100347-001 Aug. 23, 2016

1:00 PM Alan indicates winds are still too high and that we are out of time in terms of flying to Ennadai Lake.
Alan is still waiting on approval from his office to fly out to Ennadai Lake on Aug. 24.
Forecast for AM Aug. 24 does not come out until 19:00 Aug. 23

2:00 PM H8S
2:15 PM on-site, used DGPS to map out Rankin Inlet Nickel Mine Site
3:17 PM Alan texted and indicates flying to Ennadai Lake on Aug. 24, 2016 is a go weather permitting

100347-001 Aug. 23, 2016

Rankin Inlet

5:43 PM

Thermister T8
XR-420-T8
Serial # 19353

- 9 sensors/beads connections

Thermister T6

- ~~8 sensors/beads~~ (E4)
- ~~12 sensors/beads~~ (E4)
- 9 (yellow), 6 (red), 1 (orange) 2 (grey), 11 (brown grey)
- ~~1 group of return wires~~ (E1) (E)
- ~~3 wires unused and tapped down~~

Thermister T1

- 8 sensors/beads
- 1 group of extra wires

100347-001 Aug. 23, 2016

Thermister T11

- casing is missing
- 7 sensors/beads
- 4 unknown wires taped down
  - 1 group of 7 wires
- one bead sensor on string above ground see photo

Therimister T9

- 20 sensors/beads

Thermister T10

- missing casing/string/ and datalogger

100347-001 Ennadai Aug. 24, 2016
partly cloudy
17-22°C
~20 km/hr

Site: Ennadai Lake

Client: INAC
Contact: Karla Letto

Personnel: Elliott Holden (Arcadis)
Jason Mauchan (Arcadis)
Alan Gilbertson (Cockpit)
John Ell (HTO)

Aircraft: Turbine Otter

At Airport in Rankin INLET at 7:40 AM

Departed 8:20 AM to Ennadai Lake

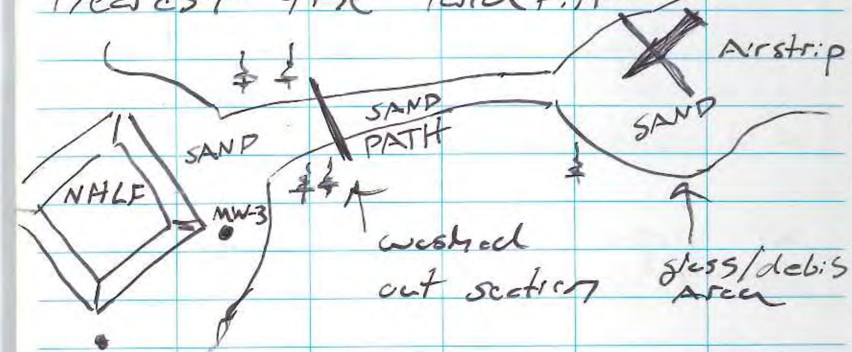
Arrived at Ennadai Lake Airstrip at 10:17 AM

caribou (2) spotted while circling the site in the Otter

100347-001 Ennada: Aug. 24, 2016

3 more caribou spotted on the airstrip as we landed

Lots of broken glass and pieces of metal (small) at the end of the Airstrip nearest the landfill



lots of fresh caribou trackS male/female and cafts, cows and ~~[illegible]~~ Bull (EH) according to John

2 Eagles spotted

100347-001 Ennada: Aug 24, 2016

MWLF-3 11:25 AM

- cut off old lock and replaced w new one
- J-plug in good condition and was tightly secured

DTB: 2.415 m btoc
WL: 1.488 m btoc

Bottom of well sounds/feels hard

well volume ~ 1.5L
3 well volumes ~ 4.5L

8L purged, good recharge

- water obs. slightly cloudy yellow-brown-gray colour, no odour, no sheen
- Yellow-brown-gray Sediment was observed at the bottom of the well in the first bailer

100347-cal Ennadai Aug. 24, 2016

MWLF-3

Temp. 5.12 °C
Cond. 207 µS/cm
DO 4.40 mg/L
PH ~~4.00~~ (EH) 3.75
ORP 205.5 mV

MWLF-1 12:05 AM

- cut off old lock and replaced w new one J-plug is in good condition and plug was tightly secured (EH)

DTB: ~~3~~.496 m btoc 3.496 m btoc (EH)
WL: no liquid water detected

- Bottom of well sounds/feels a little soft.
- Ice at bottom of well
  → ice was observed on the end of the WL prob, See photo

slope of ground surface around MWLF-1 ranges between 8° and 14° approx.

MWLF-2 12:40 PM

old lock was cut off and replaced with new one (Master V Line) same as MWLF-1 and MWLF-3

J-plug is in good condition and was tightly secured

DTB: 3.684 m btoc
WL: no liquid water detected

Bottom of well sounds/feels soft

Ice at bottom of well, see photo of water level probe

100347 - 001 Ennadai Aug. 24, 2016

Slope of ground surface around MWLF-2 ranges between 7° and 13°

MWLF-3 and MWLF-DUP

Sampled by bailer at 2:00 PM

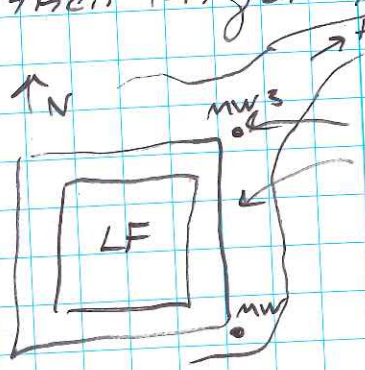
Water obs.

Slightly cloudy, slight light yellow-brown-gray color, no odour, no sheen

John counted nine caribou in the ~~for~~ grass lands to the south of the site, around 3:20 PM, Caribou droppings on path to LF from aircraft. John also saw some seagulls and some small birds. No other signs of animal activities no animal burrows.

100347 - 001 Ennadai Aug. 24, 2016

John also indicated that the caribou travel S to N across the site during their Migration.



grass and metal debris - small amounts

Departed from Ennadai Airstrip 3:52 PM

A small boat was spotted in the lake to the NW of the site

Arrived at Rankin Inlet airstrip 5:58 PM

No. Rankin
Date Aug 23, 2016 Page 13

To Do: Read HHERA
" Stantec Rpt
get .dwg files } asked Karla ✓
get excel files }

1. A summary of work done from initial cleanup to 2012

2. LTM Plan

3. perhaps a RAP

Based on the 2016 observations we need to know the HHERA assumptions and recommend further remediation.
Is there a ground source to cover the tailings?
Is there rip rap that can be used for shoreline protection

There is a playground on site!

No. Ennadai
Date Aug 24, 2016 Page 1

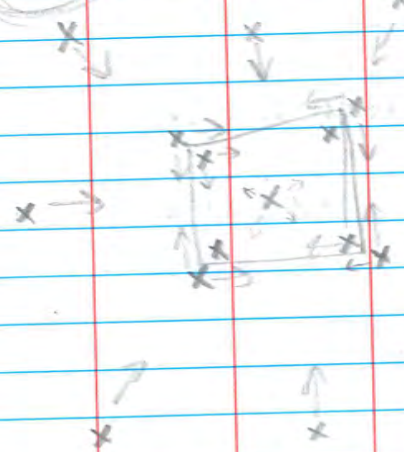
- o HASP
- o relabel date on bottles.
- o MW1
- o MW2
- o MW3
- o DUP
- o Photos ! DGPS locations
- o Checklist
- o Airstrip Qualitative Assessment
- o Aerial photos → Ask Pilot
- o Borrow Areas ?
- o Wildlife Qual Assmt.
- o GPS the centre of the LF ?
- o GPS the new weather stn

No. Ennadai
Date Aug 24, 2016 Page 2

Team: Elliott Arcadis
Jay "
Allen pilot
John Ell WM

The pilot said he went to Ennadai in 2014.

General P location plan



No. Ennadai
Date Aug 24, 2016 Page 3

0715 packs up
0745 meet Allan, drive to airport
0818 take off

caribou x 3 spotted from air - SE of site.

0814 land

lots of caribou tracks on airstrip

W end of airstrip is a "dump"

In future years, the plane can park slightly farther away.

Wetherby 223 - John's rifle

Let's get better northern locks and include keys in the hard copy rpt.

No. Ennadai

Date

Page 4

±1.9m

P-1 on path to NHWL

view SW

new stn visible to the south

P-2 view toward MW-3

P-3 adjacent to MW-3

looking toward NHWL

P-4 E of MW1, S of MW3

P-5 View toward MW-1

" NHWL

F-A Feature A small erosion channel near MW-1

P-6 Photo of Feature A

P-7 W of MW1

a good example of a photo location good for 180°

No. Ennadai Add →→→ slopes to maps

Date

Page 5

Feature	W	L	D		
A	0.10	4m	0.05	minor	erosion channel
B	0.10	10m	0.03	minor	ATV tracks
C	0.45	0.3	0.08	minor	pothole
D	0.15	15m 10m	0.05	minor	erosion channel
E	0.20	20m	0.04	minor	ATV tracks
F	0.20	10m	0.03	minor	ATV track
G	0.3	0.5	0.09	minor	pothole slight depression

Site is on migration route for caribou

P-8 SE corner of crest

crest

lots of caribou tracks

P-9 SW corner of crest
boulder is 0.7m x 0.7m x 0.1m

P-10 NW corner of crest
view of MW-1 & Elliott
view of Feature B
assume ATV tracks

DGPS frozen 16 satellites

P-11 NE corner of crest

P-12 NE corner of toe
Feature C (pothole seen on slope)
* note many photos taken from 360°
for rpt, can choose on direction or multiple

frozen, reboot required.

P-13 NW corner of toe

P-14 NW of NW corner
at edge of wetted area

P-15 at road washout between
NHWL and W end of airstrip

washout is ~2m x 10m x 0.7m
still usable by ATV

road CL = access route
centre line
from NHWL to
unmanned weather station
(UWS)

WS Area of the present-day
unmanned WS
three blog + instruments

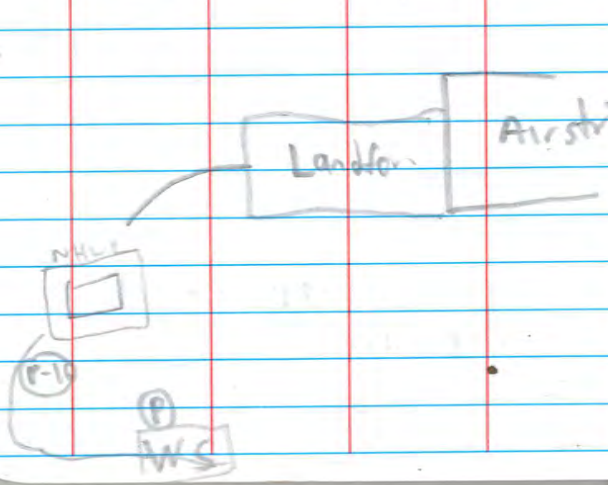
No. Ennadai
Date Page 8

View of NHWL from WS

Elliott at MW-3
view is north
Add to (P) locations if warranted.

Bldgs noted in good condn
ATV track noted from airstrip to WS

In photos, the turbo otr is parked on the landfarm



No. Ennadai
Date Page 9

All old bldgs are gone.

P-16 on access road to WS

P-17 on access road to WS
Feature D visible

Feature D
2 erosion channels parallel on access road from NHWL to WS. Not part of NHWL directly but eventually could impair access to WS as per washout

P-18 N side of LF
view SW
ATV track seen in foreground are beyond the toe and on the access road to WS

No. Ennadai

Date Aug 24 Page 10

P-19 view from access road from top of Feature D

photo towards NNW

! photo looking down along access road of Feature D

P-20 view from crest (east slope) from N of SE crest corner looking down slope to Feature E

Feature E ATV tracks

There are lots of ATV tracks beyond toe but Feature E ! Feature B & F were noted because these are on slope from crest to toe and beyond. No concern but may develop into a preffered drainage channel and increase in depth over time.

Feature F ATV tracks on slope Ennadai

No.

Date Page 11

P-21 looking up slope along Feature F

Feature G pothole

minor depression on cap.

this was the largest depression observed. Only 0.09 m depth

∴ minor

caribou travelling NE

lots of males observed ~ 15

one calf noted

no other tracks seen by John

no bear, wolf or wolverine.

∴ presumably these animals may frequent the area.

What year was cleanup? 2015?

No veg on crest, slope or at toe

∴ < 1% or 0%

The LFill is performing as designed (assuming no impact to GW)

change name from fuel cache to drum cache.

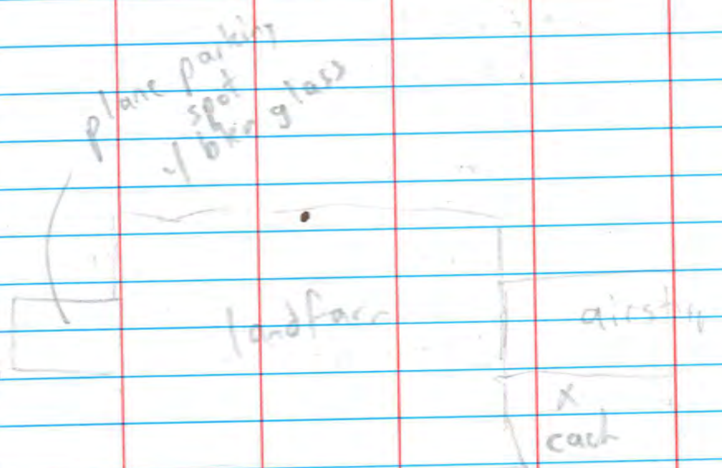
~23 drums

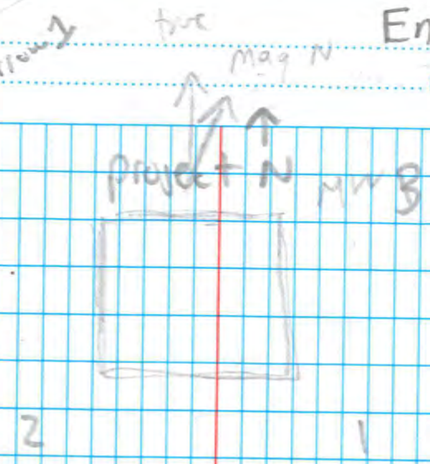
Drum cache noted (empties)
This spot is really the end of the airstrip.

Airstrip W end C1 GPS'd ✓

∴ the plane is not on the old landfarm.

The old landfarm connects the airstrip to the access route to WS





Loose Dry, lt brn well graded SAND with freq. gravel, occasional cobble.

GSA likely done by STANTEC (grain size analysis) for borrow source

345 pm Engines on
400 pm take off
P2071 - 2074 landfarm N side
2075 - old wind sock (no sock)
2076-2077 airstrip view west
2078 fuel cache

2082 NHWL view SW
2084 " " S

No.

Date Ennadai Page 14

P2090 the treeline view N from East of Ennadai lake.

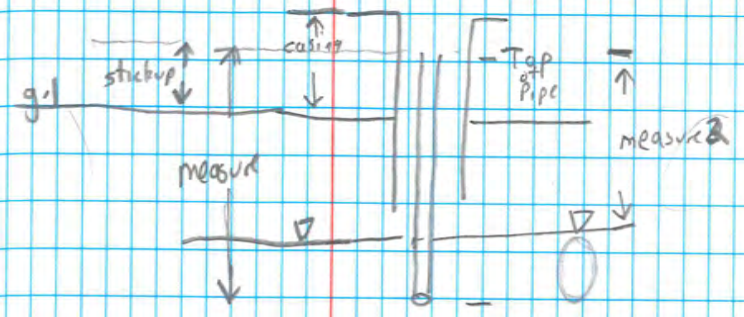
* check treeline map of Canada in Ennadai region. Would be interesting to see where the 'line' is.

P2091 much less trees.

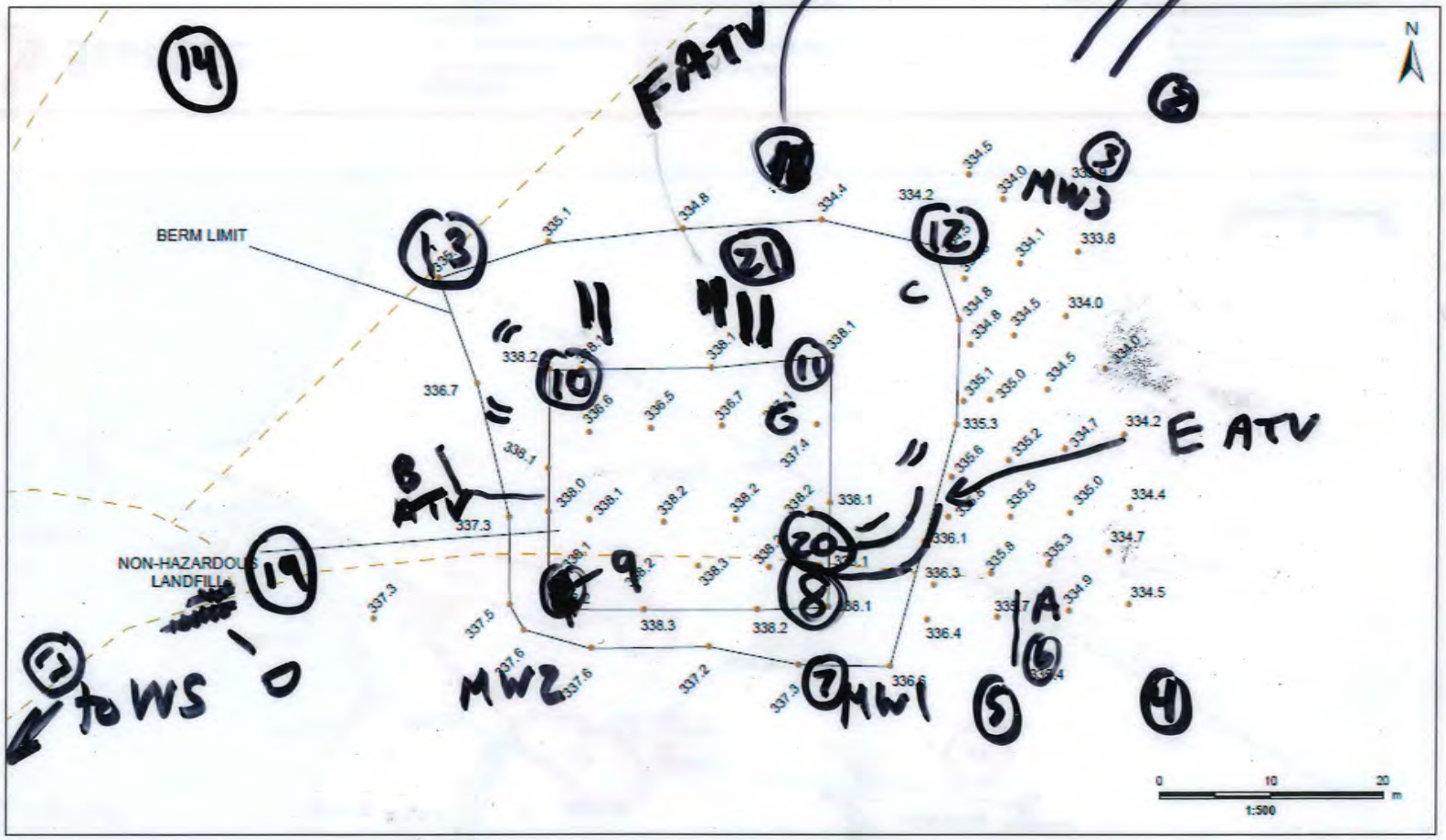
Even though P-20 was the last DGPS photo location mapped as a P-#. There are others that can be added. For example P-21 could be from the WS. P-22 could be at the drum cache.

No. Ennadai

Date 4 measurements Page 15



1. bottom to ToP
2. WL to ToP
3. Casing top to g.l.
4. ToP to g.l.



Stantec

Legend

- Elevation Survey Point
- Road/Trail
- Site Feature

300.8 Elevation in m asl

Notes

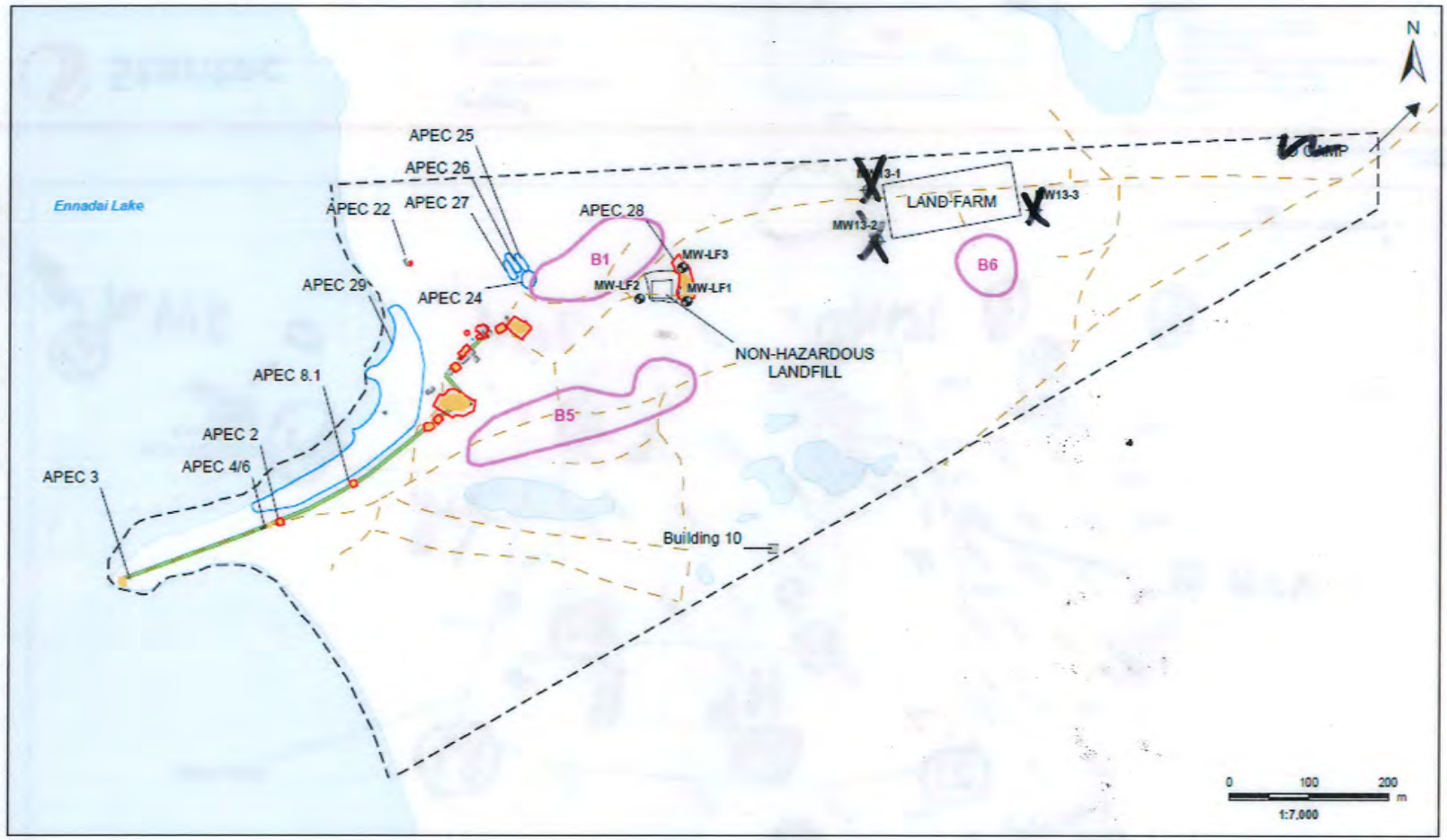
1. Coordinate System: NAD 1983 UTM Zone 14N
2. © Department of Natural Resources Canada. All rights reserved.

KEY MAP

Client/Project
Public Works & Government Services Canada (PWGSC)
Ennadai Lake Former Weather Station
Site Supervision
Impacted Soil Excavations

Figure No.
7

Landfill As-Built



July 2015
Project No.: 122511006

Stantec

Legend

- Monitoring Well
- Monitoring Well (Temporary)
- Pipeline
- Road/Trail
- Inuit-Owned Land
- Site Limits
- APEC Location - Other
- Building (Former)
- Location of Borrow Areas
- Site Feature
- Surveyed Excavation Extent
- Predicted Excavation Extent
- Watercourse
- Waterbody

Notes
1. Coordinate System: NAD 1983 UTM Zone 14N
2. © Department of Natural Resources Canada. All rights reserved.

Client/Project
Public Works & Government Services Canada (PWGSC)
Ennadai Lake Former Weather Station
Site Supervision
Impacted Soil Excavations

Figure No.
2

Title
Site Plan

Ennadai Lake
VISUAL MONITORING CHECKLIST

ITEM	PRESENCE/ ABSENCE	EXTENT	DESCRIPTION/ PHOTOGRAPHIC REFERENCE
Instructions	*Yes or No*	*Provide dimensions as applicable: Length, Width, Depth*	*Features of note, photographic reference with scale, point of view & direction*
Settlement	YES	Feature C 8G	
Erosion	YES	A & D	
Frost Action	NO		
Animal Burrows	NO		
Vegetation	<1%		
Staining	NO		
Vegetation Stress	NO		
Seepage Points	NO		
Exposed Debris	NO	Small amounts at ↑ NE side Scattered debris at base of LF	
Condition of Monitoring Instruments	Great		
Other Features of Note	ATV tracks	Feature B, E, F	

APPENDIX E

Health and Safety Plan

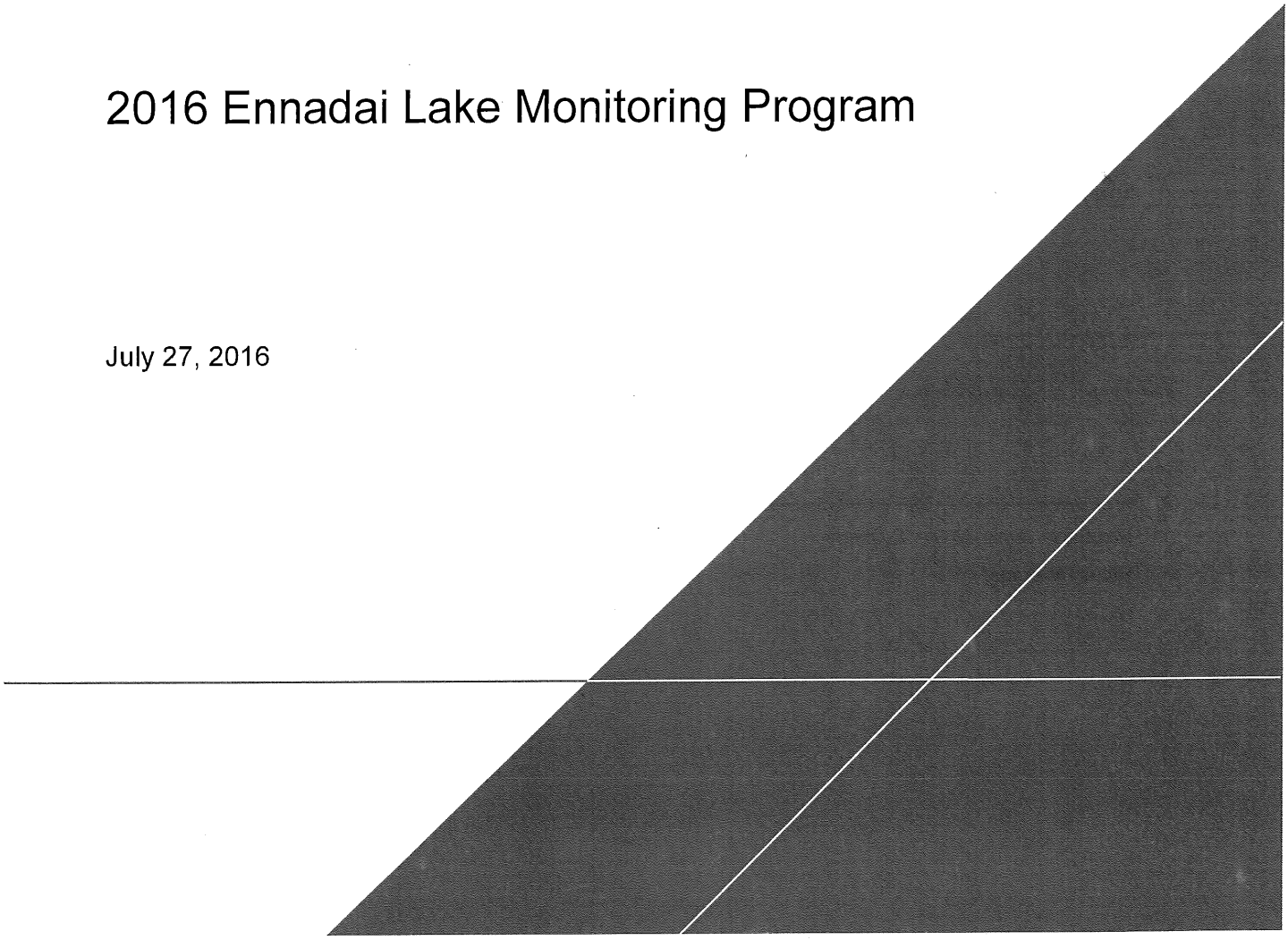
ARCADIS Design & Consultancy for natural and built assets

Indigenous and Northern Affairs Canada

HEALTH AND SAFETY PLAN

2016 Ennadai Lake Monitoring Program

July 27, 2016



HEALTH AND SAFETY PLAN

2016 Ennadai Lake Monitoring Program

Jason Mauchan, P.Eng.
Environmental Technician

Elliott Holden, B.Eng.
Environmental Technician

Stephanie Joyce, M.Sc., C.Chem.
Project Manager

Prepared for:

Karla Letto

Contaminants Specialist

Indigenous and Northern Affairs Canada – Nunavut Regional Office

969 Qimugjuk Building, 2nd Floor

Iqaluit, NU, X0A 0H0

Prepared by:

Arcadis Canada Inc.

329 Churchill Avenue North

Suite 200

Ottawa

Ontario K1Z 5B8

Tel 613 721 0555

Fax 613 721 0029

Our Ref.:

100347-001

Date:

July 27, 2016

CONTENTS

TABLES

APPENDICES

1 PURPOSE

The purpose of this Site Specific Health and Safety Plan (HASP) prepared by Arcadis Canada Inc. (Arcadis) is to specify the detailed measures to be taken to protect both site workers and the public during the work to be carried out at Ennadai Lake. The site specific HASP also assigns responsibilities; establishes personnel protection standards and mandatory safety practices and procedures with respect to environmental aspects of the site related activities; and provides for contingencies that may arise during on-site activities.

The provisions of this plan are mandatory for all sub-contractors engaged in conducting the work activities. As necessary, when new information regarding a potential hazard emerges and this new information suggests that further safeguards would be prudent, amendments to this plan will be issued pertaining to specific precautions to be taken for specific locations or operations or regarding specific hazards. Unless any of these amendments specify otherwise, all provisions of this plan shall remain in effect for the duration of project work at the Site.

This plan has been developed in accordance with accepted worker health and safety practices and applicable territorial and federal Occupational Health and Safety regulations. This HASP represents the minimum Health and Safety precautionary requirements and guidelines to be expected. All sub-contractors working on-site will agree to, and abide by, the requirements of this site specific HASP as a condition of working on this Project. A copy of the site specific HASP shall be kept on-site at all times for the duration of on-site activities. Anticipated personnel to whom this HASP becomes applicable are:

- 2 Arcadis staff members;
- 1 Bear Monitor;
- 1 Nunatta field technician
- 1 Indigenous and Northern Affairs Canada (INAC) representative; and
- 1 Aircraft Pilot.

2 AUTHORITY

This site specific HASP is provided by Arcadis to cover environmental activities at Ennadai Lake, the Site. This plan is intended to supplement, not replace, applicable acts and regulations regarding worker health and safety.

The Arcadis Site Health and Safety Officer (SHSO) or his/her representative will be responsible for implementing the site specific HASP for the duration of work being conducted at the Site. Mr. Jason Mauchan, or his designate shall function as the SHSO and will be responsible for the health and safety of those on the site. Mr. Mauchan is appropriately trained for the position. The SHSO has the authority to stop work and to authorize the resumption of work based on health and safety considerations, as specified in this plan. Any health and safety issues or concerns will be communicated directly to the on-site representative of INAC, to the Arcadis Project Manager and to the appropriate authority at INAC.

Prior to commencement of the work, every sub-contractor working at the Site will provide a copy of their HASP to Arcadis for their records and maintain a copy at the site. This is a mandatory requirement to work on the site.

Personnel involved in health and safety related communications and other emergency numbers are listed in Table 1:

Table 1: Emergency Contact Information

Contact	Person or Agency	Phone Number
Hospital	Stanton Territorial Hospital, Yellowknife	867-669-4100
	Rankin Inlet Health Centre, Rankin Inlet	867-645-8300
	Rankin Inlet Public Health, Rankin Inlet	867-645-8070
	Qikiqtani General Hospital, Iqaluit	867-975-8600
Police	RCMP Rankin Inlet	867-645-0123
	RCMP Emergency Contact	867-645-1111
Fire Department	Rankin Inlet Fire Department	867-645-2598
Consulting Engineers	Arcadis Canada Inc. 329 Churchill Avenue North	(613) 721-0555
Drug and Alcohol Testing	Driver Check Inc.	1-800-463-4310
Arcadis Canada Inc.	Chris Ludwig	613-721-0555 ext. 234 (O) 613-222-8192 (cell)
	Stephanie Joyce	613-721-0555 ext. 240 (O) 613-986-8398 (cell)
	Andrew Henderson	613-721-0555 ext. 223 (O) 613-286-7760 (cell)
	Julie Dittburner	613-721-0555 ext. 226 (O) 613-794-7447 (cell)
	Dave McClellan	905-614-1978
INAC	Charlotte Lamontagne	867-975-4578 (O) 867-222-1712 (cell) 867-223-1417 (cell)
	Spencer Dewar	867-975-4625 (O)
Nunatta Environmental Services Inc.	Jim Wilson	867-979-1488 (O) 867-222-4111 (cell)
Aircraft Charter Company	Ookpik Aviation – Baker Lake	867-793-4720
Spill Report Line (24-hr)	Department of Environment, Nunavut	867-920-8130
WorkCare	Non-life-threatening injury/illness for Arcadis	1-800-455-6155

The Arcadis SHSO may choose to conduct a safety site audit as and when site operations demand. During the audit, if health and safety related deficiencies are found, suitable written corrective actions will be recommended. It is binding on the part of the subcontractors to abide and implement the recommended corrective actions within the specified time limits. The Arcadis SHSO will reserve the authority to inspect the implementation of corrective and/or mitigative actions.

3 HEALTH AND SAFETY REGULATIONS

Before activities at the Site commence, sub-contractor(s) Health and Safety representative(s) must review this HASP and indicate that they understand, and all workers engaged at the Site will demonstrate ongoing compliance of the plan by signing the Tailgate Health and Safety Meeting Form(s) (**Appendix B**). While carrying out work at the site, it is the responsibility of the Prime sub-contractor to ensure the health and safety of its employees and sub-contractors engaged by it. It is the duty of all workers employed at the site to report unsafe working conditions to the SHSO. To comply with the health and safety requirements outlined in this plan, Arcadis will ensure/provide that:

- At least one on-site personnel is trained in first aid and level C CPR. First-aid and additional Arcadis personnel certification is provided in **Appendix A**.
- On-site personnel are equipped with appropriate Canadian Standards Association (CSA) approved personal protective equipment as deemed necessary by the SHSO (personal protective equipment requirements at the Site are discussed in Section 7.0 of this HASP).
- On-site personnel will attend daily health and safety tailgate meetings led by the Arcadis SHSO. Daily Health and Safety Meetings will be conducted at the beginning of each work day for the review of health and safety issues and site conditions. Tailgate Health and Safety Meeting forms are provided in **Appendix B**.
- Equipment and materials used in the project meet applicable safety standards.
- A health and safety incident/accident reporting system will be in place to prevent reoccurrence of incidents/accidents through staff education.
- An appropriate area shall be designated as the onsite First-Aid Station. It shall be selected so that it is in close proximity to the work area but remain a safe distance from major activities and potential hazards. The First Aid Station shall be clearly identified and will contain: the First Aid Kit, copy of this HASP, an appropriate supply of water for washing/decontamination, and any other objects deemed necessary by the SHSO and/or Arcadis Project Manager.

4 SITE AND WORK PROGRAM DESCRIPTION

4.1 Site Location and Description

The Ennadai Lake Remediation Project site is located approximately 370 km west of Arviat (the nearest community) and 500 km southwest of Rankin Inlet, Nunavut, at approximately 61° 07' 51" N latitude and 100° 53' 14" W longitude. Ennadai Lake was a former weather station operated as such since the 1950s. It was operated both as a manned and unmanned station, at different times since its construction and was abandoned in the late 1980s to early 1990s. Remediation activities, including construction of the non-hazardous waste landfill (NHWL) were undertaken in 2014 and 2015. Other remediation activities included the demolition and disposal of buildings, structures and other debris and clean-up of hazardous materials and contaminated soil.

This is the first year of LTM activities at the Ennadai Lake site. Arcadis personnel will be visiting the Site for the first time. This HASP has been developed in preparation for this first monitoring event prescribed in the Ennadai Lake LTM Plan.

4.2 Description of Work Program

Arcadis proposes to complete Year 1 of the Ennadai Lake LTM Plan. Tasks involved in the completion of site monitoring include, but are not limited to:

- Visual monitoring of the general site conditions including borrow areas, excavation areas, regrades etc.
- Natural environmental monitoring as detailed in the Abandoned Military Site Remediation Protocol (AMSRP);
- Visual monitoring, including photographs, of the physical integrity of the NHWL looking for evidence of settlement, erosion, ponding, frost action, animal burrows, vegetation, staining, vegetation stress, seepage points, exposed debris, and condition of monitoring instruments;
- Purging of water and collection of groundwater (permafrost active layer) samples from the three monitoring wells around the NHWL; analyses will include total and dissolved metals, petroleum hydrocarbon (PHC) fractions F1 and F2, polychlorinated biphenyls (PCBs), major ions, hardness, total dissolved solids (TDS), total suspended solids (TSS), pH, colour and conductivity;
- Collection of soil samples in areas of seepage and staining identified during the visual monitoring, if required; analyses will include PHC F1 to F4, select metals and PCBs; and
- Submission of samples to a Canadian Association of Laboratory Accreditation (CALA)-accredited laboratory for analysis.

4.3 General Safety Precautions

The following general safety precautions are applicable to all work tasks:

- Eating, chewing gum or tobacco, and smoking are prohibited in contaminated or potentially contaminated areas, or where there is a possibility for the transfer of contamination.

- Contact with potentially contaminated substances should be avoided. Puddles, pools, mud, etc., should not be walked through. Kneeling, leaning, or sitting on equipment or the ground should be avoided, whenever possible. Monitoring equipment should not be placed on a potentially contaminated surface, such as the ground.
- Spillage of contaminated/hazardous liquids should be prevented, to the extent possible. In the event that spillage occurs, the liquid should be contained, if possible.
- Splashing of contaminated materials should be prevented.
- Field crew members should use all their senses to alert themselves to potentially dangerous situations (i.e. presence of strong, irritating, or nauseating odours).
- Field crew members should be familiar with the physical characteristics of investigations, including:
  - Wind direction in relation to the ground zero area
  - Accessibility to associates, equipment, and vehicles
  - Communications
  - Hot zones (areas of known or suspected contamination)
  - Site access
  - Nearest water sources
  - Routes and procedures to be used during emergencies
- A minimum number of personnel and equipment should be in the contaminated area, but only to the extent consistent with workforce requirements of safe site operations.
- All wastes generated during Arcadis or subcontractor activities at the site must be disposed of as directed by the Project Manager.

4.3.1 Buddy System

Where deemed hazardous by the Arcadis SHSO, workers will conduct all site activities with a buddy who is able to:

- Provide his or her partner with assistance;
- Observe his or her partner for signs of chemical or heat exposure;
- Check the integrity of his or her partner's protective clothing periodically;
- Notify the site supervisor if emergency help is needed;
- Prearrange hand signals or other emergency communication signals such as:
  - Hand gripping throat: out of air, can't breathe;
  - Gripping partners wrist or placing both hands around waist: leave area immediately, no debate;
  - Hands on top of head: need assistance;
  - Thumbs up: okay, I'm alright, I understand;
  - Thumbs down: no, negative.

4.4 Aircraft Passengers Safety

Fixed-wing aircraft will be used extensively to mobilize to and from the Site. A "Safety Guide for Aircraft Charter Passengers", produced by Transport Canada is available in **Appendix C**. Standard protocols for the use of aircraft will be followed, including:

Normal Operation

- Inform the pilot of:
    - Cargo weights;
    - Site coordinates;
    - Any hazardous goods (e.g. firearms, ammunition, bear spray, bear bangers, fuel, volatile substances, flammable liquids). Note that batteries for data loggers are considered dangerous goods;
    - Applicable medical problems; and
    - Susceptibility to motion sickness.
- Stay well to the side of runways/approaches when aircraft are arriving or departing;
- Protect eyes against blown dust and particles;
- Keep runways/approaches clear;
- Wait for instruction to approach or leave aircraft;
- Load cargo carefully and secure it against movement;
- Secure seatbelts (and shoulder straps, if provided) while in flight; and
- Read instructions on the operation of doors, emergency exits, and the location of the emergency locator transmitter (ELT) and emergency equipment.

During an Emergency

- Follow instructions;
- Do not distract the pilot;
- Check that any loose gear in the cabin is secured;
- Assume brace position;
    - Tighten seatbelt;
    - If shoulder straps are present, tighten shoulder straps and sit upright, knees together, arms folded across chest; or
    - Without shoulder straps, bend forward so chest is on your lap, head on knees, arms folded under thighs.

After an Emergency Landing

- Wait for instructions to exit;
- Ensure no hazards (i.e. fire, water) are present outside emergency exit before opening. If hazards exist, locate an alternative exit;

- Assist others to evacuate well clear of the aircraft (up-wind of aircraft to avoid inhalation of fumes if necessary);
- Remove first aid and other emergency equipment after no threat of fire;
- Administer first aid if required;
- Remove ELT, read instructions and activate;
- Make the site as conspicuous as possible from the air; and
- Stay near the aircraft - don't wander away from the site.

4.5 On-site Communications

Communications during the fieldwork is as follows:

- Satellite phone, activated 24/7 to contact Rankin Inlet, Yellowknife, Iqaluit, Ottawa, or other external locations during emergencies and for routine updates of field progress;
- Verbal communications between workers using 2-way radios;
- Use of a rifle or bear banger to get immediate attention of all staff.

A rally/muster point in case of an emergency will be established once on-site and will remain for the duration of the field program unless otherwise decided by the SHSO.

4.6 Physical Hazards and Mitigation Procedures

The following sections provide potential physical hazards encountered during the execution of tasks included in the work program. Procedures for the mitigation of hazards are also discussed as part of this HASP. Further, the identified hazard(s) and mitigation procedures will be discussed with all personnel working on site prior to working in the area of the hazard(s).

Generally encountered hazards during field operations include but are not limited to:

- Slips, trips and falls;
- Partially buried debris, exposed at the surface, which might be unseen;
- Heavy lifting, bending, shovelling, (general manual labour) hazards;
- Poor housekeeping practices;
- Cuts, scrapes, and bruises from hand tool usage or handling of soils/rock;
- Heat stress/cold stress (harsh weather, including snow etc. – See Section 4.8);
- Bears and other wildlife (See Section 4.9); and
- Entering/exiting charter planes/working near propellers.

The following measures are considered mandatory to ensure that the above hazards are mitigated to the greatest extent possible:

- Daily Health and Safety meetings – be aware of specific known physical hazards;
- Ongoing last minute risk assessment will be conducted by site workers;

- Job Safety Analysis forms shall be completed for required specific work tasks and shall be reviewed prior to the execution of the task (**Appendix D**);
- Personal Protective Equipment (PPE) as prescribed by the HASP and SHSO;
- All underground utilities will be clearly marked and delineated prior to any subsurface disturbances;
- Overhead utilities will be identified and strategies for their avoidance will be decided upon prior to execution of the work program;
- Labour intensive tasks shall be carried out at an appropriate pace, and using appropriate lifting/bending techniques;
- Potentially hazardous debris shall be removed from work areas or flagged at the soonest possible opportunity; and
- Work areas will be kept clean and clear of obstructions to the extent possible.

4.7 Chemical Hazards and Mitigation Procedures

Potentially hazardous chemical constituents are present at the site in contaminated soil and groundwater). Contaminants of concern include PHCs, PCBs, and metals. All work involving the handling of contaminated/hazardous material requires the following mitigation procedures:

- PPE must be worn as prescribed for the handling of potentially contaminated materials.
- Normal hygiene practices such as washing hands and face before eating, drinking, smoking, chewing gum or tobacco, or other hand-to-face activity, or before leaving the project site shall be employed.
- Avoid skin contact with or accidental ingestion of soil or water.
- Field staff should use all their senses to alert themselves to potentially dangerous situations (i.e., presence of strong, irritating, or nauseating odours). Respirators may be prescribed by the SHSO at any time throughout the execution of the work program.

All recovered contaminated/hazardous materials shall be contained appropriately in a manner preventing potential releases to the environment.

4.8 Monitoring

Based on the nature of the site activities that will be performed and the type of (suspected) contamination present in the area, monitoring of chemical concentrations in air or for combustible gases is not required as part of this HASP.

Should operations commence which disturb or expose any substance to create a potential airborne hazard or if airborne contamination is suspected as a result of observed site conditions; work at the Site shall cease until a sufficient air monitoring program is in place and appropriate protective measures are implemented to mitigate identified risks.

4.9 Harsh Weather Conditions

Harsh weather conditions can arrive at the Site anytime, therefore, each member of the team must abide by the following:

- To deal with low and sub zero temperature every staff member must bring warm clothes, backup clothes, waterproof breathable outerwear, waterproof boots, hats, gloves, rain vests; learn how to use a kerosene heater; and learn how set up wall tents;
- To deal with strong winds, have adequate clothing and shelter, avoid working near steep slopes or water bodies until winds have calmed down, and cancel return charter until landing conditions are improved;
- To deal with fog, only work near camp where field workers can always be under direct sight of the bear monitor and stop work if fog is too dense; and
- To deal with rain and freezing rain, have adequate clothing and shelter and remember keeping dry remains the most important point.

Occasional delays may occur due to adverse weather conditions. It is of primary importance to work under safe conditions even if it causes delays. The Team Leader/SHSO decides when to stop work. Staff will stay in their tents, the aircraft or nearby buildings (e.g. Hope Bay mine) during adverse weather conditions. Regular safety rounds are undertaken every hour around the camp installations by the Team Leader/SHSO.

4.10 Wildlife Safety

Wildlife safety and monitoring is continuous during the entire fieldwork period. One Inuit staff member or sub-contractor having a strong knowledge of wildlife, and the use of rifles to scare or kill bears will be assigned as the Bear Monitor. The role of a Bear Monitor is as follows, but not limited to:

- Conduct a visual inspection of gun and fire a test shot to ensure gun is in working order;
- Check for wildlife, such as bears, approaching the work site;
- Protect wildlife by preventing it from approaching the workers by using a loud noise such as a shot from a fire arm by the wildlife monitor, aimed towards the sky (bears will be temporarily scared by a loud noise);
- Ensure that all garbage and food waste are picked up and properly packaged after meals (all workers at the site should assist with maintaining a clean camp);
- Have all field workers under direct view at all times;
- Walk around perimeter of the work place or hills to look for wildlife approaching the site, inform staff if wildlife are approaching, and inform field workers of the measures being taken to address the approaching wildlife; and
- Conduct any other measures necessary to protect the health and safety of staff and contractors from wildlife, especially bears.

Before any fieldwork begins on this project, all Arcadis staff and subcontractor staff are to have reviewed documentation related to Grizzly and Polar Bear Safety. Listed below are resources where some documentation is located.

- Parks Canada Polar Bear Safety and other wildlife can be found at: http://www.pc.gc.ca/eng/pn-np/nu/quttinirpaaq/activ/activ3/e.aspx
- Parks Canada – If you Encounter a Bear: http://www.pc.gc.ca/eng/docs/pc/guide/nature/nature03.aspx
- Hinterland's Who's Who – Grizzly Bear Fact Sheet found at: http://www.hww.ca/en/wildlife/mammals/grizzly-bear.html?referrer=https://www.google.ca/
- Hinterland's Who's Who – Polar Bear Fact Sheet found at: http://www.hww.ca/en/wildlife/mammals/polar-bear.html

A couple of general comments regarding bear behaviour include:

- Do not try to run away from a bear. They can outrun a human. Seeing an animal fleeing from them arouses their instincts to chase. They think you are prey. Always back away slowly from a bear.
- Do not stare at them directly. Direct eye contact, to them, is a sign of aggression.
- If a bear stalks you and then attacks, or attacks at camp while you are sleeping do not play dead – fight back.

5 TASK SPECIFIC JOB SAFETY ANALYSES

Activities which involve potentially higher risks require a documented risk management procedure referred to as a Job Safety Analysis (JSA). A JSA consists of a step by step analysis of the task to be carried out, the hazards which may be encountered, and the techniques or controls to be implemented in order to prevent an incident or near-miss from occurring. JSAs are to be completed prior to the undertaking of the activity for which it is written and reviewed and discussed by all persons involved in the task. Since site, weather, equipment, and/or crew conditions may vary from day to day; the JSA must be reviewed and revised as per any changes during the daily safety meeting. Activities included in the scope of work which will require the completion of a JSA include, but are not necessarily limited to:

- Water sampling
- Soil sampling
- Geotechnical assessment
- Wildlife Monitoring

Four partially completed and one blank JSA forms, to be completed prior to any of the aforementioned activities or when deemed necessary by the SHSO, are provided in **Appendix D**.

6 PERSONAL PROTECTIVE EQUIPMENT

PPE that will protect personnel and visitors from the hazards and potential hazards likely to be encountered during site work will be prescribed by the Arcadis SHSO and used by all personnel working at or visiting the Site. PPE selection is based on an evaluation of the performance characteristics of the PPE relative to the requirements and limitations of the site, the task-specific conditions and duration, and the hazards and potential hazards identified at the site.

6.1 Level of Protection

PPE required to be worn at the site is dependent upon the task(s) being performed. The SHSO/project manager has the authority to regulate additional PPE requirements should he/she deem it necessary. Based on the task(s) being carried out at the Site, the following PPE levels are required:

Table 2: PPE Requirements

TASK	Description	Required Protection
Charter Aircraft Travel	Travel by plane to site	• As per pilot's direction
Water Sampling	Sampling water using peristaltic pump from pre-installed monitoring wells	• Hard hat • Visi-Vest • Safety Boots • Safety Glasses • Work Gloves (handling tools) • Nitrile Gloves (handling water/soils)
Soil Sampling	Sampling soil from hand-excavations	• Hard hat • Visi-Vest • Safety Boots • Safety Glasses • Work Gloves (handling tools) • Nitrile Gloves (handling water/soils)
Geotechnical Assessment	Visual and photographic inspection of landfill areas	• Hard hat • Visi-Vest • Safety Boots • Safety Glasses • Work Gloves (handling tools) • Nitrile Gloves (handling water/soils)

7 HAZARD, INCIDENT AND NEAR MISS REPORTING

If an accident occurs or an incident which could have resulted in an accident occurs, the SHSO or his/her representative and the affected party or parties will complete an incident/accident report. The affected parties will review the report and determine together, as a team, appropriate mitigation to prevent the reoccurrence of the incident/accident in the future. The incident/accident, regardless of severity, will be reported immediately to the client representative and Arcadis Project Manager. Near-Miss occurrences and hazard identifications will also be recorded and reported for the prevention of future hazardous situations. Forms for the reporting of near misses, hazard identification, and incidents are attached in **Appendix E**.

8 EMERGENCY RESPONSE PLAN

This section describes contingencies and emergency planning procedures to be implemented at the Site. This Emergency Response Plan is compatible with local emergency management plans.

8.1 Emergency Contacts

A listing of emergency contacts, including the local police, fire department, ambulance, poison control centre, spill reporting department, client and project manager is provided in **Appendix F**. Copies of this listing will be posted in close proximity to all work areas across the site.

8.2 Pre-Emergency Planning

An emergency evacuation route to the nearest health care facility is provided in **Appendix F.** If necessary, this route will be reviewed and revised by the SHSO to ensure that the route is adequate and consistent with prevailing conditions. Note that this route is from the Arviat Airport to the Arviat Health Centre as Arviat is the closest community to Ennadai Lake.

8.3 Emergency Supplies

Arcadis personnel will carry emergency supplies with them to Ennadai Lake. These will include:

- First aid kit
- Tent
- Tarp
- Matches
- Cooking equipment (i.e. pots)
- Dehydrated meals
- Emergency blanket
- Drinking water (to be purchased in Rankin Inlet)
- Bear bangers and/or bear spray (if available in Rankin Inlet – they cannot be transported by commercial aircraft)

The charter aircraft will also be equipped with emergency supplies. Prior to taking off, Arcadis personnel will confirm with the pilot(s) what emergency supplies are in the aircraft and where they are located.

As the wildlife monitor will be carrying a firearm, bear bangers and bear spray may not be required. They could be purchased in Rankin Inlet, prior to the charter flight, if they are available. However, the wildlife monitor with a firearm should be sufficient.

8.4 Roles and Lines of Authority

The SHSO has primary responsibility for responding to and correcting emergency situations. This includes taking appropriate measures to ensure the safety of site personnel (and the public), such as evacuation of personnel and adjacent residents from the site area. The site supervisor must also ensure

that corrective measures have been implemented, appropriate authorities have been notified, and follow-up reports have been completed.

8.5 Emergency Recognition

Personnel should be familiar with techniques of hazard recognition from pre-assignment and site-specific briefings. In an emergency, personnel should proceed to the closest exit with their buddies and mobilize to a safe distance area identified prior to the start of work. Personnel should remain at that area until it is deemed safe by an authorized person (e.g. SHSO) to enter the area.

8.6 Emergency Medical Treatment Procedures

In the event that any person becomes ill or injured, first aid should be administered while awaiting an ambulance or paramedics. All injuries and illnesses must be reported immediately to the SHSO and the Project Manager.

The SHSO, Mr. Jason Mauchan has experience working in remote wilderness environments and has received first aid and Level C CPR training (refer to **Appendix A**).

If an incident occurs while on-site at Roberts Bay that requires immediate medical attention, the sat phone will be used to contact emergency personnel. Depending on the situation, one of the following options could occur:

- The field team remains on site, to await assistance from emergency personnel;
- The entire field team travels by plane, to the location indicated by emergency personnel (Cambridge Bay).

It will be important to notify emergency personnel immediately and follow their instructions.

8.7 Fire or Explosion

In the unlikely event that such a hazard be identified, the property owner, Project Manager and proper authorities shall be contacted immediately. Following, an incident investigation and report will be carried out and its findings documented for future hazard identification.

8.8 Spills or Leaks

In the unlikely event that such a hazard be identified, the property owner, Project Manager and proper authorities, including the Government of Nunavut Department of Environment 24-hr Spill Line (867-920-8130) shall be contacted immediately. Following, an incident investigation and report will be carried out and its findings documented for future hazard identification.