobilization and Transportation of Equipment on Winter Road	Long-term Monitoring
Climate and Air Quality	√	√			√	√	√		√	√	√	√	√	
Terrain			√	√	√	√				√		√		
Hydrology and Hydrogeology	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Soils	√	√				√	√	√	√	√	√	√	√	
Vegetation		√			√	√	√	√		√		√		
Wildlife (Terrestrial)	√	√	√	√	√	√		√	√	√	√	√	√	√
Wildlife (Aquatic)	√	√	√	√				√	√		√	√	√	√
Cultural Features and Special Places														
Job Opportunities	√	√		√	√	√	√	√	√	√	√	√	√	√
Traditional Land Use	√										√	√	√	
Community Impacts	√	√											√	
Aesthetics			√		√		√			√		√		

Table 11 Impact Rating Criteria

Term	Rating	Criteria
Direction	Positive	Net benefit or gain to resource or indicator
	Neutral	No net benefit or gain, or benefits and losses are balanced
	Negative	Net loss to the resource or indicator
Extent	Local	Effect confined to the area directly disturbed by Project facilities
	Regional	Effect extends beyond area of direct disturbance but is limited to 14 km from Project activities*
	Territorial	Effect extends several kilometers beyond the Project and associated activities
Duration	Short Term	Less than 1 year
	Medium Term	1 to 10 years
	Long Term	Greater than 10 years
Frequency	Once	Occurs only once
	Intermittent	Occurs occasionally at irregular intervals
	Continuous	Occurs on a regular basis and regular intervals
Magnitude	Negligible	There will be no detectable change to the resource from background conditions expected after mitigation. If parameter remains than the parameter will be less than the standard, guideline, or objective
	Low	Impact within acceptable protective standards and/or causes no detectable change to the resource
	Medium	Impact within acceptable protective standards and/or causes a detectable change to the resource
	High	Impact exceeds protective standards and/or causes a detectable change to the resource beyond the range of tolerance
Probability	Low	The impact is unlikely to occur
	Medium	The impact is fairly likely to occur
	High	There is a high probability that the impact will occur
Significance	Insignificant	Minimal or no measurable change from background conditions that may last less than 10 years or for one generation
	Significant	Measurable change from background conditions that may last greater than 10 years or for more than one generation
	Unknown	Insufficient data available to make a professional judgment, more study required.

* Based on Boulanger et al. (2012) who found that space of caribou within the Bathurst Caribou Herd was directly influenced by diamond mining up to 14 km away.

4.3 Potential Impacts and Mitigations

Certain project activities have similar impacts and mitigation strategies, and therefore similar impact ratings. In the following sections, project activities with analogous impacts, mitigation, and impact ratings have been grouped together for each of the VECs. The following tables provide an assessment of project interactions, potential impacts mitigation strategies, and subsequent residual ratings. A brief summary for each VEC is also included. A discussion, rather than a table format, is provided for VSECs and project interactions later in the report.

Only residual impacts, those impacts that cannot be mitigated and that are also considered significant, are discussed later in the ESR.

4.3.1 Air Quality

Table 12 Assessment of Impacts on Air Quality

Project Activity	Potential Impact	Impact Rating	Mitigation
Site Preparation			
• Mobilization and transportation of equipment on winter road • Camp operation including waste incineration	• Greenhouse gas (GHG) emissions from equipment operation, camp waste incineration, and transportation events	Direction: Negative Extent: Local Duration: Short Term Frequency: Intermittent Magnitude: Low Probability: High Significance: Insignificant	• Proper use of equipment meeting regulatory and transportation standards • Training of staff in proper use of equipment
Site Stabilization			
• Structure demolition and debris handling • Onsite construction of non-hazardous landfill • Onsite incineration of liquid organic waste • Excavation of impacted soils • Landfarm area operation • Offsite removal of hazardous waste and Tier 2 metal-impacted soil	• GHG emissions from equipment operation • Gas emissions from organic liquid incineration	Direction: Negative Extent: Local Duration: Short Term Frequency: Intermittent Magnitude: Low Probability: High Significance: Insignificant	• Proper use of equipment meeting regulatory standards • Training of staff in proper use of equipment
Closure			
• Site contouring • Demobilization and transportation of equipment on winter road	• GHG emissions from equipment operation, and transportation events	Direction: Negative Extent: Local Duration: Short Term Frequency: Intermittent Magnitude: Low Probability: High Significance: Insignificant	• Proper use of equipment meeting regulatory and transportation standards • Training of staff in proper use of equipment
Summary			
• Adverse potential impacts to air quality are expected with all phases of this Project. Emissions of GHGs, nitrogen oxides, sulphur dioxide particulate matter, and carbon monoxide due to combustion of aviation fuel, diesel fuel, and gasoline are expected during Project work. Emissions; however, will be short term and intermittent, and will not have a significant residual effect on the climate within the local study area, regionally or nationally.			

4.3.2 Hydrology and Hydrogeology

Table 13 Assessment of Impacts on Hydrology and Hydrogeology

Project Activity	Potential Impact	Impact Rating	Mitigation
Site Preparation and Camp Operations			
• Mobilization and transportation of equipment on winter road	• Potential impact of surface water and groundwater from spills when refuelling servicing equipment and during transportation events	Direction: Negative Extent: Local Duration: Short Term Frequency: Intermittent Magnitude: Low Probability: Low Significance: Insignificant	• A spill contingency best management practices (BMP) will be developed and implemented, and be available onsite for all workers • Contain spill as close to release point as possible • Proper containment and removal of fuels from any water bodies • Fuel and hazardous material will be stored in an easily accessible bermed area, which will act as a spill barrier and allow for easy removal in case of a leak or spill • Hazardous waste and fuel storage areas (including drums) will be inspected daily • Fuel storage, hazardous material storage and refuelling of equipment will occur at the greatest reasonable distance from water bodies • Transportation procedures onsite and offsite will be in accordance with the *Transportation of Dangerous Goods Act, 1992* (S.C. 1992, c. 34) and regulations
• Camp operation including water use and waste water treatment	• The operation of the work camp will include disposal of camp sewage, grey water, garbage, and other non-hazardous wastes that could impact water quality	Direction: Negative Extent: Local Duration: Short Term Frequency: intermittent Magnitude: Negligible Probability: High Significance: Insignificant	• Camp sewage and grey water will be treated onsite and disposed of in a manner in accordance with land use inspector and permits/license • Treatment facilities and discharge sumps/areas will be closed off at the end of remediation activities • Sumps will be closed off at the end of remediation activities • All other camp waste will be disposed of offsite on completion of the remediation activities
Site Stabilization			
• Open pit filling • PKCA management • Structure demolition and debris handling • Onsite construction of non-hazardous landfill • Onsite incineration of liquid organic waste • Onsite handling and consolidation of hazardous waste • Excavation of impacted soils • Landfarm operation • Offsite removal of hazardous waste and Tier 2 metal-impacted soil	• Potential impact of surface water and groundwater from spills when refuelling and servicing equipment • Potential surface water and groundwater impact while removing, transporting, burning, or incinerating waste materials and landfarm operation	Direction: Negative (positive once hazardous and non-hazardous materials, and contaminated soils have been treated or removed from the site) Extent: Local Duration: Short Term Frequency: Intermittent Magnitude: Low Probability: Low Significance: Insignificant	• A spill contingency BMP will be developed and implemented, and be available onsite for all workers • Contain spill as close to release point as possible • Water quality of the pit water will be monitored as the water level increases to see if water quality will be acceptable for release before it overtops; appropriate treatment or water management will be implemented, if necessary, to ensure pit lake outflow does not negatively impact Carat Lake • Proper containment and removal of fuels from any water bodies • Fuel and hazardous material will be stored in an easily accessible bermed area, which will act as a spill barrier and allow for easy removal in case of a leak or spill • Fuel storage, hazardous material storage and refuelling of equipment will occur at the greatest reasonable distance from water bodies and in accordance with the land use inspector and permits/license • Hazardous waste and fuel storage areas (including drums) will be inspected daily • Hazardous materials and contaminated soil will be exposed for as short time as possible • All workers will be trained in proper handling of non-hazardous and hazardous materials and contaminated soil • Proper lining and operation of landfarm to ensure leachate will not impact the surrounding environment
• Open pit filling • Structure demolition and debris handling • Onsite construction of non-hazardous landfill • Excavation of impacted soils • Landfarm operation	• Erosion, sedimentation, or damage to riparian areas can occur during remediation activities that disturb the land surface	Direction: Negative Extent: Local Duration: Short Term Frequency: Intermittent Magnitude: Low Probability: Moderate Significance: Insignificant	• A spill contingency best management practices (BMP) will be developed and implemented, and be available onsite for all workers • Placement of temporary (during remediation or landfill construction) erosion control measures (i.e., berms, silt fences); limit disturbance of any new areas • Disturbed areas near or adjacent to watercourses and water bodies will be stabilized quickly • Remedial excavations and landfill design should provide for proper drainage and soil stability • Environmental monitoring will occur during SSP activities to ensure erosion control measures are implemented and adequate
Closure			
• Site contouring	• Sedimentation or damage to riparian areas can occur during site recontouring	Direction: Negative Extent: Local Duration: Short Term Frequency: Intermittent Magnitude: Low Probability: Moderate Significance: Insignificant	• A spill contingency best management practices (BMP) will be developed and implemented, and be available onsite for all workers • Disturbed areas near or adjacent to watercourses and water bodies will be stabilized quickly • Recontouring site to match natural terrain after infrastructure, hazardous and non-hazardous waste, and contaminated soil removal

Project Activity	Potential Impact	Impact Rating	Mitigation
• Pit Lake water releases	• Potential impact of surface water quality and thermal regimes from very deep pit lake	Direction: Negative Extent: Local Duration: Short Term Frequency: Intermittent Magnitude: Low Probability: low Significance: Insignificant	• Outflow from pit lake will be routed through shallow ponds and wetlands, if necessary, to provide further treatment and ensure water temperatures reach levels typical of the shallower water bodies and creeks that drain into Carat Lake
• Demobilization and transportation of equipment on winter road	• Potential impact of surface water and groundwater from spills when refuelling and servicing equipment	Direction: Negative (positive once hazardous and non-hazardous materials, and contaminated soils have been treated or removed from the site) Extent: Local Duration: Short Term Frequency: Intermittent Magnitude: Low Probability: Low Significance: Insignificant	• A spill contingency BMP will be developed and implemented, and be available onsite for all workers • Contain spill as close to release point as possible • Proper containment and removal of fuels from any water bodies • Fuel and hazardous material will be stored in an easily accessible bermed area, which will act as a spill barrier and allow for easy removal in case of a leak or spill • Hazardous waste and fuel storage areas (including drums) will be inspected daily • Fuel storage, hazardous material storage and refuelling of equipment will occur at the greatest reasonable distance from water bodies and in accordance with the land use inspector and permits/license • Transportation procedures onsite and offsite will be in accordance with the Transportation of Dangerous • Goods Act and Regulations (Government of Canada 1992)
• Long-term monitoring	• Potential impacts on surface water quality via disturbance of steam bed or banks, or introduction of deleterious substances during field sampling	Direction: Negative Extent: Local Duration: Short Term Frequency: Intermittent Magnitude: Negligible Probability: Low Significance: Insignificant	• Minimize disturbance of stream beds and banks during sampling • Use acceptable sampling protocols to prevent or minimize introduction of sample preservatives and other deleterious substances into surface waters or on land
Summary			
• Potential pathways exist between proposed remedial activities, facilities, materials, or structures and surface water quantity and quality, and groundwater receptors at the Project site as summarized in Table 7. Linkages between the Project and groundwater impacts are relatively weaker due to the presence of permafrost from near ground surface to great depths up to 540 m in most areas of the Project site. • Impacts of the Project to surface water and groundwater quality are predicted to be low to negligible due to absence of large sources of pollution and appropriate mitigations measures that will be implemented. Disturbed and reclaimed Project areas form a small fraction of the entire Jericho River watershed; therefore, current stream flows and water levels will not generally be affected by the Project.		

4.3.3 Aquatic Ecology

Table 14 Assessment of Impacts on Aquatic Ecology

Project Activity	Potential Impact	Impact Rating	Mitigation
Site Preparation and Camp Operations			
• Mobilization and transportation of equipment on winter road and winter road construction	• Potential spills from transport vehicles	Direction: Negative Extent: Regional Duration: Medium Term Frequency: Once Magnitude: Low Probability: Low Significance: Insignificant	• A spill contingency BMP will be developed and implemented, and be available onsite for all workers • Contain spill as close to release point as possible • Proper containment and removal of fuels from any water bodies • Stream discharge should be measured upstream and downstream of ice bridges to determine if flow restrictions occur • Fuel and hazardous material will be stored in an easily accessible bermed area, which will act as a spill barrier and allow for easy removal in case of a leak or spill • Hazardous waste and fuel storage areas (including drums) will be inspected daily • Fuel storage, hazardous material storage and refuelling of equipment will occur at the greatest reasonable distance from water bodies • Transportation procedures onsite and offsite will be in accordance with the *Transportation of Dangerous Goods Act* and regulations • All machinery working near water will be cleaned, and free of debris and organic matter before entering the construction site
• Camp operation including water use and waste water treatment	• Change in water quality (temperature, nutrients, dissolved oxygen concentrations) and water levels	Direction: Negative Extent: Local Duration: Short Term Frequency: Intermittent Magnitude: Low Probability: Low Significance: Insignificant	• Waste water will be treated and tested before release into the Project area • Water that is released into the surrounding environment should not exceed the temperature of the environment into which it is released • Source water intakes should have appropriately-sized fish screens to avoid entrainment of fish
Site Stabilization			
• Open pit filling	• Removing the C1 division and re-establishing the natural drainage could change access to habitats and habitat structure until habitat is restored along the natural drainage	Direction: Positive Extent: Local Duration: Long Term Frequency: Continuous Magnitude: High Probability: High Significance: Significant	• Habitat along the pathway will be restored through natural ecological processes and no net loss of drainage/channel habitat is expected • Provided that access to the pit is suitable and contaminants not a concern, the pit may provide suitable overwintering habitats for resident fish species
	• Sediment loading from materials in the pit being transported to downstream habitats	Direction: Negative Extent: Local Duration: Short Term Frequency: Intermittent Magnitude: Low Probability: Low Significance: Insignificant	• Installing erosion and sediment control measures around areas that have the potential to drain into surrounding water bodies and watercourses • Monitor water quality (turbidity and TSS) during construction and initial release stages
• PKCA	• Breaching containment areas could result in increased runoff and surface erosion contributing to sediment loading of the watercourses and water bodies	Direction: Negative Extent: Local Duration: Short Term Frequency: Intermittent Magnitude: Low Probability: Low Significance: Insignificant	• Installing erosion and sediment control measures around areas that have the potential to drain into surrounding water bodies and watercourses
• Onsite handling and consolidation of hazardous waste	• Spills of hazardous waste and metal-impacted soil during transportation; change in contaminant concentrations	Direction: Negative Extent: Regional Duration: Medium Term Frequency: Intermittent Magnitude: Low Probability: Low Significance: Insignificant	• A spill contingency BMP will be developed and implemented, and be available onsite for all workers • Contain spill as close to release point as possible • Proper containment and removal of fuels from any water bodies • Fuel and hazardous material will be stored in an easily accessible bermed area, which will act as a spill barrier and allow for easy removal in case of a leak or spill • Hazardous waste and fuel storage areas (including drums) will be inspected daily • Fuel storage, hazardous material storage and refuelling of equipment will occur at the greatest reasonable distance from water bodies • Transportation procedures onsite and offsite will be in accordance with the *Transportation of Dangerous Goods Act* and regulations • All machinery working near water will be cleaned, and free of debris and organic matter before entering the construction site

Project Activity	Potential Impact	Impact Rating	Mitigation
• Excavation of impacted soils	• Surface runoff of sediment into watercourses and water bodies leading to sediment loading	Direction: Negative Extent: Local Duration: Medium Term Frequency: Intermittent Magnitude: Low Probability: Low Significance: Insignificant	• Installing erosion and sediment control measures around areas that have the potential to drain into surrounding water bodies and watercourses
• Offsite removal of hazardous waste and Tier 2 metal-impacted soil	• Spills of hazardous waste and metal-impacted soil during transportation; change in contaminant concentrations	Direction: Negative Extent: Regional Duration: Medium Term Frequency: Once Magnitude: Low Probability: Low Significance: Insignificant	• A spill contingency BMP will be developed and implemented, and be available onsite for all workers • Contain spill as close to release point as possible • Proper containment and removal of fuels from any water bodies • Fuel and hazardous material will be stored in an easily accessible bermed area, which will act as a spill barrier and allow for easy removal in case of a leak or spill • Hazardous waste and fuel storage areas (including drums) will be inspected daily • Fuel storage, hazardous material storage and refuelling of equipment will occur at the greatest reasonable distance from water bodies • Transportation procedures onsite and offsite will be in accordance with the *Transportation of Dangerous Goods Act* and regulations • All machinery working near water will be cleaned, and free of debris and organic matter before entering the construction site
Closure			
• Site contouring	• Surface runoff of sediment into watercourses and water bodies leading to sediment loading	Direction: Negative Extent: Local Duration: Medium Term Frequency: Intermittent Magnitude: Low Probability: Low Significance: Insignificant	• Installing erosion and sediment control measures around areas that have the potential to draining into surround water bodies and watercourses
• Demobilization and transportation of equipment on winter road	• Potential spills from transport vehicles	Direction: Negative Extent: Regional Duration: Medium Term Frequency: Once Magnitude: Low Probability: Low Significance: Insignificant	• A spill contingency BMP will be developed and implemented, and be available onsite for all workers. • Contain spill as close to release point as possible • Proper containment and removal of fuels from any water bodies • Fuel and hazardous material will be stored in an easily accessible bermed area, which will act as a spill barrier and allow for easy removal in case of a leak or spill • Hazardous waste and fuel storage areas (including drums) will be inspected daily • Fuel storage, hazardous material storage and refuelling of equipment will occur at the greatest reasonable distance from water bodies • Transportation procedures onsite and offsite will be in accordance with the *Transportation of Dangerous Goods Act* and regulations • All machinery working near water will be cleaned, and free of debris and organic matter before entering the construction site
Summary			
• Potential adverse impacts to the aquatic ecology are associated with vehicle transportation, earth works (e.g., regrading), water use (source water and waste water discharge), movement of contaminated and non-contaminated waste, and soil treatment and/or removal. The aquatic environment in the Project area was identified as having low primary productivity and low annual fish yield. Any adverse anthropogenic effects to such communities could illicit a greater negative response and recovery time from the aquatic ecology. Provided that industry standard BMPs are implemented, DFOs *Measures to Avoid Causing Harm to Fish and Fish Habitat* (DFO 2013b) are followed, and a qualified environmental specialist is onsite to monitor the effectiveness of mitigation measures; no significant negative impacts are expected. • The causeway into Carat Lake resulted in a loss of fish habitat, which was meant to be offset as per the DFO Authorization (DFO File No. NU-00-0068). However, the causeway was also predicted to result in indirect loss of habitat due to alteration in water movement patterns in the southeast corner of Carat Lake. The causeway is not being removed during the scope of this work. However, the INAC is proposing to re-establish drainage into the open pit. If appropriate designs are implemented to ensure habitat suitability of resident fish species, the drainage and open pit should result in a net gain of fish habitat.		

4.3.4 Soils and Terrain

Table 15 Assessment of Impacts on Terrain

Project Activity	Potential Impact	Impact Rating	Mitigation
Site Stabilization			
• Open pit filling	• Erosion due to infilling of open pit	Direction: Neutral Extent: Local Duration: Medium Term Frequency: Once Magnitude: Low Probability: High Significance: Insignificant	• Monitor for signs of erosion, and alter rate and location of filling if required
• PKCA	• After breaching the West Dam and Divider Dyke A to direct water along the original flow path, impact to terrain is expected from stabilization of Cell A using coarse PK	Direction: Positive Extent: Local Duration: Long Term Frequency: Once Magnitude: Low Probability: High Significance: Significant	• Use of coarse PK will be spread as cover to stabilize Cell A dry tailings from water and wind erosion • Cap the PK cover with some waste rock or till to provide erosion protection and a more varied reclamation surface
• Structure demolition and debris handling	• Structure demolition and debris handling could disturb terrain and potentially impact permafrost	Direction: Negative Extent: Local Duration: Short Term Frequency: Once Magnitude: Low Probability: High Significance: Insignificant	• Minimize disturbance to terrain and use existing disturbed areas where possible • Re-contour disturbed areas to conditions that are consistent with the landforms in the surrounding undisturbed areas, to the extent possible
• Onsite construction of non-hazardous landfill	• Construction of the landfill will impact an area of undisturbed soil and terrain west of the tank farms and may impact permafrost		
• Landfarm operation	• Impact to permafrost may occur as a result of activities	Direction: Negative Extent: Local Duration: Medium Term Frequency: Once Magnitude: Low Probability: High Significance: Insignificant	• Landfarm will use an existing bermed area with a proper liner and leachate collection system • Proper operation of the landfarm to ensure impacted soil is contained and managed within the landfarm
Closure			
• Site contouring	• Activities could disturb the terrain and potentially impact permafrost	Direction: Negative Extent: Local Duration: Medium Term Frequency: Once Magnitude: Low Probability: Moderate Significance: Insignificant	• Grading of the coarse PK piles and recontouring disturbed surfaces (berms, pads) to conditions that are similar to landforms in the surrounding undisturbed areas, to the extent possible • Restore drainage to connect with and not impede drainage in the surrounding areas
Summary			
• Potential impacts to terrain and geology, and underlying permafrost or bedrock are associated with the construction of a landfill and operation of a landfarm. Construction of the proposed non-hazardous waste landfill west of the tank farms and north of the main camp would newly disturb approximately 2.5 ha of rocky tundra, which includes a small ephemeral pond (EBA 2013). Provided that proper construction and maintenance activities are implemented, no significant impacts are expected. The landfill and landfarm are not expected to contribute to any cumulative effects on terrain and soils. It is expected that the site stabilization activities of the Project will have beneficial effects on the terrain onsite because grading of piles and other reclamation will return the surface disturbance to conditions that will be more consistent with the surrounding areas.			

Table 16 Assessment of Impacts on Soils

Project Activity	Potential Impact	Impact Rating	Mitigation
Site Preparation			
• Mobilization and transportation of equipment on winter road	• Spills of PHCs onto soil when refuelling and servicing equipment, potentially producing new areas of contaminated soil	Direction: Negative Extent: Local Duration: Short Term Frequency: Intermittent Magnitude: Low Probability: Low Significance: Insignificant	• A spill contingency BMP will be developed and implemented, and be available onsite for all workers • Clean up spill promptly, and remove and containerize contaminated waste for proper disposal • Transportation procedures will be in accordance with the *Transportation of Dangerous Goods Act* and regulations
• Camp operation including water use and waste water treatment	• Potential impact of a release or releases of untreated waste water on soil	Direction: Negative Extent: Local Duration: Short Term Frequency: Once Magnitude: Low Probability: Low Significance: Insignificant	• Follow best practices to ensure untreated waste water is not discharged before it is treated and meets applicable guidelines • If untreated waste water is discharged, remove soil impacted by untreated waste water and treat the soil in the landfarm area
Site Stabilization			
• Onsite construction of non-hazardous landfill	• Construction of the landfill will disturb an area of undisturbed soil and terrain west of the tank farms and may impact permafrost • Potential degradation of topsoil from admixing • Potential soil degradation by erosion and compaction under adverse conditions	Direction: Negative Extent: Local Duration: Short Term Frequency: Once Magnitude: Low Probability: High Significance: Insignificant	• Minimize disturbance and use existing disturbances where possible • Salvage and stockpile organics, plants and topsoil, where present, as one lift for later use during reclamation • Avoid stripping or handling topsoil during wet or very windy conditions
• Onsite incineration of liquid organic waste • Onsite handling and consolidation of hazardous waste	• Spills of PHCs onto soil when refuelling and servicing equipment • Possible impact to soil from a spill while removing, consolidating, transporting, or incinerating waste materials	Direction: Negative Extent: Local Duration: Short Term Frequency: Intermittent Magnitude: Low Probability: Low Significance: Insignificant	• Use best practices and care to prevent spills when storing and handling liquid organic waste and hazardous wastes • Train all workers in proper handling of non-hazardous and hazardous wastes and impacted soil • Store fuel and hazardous material in easily accessible and bermed areas, which will provide containment and allow removal in case of a leak or spill • Inspect fuel and hazardous waste storage areas daily
• Excavation of impacted soils	• Removal of impacted soils from areas affected by historical spills of PHCs may impact non-impacted soil while removing and/or transporting contaminated soil to landfarm • Potential soil degradation by erosion and compaction	Direction: Neutral Extent: Local Duration: Short Term Frequency: Intermittent Magnitude: Low Probability: High Significance: Insignificant	• Use best practices and care to prevent spills when excavating and handling impacted soils • Train all workers in proper handling of non-hazardous and hazardous wastes and impacted soil • Avoid stripping or handling topsoil during wet or very windy conditions • Re-contour disturbed areas to conditions that are consistent with the landforms in the surrounding undisturbed areas, to the extent possible
• Landfarm operation	• Soil and gravel underlying the landfarm area may be impacted during operation of the landfarm	Direction: Negative Extent: Local Duration: Medium Term Frequency: Intermittent Magnitude: Low Probability: Low Significance: Insignificant	• Landfarm will use an existing berm area and a liner containment • Operation of the landfarm to ensure impacted soil material and leachate is contained and managed within the landfarm
• Offsite removal of hazardous waste and Tier 2 metal-impacted soil	• Possible impact to soil offsite from a spill while transporting hazardous waste and metal-impacted soil	Direction: Negative Extent: Local Duration: Short Term Frequency: Intermittent Magnitude: Low Probability: Low Significance: Insignificant	• Have a spill contingency plan ready and available to all workers • Clean up spill promptly and remove and containerize waste materials for proper disposal • Transportation procedures will be in accordance with the *Transportation of Dangerous Goods Act* and regulations

Project Activity	Potential Impact	Impact Rating	Mitigation
Closure			
• Site contouring	• Potential soil degradation by wind or water erosion and compaction during contouring • Impact to soil from pooling of water in undesired areas	Direction: Negative Extent: Local Duration: Medium Term Frequency: Intermittent Magnitude: Low Probability: Moderate Significance: Insignificant	• Restore drainage to connect with and not impede drainage in the surrounding areas • Spread any available salvaged surface soil and foster natural revegetation • Avoid handling and spreading topsoil during wet or very windy conditions
• Demobilization and transportation of equipment on winter road	• Spills of PHCs onto soil when refuelling and servicing equipment, potentially producing new areas of contaminated soil	Direction: Negative Extent: Local Duration: Short Term Frequency: Intermittent Magnitude: Low Probability: Low Significance: Insignificant	• Use the same winter road route used during the Project construction and operation phases • Have a spill contingency plan ready and available to all workers • Clean up spill promptly, and remove and containerize contaminated waste for proper disposal • Transportation procedures will be in accordance with the *Transportation of Dangerous Goods Act* and regulations
Summary			
• Mitigation measures presented above will help prevent and manage spills. Spills will be cleaned up promptly, and in the case of soils impacted by PHCs, remediated by land farming in the onsite landfarm. Other potential adverse effects may include soil degradation from compaction, erosion and/or admixing of topsoil and subsoil. The mitigation measures presented above will help prevent the occurrence of soil degradation. Impacts to soils are considered insignificant if mitigation measures are implemented.			

4.3.5 Vegetation

Table 17 Assessment of Impacts on Vegetation

Project Activity	Potential Impact	Impact Rating	Mitigation
Site Preparation and Camp Operations			
• Camp operation including water use and waste water treatment	• Potential impact to vegetation from water and waste water release	Direction: Neutral Extent: Local Duration: Medium term Frequency: Intermittent Magnitude: Low Probability: Low Significance: Insignificant	• Contain water as close to release point as possible
Site Stabilization			
• Structure demolition and debris handling	• Dust from remediation activities could impact vegetation	Direction: Negative Extent: Local Duration: Short Term Frequency: Intermittent Magnitude: Low Probability: Medium Significance: Insignificant	• Development and implementation of a dust control BMP, such as using water for controlling dust and limiting remediation activities during high wind periods
• Onsite construction of non-hazardous landfill	• Physical disturbance to vegetation • Loss or alteration of vegetation cover will occur when constructing landfill	Direction: Negative Extent: Local Duration: Long Term Frequency: Intermittent Magnitude: Medium Probability: Medium Significance: Insignificant	• Use existing roads, pathways, and previously disturbed areas to the fullest extent possible • Ensure natural drainages are recreated to limit water ponding and foster natural revegetation • Limit creation of new disturbed areas while completing remediation • Use equipment with low pressure tires • Proper landfarm design and operation to ensure leachate will not impact the surrounding environment
• Landfarm operation	• Physical disturbance to vegetation		
• Onsite handling and consolidation of hazardous waste • Onsite incineration of liquid organic waste • Onsite burning of liquid organic waste	• Potential impact to vegetation from wastes while moving, transporting, burning, and incinerating waste materials	Direction: Negative Extent: Local Duration: Medium term Frequency: Intermittent Magnitude: Low Probability: Low Significance: Insignificant	• A spill contingency BMP will be developed and implemented, and be available onsite for all workers • Contain spill as close to release point as possible • Fuel and hazardous material will be stored in an easily accessible bermed area, which will act as a spill barrier • Allow for easy removal in case of a leak or spill • Hazardous waste and fuel storage areas (including drums) will be inspected daily • All workers will be trained in proper handling of non-hazardous and hazardous materials and contaminated soil • Hazardous materials and contaminated soil will be exposed for as short time as possible
Closure			
• Site contouring	• Loss or alteration of surrounding undisturbed vegetation cover can occur when completing site contouring activities	Direction: Negative Extent: Local Duration: Long Term Frequency: Once Magnitude: Low Probability: Medium Significance: Insignificant	• Use existing roads, pathways, and previously disturbed areas to the fullest extent possible • Ensure natural drainages are recreated to limit water ponding and foster natural revegetation • Land surface will be contoured in to match pre-disturbance conditions to the fullest extent possible but with the minimal equipment use to foster natural revegetation • Utilize stockpiled surface soil for revegetation • Use equipment with low pressure tires
Summary			
• Adverse potential impacts to vegetation are associated with the structure demolition and debris handling, construction of a landfill, operation of a landfarm, and site contouring. Provided that proper construction and maintenance activities are implemented, no significant impacts are expected. Overall, the removal of abandoned site infrastructure and remediation of contaminated soils from the Project will improve vegetation.			

4.3.6 Wildlife

Table 18 Assessment of Impacts on Wildlife

Project Activity	Potential Impact	Impact Rating	Mitigation
Site Preparation			
• Mobilization and transportation of equipment on winter road • Camp operation including water use and waste water treatment	• Human activity changing animal use patterns (i.e., avoidance) or animal movement patterns	Direction: Negative Extent: Regional Duration: Short Term Frequency: Continuous Magnitude: Low Probability: High Significance: Insignificant	• Suspend activities if large numbers (>100) of caribou are observed onsite • Suspend activities if cows are present during caribou calving and post-calving (late-April to August) • Maintain equipment in good working condition, turn equipment off when not in use, and use mufflers to reduce noise • Restrict wildlife access to contaminated areas • Bear safety training and associated deterrents will be provided, as will information on other wildlife encounters • Limit traffic speed and give wildlife the right-of-way on roads • Proper containment and disposal of waste, garbage, fuel, and hazardous materials • Storage areas will be inspected regularly and transportation procedures will be in accordance with the *Transportation of Dangerous Goods Act* • Implement spill prevention and response plans
	• Traffic collisions with wildlife • Indirect mortality from wildlife-human interactions • Interaction with camp waste and refuelling spills resulting in compromised health or animal mortality	Direction: Negative Extent: Local Duration: Short Term Frequency: Intermittent Magnitude: Negligible Probability: Low Significance: Insignificant	
Site Stabilization			
• Open Pit filling • PKCA • Structure demolition and debris handling • Onsite construction of non-hazardous landfill • Onsite handling and consolidation of hazardous waste • Excavation of impacted soils • Landfarm area operation • Offsite removal of hazardous waste and Tier 2 metal-impacted soil	• Human activity changing animal use patterns (i.e., avoidance) or animal movement patterns	Direction: Negative Extent: Regional Duration: Short Term Frequency: Continuous Magnitude: Low Probability: High Significance: Insignificant	• Suspend activities if large numbers (>100) of caribou are observed onsite • Suspend activities if cows are present during caribou calving and post-calving (late-April to August) • Maintain equipment in good working condition, turn equipment off when not in use, and use mufflers to reduce noise • Restrict wildlife access to contaminated areas • Bear safety training and associated deterrents will be provided, as will information on other wildlife encounters • Limit traffic speed and give wildlife the right-of-way on roads • Proper containment and disposal of waste, garbage, fuel, and hazardous materials • Storage areas will be inspected regularly and transportation procedures will be in accordance with the *Transportation of Dangerous Goods Act* • Implement spill prevention and response plans • Inspect infrastructure and associated areas for wildlife before initiating project activities; develop a site-specific plan in cooperation with government agencies if wildlife are present • Adhere to the *Migratory Birds Convention Act* and associated regulations
	• Traffic collisions with wildlife • Indirect mortality from wildlife-human interactions • Interaction with contaminants, hazardous materials, and refuelling spills resulting in compromised health or animal mortality • Direct mortality arising from demolishing structures, removing infrastructure, and excavating soils	Direction: Negative Extent: Local Duration: Short Term Frequency: Intermittent Magnitude: Negligible Probability: Low Significance: Insignificant	
Closure			
• Site contouring • Demobilization and transportation of equipment on winter road • Long-term monitoring	• Human activity changing animal use patterns (i.e., avoidance) or animal movement patterns	Direction: Negative Extent: Regional Duration: Short Term Frequency: Continuous Magnitude: Low Probability: High Significance: Insignificant	• Suspend activities if large numbers (>100) of caribou are observed onsite • Suspend activities if cows are present during caribou calving and post-calving (late-April to August) • Maintain equipment in good working condition, turn equipment off when not in use, and use mufflers to reduce noise • Bear safety training and associated deterrents will be provided, as will information on other wildlife encounters • Limit traffic speed and give wildlife the right-of-way on roads • Proper containment and disposal of waste, garbage, fuel, and hazardous materials • Storage areas will be inspected regularly and transportation procedures will be in accordance with the *Transportation of Dangerous Goods Act* • Implement spill prevention and response plans • Inspect infrastructure and associated areas for wildlife before initiating project activities; develop a site-specific plan in cooperation with government agencies if wildlife are present • Adhere to the *Migratory Birds Convention Act* and associated regulations
	• Traffic collisions with wildlife • Indirect mortality from wildlife-human interactions • Interaction with refuelling spills resulting in compromised health or animal mortality • Direct mortality arising from soil contouring actions	Direction: Negative Extent: Local Duration: Short-Term Frequency: Intermittent Magnitude: Negligible Probability: Low Significance: Insignificant	

Project Activity	Potential Impact	Impact Rating	Mitigation
• Site contouring	• Loss or alteration of vegetation cover can occur when completing site contouring activities	Direction: Neutral Extent: Local Duration: Long Term Frequency: Continuous Magnitude: Negligible Probability: Medium Significance: insignificant	• Use existing roads, pathways and previously disturbed areas to the fullest extent possible • Ensure natural drainages are recreated to limit water ponding and foster natural revegetation • Land surface will be contoured in to match pre-disturbance conditions to the fullest extent possible but with the minimal equipment use to foster natural revegetation • Use equipment with low pressure tires

Summary

Based on the baseline wildlife information (Section 3.5), Project activities outlined in the SSP have the potential to impact wildlife use, movement, health, and mortality. Table 12 summarizes potential impacts, impact ratings, and associated mitigations relevant to wildlife that could interact with the Project. Wildlife has the potential to be adversely effected by all four phases of the Project. Adverse effects could include changes to wildlife use, movement, health, and mortality. A summary of these issues and key mitigations aimed at protecting wildlife follows:

- Human activity will likely alter the spatial distribution of some wildlife species and could change movement between Contwoyto and Carat Lakes. There is evidence that human activity associated with mines has increased movement rates and displaced caribou in the Bathurst Caribou Herd (Boulanger et al. 2004, 2012). The degree to which caribou are displaced by human activity is related to the amount of traffic and surrounding habitat conditions (Wasser et al. 2011). Temporarily suspending activities if caribou cows are present during the calving and post-calving season (late-April to July) will decrease impacts to caribou.
- Nests and dens could be disturbed during remediation and closure activities. Infrastructure and associated areas will be checked for wildlife species before initiating project activities. If activities cannot be completed without harming animals, their nests, or dens, a wildlife biologist from Environment Canada (for migratory birds) or the Government of Nunavut (for species managed by the Territory) will be contacted for guidance or to request a permit authorizing the disturbance.
- Wildlife-human interactions could occur during Project activities, particularly at the camp and where waste materials are stored. Proper containment and disposal of waste/garbage, such as removal or incineration, and training workers in wildlife safety will reduce the probability of adverse wildlife encounters. Vehicle-wildlife interactions could also result in occasional wildlife mortalities. Activities will be suspended for caribou, traffic speed limited, and wildlife will be given the right-of-way by vehicles. With implementation of mitigation measures, encounters are expected to be infrequent and insignificant.
- Wildlife-contaminant interactions are possible and could impact wildlife health and mortality. Western Kitikmeot residents have prioritized managing contamination for caribou within the region (Dumond 2007b). Wildlife access to contaminated areas will be restricted, and spill prevention and response will be implemented during Project activities. All soil treatment will be completed during the summer of 2017 so wildlife-contaminant interactions are not expected following closure. With implementation of mitigation measures, adverse effects are expected to be local, short term, and insignificant.
- Overall, the removal of abandoned site infrastructure and remediation of contaminated soils will improve habitat quality and therefore have long-term benefits for wildlife. Remediation has the potential to negatively affect wildlife, but with mitigations, is expected to have a net benefit on wildlife in the Project area.

4.3.7 Culture

Historical Land Use

None of the 25 heritage sites identified during the Project EIS were determined to be of sufficient potential of significance to require avoidance by development (Tahera 2003a). It is not expected that remediation of the Project will contribute to further impact to cultural sites as most of the work will be completed within the existing footprint. The landfill will be located outside the existing footprint, but not located in areas of historical significance. If previously identified cultural features remain at the Project site, the locations will be identified and marked while remediation activities are taking place to ensure they are not further affected. If any new cultural features are discovered before or during the remediation, the location will be marked and the area avoided and the discovery will be reported to the Government of Nunavut. It is anticipated that effects to previously identified cultural features or the discovery of new cultural features can be appropriately mitigated and no adverse cumulative effects are expected.

Current Land Use

The Site Stabilization Project is in line with current draft land use planning and is consistent with the community values and priorities for the area (Nunavut Planning Commission 2016a; 2016c).

The site stabilization activities will improve the aesthetics of areas as buildings will be demolished (with the exception of the truck shop and process plant), water flow into the area of the open pit will be re-established, pads and borrow areas will be graded, and hazardous and non-hazardous waste will be disposed of or removed.

Traditional Use

The remediation activities will only affect traditional land use in the Project area during the project work. When finalized, a schedule will be provided to the Kitikmeot Hunters and Trappers Association and the Kitikmeot Inuit Association. The development of the winter road to mobilize and demobilize equipment to the site may also allow traditional users to access the area during the winters of 2017 and 2018, but will not provide permanent access. Positive residual impacts are expected with the remediation activities, which may increase opportunity for traditional land use activities.

Residual Impacts

The Project is not expected to result in any negative residual cultural impacts. The remediation will be short term and will likely provide positive benefits to land use and traditional use opportunities through improved aesthetics and clean up of equipment, and hazardous and non-hazardous waste.

4.3.8 Socio-economics

The Project will result in positive socio-economic benefits to the community of Kugluktuk. Employment and procurement opportunities will benefit local individuals and businesses, and related economic benefits will occur in the region. Employment opportunities could also provide additional socio-economic benefit of skill development, training, and work experience. Potential employment opportunities on the Project may include trades and labourers, equipment operators, environmental monitors, and camp staff.

Employment statistics indicate that there are skilled employees available in the local community and the region. Statistics also indicate that there is available workforce in Kugluktuk (Statistics Canada 2011). It is expected that a portion of the workforce will come from Kugluktuk or other local communities in the region. Employment opportunities from the Project will provide short-term positive impact to the community.

While a portion of the workforce will come from local communities, it is also expected that there will be a short-term temporary mobile workforce for positions where the skills are not available locally. The increase in temporary workers in the community will be mitigated by the use of an onsite camp, which will not have road access to the local communities. It is anticipated that most workers will mobilize directly from Yellowknife to site; however, any workers that do stay temporarily in the community of Kugluktuk will likely be accommodated by available hotel and motel accommodations. No impacts to the community of Kugluktuk are anticipated as it is expected that any demand on community infrastructure will be accommodated by existing capacity.

Residual Impacts

The Project is not expected to result in any negative residual socio-economic impacts. The remediation will contribute to short-term economic growth and employment, and will not exceed the existing capacity of the local community.

5 MONITORING PROGRAM RECOMMENDATIONS

Project monitoring has the following objectives:

- to confirm compliance with the site stabilization objectives
- determine accuracy of impact predictions
- measuring environmental conditions against triggers and thresholds that would initiate adaptive management and contingency plans

The Project will require both short-term and long-term monitoring. Below is a list of possible monitoring requirements:

- Annual geotechnical monitoring of remaining water and building infrastructure for the first 2 years then determination of long-term geotechnical monitoring.
- Monitor water quality (including uranium), thermal regimes, and stratification potential of the pit lake during the filling period.
- Monitor effect of runoff diversion to fill the pit lake on Carat Lake levels.
- Water quality monitoring in the coarse PK and the kimberlite piles should be continued at the east sump post-closure to establish trends.
- Monitor water quality and sediment loading during any instream work (i.e., causeway works).
- Field inspections of erosion and sediment control measures to ensure surface runoff is not contributing to sediment loading of watercourses and water bodies. Discharging water onto permafrost will lead to runoff into low points of the Project area (i.e., drainages and watercourses).
- Monitoring for signs of erosion near reclaimed lands where surface soil was replaced or till was graded during contouring.
- Soil sampling may be required to assess soil conditions if stressed vegetation is identified.

6 KNOWLEDGE DEFICIENCIES

Information on the environmental conditions at the site was collected during previous field studies. While this information is adequate for the scope of this work, there are some knowledge deficiencies with respect to remediation work in the arctic that are not specific to this Project.

- The thermal regime, water quality, and meromixis potential of the relatively deep pit lake requires further investigation, especially if it is to be used as fish habitat compensation.
- No information was encountered describing the pre-disturbance, site-specific terrain and soil conditions, which were not documented in the EIS or the supplemental reports. Limited information on soils in the area was interpreted from six borehole logs documented during the environmental site assessment (Tetra Tech EBA 2014). Other published reports and a broad scale regional map were reviewed to develop an understanding of the soils and the soil parent materials for the general area of the Project location.

- Western Kitikmeot residents have prioritized managing contamination for caribou within the region (Dumond 2007b). It is unclear to what extent soil and water contamination influence can vector into caribou, and if it can vector into caribou, how it does so.

- Migratory routes of caribou can change from year to year. It is unknown whether Bathurst caribou will use the area around the Project a lot, little, or none when the Project is scheduled in 2017. Therefore, it is difficult to assess the potential short-term impacts of the Project on caribou behaviour (and what that might mean for the population).

- Unclear to what extent revegetation will support wildlife in the future due to the slow establishment of vegetation in arctic climates.

7 PUBLIC CONCERNS

During public consultation for the Project, the local communities expressed an interest in employment, particularly by young residents (Tahera 2003a). General concerns for the Project area included protection of water and wildlife, particularly caribou (Tahera 2003a). During a community meeting held in Kugluktuk in August 2016, no major concerns with the SSP were raised. The community expressed interest in employment opportunities during the implementation of the SSP.

8 CONCLUSION

The mitigation strategies outlined for the remediation of the Project are predicted to result in no negative residual impacts. Overall the site stabilization of the Project will have a positive effect on the environment by restoring the site to an environmentally safe condition, preventing environmental migration of contaminants into the surrounding ecosystem, and removing some physical hazards for the protection of human health and safety. The Project will also have overall positive benefits to local economic growth, employment, land use, and traditional use opportunities through improved aesthetics from remediation.

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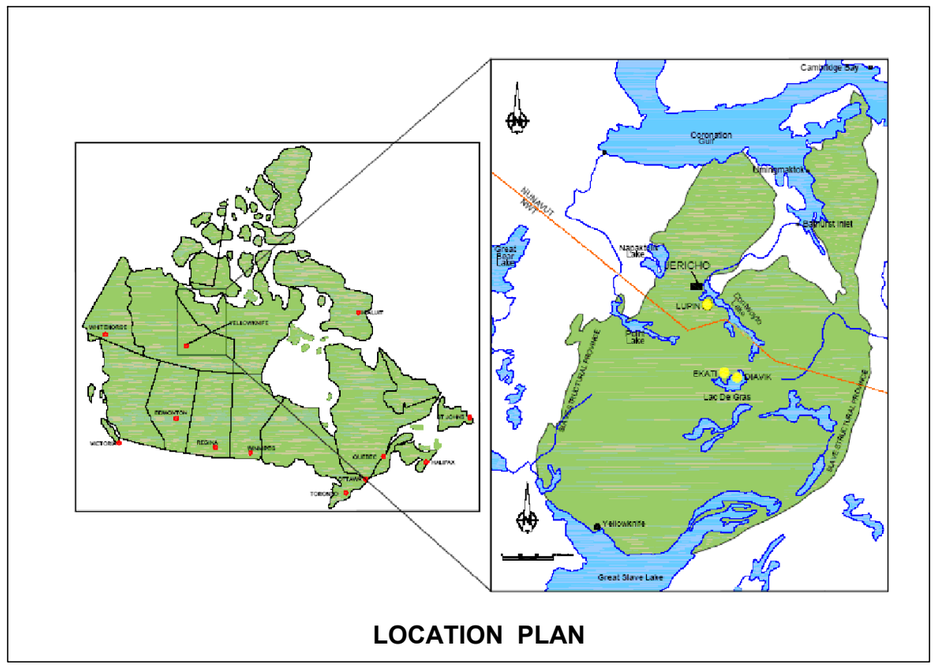
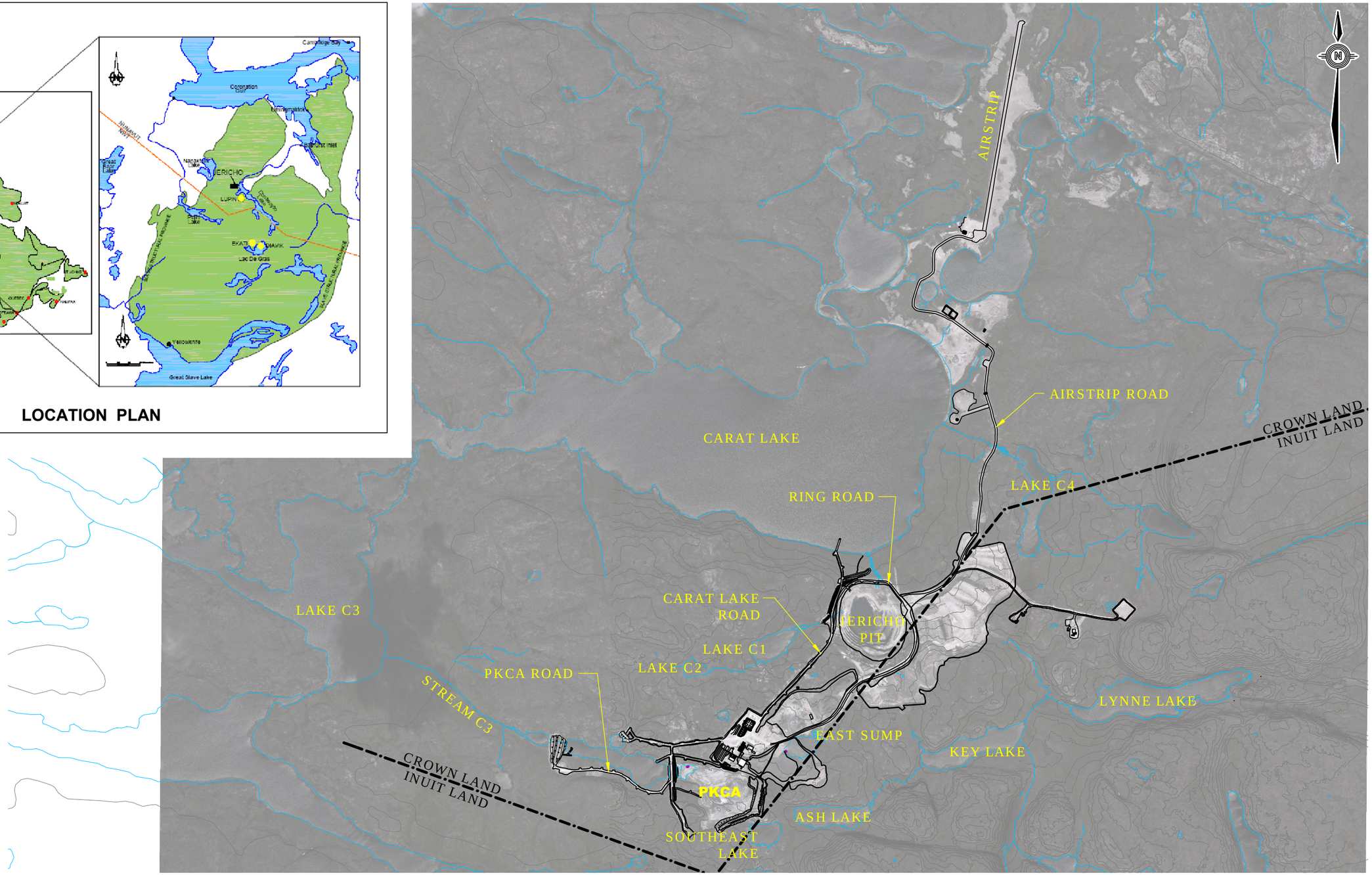
APPENDIX A
Figures Completed by Tetra Tech EBA



LOCATION PLAN



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NOTE:
BASE AIRPHOTOS PROVIDED BY
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STATUS
ISSUED FOR USE

CLIENT

Aboriginal Affairs and Northern Development Canada

Closure Assessment
Jericho Diamond Mine, Nunavut

OVERALL SITE PLAN

TETRA TECH EBA

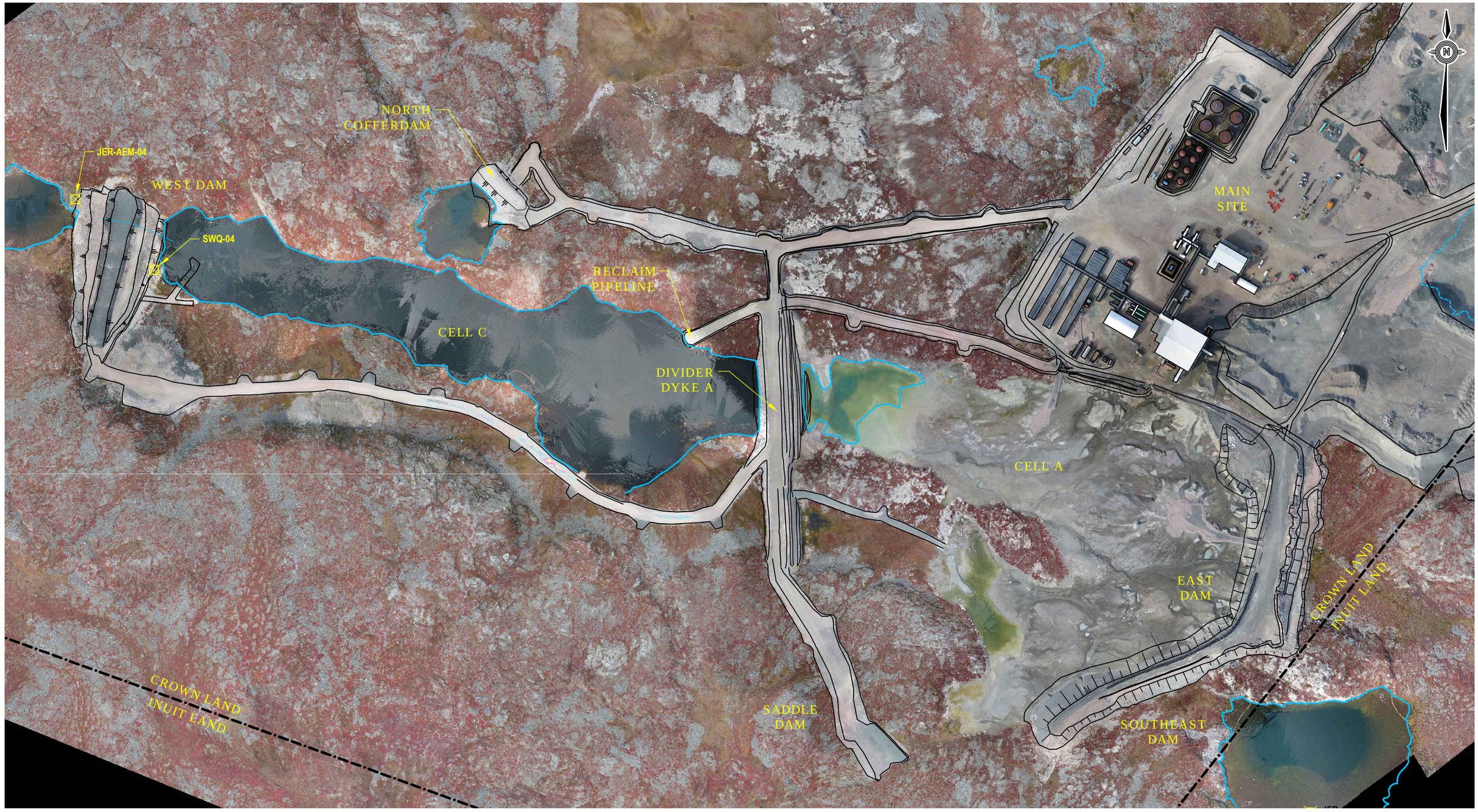
PROJECT NO.	DWN	CKD	REV
E14103202	GDK/DBD	WTH	0

OFFICE: EDM

DATE: December 2014

Figure 1

Q:\Edmonton\Engineering\E1411\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA2.0 Producton Drawings\ESA Figures_Figure 1.dwg [FIGURE 1] December 16, 2014 - 9:41:48 am (BY: STIRLING, JENNIFER)



LEGEND:

- JERICHO SURFACE SAMPLE LOCATION

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Scale: 1:4,000 @ 11"x17"

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Jericho Diamond Mine, Nunavut

PROCESSED KIMBERLITE CONTAINMENT AREA

TETRA TECH EBA

PROJECT NO.	DWN	CKD	REV
E14103202	GDK/DBD	WTH	0

OFFICE	DATE
EDM	December 2014

Figure 2

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Site Plans.dwg [FIGURE 2] December 15, 2014 - 2:58:57 pm (BY: STIRLING, JENNIFER)

LEGEND:

- JERICHO SURFACE SAMPLE LOCATION

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Scale: 1:2,500 @ 11"x17"

NOTE:
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STATUS
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CLIENT

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Closure Assessment
Jericho Diamond Mine, Nunavut

MAIN SITE AND COARSE PK PILE

TETRA TECH EBA

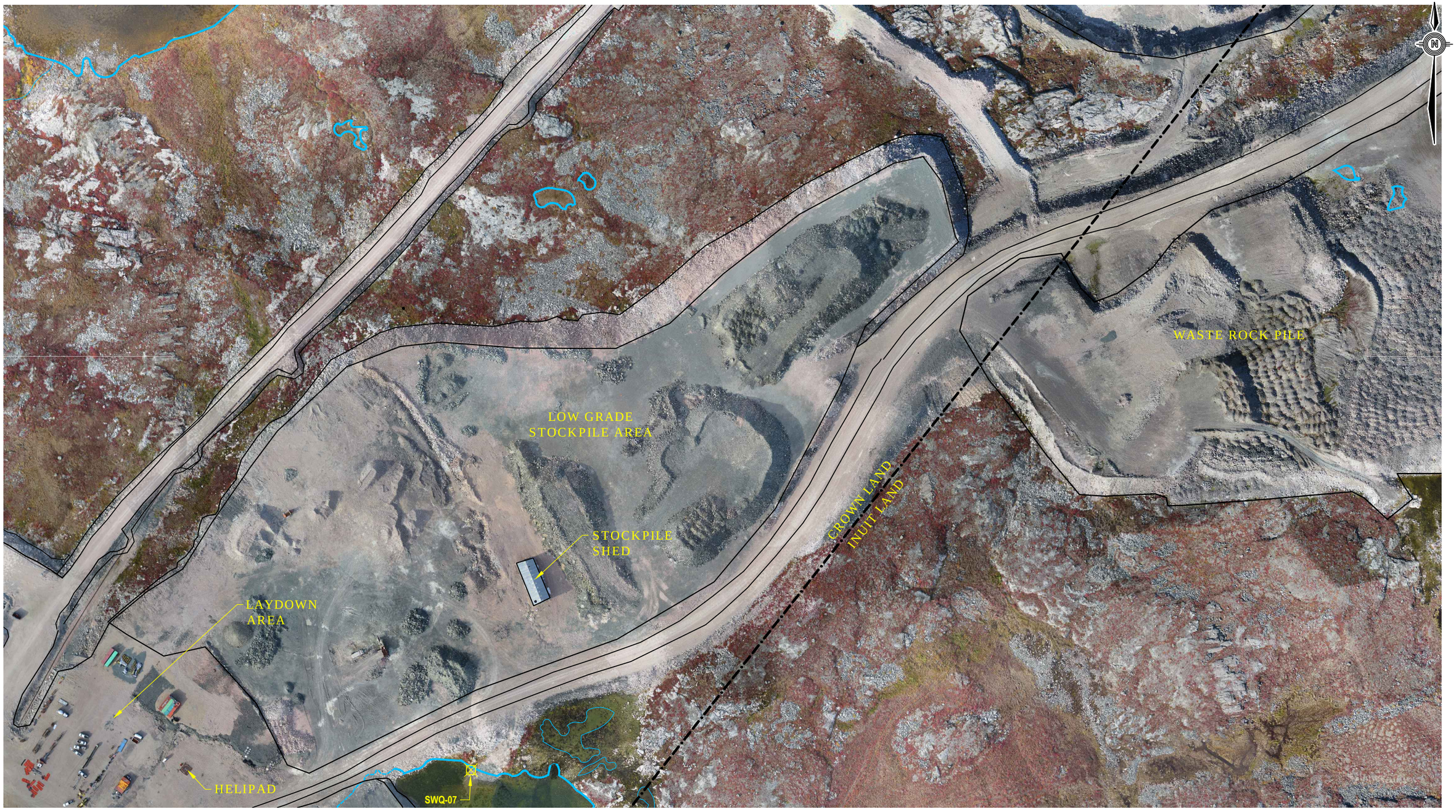
PROJECT NO.	DWN	CKD	REV
E14103202	GDK/DBD	WTH	0

OFFICE: EDM

DATE: December 2014

Figure 3

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Site Plans.dwg [FIGURE 3] December 15, 2014 - 3:00:06 pm (BY: STIRLING, JENNIFER)



LEGEND:

- JERICHO SURFACE SAMPLE LOCATION

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Scale: 1:2,500 @ 11"x17"

NOTE:
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CLIENT

Aboriginal Affairs and Northern Development Canada

Closure Assessment
Jericho Diamond Mine, Nunavut

LOW GRADE STOCKPILE

TETRA TECH EBA

PROJECT NO.	DWN	CKD	REV
E14103202	GDK.DBD	WTH	0

OFFICE	DATE
EDM	December 2014

Figure 4

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Site Plans.dwg [FIGURE 4] December 15, 2014 - 3:03:22 pm (BY: STIRLING, JENNIFER)

LEGEND:

- JERICHO SURFACE SAMPLE LOCATION

0 250m

Scale: 1:5,000 @ 11"x17"

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Closure Assessment
Jericho Diamond Mine, Nunavut

PIT AND WASTE ROCK PILES

TETRA TECH EBA

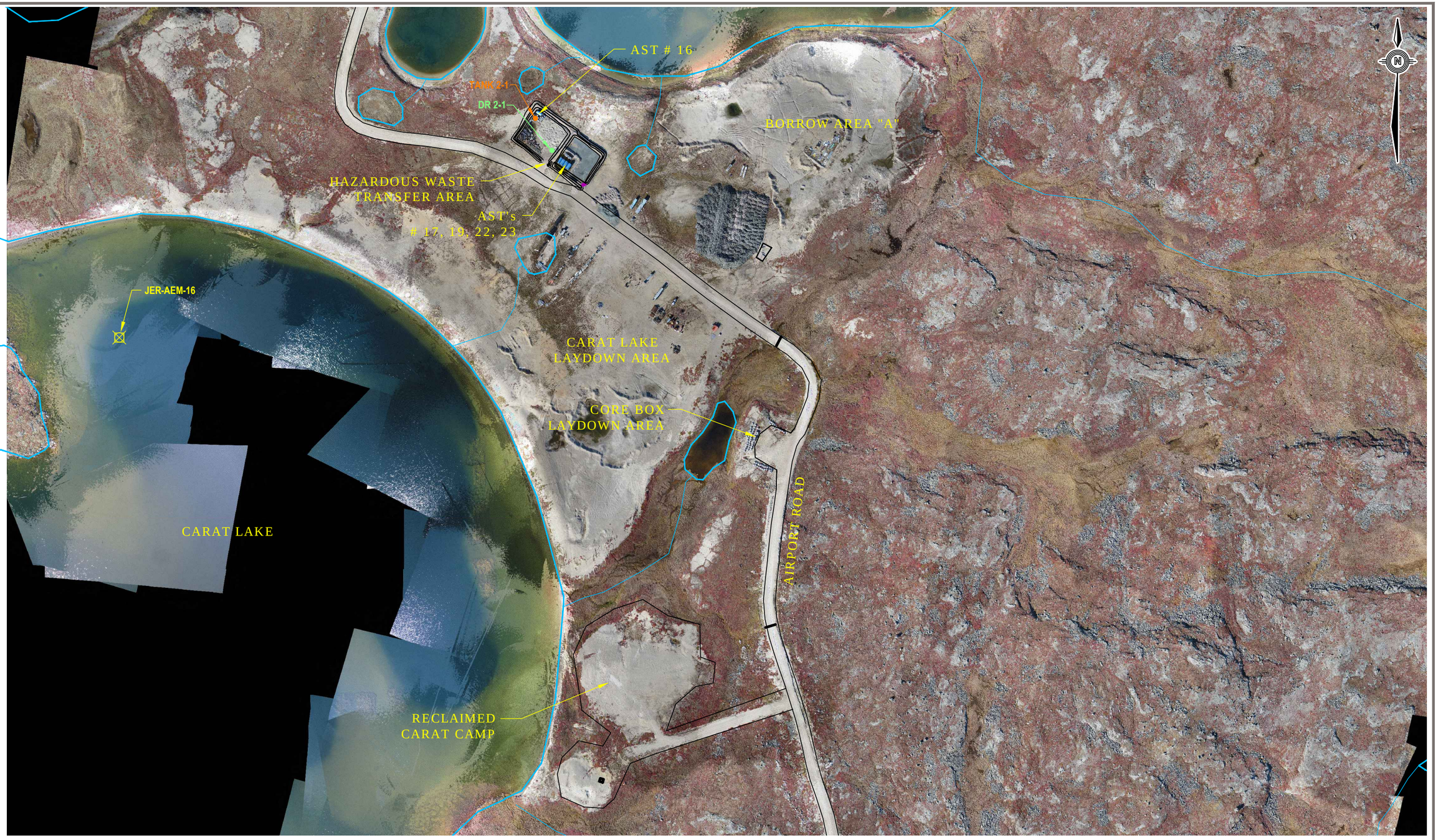
PROJECT NO.	DWN	CKD	REV
E14103202	GDK/DBD	WTH	0

OFFICE: EDM

DATE: December 2014

Figure 5

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Site Plans.dwg [FIGURE 5] December 15, 2014 - 3:04:05 pm (BY: STIRLING, JENNIFER)



LEGEND:

- JERICHO SURFACE SAMPLE LOCATION
- AST CONTENT SAMPLE LOCATION
- DRUM CONTENT SAMPLE LOCATION

0 200m

Scale: 1:4,000 @ 11"x17"

NOTE:
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Aboriginal Affairs and Northern Development Canada

Closure Assessment
Jericho Diamond Mine, Nunavut

CARAT LAKE INFRASTRUCTURE

TETRA TECH EBA

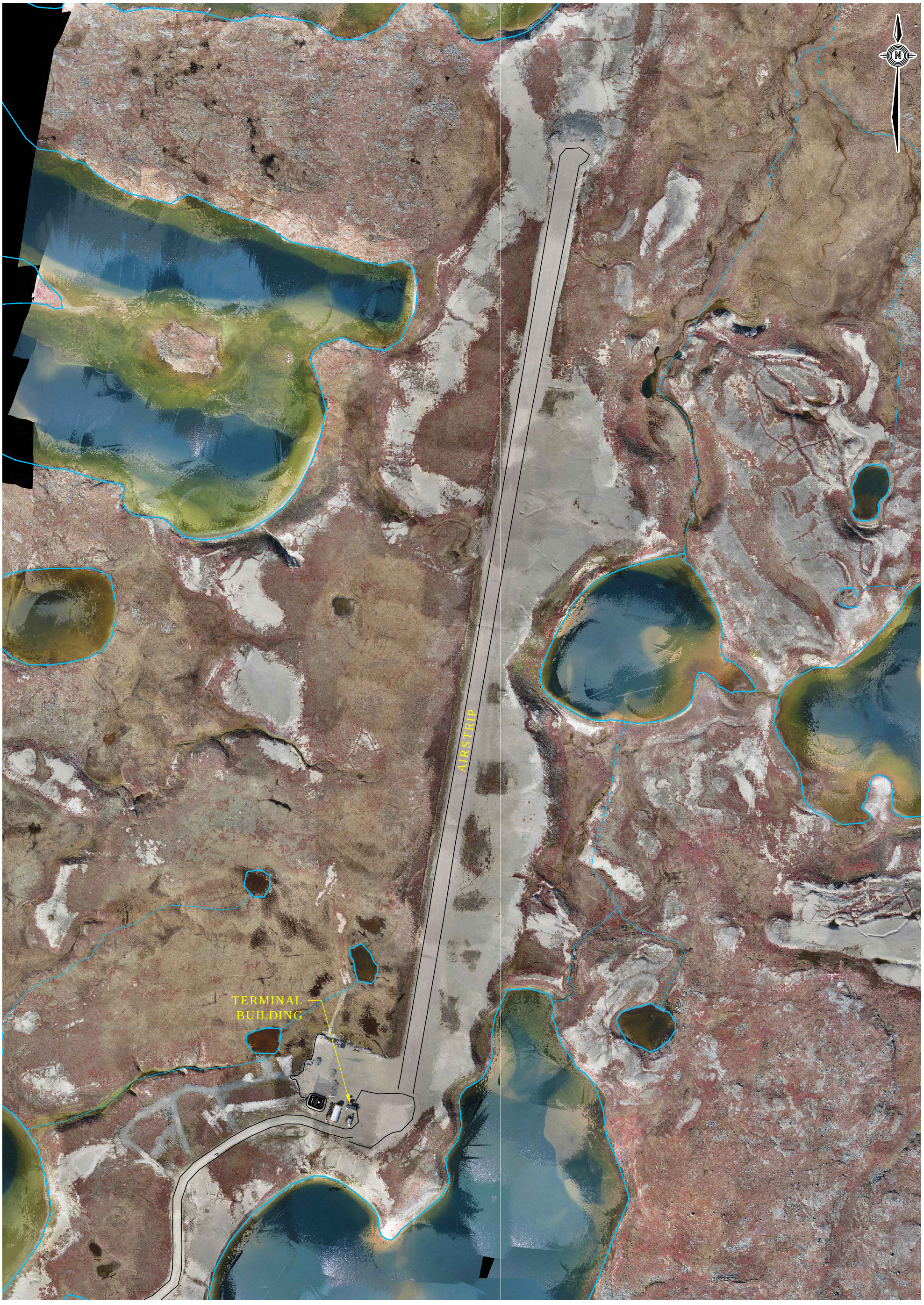
PROJECT NO.	DWN	CKD	REV
E14103202	GDK/DBD	WTH	0

OFFICE: EDM

DATE: December 2014

Figure 6

Q:\Edmonton\Engineering\E141\Projects\E14103202 - Jericho Reclamation\5.0 Drawings\ESA\2.0 Producton Drawings\Site Plans.dwg [FIGURE 6] December 15, 2014 - 3:04:46 pm (BY: STIRLING, JENNIFER)



NOTE:
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0 250m
Scale: 1:5,000 @ 11"x17"

STATUS
ISSUED FOR USE

CLIENT
Aboriginal Affairs and Northern Development Canada

TETRA TECH EBA

Closure Assessment
Jericho Diamond Mine, Nunavut

AIRSTRIP AREA

PROJECT NO.	DWN	CKD	REV
E14103202	DBD	WTH	0

OFFICE	DATE
EDM	December, 2014

Figure 7

APPENDIX B
Nunavut Impact Review Board Project-specific Information Requirement Forms

THE NUNAVUT IMPACT REVIEW BOARD
PROJECT SPECIFIC INFORMATION REQUIREMENT - PART 2 FORM

TABLE 1 - IDENTIFICATION OF ENVIRONMENTAL IMPACTS

		ENVIRONMENTAL COMPONENTS	PHYSICAL	designated environmental areas (ie. Parks, Wildlife Protected areas)	ground stability	permafrost	hydrology/ limnology	water quality	climate conditions	eskers and other unique or fragile landscapes	surface and bedrock geology	sediment and soil quality	tidal processes and bathymetry	air quality	noise levels	other VEC:	other VEC:	other VEC:	BIOLOGICAL	vegetation	wildlife, including habitat and migration patterns	birds, including habitat and migration patterns	aquatic species, incl. habitat and migration/spawning	wildlife protected areas	other VEC:	other VEC:	other VEC:	SOCIO-ECONOMIC	archaeological and cultural historic sites	employment	community wellness	community infrastructure	human health	other VSEC: aesthetics
	PROJECT COMPONENTS/ACTIVITIES																																	
CONSTRUCTION	Winter road construction, mobilization, transportation of equipment						M				M	M		M							M	M	M							P	P	P		
OPERATION	Camp Operation Including Water Use, Waste Water Treatment, Waste Incineration						M					M		M						M	M	M	M							P	P			
DECOMMISSIONING	Open Pit Infilling and Stabilization				M		M	M				M										M	M	P							P				P
	Processed Kimberlite Containment Area Management				P		P	P				P										M	M	M							P				P
	Structure Demolition and Debris Handling				M		M					M		M						M		M	M	M							P				P
	Onsite Construction of Non-hazardous Landfill				M		M					M		M						M		M	M	M							P				M
	Onsite Incineration of Liquid Organic Waste						P	P				M		M						P		P	P	P							P				P
	Onsite Handling and Consolidation of Hazardous Waste						M	P				M								M		M	M	M							P				P
	Excavation of Impacted soils						M	P				M										M	M	M							P				
	Landfarm Area Operation				M		M					M		M						M		M	M								P				
	Offsite Removal of Hazardous Waste and Tier 2 Metal Impacted Soil						P	P				M		M								P	P	P							P				P
	Site Contouring				M		P					M		M						M		M	M	M							P				P
	Demobilization, Transportation of Equipment on Winter Road						M					M		M								M	M	M									P		
	Long-term Monitoring						M	M														M	M	M							P				

Notes: Please indicate in the matrix cells whether the interaction causes an impact and whether the impact is:

P *Positive*
N *Negative and non-mitigatable*
M *Negative and mitigatable*
U *Unknown*
If no impact is expected then please leave the cell blank

THE NUNAVUT IMPACT REVIEW BOARD
SCREENING PART 2 FORMS

TABLE 2 - MITIGATION AND MONITORING

	PROPOSED MITIGATION MEASURE	IMPLEMENTATION SCHEDULE	RESIDUAL IMPACTS	PROPOSED MONITORING SCHEDULE	REPORTING SCHEDULE
IMPACTS (IDENTIFIED IN TABLE 1)					
Winter Construction, Mobilization, Transportation of Equipment	Proper use of equipment; meeting regulatory and transportation standards	March 2017	none	March 2017	March 31, 2018
Camp Operation Including Water Use, Waste Water Treatment, Waste Incineration	Training of staff in proper use of equipment	May - October 2017	none	Ongoing May to October 2017 for the duration of the stabilization project	March 31, 2018
Open Pit Filling	Development and implementation best management practices	May 2017 and until pit meets desired water elevation	none	Ongoing May to October 2017 during stabilization project and then as required until the pit is filled with water	March 2018 and then as required based on monitoring schedule
Processed Kimberlite Containment Area Management	Development and implementation best management practices	May - October 2017	none	Ongoing May to October 2017 during stabilization project and then as required until the PKCA is stable	March 2018 and then as required based on monitoring schedule
Structure Demolition and Debris Handling	Proper use of equipment meeting regulatory standards	May - October 2017	none	Ongoing May to October 2017	March 31, 2018
Onsite Construction of Non-hazardous Landfill	Proper design, construction and implementation best management practices	May 2017	none	Ongoing May to October 2017 during stabilization project and then as required	March 31, 2018 and then as required based on monitoring schedule
Onsite Incineration of Liquid Organic Waste	Proper identification of liquids; training of staff in proper use of equipment	May - October 2017	none	Ongoing May to October 2017	March 31, 2018
Onsite Handling and Consolidation of Hazardous Waste	Hazardous waste and fuel storage areas (including drums) will be inspected daily; proper training of staff; implementation of best management practices	May - October 2017	none	Ongoing May to October 2017	March 31, 2018
Excavation of Impacted soils	Impacted soil will be exposed for as short time as possible; sedimentation control measures in place; monitoring of exposed soil; timely recontouring of exposed areas	May - July 2017	none	Ongoing May to October 2017	March 31, 2018
Landfarm Area Operation	Training of staff in proper use of equipment and materials	May - October 2017	none	Ongoing May to October 2017	March 31, 2018
Offsite Removal of Hazardous Waste and Tier 2 Metal Impacted Soil	Training of staff in proper packaging of hazardous materials, use of equipment and following TDG regulations	March 2018	none	March 2018	March 31, 2018
Site Contouring	Installing erosion and sediment control measures around sensitive areas; proper of equipment; minimizing exposed soils	May - October 2017	none	Ongoing May to October 2017	March 31, 2018
Demobilization, Transportation of Equipment on Winter Road	Proper use of equipment meeting regulatory and transportation standards	March 2018	none	March 2018	March 31, 2018
Long-term Monitoring	Best management practises for accessing long term monitoring sites	TBD at the end of the SSP program	none	TBD at the end of the SSP program	TBD at the end of the SSP program

Note: Residual impacts refers to those impacts that remain after mitigation has been implemented.