SITE DESCRIPTION

1.1 CAM-3, Shepherd Bay, NU

1.1.1 Location, Terrain, and Topography

Latitude: 68° 48' 22.96" N Longitude: 93° 26' 38.76" W Elevation: 42 m

Location: This Long Range Radar (LRR) site is situated on 22 km² of a gently and uniformly sloping coastal plain area that appears to be an emerging sea bottom. The module train is located on the crest of an elevated "U" shaped gravel ridge. The closest source of support is LSS-C in Cambridge Bay, 467 km to the west. Flight time from the LSS is 2 hours 40 minutes by helicopter under normal conditions. A helipad is located on-site, as well as an abandoned airstrip.

Terrain: The plain between the ridge and the sea contains a number of irregularly aligned gravel ridges and is covered with many small lakes, ponds, and swamp areas. The lakes and ponds are shallow, partly filled with vegetation, and surrounded by a spongy humus comprised of mosses. Well sorted sands, gravels, and silts form a blanket of glacial drift over the region. Vegetation in the drier areas of Shepherd Bay may consist of Arctic willow, a variety of sedges, and flowering herbs.

Topography: The shoreline of Shepherd Bay has a wavy outline. Much of the shore is a thin gravel beach and the coastal slopes are covered with sand, silt, and rock fragments.

1.1.2 Climate

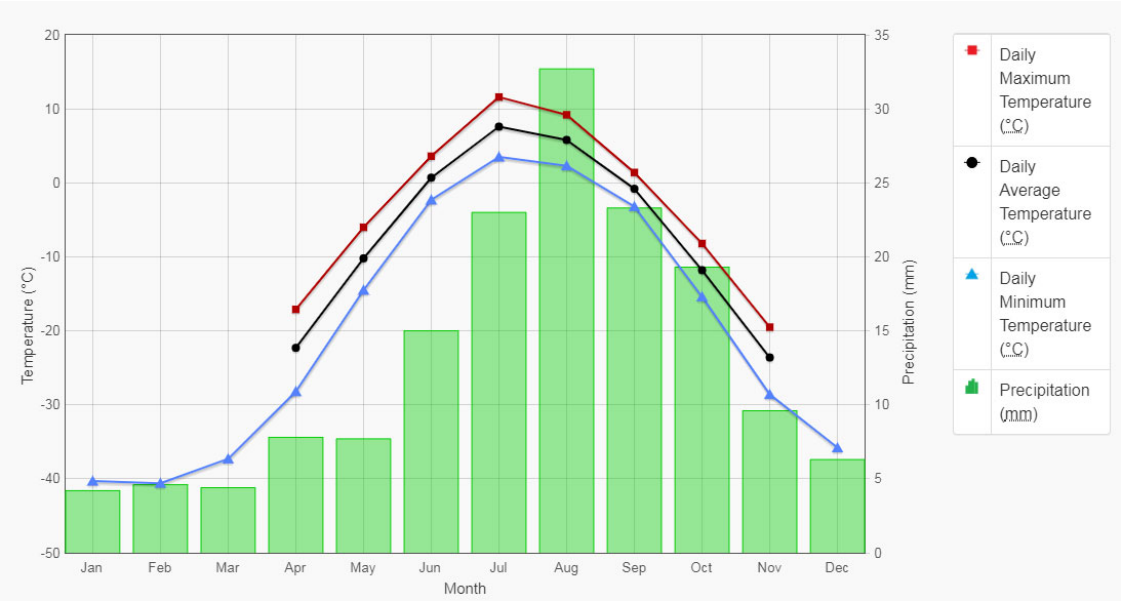

Figure 1: Temperature and Precipitation at Cambridge Bay, Averages of Information from 1961 to 1990

Precipitation:

- Annual Average: 145 mm
- Snowfall: 65 cm
- Rainfall: 80 mm

1.1.3 Site Population

This LRR site was transitioned to “unattended” status on 31 August 1995.

1.1.4 Land Use

There are no commercial developments in the area. Some Inuit from Gjoa Haven, Taloyoak (formerly Spence Bay), and Kugaaruk (formerly Pelly Bay) may hunt near the site and to the north towards the Boothia Peninsula, primarily for caribou, arctic fox, and waterfowl. The site is located in the Nunavut Settlement Area in the Kitikmeot administrative region. DND has been transferred the management, charge, and direction of the property by DIAND for the life of the NWS.

The Shepherd Bay area contains significant archaeological remains. Three prehistoric sites were identified. All of the sites, containing tent rings and caches, appear to be of Thule age. One of the sites has been disturbed severely by gravel extraction and probably looting activities. The remaining two are located in close proximity to existing roads and may be impacted by continued use of these communication routes.

1.1.5 Wildlife

Shepherd Bay provides good habitat for wildlife, particularly nesting waterfowl in the spring and summer. The region also provides good habitat for arctic foxes, arctic hares, and wolves. Caribou are common near the site and are frequently seen in the vicinity of the airstrip. Muskoxen may be found occasionally, south of the site near the Murchison River.

Polar bears, bearded seals, and narwhal can occasionally be seen during the open water season. Ringed seals prefer the land-fast ice in Shepherd Bay along the coastline.

Pacific loons have been observed to nest on a lake northeast of the airstrip. Ptarmigan are locally common. Site personnel have reported that Shepherd Bay is an important area for staging Canada Geese. King eider have been spotted on small ponds surrounding the facilities and at the sewage outlet. Flocks of oldsquaw and tundra swans were found nesting near the coast at the beach area. Snow buntings were found in disturbed areas around the station and appeared to be nesting beneath the trains.

Important fish in the area include arctic char, lake trout, least cisco, whitefish, and cod.

Table 1: Wildlife Species Encountered at or within range of CAM-3 and their classification under SARA, and Territorial Regulations

Taxon	Common Name	Scientific Name	Time frame of Occurrence on-site	SARA Status[1]	SARA Schedule[2]
Terrestrial Mammals	Arctic Fox	*Vulpes lagopus*	Annual	---	---
Terrestrial Mammals	Arctic Hare	*Lepus arcticus*	Annual	---	---
Terrestrial Mammals	Caribou, Barren Ground subspecies (Union and Dolphin population)	*Rangifer tarandus groenlandicus*	Annual	Special concern	1
Terrestrial Mammals	Grey Wolf	*Canis lupus*	Annual	---	---
Terrestrial Mammals	Grizzly Bear	*Ursus arctos horribilis*	Seasonally	Special concern	1
Terrestrial Mammals	Muskoxen	*Ovibos moschatus*	Spring-late summer	---	---

Taxon	Common Name	Scientific Name	Time frame of Occurrence on-site	SARA Status[1]	SARA Schedule[2]
Terrestrial Mammals	Red Fox	*Vulpes vulpes*	Annual	---	---
Terrestrial Mammals	Wolverine	*Gulo gulo*	Annual	Special Concern	1
Marine Mammals	Bowhead Whale	*Balaena mysticetus*	Annual	---	---
Marine Mammals	Polar Bear	*Ursus maritimus*	Annual	Special Concern	1
Marine Mammals	Ringed Seal	*Phoca hispida*	Winter-Spring	---	---
Birds	American Golden Plover	*Pluvialis dominica*	Summer	---	---
Birds	American Pipit	*Anthus rubescens*	Summer	---	---
Birds	Arctic Tern	*Sterna paradisaea*	Summer	---	---
Birds	Baird's Sandpiper	*Calidris bairdii*	Summer	---	---
Birds	Black-Bellied Plover	*Pluvialis squatarola*	Summer	---	---
Birds	Brant	*Branta bernicla*	Summer	---	---
Birds	Buff-Breasted Sandpiper	*Tryngites subruficollis*	Summer	Special Concern	1
Birds	Cackling Goose	*Branta hutchinsii*	Summer	---	---
Birds	Canada Goose	*Branta canadensis*	Summer	---	---
Birds	Common Eider	*Somateria mollissima*	Summer	---	---
Birds	Common Raven	*Corvus corax*	Annual	---	---
Birds	Common Redpoll	*Acanthis flammea*	Summer	---	---
Birds	Dunlin	*Calidris alpina*	Summer	---	---
Birds	Glaucous Gull	*Larus hyperboreus*	Summer	---	---
Birds	Gyrfalcon	*Falco rusticolus*	Annual	---	---
Birds	Herring Gull	*Larus agrentatus*	Summer	---	---
Birds	Hoary Redpoll	*Acanhis hornemanni*	Annual	---	---
Birds	Horned Lark	*Eremophila alpestris*	Summer	---	---
Birds	King Eider	*Somateria spectabilis*	Summer	---	---
Birds	Lapland Longspur	*Calcarius lapponicus*	Summer	---	---
Birds	Long-Tailed Duck	*Clangula hyemalis*	Summer	---	---
Birds	Long-Tailed Jaeger	*Stercorarius longicaudus*	Summer	---	---
Birds	Pacific Loon	*Gavia pacifica*	Summer	---	---
Birds	Parasitic Jaeger	*Stercorarius parasiticus*	Summer	---	---
Birds	Pectoral Sandpiper	*Calidris melanotos*	Summer	---	---
Birds	Peregrine Falcon, Anatum/Tundrius subspecies	*Falco peregrinus anatum/tundrius*	Annual	Special Concern	1
Birds	Red Knot, Rufa	*Calidris canutus rufa*	Summer	Endangered	1
Birds	Red Phalarope	*Phalaropus fulicarius*	Summer	---	---
Birds	Red-Necked Phalarope	*Phalaropus lobatus*	Summer	Special Concern	1
Birds	Red-Throated Loon	*Gavia stellata*	Summer	---	---
Birds	Rock Ptarmigan	*Lagopus muta*	Winter	---	---
Birds	Ross's Goose	*Chen rossii*	Summer	---	---
Birds	Rough-Legged Hawk	*Buteo lagopus*	Summer	---	---
Birds	Ruddy Turnstone	*Arenaria interpres*	Summer	---	---
Birds	Sabine's Gull	*Xema sabini*	Summer	---	---
Birds	Sandhill Crane	*Grus canadensis*	Summer	---	---
Birds	Semipalmated Plover	*Charadrius semipalmatus*	Summer	---	---
Birds	Snow Bunting	*Plectrophenax nivalis*	Summer	---	---

Taxon	Common Name	Scientific Name	Time frame of Occurrence on-site	SARA Status[1]	SARA Schedule[2]
Birds	Snow Goose	*Chen caerulescens*	Summer	---	---
Birds	Snowy Owl	*Bubo scandiacus*	Annual	---	---
Birds	Thayer's Gull	*Larus thayeri*	Summer	---	---
Birds	Tundra Swan	*Cygnus columbianus*	Summer	---	---
Birds	White Rumped Sandpiper	*Calidris fuscicollis*	Summer	---	---
Birds	Willow Ptarmigan	*Lagopus lagopus*	Annual	---	---
Birds	Yellow-Billed Loon	*Gavia adamsii*	Summer	---	---
1 = SARA Status. The federal Species At Risk Act (SARA) classifies species as extinct, extirpated, endangered, threatened, or special concern.					
2 = SARA Schedule. The federal Species at Risk Act (SARA) assigns species to Schedule 1, 2 or 3. Schedule 1 is the official List of Wildlife Species at Risk. Schedule 1 species and their residences and critical habitats are protected. Species in Schedule 2 or 3 are not protected under SARA, but they are monitored and their designation is subject to re-assessment.					
5 = Under Nunavut's Wildlife Act, a List of Species at Risk can be established. No species have been listed yet.					
--- Means there is no classification					

1.1.6 Water Supply

Water is trucked from a nearby freshwater lake during the summer.

1.1.7 Sewage Disposal

Sewage is piped from the holding tank system to the sewage outfall area.

1.1.8 Waste Disposal

Domestic waste is transported to LSS-C where it is sent to the community landfill.

1.1.9 Electrical Power

Power is generated at this site.
Total site capacity (4 generators) 585 kW
Normal operating capacity (1 generator) 175 kW

1.1.10 Fire Protection

Components: The fire protection system consists of:

a. Fire Alarm & Detection System;
b. CO_2 Fire Suppression Systems;
c. FM-200 Fire Suppression System; and
d. Portable Fire Extinguisher.

Description: The Fire Alarm Control Panel (FACP) for the main detection system (GE quick start) is located in the dining area.

If the FACP fire alarm is activated, the system will:

a. activate the fire doors in the activated zone;
b. set off the alarm bells and horns throughout the site;
c. activate the station siren to notify personnel outside; and
d. send a signal to notify the NWSCC.

The Pyrene CO_2 system is located in the C&E and the Power Plant area.

If a single detector from the Pyrene System is activated, the system will:

a. set off the alarm bells and horns in that area;
b. send a signal to the main FACP, which activates the main fire alarm panel and will set off the alarm bells and horns throughout the site; and
c. send a signal to notify the NWSCC.

If a second device in the C&E area is activated, the following will occur:

a. the FACP will initiate shutdown of the exhaust fans and radar;
b. the FACP will initiate the discharge of CO2 into the zone where alarm initiated from;
c. the FACP will activate the discharge strobes above the entrance way to the fire zone;
d. the discharge pressure switch will activate; and
e. send a signal to notify the NWSCC.

If a second device in the Power Plant on the site is activated, the following will occur:

a. the FACP will initiate the shutdown of the exhaust fan & power;
b. the FACP will initiate the generator shut down;
c. the FACP will initiate CO2 discharge into the power plant;
d. the FACP will initiate the discharge strobes above the entrance way to the fire zone;
e. the discharge pressure switch will activate; and
f. send a signal to notify the NWSCC.

The FM-200 Suppression System is located in the Communications Room (Comms Room), and is made up of two 60 lbs cylinders with 48 lbs of agent. The system is supervised by the GE Quick Start Fire Alarm Panel.

If a single device in the Comms Room is activated, the following will occur:

a. the FACP will initiate evacuation bell within the Comms Room;
b. the FACP will send a signal to the GE Quick Start FACP which will activate the sites Fire Alarm System; and
c. the FACP will send a signal to notify the NWSCC.

If a second device in the Comms room is activated, the following will occur:

a. the FACP will initiate the discharge sequence; and
b. the discharge strobes will activate above the entrance way to the Comms Rooms.

The Kitchen Range Guard System is located in the dining area, and is made up of one cylinder containing 11.3 L (2.5 Gal) of agent. The system is supervised by the GE Quick Start Fire Alarm Panel.

a. If the system is activated by either the release of a fusible link in the canopy which will flood the grills and canopy with agent, or by a manual pull station located on the canopy, the main FACP will:
b. will be signaled;
c. will set off the alarm bells and horns; and
d. send a signal to notify the NWSCC.

1.1.11 Kits

Table 2 CAM-3 Kits and Locations

Kit	Location	Note
Fire Fighting Equipment	"B" Train Module and "A" Train	
Safety Boards	Strategic locations throughout site	
Disaster/Survival	Garage Mezzanine	
Fuel Spill Kit	Warehouse B13A	The contents of this kit on-site are listed in the Spill Contingency Plan (PLN-EHS-2).
Chemical Spill Kit	"A" Train	The contents of this kit on-site are listed in the Spill Contingency Plan (PLN-EHS-2).
Asbestos Response Kit	"A" Train	The contents of this kit on-site are listed in the Spill Contingency Plan (PLN-EHS-2).
First Aid Kit	"B" Train and strategic locations throughout site	

1.1.12 Bulk Fuel Storage and Distribution

Fuel is delivered to the site annually via sealift. The barge pumps directly into the beach tanks via a 150 mm diameter fuel transfer line. Bulk Fuel Technicians transfer fuel annually from the beach tanks to the summit bulk tanks via the 50 mm fuel transfer line. After each transfer, the majority of the fuel is drained from the line and all valves are closed and locked.

Table 3 CAM-3 Bulk Fuel Storage

LOCID	Location	Fuel Usage	Tank Size (L)	Max Fill Volume (L)	Usable Volume (L)
Environment Canada ID # & System Name: EC-00003945, CAM-3 Beach to Summit					
SHEW22A	Summit	PGS	246,000	231,211	213,882
SHEW22C	Beach	PGS	246,000	231,211	213,882
SHEW22D	Beach	PGS	246,000	231,211	213,882
SHEW22I	Summit	PGS	75,000	70,494	69,428
SHEW22J	Summit	PGS	75,000	70,494	69,428
SHEW22H	Summit	PGS	75,000	70,494	69,428
SHEW21C	Summit	Vehicle Refueller	4,100	3,878	3,770
SHEW20A	Summit	Aviation	50,000	46,917	45,981
SHEDAYT1	Summit	PGS	1,135	1,067	1,067
SHEDAYT2	Summit	PGS	1,135	1,067	1,067
SHEDAYT3	Summit	PGS	1,135	1,067	1,067
SHEDAYT4	Summit	PGS	1,135	1,067	1,067
SHEDAYT5	Summit	PGS	1,135	1,067	1,067
SHEDAYT6	Summit	PGS	1,135	1,067	1,067
SHEDAYT7	Summit	PGS	1,135	1,067	1,067

LOCID	Location	Fuel Usage	Tank Size (L)	Max Fill Volume (L)	Usable Volume (L)
Environment Canada ID # & System Name: EC-00003946, CAM-3 Beach Aviation					
SHEW20C	Beach	Aviation	50,000	46,917	45,981
SHEW20D	Beach	Aviation	50,000	46,917	45,981
		Summit Totals:	**533,045**	**500,957**	**479,386**
		Beach Totals:	**592,000**	**556,256**	**519,726**
		Site Totals:	**1,125,045**	**1,057,213**	**999,112**

Table 4 CAM-3 Bulk Fuel Storage Components

COMPONENT	USE	DESCRIPTION
Tank SHE W22A	PGS	Field-erected, vertical, single bottom, steel, 246,000L-summit tank (1956-1957) contained in a gravel dike with impermeable liner (1995). The membrane in the dike attaches to the perimeter of the tank concrete foundation but does not pass under bottom of tank.
Tanks SHE W22C & SHE W22D	PGS	Field-erected, vertical, single bottom, steel, 246,000L-beach tanks (1956-1957) contained in a gravel dike with impermeable liner (1995). The membrane in the dike attaches to the perimeter of the tank concrete foundation but does not pass under bottom of tank.
Tanks SHE W22H to SHE W22J	PGS	Self-diked, horizontal, 75,000L steel tanks at the summit (1994-1995).
Tank SHE W20A	Aviation	Self-diked, horizontal, 50,000L steel tank at the summit helipad (1997)
Tanks SHE W20C & SHE W20D	Aviation	Self-diked, horizontal, 50,000L steel tanks at the Beach helipad (1997)
Piping		a. 13,000 m of 50 mm aboveground piping from beach to summit b. 50 mm aboveground piping from Summit tank to TSB c. 17.4 m of 50 mm underground piping* from Summit tanks to TSB d. 16.4 m of 50 mm underground piping* from TSB to Warehouse e. 50 mm aboveground piping around TSB to PGS tanks and Aviation tanks f. 39.2 m of 50 mm underground piping* from TSB to garage g. 50mm aboveground piping from TSB to garage h. 6 m of 50 mm underground piping* from garage to vehicle refueller i. 50 mm aboveground piping from garage to vehicle refueller j. 50 mm aboveground piping from Beach aviation tanks to Helipad k. 150 mm aboveground piping from sealift intake to Beach bulk tanks l. 500 m of aboveground piping from summit tanks to warehouse and garage * removed from service in 2008

Pumphouses: SHE B06A (Summit)

SHE B06B (Beach)

Sources Include:

1. Initial Environmental Evaluation of the North Warning System Project, Vols 1 & 2. Monenco-Eyretechnics Group, 1987 (Vol. 1), 1989 (Vol.2).
2. Environmental Cleanup Study of 21 DEW Line Sites in Canada. UMA, June 1991.
3. NWS Environmental Study, Vol. 2: Site Analysis. Royal Roads Military College Environmental Sciences Group (Reimer), June 1991.
4. The Nunavut Land Claims Agreement, 1993.
5. NWS Site Record Drawings.
6. The Nunavut Wildlife Harvest Study. Nunavut Wildlife Management Board, February 2004.
7. Nunavut Wildlife Resource and Habitat Values. Nunami Jacques Whitford Limited. October 2008.
8. Environment Canada Monthly Data – Shepherd Bay, Nunavut http://www.climate.weatheroffice.gc.ca/climateData/monthlydata_e.html?timeframe=3&Prov=NU&StationID=1723&mlyRange=1957-01-01|2006-07-01&Year=1957&Month=01&Day=01# Retrieved in March 2015.

1.1.13 Site Plan

A copy of the site plan is included. Refer to the site record drawings for the current revisions of any drawings.