SITE DESCRIPTION

1.1 DYE-M, Cape Dyer, NU

1.1.1 Location and Topography

Latitude: 66° 39' 56.94" N Longitude: 61° 21' 19.76" W Elevation: 725 m

Location: This Long Range Radar (LRR) site is located at the extreme eastern edge of a mountainous peninsula at Cape Dyer on Baffin Island. DYE-M is located 460 km NNE of Iqaluit. The host LSS for DYE-M is LSS-Q, Iqaluit. Flight time from the LSS is 2 hours, 40 minutes by helicopter under normal conditions. Infrastructure at DYE-M is in three main areas: a beach area in the west, an airstrip area at the lower site (west-central area) and the upper site at the east (aka. summit). A helipad is located on-site at the summit, as well as an abandoned airstrip at the lower site. The areas are connected by a gravel road.

Terrain: The terrain is rugged and boulder strewn with very little soil, consisting of mostly silt. Vegetation on the upper site is sparse, consisting of grass, wildflowers, mosses, and lichen. Vegetation at the lower site is more abundant consisting of wildflowers, creeping willows, and sedges. Several small ice fields exist within five miles of the site.

Topography: The mountainous terrain and the sheer cliffs, some over 610 masl high, along the eastern coastline are the most prominent features of the site. Along the western coast line steep hills surround the site but are less severe than the eastern side, enabling personnel access to the ocean.

1.1.2 Climate

No average temperature and precipitation information is available from Environment Canada for this site.

Precipitation:

- Annual Average: 708 mm
- Snowfall: 602 cm
- Rainfall: 106 mm

1.1.3 Site Population

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

1.1.4 Land Use

There are no commercial operations within the vicinity of DYE-M. Hunters from Qikiqtarijuaq (formerly Broughton Island) may hunt arctic fox, walrus, and seal. The site is located in the Nunavut Settlement Area in the Baffin administrative region. DND has been transferred the management, charge, and direction of the property by DIAND for the life of the NWS.

There are existing heritage sites recorded in the DYE-M site area. A relatively recent Inuit camp containing two rings, one cache, and one shelter was located north of the bulk fuel storage tank and beach landing facilities. Approximately 800 m north of this site, another complex of ten rings was observed. Another historic site associated with construction of the base was observed 1.5 km north of the beach landing. It consists of an access ramp and three building foundations.

South of the bulk fuel storage area is a historic grave site relating to a French whaling expedition of the 1930's. Further removed to the south are three houses, probably Thule in origin. Two have been seriously disturbed by natural erosion and by bulldozing activity. The southernmost site appears to be recent in age, likely dating to post construction of the DEW Line station itself. Features at this site consisted of 11 structure foundations, airplane debris, three tent rings, and six caches.

1.1.5 Wildlife

Caribou are occasionally seen at the lower site on the plateau. Arctic foxes, and more infrequently wolves, can be found in the region and near the site. Periodically polar bears are encountered at both camps, particularly during the start of the open water season when they are forced ashore by the break-up of the land-fast ice. Cape Dyer is a major denning area for polar bears on south eastern Baffin Island.

The coastal waters are important habitat to walrus, seals, and many species of whales and porpoises. During the fall and early winter, bowhead whales migrate southward along the east coast of Baffin Island to the Cumberland Sound region. Also during this time, there is a migration of narwhals south along the east coast of Baffin Island to their overwintering areas in the Davis Strait and west Greenland. Bearded seal, harp seal, ringed seal, narwhal, and killer whale can be found in the coastal water of Davis Strait as well.

The cliff terrain that DYE-M is situated on is the preferred habitat for several raptor species including peregrine falcon, gyrfalcon, and snowy owl. The Canadian Wildlife Service (CWS) has recognized western Baffin Bay as a key migratory bird habitat site. This area also contains many seabirds including black-legged kittiwake, thick-billed murre, and black guillemot. Colonies of Sabine's gull can be found south and west of the site.

Table 1 Wildlife Species Encountered at or within range of DYE-M 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	*Rangifer tarandus groenlandicus*	Annual	---	---
Terrestrial Mammals	Grey Wolf	*Canis lupus*	Annual	---	---
Terrestrial Mammals	Red Fox	*Vulpes vulpes*	Annual	---	---
Terrestrial Mammals	Wolverine	*Gulo gulo*	Annual	Special Concern	1
Marine Mammals	Atlantic Walrus (Northwest Atlantic population)	*Odobenus rosmarus*	Seasonally	Extirpated	1
Marine Mammals	Bowhead Whale (Eastern Arctic Population)	*Balaena mysticetus*	Annual	Endangered	2
Marine Mammals	Bowhead Whale (Eastern Canada-West Greenland Population)	*Balaena mysticetus*	Annual	---	---
Marine Mammals	Harbour Porpoise	*Phocoena phocoena*	Seasonally	---	---
Marine Mammals	Harbour Seal	*Phoca vitulina concolor*	Seasonally	---	---
Marine Mammals	Killer Whale	*Orcinus orca*	Seasonally	---	---
Marine Mammals	Narwhal Whale	*Monodon monoceros*	Seasonally	---	---

Taxon	Common Name	Scientific Name	Time frame of Occurrence on-site	SARA Status[1]	SARA Schedule[2]
Marine Mammals	Polar Bear	*Ursus maritimus*	Annual	Special Concern	1
Marine Mammals	Ringed Seal	*Phoca hispida*	Seasonally	---	---
Birds	American Golden Plover	*Pluvialis dominica*	Summer	---	---
Birds	American Pipit	*Anthus rubescens*	Summer	---	---
Birds	Arctic Tern	*Sterna paradisaea*	Summer	---	---
Birds	Black-legged Kittiwake	*Rissa tridactyla*	Summer	---	---
Birds	Black Guillemot	*Cepphus grylle*	Annual	---	---
Birds	Baird's Sandpiper	*Calidris bairdii*	Summer	---	---
Birds	Common Eider	*Somateria mollissima*	Summer	---	---
Birds	Common Loon	*Gavia immer*	Summer	---	---
Birds	Common Raven	*Corvus corax*	Annual	---	---
Birds	Common Redpoll	*Acanthis flammea*	Summer	---	---
Birds	Common Ringed Plover	*Charadrius hiaticula*	Summer	---	---
Birds	Glaucous Gull	*Larus hyperboreus*	Summer	---	---
Birds	Gyrfalcon	*Falco rusticolus*	Annual	---	---
Birds	Hoary Redpoll	*Acanhis hornemanni*	Annual	---	---
Birds	Horned Lark	*Eremophila alpestris*	Summer	---	---
Birds	Iceland Gull	*Larus glaucoides*	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	Northern Wheatear	*Oenanthe oenanthe*	Summer	---	---
Birds	Parasitic Jaeger	*Stercorarius parasiticus*	Summer	---	---
Birds	Peregrine Falcon, Anatum/Tundrius subspecies	*Falco peregrinus anatum/tundrius*	Annual	Special Concern	1
Birds	Pomarine Jaeger	*Stercorarius pomarinus*	Summer	---	---
Birds	Red-Breasted Merganser	*Mergus serrator*	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	Rough-Legged Hawk	*Buteo lagopus*	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	---	---

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 lake or from the melt water stream between the upper and lower sites during the summer months as required.

1.1.7 Sewage Disposal

Sewage is piped from the holding tank system to the sewage sumps.

1.1.8 Waste Disposal

Domestic waste is collected on site and then flown to LSS-Q where it is disposed of in the Iqaluit community landfill. The City of Iqaluit authorized the disposal of non-hazardous waste from the North Warning System Radar sites in the city landfill.

1.1.9 Electrical Power

Power is generated at this site through three generators, which have the capacity to be synchronized together. Total capacity can vary depending on the site load and the number of DEGs online. This range can vary from 175 kW to 525kW.

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 CO2 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
c. alarm panel and will set off the alarm bells and horns throughout the site; and
d. 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 DYE-M Kits and Locations

Kit	Location	Note
Fire Fighting Equipment	"A" & "B" Train Receiving Room, Garage	
Safety Boards	"A" Train Mod 29 (C&E) & A" Train Mod 49 (Old Cummins Plant, Power House)	
Disaster/Survival	“C” Train	
Fuel Spill Kit	C&E Maintenance Shop	The contents of this kit on-site are listed in the Spill Contingency Plan (PLN-EHS-2).
Chemical/PCB Spill Kit	“C” Train	The contents of this kit on-site are listed in the Spill Contingency Plan (PLN-EHS-2).

Kit	Location	Note
Asbestos Response Kit	“C” Train	The contents of this kit are listed in the Storage and Tracking of Waste HAZMAT Plan (PLN-EHS-4).
First Aid Supplies	"A" Train, Mod 39	

1.1.12 Bulk Fuel Storage and Distribution

Fuel is delivered to the site annually. The ship pumps directly into the beach tanks via a 100 mm diameter fuel transfer line. Bulk fuel technicians transfer fuel annually from the beach tanks to the summit bulk tank DYE W20A using two 13,000 L fuel trucks.

Table 3 DYE-M Bulk Fuel Storage

LOCID	Location	Fuel Usage	Tank Size (L)	Max Fill Volume (L)	Usable Volume (L)
Environment Canada ID # & System Name: EC-00004476, DYE-M Summit					
DYEW22J	Summit	PGS	69,200	65,084	63,427
DYEW22K	Summit	PGS	69,200	65,084	63,427
DYEW21E	Summit	Vehicle Refueller	4,125	3,878	3,770
DYEW20A	Summit	PGS	946,300	890,038	845,653
DYEW20B	Summit	PGS	69,200	65,084	63,427
DYEDAYT1	PGS	Power Plant	1,135	1,067	1,067
DYEDAYT2	PGS	Garage	1,135	1,067	1,067
DYEDAYT3	PGS	Garage	1,135	1,067	1,067
DYEDAYT4	PGS	HVS	1,135	1,067	1,067
DYEDAYT5	PGS	HVS	1,135	1,067	1,067
Environment Canada ID # & System Name: EC-00004477, DYE-M Beach					
DYEW20G	Beach	PGS	91,000	84,631	78,708
DYEW20H	Beach	PGS	91,000	84,631	78,708
DYEW20I	Beach	PGS	91,000	84,631	78,708
DYEW20J	Beach	PGS	91,000	84,631	78,708
DYEW20K	Beach	PGS	91,000	84,631	78,708
DYEW20L	Beach	PGS	91,000	84,631	78,708
DYEW20M	Beach	PGS	91,000	84,631	78,708
DYEW20N	Beach	PGS	91,000	84,631	78,708
DYEW20O	Beach	PGS	91,000	84,631	78,708
DYEW20P	Beach	PGS	91,000	84,631	78,708
DYEW20Q	Beach	PGS	91,000	84,631	78,708
Environment Canada ID # & System Name: EC- 00041602, DYE-M Summit (Cape Dyer) - Generator					
DYEW22L	Summit	PGS	90,000	84,528	82,857
Environment Canada ID # & System Name: EC- 00041605, DYE-M Summit (Cape Dyer) - Generator					
DYEW22M	Summit	PGS	90,000	84,528	82,857
Environment Canada ID # & System Name: EC- 00041606, DYE-M Summit (Cape Dyer) - Generator					

LOCID	Location	Fuel Usage	Tank Size (L)	Max Fill Volume (L)	Usable Volume (L)
DYEW22N	Summit	PGS	90,000	84,528	82,857
Environment Canada ID # & System Name: EC- 00041602, DYE-M Summit (Cape Dyer) - Generator					
DYEW22R	Summit	PGS	50,000	46,917	45,981
		Summit Totals:	**1,483,700**	**1,395,004**	**1,339,591**
		Beach Totals:	**1,001,000**	**930,941**	**865,788**
		Site Totals:	**2,484,700**	**2,325,945**	**2,205,379**

Table 4 DYE-M Fuel System Components

Component	Use	Description
Tanks DYE W22L; DYE W22M; DYE W22N; and DYE W22R	PGS	Double walled, horizontal, steel tanks at the Upper site. The tanks were brought into service in 2016.
Tanks DYE W20B; DYE W22I; DYE W22J; & DYE W22K	PGS	Single walled, horizontal, steel 69,200L tanks at the Upper site (DEW Line Vintage) contained in a gravel dike with an impermeable liner (1995). Dike volume meets the required code capacity with membrane under the tank.
Tank W20A	Aviation	Field-erected, vertical, single bottom, steel 946,000L Summit tank (1956-1957) contained in a gravel dike with an impermeable liner (1995). The dike volume meets the required code capacity. The membrane in the dike attaches to the perimeter of the tank concrete foundation but does not pass under bottom of tank.
Tanks DYE W20G to DYE W20Q		11 Self-diked, horizontal, steel 91,000L tanks at the beach (2001). All double-walled construction, linked together with header piping and single cat-walk structure.
Pipelines		a. 100 m of 100 mm diameter aboveground piping from sealift connection point to beach tanks b. 80 m of 50 mm diameter aboveground piping from beach tanks to fuel truck connection point c. There is a network of aboveground and underground piping at the upper site. The piping interconnects each of the tanks with each of the buildings, although a majority of it has not been in service since the transition in 1995. Below is a summary of the primary segments: i. 50 mm diameter aboveground and underground piping running from DYE W20A and DYE B06A, along both trains A and B to connect to PGS and Aviation tanks DYE W22J, DYE W22K, and DYE W20B. ii. 50 mm diameter aboveground piping running from DYE W20B to helicopter refueling point at end of Train A. iii. 50 mm diameter aboveground and underground piping running from DYE W20A and DYE B06A, to garage (DYE B10A) and vehicle refueller DYE W21E. iv. 50 mm diameter aboveground and underground piping connecting to various segments listed above, running to cold-soaked and decommissioned buildings DYE B03B, DYE B10A, DYE B27A, and DYE B11B.

Component	Use	Description
Pumphouse		Upper Site Tank Area

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. Nunavut Land Claims Agreement, 1993.
5. NWS Site Record Drawings.
6. Nunavut Wildlife Resource and Habitat Values. Nunami Jacques Whitford Limited. October 2008.

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.