

Fuel and Hazardous Material Spill Contingency Plan

CAM-E (Keith Bay) Intermediate Distant Early Warning (DEW) Line Site, Nunavut

**Submitted by: Department of Indigenous and Northern Affairs Canada
(INAC) (Nunavut Regional Office)**

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1 Site Description and characteristics

- 1.1 CAM-E (Keith Bay) site is located at approximate latitude 68° 17' 16" N and longitude 88° 7' 10" W in the Kitikmeot region of Nunavut. The site is on the Simpson Peninsula approximately 75 kilometres (km) east of Kugaaruk (formerly Pelly Bay) – the nearest Nunavut community to the site. The site was historically used as an intermediate DEW Line site by Department of National Defense (DND). The DEW Line site was constructed in 1957 and was taken out of service in 1963. In 1965, responsibility for the site was assumed by the Department of Indigenous and Northern Affairs Canada (INAC)

CAM-E (Keith Bay) site consists of two separate areas; Area 1 and Area 2. Area 1 includes former infrastructure such as module train debris, warehouse, garage, Inuit house, POL tanks, Quonset huts, storage pads, a small airstrip, multiple drum caches and a dismantled radar tower. Area 2 is located on a beach plateau approximately 5.6 km away from Area 1 and includes a larger airstrip, two former Quonset huts, a bunker and various debris including scattered and cached drums.

- 1.2 The entire territory of Nunavut lies within the Arctic climate zone, with exceptionally cold winters, and cool to cold summers. There is no Environment Canada weather monitoring station in Kugaaruk, the nearest community to CAM-E. The closest weather monitoring station to the site is situated at Hall Beach, another Nunavut community. Based on the climate normals from 1971 – 2000 at Hall Beach, the mean annual temperature is -14.1°C. The area has a summer mean of approximately 4°C (June, July, and August) and a winter mean of approximately -20°C. Precipitation is scarce throughout most of the territory of Nunavut and falls almost entirely as snow, with very small quantities of rainfall during the summer months. Average rainfall is 102.3 mm while average snowfall is 124 cm.

The Site is situated within the Gulf of Boothia Plain ecoregion of the Northern Arctic ecozone.² Permafrost is continuous across the ecoregion and regosolic cryosol soils dominate. Throughout the ecoregion, upland areas are dominated by purple saxifrage (*Saxifraga oppositifolia*), avens (*Dryas* spp.), Arctic willow (*Salix arctica*), alpine foxtail (*Alopecurus alpinus*), as well as wood rush (*Luzula* spp.) and other saxifrage species; lowland or wet areas tend to have a continuous cover of sedge (*Carex* spp.), cottongrass (*Eriophorum* spp.), saxifrage and moss.² At the Site, vegetation was sparse and intermittent in upland areas and was primarily comprised of purple saxifrage, mountain avens (*Dryas integrifolia*), willows (*Salix* spp.), Arctic poppy (*Papaver radicatum*), cushioned whit-low grass (*Draba corymbosa*) and lichens. Within wetlands on-Site, or around depression areas with standing water, vegetation is more abundant and typically includes buttercup species (*Ranunculus* spp.), Arctic cottongrass (*Eriophorum vaginatum*), purple

Several terrestrial wildlife species may be found on or near the Site as it lies within the ranges of barren ground caribou (*Rangifer tarandus groenlandicus*) of the Wager Bay and Lorillard herds³, grizzly bear (*Ursus arctos*), muskox (*Ovibos moschatus*), and

Arctic fox (*Alopex lagopus*), as well as several small mammal species. Due to the Site's proximity to the marine environment of Keith Bay, one marine mammal, polar bear (*Ursus maritimus*), may also be found within Site boundaries. Various avifauna species may also occur, depending on the time of year. Ptarmigan (*Lagopus* spp.) and common ravens (*Corvus corax*) are likely found year-round while other breeding birds and waterfowl would only occur during May through to September. During the field investigation, barren ground caribou were observed several times at various locations throughout the Site, as well as a nesting raven (within the garage structure), and several song bird and waterfowl species.

According to available surficial geology mapping, surficial geology at the Site varies within each assessed area.⁴ Surficial geology over the Site consists of three separate formations; till veneer with a thickness of 0.5 to 2 metres (m) (Area 1 and 2), marine sediments consisting of gravel, sand, silt and clay (1 to 20 m thick) deposited in deltaic, near shore, and beach environments, and 1 to 5 m of beach sediments consisting of gravel and sand (Area 1 and 2), and consolidated sedimentary rocks consisting of limestone and dolostone with minor sandstone (Area 1 only).

Based on Site observations, regional surface drainage (anticipated shallow groundwater flow direction) appears to be generally to the west toward Keith Bay. As the topography is variable throughout the Site and the surrounding areas, surface water drainage will change locally depending on the locality. However, overall Site drainage is anticipated to the west.

- 1.3 Environmental Site Assessments (ESAs) completed on the CAM-E (Keith Bay) site in 1994/5, 2011/12 and 2012/13 showed that the site contained substances that require remediation. The site consists of two (2) parts: the main site area and the beach area. According to the results of the ESA, the current features identified at the 2 areas of the site are as listed below.

The main site area currently consists of:

- An Airstrip (460 m long)
- Concrete foundations of the Garage and Warehouse
- Metal framework and some interior walls of the Garage
- POL foundations and pump house piping
- Remains of the Module building train
- Downed antenna, crumpled in half
- Two collapsed Quonset huts
- Two small drum caches (consisting of mostly empty drums) near the Garage
- Piles of metal and other debris from building demolition
- Pallet storage line (consisting of some full and partially full drums)
- Extensive staining on and near the garage berm
- Freshwater lake with about 40 barrels in and around the lake
- Small pile of empty solvent and starting fluid containers
- Other scattered and bulldozed debris

- Large drum cache (Drum Cache D) consisting of about 2,700 drums between the station and the station airport.

The beach site area consists of:

- An airstrip (915 m long)
- Remains of two Quonset huts and a helipad
- Remains of a plane wreck
- Small domestic garbage dump
- Several hundred stacked empty barrels
- Large dump consisting of barrels (approximately 1000) and heavy equipment strewn down the steep slope to the beach
- Empty bunker with some scattered and partially buried domestic garbage nearby;
- Remains of a small shack
- About 300 to 400 barrels scattered around the beach area.

The ESAs reports prior to 2013 estimated that at least 5000 m³ of soil impacted by PHCs, PCBs and/or metals is present at the site. Further delineation in 2013 provided further breakdown of the impacted soils and other parameters on the site as follows:

- Tier I : ~ 83 m³ of soil greater than DCC Tier I criteria
- Tier II : ~ 3,200 m³ of soil greater than DCC Tier II criteria
- Type A hydrocarbon: ~ 1,043 m³ of soil greater than Type A hydrocarbon AMSRP criteria
- Type B hydrocarbon: ~1,900 m³ of soil greater than Type B hydrocarbon AMSRP criteria.
- Eight BDAs were identified and reviewed in accordance with the Abandoned Military Site Remediation Protocol (AMSRP) requirements.
- Two of the BDAs were determined to be Class B (moderate potential environmental risk), while the remaining six were Class C (low potential environmental risk).
- Asbestos containing waste ~ 25 m³
- PCB and Lead Paint~ 1,050 m³.
- Debris and other Inert Wastes (crushed nonhazardous wastes): ~ 1,600 m³.

Consequently, a Remedial Action Plan (RAP) recommending options to clean-up the various waste streams at the site was written developed. The RAP has been scheduled for implementation within the next four (4) years – 2016 to 2020.

- 1.4 Details of the site location, characteristics/features, topography and other details are contained in the drawings attached to this Spill Contingency Plan.

2 Fuel and Hazardous Material Spills - General Information

- 2.1 This Spill Contingency Plan presents the prescribed course of action to be followed in the case of unanticipated *fuel or chemical spills* during the remediation of the former DEW Line Site at CAM-E (Keith Bay), 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.
- 2.2 This current plan follows the standard procedure adopted by PWGSC / INAC on Crown lands to address unanticipated spills. The procedure has been customised and made specific to the CAM-E (Keith Bay) 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 Impact Review Board (NIRB), Nunavut Water Board (NWB), Lands Department of the Indigenous and Northern Affairs Canada (INAC) and other relevant regulatory bodies as soon as it is completed. The following information will be included in the SSHSP:
- a description of pre-emergency planning;
 - personnel roles, lines of authority and communication;
 - emergency alerting and response procedures;
 - evacuation routes and procedures, safe distances and places of refuge;
 - emergency alerting and response procedures;
 - directions/methods of getting to the nearest medical facility;
 - emergency decontamination procedure;
 - emergency medical treatment and first aid;
 - emergency equipment and materials;
 - emergency protective equipment;
 - procedures for reporting incidents; and
 - 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

- 3.1 The types and approximate minimum quantities of fuels that will be stored on-site are:

Gasoline: Approximately 2050 L stored in ten (10) 205 L barrels;

Diesel: Approximately 10,200 L stored in forty (40) 205 L barrels;

Oil: Approximately 40 L of hydraulic oil (two 20 L pails) and 40 L of motor oil (two 20 L pails);

Propane: Three (3) 45 kg tanks; and

Grease: Approximately 20 tubes stored within two 4 kg cases.

3.2 Method of Storage & MSDS Sheets:

All liquid fuels will be stored in barrels on pallets 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 in the containment area into the respective vehicle. The containment area will be located on flat, even ground at a distance of no less than 30 m away from the camp and any natural drainage area or water body.

Propane will be stored in 45 kg (100 lb) certified tanks near the kitchen tent.

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 remediation of CAM-E (Keith Bay) project, the successful contractor will prepare the MSDS sheets for all fuels and chemicals he is 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

- 4.1 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.

- 4.2 A variety of fuels (diesel, gasoline and lubricating oils) will be used during the site remediation of the CAM-E (Keith Bay) site. Fuels will be stored in either barrels of 205 liters or smaller capacity or in double walled tanks. For either storage option, it is anticipated that any spill quantity would likely be small.
- 4.3 Transportation of fuels will be ensured to comply with the *Transportation of Dangerous Goods Act and Regulations*.
- 4.4 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.
- 4.5 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 CAM-E (Keith Bay) Remediation 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 in Section 2.5.1 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 in Table 1 below. Report spills immediately on the 24-Hour Spill Report Line (867) 920-8130.

4.6 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.

5 Notification & Reporting Procedure on CAM-E (Keith Bay) Site

Notification and reporting procedure on CAM-E (Keith Bay) will follow similar procedures we adopt on all Crown sites. These are:

- 5.1 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.
- 5.2 A person shall immediately report the spill, where there is a spill, or where there is a reasonable 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* or in Schedule A of the *Yukon Spill Regulations*.
- 5.3 Notify appropriate government agencies using the contact list provided below (Table 1).
- 5.4 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 the spill is moving.
 - iv. Name and phone number of a contact person close to the location of the 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, and dispose of the spilled material.
 - x. Name, address and phone number of person reporting spill.
 - xi. Name of owner or person in charge, management or control of hazardous materials at the time of the spill.

6 Key Contacts' List

6.1 24-Hour Spill Report Line

1. In the event of a spill, contact the 24-Hour Spill Report Line and provide them with all the relevant details (as stated in section 5 above). The contact details are:
Telephone: (867) 920-8130 Fax: (867) 873-6924
2. Environment Canada, as lead agency, shall then be contacted by officials to ensure the appropriate response. The lines are staffed 24 hours a day and can also be used to co-ordinate a response in the event of a non-spill emergency outside of normal working hours.

6.2 Other Contacts

1. Detailed list of contacts in the event of spill emergency or a non-spill emergency (e.g. related to wildlife, fisheries, heritage resources etc.), are provided in Table 1 below.

Table 1: Contact List

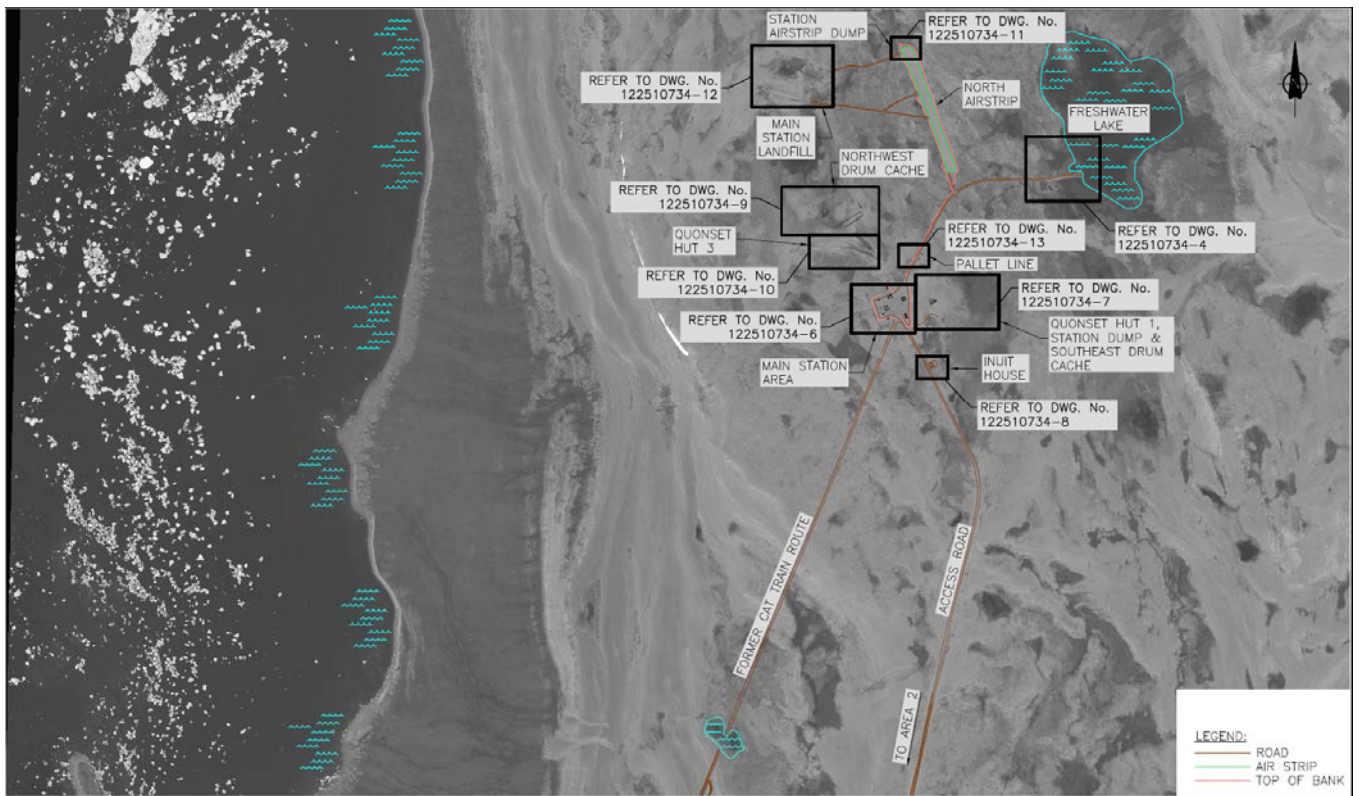
Resource	Location	Phone Number	Fax Number
24 Hour Spill Line	NWT/Nunavut	(867) 920-8130	(867) 873-6924
Local Fire Department	Director / Fire Chief Emergency and Protective Services, Government of Nunavut, Iqaluit, Nunavut	(867) 976-5657	(867) 979-0680
Environment Canada, Enforcement Branch	Enforcement Officer, Environment Canada, Iqaluit, Nunavut	(867) 975-4644	(867) 975-4645
Indigenous and Northern Affairs Canada – Operations Department	Manager, Water Resources, INAC Iqaluit, Nunavut	867-975-4550	867-975-4286
Government of Nunavut	Director, Environmental Protection, Government of Nunavut Iqaluit, Nunavut	(867) 975-7729	867) 975-7739
Fisheries and Ocean Canada (DFO)	Director, Fisheries and Oceans Canada P.O. Box 2208 Iqaluit, X0A 0H0	(867) 979-8000	(867) 979-8039
Kitikmeot Inuit Association (QIA), Kugluktuk	Director of Lands, Qikiqtani Inuit Association (QIA) Igluvut Building, 2nd floor P.O. Box 1340, Iqaluit, NU X0A 0H0	(867) 975-8400	(867) 979-3238
Indigenous and Northern Affairs Canada – Project Proponent	HQ – Gatineau: Dele Morakinyo, INAC Project Manager OR Iqaluit Office: Charlotte Lamontagne, A/Director, Contaminated Sites & Lands (NRO)	(819) 934-9224 (867) 975-4578	(819) 934-9229 (867) 975-4736
Public Works and Government Services Canada – Project Manager	Project Manager – Matthew McElwaine, PWGSC Project Manager	(780) 887-6288	(780) 497-3842

7 NT-NU Spill Report Form

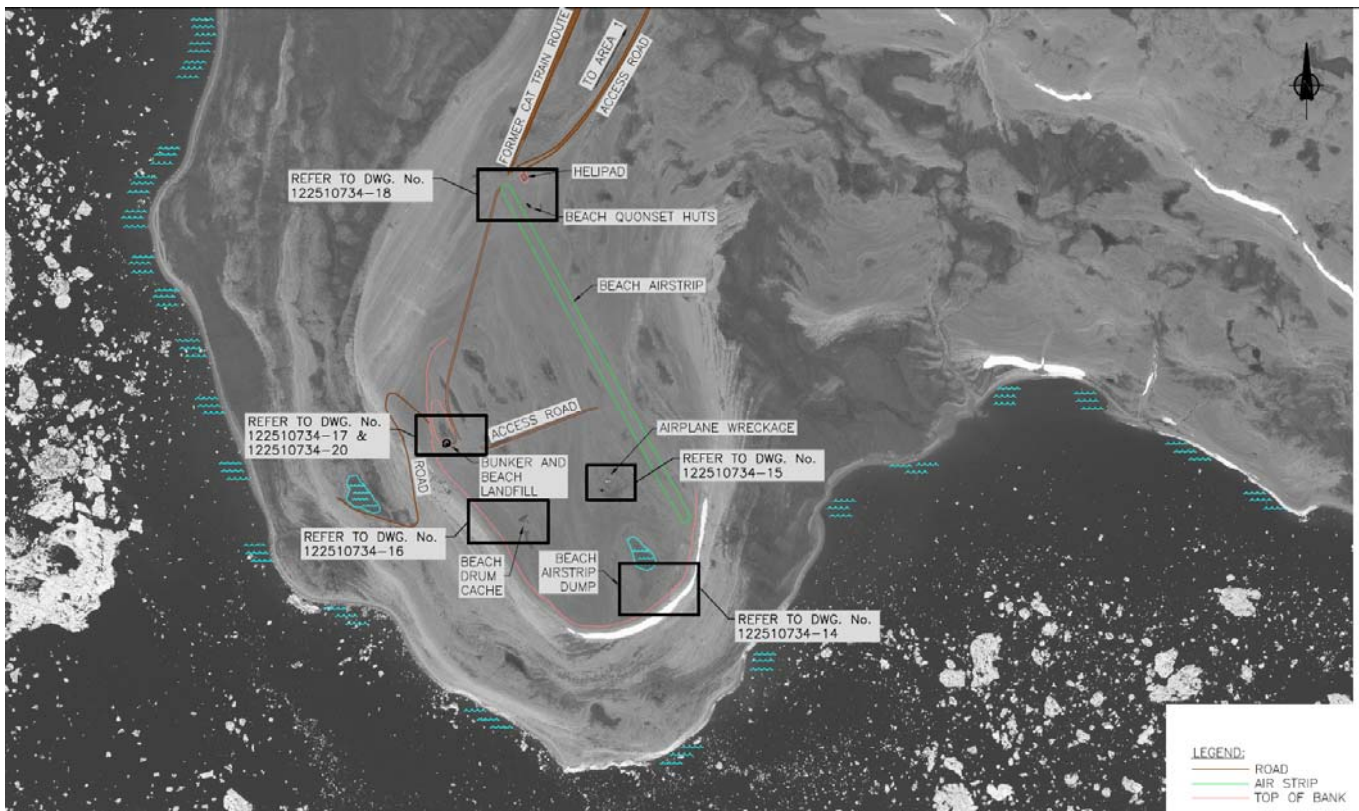
8 MAPS - Site Location, Features and Topography Maps



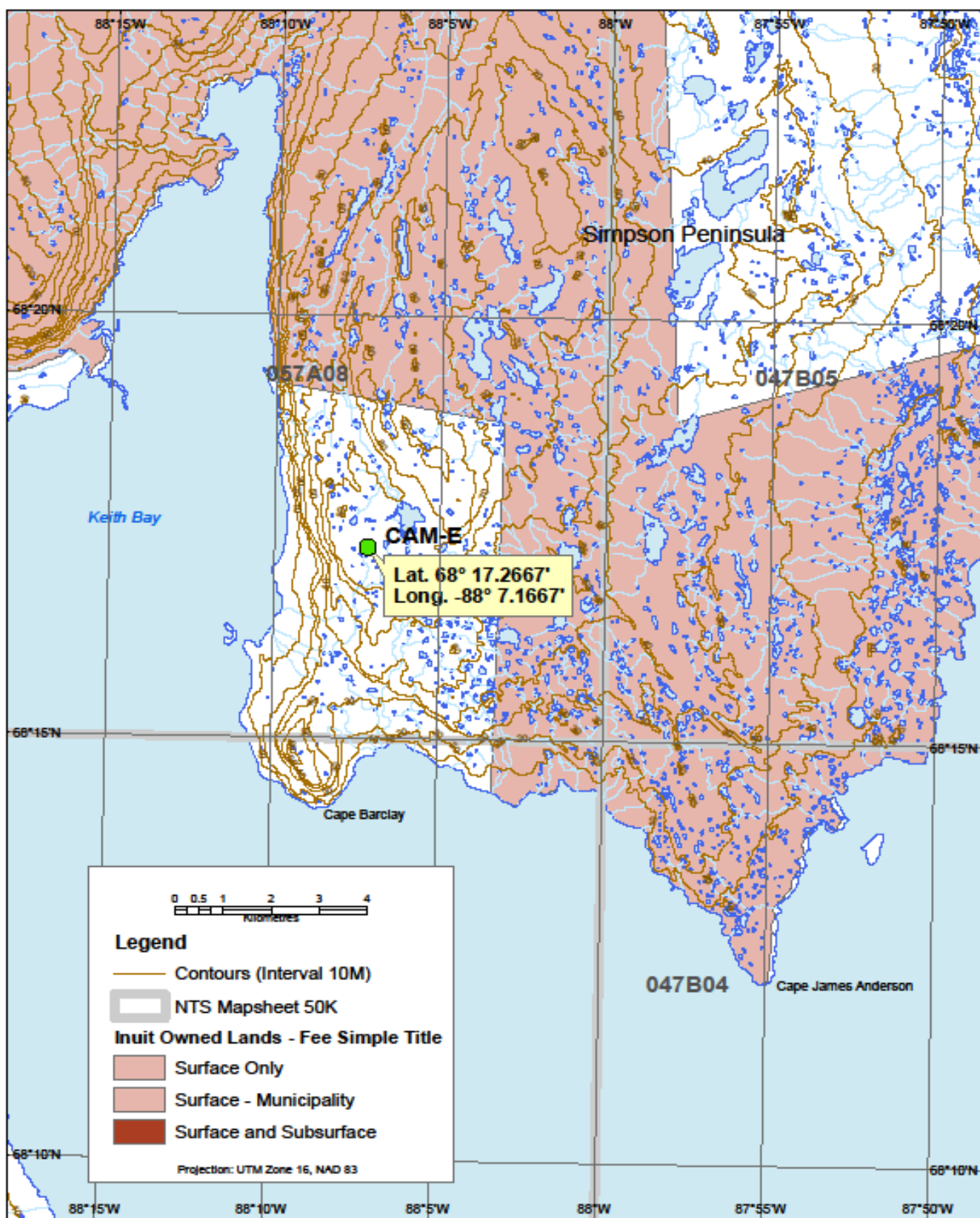
LOCATION MAP: Keith Bay - 75 km East of Kugaaruk, NU, Canada



Layout Map of Area 1 (Main Station)
 (Referred drawings and contained in the Phase III report submitted to NIRB through NPC)



Layout Map of Area 2 (Beach Area)
 (Referred drawings and contained in the Phase III report submitted to NIRB through NPC)



NTS Map Sheet No 057A08 (Scale: 1:50,000)