Table 1: Summary of Activities, Impacts and Mitigative Measures

Impacts	Mitigative Measures
Habitat Alteration Some habitat alteration may occur if a spill of maintenance fluids occur.	*Vehicle and equipment maintenance and servicing shall be conducted only in designated areas on gravel pads, where special procedures can be implemented to manage fluids, waste, and contain potential spills. Maintenance, fuelling and lubrication of machinery shall be conducted in such a way as to avoid fluid spills. Used fluids (e.g., oils, antifreeze) and filters (e.g., oil, fuel) shall be containerized in separate and appropriately identified drums (or other appropriate containers) and shall be treated as hazardous materials. All storage containers shall be properly sealed after use. Waste fluids shall not be used for dust control.*
Health and Safety Because of the topography of the site, there is a concern for accidents involving vehicles on roads.	*A speed limit shall be established (tentatively 30 km/hour or less) and enforced by the site superintendent..*
7.5 Water Supply	
Fish Habitat Alteration There is a potential for fish habitat alteration from freshwater withdrawal activities.	*Water usage shall respect all conditions of the water permits delivered by the Nunavut Water Board.*

Table 1: Summary of Activities, Impacts and Mitigative Measures

Impacts	Mitigative Measures
7.6 Asbestos Abatement	
Health and Safety The buildings contain friable asbestos. The removal of such materials creates a health risk for personnel involved in the asbestos abatement activities.	*The removal of the asbestos from any locations is to be treated as an asbestos project and all of the related health and safety requirements adhered to. This will include the removal of all visible asbestos. The Safety Act and Occupational Health Regulations (Nunavut) require that workers handling asbestos material wear respiratory equipment approved by the Canada Standards Association, as well as other safety equipment including coveralls, gloves, eye protection and head gear. All personnel who work on the asbestos material must be trained for the use of protective equipment and safe handling and disposal of the asbestos. Warning signs should be posted at the site informing staff that asbestos removal is occurring and ensure that personnel not working with the asbestos should not be near the working site.*
7.7 Demolition of Work	
Health and Safety There is a safety concern for workers involved in demolition activities.	*A health and safety program that meets the standards and requirements of applicable regulatory agencies shall be implemented. The construction safety measures of the National Building Code shall be respected and enforced.*
7.8 Construction and Maintenance of Roads	
Permafrost Degradation Cut and fill operations required to provide the sub-granular base for the road access to the S1/S4 beach area may disrupt the permafrost.	*Disturbed soil that disrupts natural drainage patterns or exposes permafrost in ice rich soils shall be repaired.*

Table 1: Summary of Activities, Impacts and Mitigative Measures

Impacts	Mitigative Measures
Habitat Degradation Installation of culverts in the stream and subsequent covering by gravel might, or installation of a boulder layercause stirring of bottom sediments and generate an increase in water turbidity downstream. This could cause impacts to the stream aquatic habitats as well as fish habitats in the ocean downstream.	*These impacts should be temporary (i.e., only during the construction and removal of the road and culverts), however, during these activities, a silt fence shall be installed to limit the spreading of sediments and turbidity downstream. The use of a bridge would eliminate the need for mitigation measures.*
7.9 Excavation of Contaminated Soil	
Rutting and Erosion Unstable areas such as steep slopes and streams may be encountered during the excavation phase. These areas are more prone to rutting, erosion and environmental damage.	*Excavation work shall be minimized in the vicinity of watercourses. Heavy machinery, vehicles and equipment shall not be operated in waterways. Waste, excavated fill and/or debris shall not be disposed in waterways. Suitable barriers such as silt fences shall be installed if required to separate work areas from waterways. All unstable areas requiring excavation shall be identified and procedures shall be implemented to minimize surface rutting.*
Contamination of "Clean" Areas There is a risk that excavation activities contribute to the contamination of non-contaminated areas including fish habitat. Furthermore, equipment and machinery used during contaminated soil excavation and handling will require cleaning, and this will produce hazardous materials (solids and fluids) that can have a negative environmental impact if not managed properly.	*Hazardous material management areas shall be located at a minimum distance of 30 metres from the nearest water body. CEPA soils screening procedures shall be implemented in such a way as to prevent the spreading of contaminated dust. Movement of heavy machinery, vehicles and equipment within the hazardous material management areas shall be controlled to prevent the dispersion of potentially hazardous dust and materials into the environment. Wash water resulting from the cleaning (i.e., decontamination) of equipment and heavy machinery used in the hazardous waste management areas shall be recovered and treated as per regulations.*

Table 1: Summary of Activities, Impacts and Mitigative Measures

Impacts	Mitigative Measures
Permafrost Degradation Material and equipment will have to be stored temporarily within each hazardous material management area for the duration of the excavation activities.	*Storage areas shall be sited in locations where the natural surface drainage will not be affected and where ponding can be avoided. Materials shall not be stored on unprotected ground. Gravel pads or other appropriate methods shall be constructed to protect ice-rich soil from damages.*
7.10 Construction of Engineered Landfills	
Rutting and Erosion Use of heavy equipment and machinery can damage soil integrity, especially in unstable areas.	*Heavy equipment operations shall be limited to pre-determined work areas. Activities outside these areas shall be minimized, and conducted only when the soil is sufficiently dry so that excessive rutting can be prevented.*
Surface Water Runoff/Sediment Movement Heavy equipment traffic and large movements of granular material may generate high sediment loads in surface water runoff.	*Landfill sites shall be located at a minimum distance of 30 metres from the nearest water body. Silt fences shall be installed in drainage ditches in order to prevent migration of sediments to streams and water bodies.*
Habitat Loss/Alteration Habitat will be lost and altered through the excavation and removal of top soil, as well as by backfilling over vegetated areas.	*Upon landfill closure, the area shall be covered with granular material, graded and reshaped to match the surrounding topography and minimize erosion. Vegetation will eventually colonize this new surface area.*
7.11 On-site Treatment of Hydrocarbon Contaminated Soils	
Contamination of "Clean" Areas Treatment activities may potentially contribute to the contamination of non-contaminated areas. Dry contaminated soil particles and dust may be spread by wind. Furthermore, runoff water draining from the soil may be contaminated.	*The landfarming treatment pad shall be located at a minimum distance of 30 metres from the nearest water body. The soil moisture level shall be kept at an optimal level to promote biodegradation, therefore this soil moisture will minimize loss of particles to wind. Drainage ditches located around the treatment pad will recover potentially contaminated water. The water will then be tested, and treated if required, before being discharged.*

Table 1: Summary of Activities, Impacts and Mitigative Measures

Impacts	Mitigative Measures
7.12 Disposal of Hazardous Materials	
Health and Safety There is a safety concern for workers involved in the handling of hazardous waste.	*Every possible precaution shall be taken when hazardous materials and contaminated soils are handled, hauled or transported to ensure that such materials do not come into contact with site personnel. Protective clothing shall always be used by site workers when hazardous materials including contaminated soils are handled. All clean up personnel shall be informed and shall comply with requirements of the Workplace Hazardous Materials Information System (WHMIS) program and the Hazardous Waste Operations and Emergency Response (HAZWOPER) program.*
Habitat Degradation Spill of hazardous materials during off site shipping could cause severe impacts to terrestrial and/or fish habitats.	*Any unknown waste that may require off-site shipping shall be characterized to determine whether it must be considered as a transport hazard according to regulations. All provisions from the Transportation of Dangerous Goods Act (TDGA), the International Maritime Dangerous Goods (IMDG) Regulations, and the International Air Transport Association (IATA) Dangerous Goods Regulations shall be respected.*
7.13 Temporary Storage of CEPA Soils	
Contamination of "Clean" Areas There is a environmental concern with the release of contaminated soils in non-contaminated areas during transportation to storage facilities.	*Spillage of material during transportation between the excavation site and the storage/stockpile location shall be minimized, if not avoided.*
7.14 Disposal of Non-hazardous Materials	
Aesthetic and Safety Non-hazardous waste may cause both an aesthetic and safety concern at the site if not managed properly. Non-hazardous waste can be scattered by wind or animals and thereby becoming a safety concern to personnel as well as wildlife.	*Waste to be placed in non-hazardous landfills shall be compacted and rapidly covered with a layer of granular fill.*

Table 1: Summary of Activities, Impacts and Mitigative Measures

Impacts	Mitigative Measures
7.15 Landfill Closure	
Safety and Health Because of the nature of work involved and potential hazardous material exposure, there is a concern for the health and safety of workers.	*The impact of these operations is similar to that of the section 7.12 and 7.14 and the mitigative measures identified in these sections apply.*
7.16 Development of Granular Borrow Areas	
Wildlife Avoidance Blasting rock produces a high decibel noise which may alarm wildlife causing some avoidance and resident bird populations may be vulnerable to noise during their nesting period in May and June. This operation will only be required over short periods during the project. Therefore, avoidance by wildlife should not be permanent.	*Blasting shall be limited to the time of the season when nesting is mostly over (i.e., July and August).*
Safety Hazard The transportation and handling of explosives is a safety concern for workers.	*Handling, storage and transportation of explosives shall be conducted according to applicable laws and regulations. The handling of explosives shall be restricted to authorized and licensed personnel. Blasting shall be conducted in such a way as to minimize dispersal of material, and prevent dispersed materials from reaching fuel or hazardous material storage locations. A buffer zone of 300 metres shall be respected.*
Habitat Loss/Alteration Habitat may be lost through the removal of vegetation from blasting operations. However, the bedrock areas to be blasted are relatively free of vegetation.	*No mitigative measures were considered necessary.*

Table 1: Summary of Activities, Impacts and Mitigative Measures

Impacts	Mitigative Measures
Environmental Disturbances Quarrying activities may create environmental impacts to the immediate surroundings of the borrow pits.	*A quarry permit issued under the INAC Territorial Quarrying Regulations shall be obtained. The permit shall have site-specific provisions for environmental protection. These conditions are provided to minimize the extraction process impacts on water quality, drainage, erosion and ecosystems. All terms and conditions of the quarry permit shall be respected, including borrow area recontouring and clean up before abandonment.*
Disruption of Drainage Drainage may be impacted during excavation of the borrow areas. Sediments may be deposited into streams, thereby disrupting natural drainage of the area.	*Borrow pits shall be protected from erosion and ponding by proper grading.*
Permafrost Degradation Excavation of the borrow areas will remove the insulating ground cover and expose the sides and the bottom of the excavations to direct sunlight. This may result in erosion and slumping of the pit side walls. Damage to permafrost in the immediate vicinity of the pits is unavoidable. The areas are, however, surrounded by bedrock outcrops and it is likely underlain by bedrock as well. The excavations may therefore extend to surface bedrock in some areas, eliminating the concern for permafrost degradation.	*Final grading of any non-bedrock side walls will be required to address slumping and erosion of the pits the following summer.*
7.17 Migration Barriers	
Safety and Health Because of the nature of the work involved to remove existing containment booms, there is a concern that workers may be exposed to potentially hazardous materials.	*The impact of these operations is similar to that of the section 7.12 and 7.14 and the mitigative measures identified in these sections apply.*
Habitat Loss/Alteration Habitat will be lost through the removal of vegetation from excavation of trenches. However, the surface of land to be excavated to construct migration barrier is relatively small.	*No mitigative measures were considered necessary except that movement of heavy machinery required to excavate trenches shall be restricted to the close vicinity of excavation areas.*

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ASU	Queen's University Analytical Services Unit
CACAR	Canadian Arctic Contaminants Assessment Report
CCME	Canadian Council of Ministers of the Environment
CEAA	Canadian Environmental Assessment Act
CEPA	Canadian Environmental Protection Act
CSO	Contaminated Sites Office
DCC	DEW Line Clean Up Criteria
DEW Line	Distant Early Warning Line
DIAND	Department of Indian Affairs and Northern Development ("Owner")
DND	Department of National Defence
EPP	Environmental Protection Plan
ERP	Emergency Response Plan
ESG	Environmental Sciences Group
GNWT	Government of Northwest Territories
HAZWOPER	Hazardous Waste Operations and Emergency Response
HTA	Hunters and Trappers Association
IATA	International Air Transport Association
IMDGC	International Marine Dangerous Goods Code
INAC	Indian and Northern Affairs Canada
LDS	Legault Desjardins Simon Consultants Inc.
LRR	Long Range Radar
LSS	Logistic Support Site or Station
MOU	Memorandum of Understanding
MSDS	Material Safety Data Sheet
NFC	National Fire Code
NH	Non Hazardous
NIRB	Nunavut Impact Review Board
NLCA	Nunavut Land Claims Agreement
NPC	Nunavut Planning Commission
NTI	Nunavut Tunngavik Inc.
NWB	Nunavut Water Board
NWS	North Warning System
NWT	Northwest Territories
PCB	Polychlorinated Biphenyls
POL	Petroleum Oil and Lubricant
QC	Qikiqtaaluk Corporation
QIA	Qikiqtani Inuit Association
SRR	Short Range Radar
RMC	Royal Military College
RRMC	Royal Roads Military College
TDGA	Transportation of Dangerous Goods Act
USAF	United States Air Force
WHMIS	Workplace Hazardous Materials Information System

1.0 BACKGROUND INFORMATION

After the second world war, a defence detection and communication system consisting of main, auxiliary, and intermediate stations (named BAR-*, PIN-*, CAM-*, FOX-*, and DYE-M)[1] emerged in the Canadian Arctic; these were the Distant Early Warning (DEW) Line Sites. These communication facilities were part of the American military response strategy to prevent a Russian invasion from the North during the cold war. Apart from this DEW Line, other sites were constructed along the eastern part of Baffin Island and Labrador to transmit intercepted northern signals to southern military stations: these sites were part of the Pole Vault Line (named BAF-*)[1]. The surveillance and communication station installed at Resolution Island (RI) was one of the major Pole Vault sites (BAF-5).

In March 1985, Canada and the United States signed a Memorandum of Understanding (MOU), an agreement to modernize the North American Air Defence System. The memorandum sets out the requirements for replacement of the Distant Early Warning (DEW) Line with an automated system called the North Warning System (NWS). The Resolution Island site now hosts a Short Range Radar (SRR) station as part of this new radar system.

The SRR sites, including BAF-5, are remotely operated and personnel are no longer required on a full-time basis (on site staff is only required for short periods: maintenance and inspection). Obsolete radar stations such as Resolution Island were abandoned in poor environmental conditions. It should be mentioned that approximately 200 persons occupied this station that was operated from 1956 to 1972.

Environmental assessments of the DEW Line sites were conducted to identify the principal contaminants and determine the impact of these contaminants on the arctic ecosystem (1,2,3). Most of these studies were conducted by the Environmental Sciences Group (ESG) from the Royal Military College (RMC) and the Analytical Services Unit (ASU) from Queen's University in Kingston. Generally, these studies have revealed past waste disposal practices, confirmed contamination sources, and illustrated potential for contaminant migration. Furthermore, the major pollution problems usually found on these old radar sites have been targeted.

Among these studies, many environmental investigations were conducted at Resolution Island (9).

[1] The symbol * refers either to a letter (A to E) or a number (1 to 5) which corresponds to a radar site location.

Most of the site-specific problems were characterized through an extensive monitoring program performed by ESG and ASU (4,5,6,7). These environmental studies were predominantly carried out during summer seasons from 1993 to 1997 and they documented the implications for clean up activities.

An engineering site investigation was also conducted to collect the information required to complete clean up design drawings and specifications. This investigation included the establishment of temporary benchmarks, surveys of contaminated areas and proposed landfill areas for non-hazardous (NH) materials, identification of requirements for the Canadian Environmental Protection Act (CEPA) soil storage facilities and granular borrow areas. The engineering site survey and investigation was carried out during the summer of 1997 with the objectives of more accurately determining soil volumes from known contaminated areas and verifying overall site conditions. The need for extended monitoring and for previously proposed project activity modifications was also identified.

Since then, clean up activities were carried out every summer season. Works conducted to date have been reported elsewhere[2] and are summarized in section 4.22. A revision to the initial Environmental Screening Report submitted in February 1998 was required since more stringent clean up criteria that generates additional clean up activities are to be implemented by INAC.

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2 Resolution Island 2001 Scientific Investigations, prepared by Queen's University ASU for DIAND, March 2002.

Resolution Island 2000 Scientific Investigations, prepared by Queen's University ASU for DIAND, November 2000.

Resolution Island 1999 Scientific Investigations, prepared by Queen's University ASU for DIAND, March 2000.

Resolution Island 1998 Scientific Investigations, prepared by Queen's University ASU for DIAND, January 1999.

Resolution Island 1997 Scientific Investigations, prepared by Queen's University ASU for DIAND, March 1998.

Summary of 2002 Activities Resolution Island Project, prepared by Sinanni Inc. and Qikiqtaaluk Corporation for Indian and Northern Affairs Canada (INAC), November 2002.

Summary of 2001 Activities Resolution Island Project, prepared by Sinanni Inc. and Qikiqtaaluk Corporation for INAC, December 2001

Summary of 2000 Activities Resolution Island Project, prepared by LDS Consultants Inc. and Qikiqtaaluk Corporation for DIAND, November 2000

Summary of 1999 Activities Resolution Island Project, prepared by LDS Consultants Inc. and Qikiqtaaluk Corporation for DIAND, December 1999.

Summary of 1998 Activities Clean up of Resolution Island, prepared by LDS Consultants Inc. and Qikiqtaaluk Corporation for DIAND, November 2000.

2.0 PROJECT RATIONALE

Previous studies have shown that approximately 5,000 m^3 of soils are contaminated with polychlorinated biphenyls (PCB) exceeding the CEPA criteria (concentrations > 50 ppm). These soils are mainly located in the S1/S4 valley, the S1/S4 beach area and the Furniture dump. Part of the floor from two buildings (S1-A and S3-A) were also found to exceed the CEPA criteria for PCBs: at one sampling location, concentration was as high as 60,000 ppm. Furthermore, approximately 10,000 m^3 of soil exceed the Canadian Council of Ministers of the Environment (CCME) for Residential/Parkland land use. Apart from PCBs, other contaminants of concerns are mainly mercury, cobalt, copper, lead and petroleum hydrocarbons. Some of these contaminated soils are located near the ocean and pose a more direct threat to marine habitats.

Furthermore, most buildings contain asbestos. Approximately 2500 linear metres of pipe insulation (< 150 mm outside diameter) and 500 m^2 of tiles were found in buildings at the upper site. Some of the buildings are in poor conditions and pose a health and safety problem for workers and visitors.

Approximately 4,000 drums are present on site, some of which still contain their original contents. Finally, some landfills are still leaching contaminants, thus requiring excavation and sorting to remove the sources.

The primary clean up requirements for the Resolution Island site (BAF-5) are as follows:

- asbestos abatement (completed);
- demolition work (on-going);
- road construction to contaminated areas (on-going);
- excavation and containerization of CEPA soils and other contaminated soils (on-going);
- construction of permanent migration barriers (to do);
- drum collection, handling and shredding (on-going);
- POL incineration (on-going);
- collection and disposal of debris (on-going); and
- closure of existing landfills (on-going).

3.0 SITE DESCRIPTION

Resolution Island, BAF-5 (Inuit name: Tujjaat - "place where birds land") is situated at the southeastern tip of Baffin Island approximately 310 km southeast of Iqaluit and just outside of Frobisher Bay (61° 35' N and 64° 40' W). The radar site occupies a surface of approximately 3 square kilometres (km^2). Figure 3.1 illustrates the general location of the Island where BAF-5 was constructed.

The main station is located on the summit of Cape Warwick, 360 m above sea level, at the northeastern end of the Island overlooking Brewer Bay. This area is where the construction camp and the new SRR station are found. The upper site also contains areas of environmental concerns such as the S1/S4 valley, the furniture dump (completed) and the PCL dump. The S1/S4 beach area, another important site of environmental concern, is situated down gradient from the S1/S4 valley, at the bottom of the cliff near the ocean.

From the upper site, a gravel road leads to the airstrip and to the former freshwater lake. For the clean up project at Resolution Island, this area, including the remote antenna hill, does contain some areas of environmental concerns: the airstrip dump, the northslope dump, the maintenance dump and petroleum hydrocarbon contaminated soil. The road goes further to the beaching area and gives access to beach landfills which contain areas of lead and mercury contamination. Furthermore, a new road constructed to provide access to the S1/S4 beach area still need to be completed. Figure 3.2 gives a general layout of the abandoned military radar station found at Resolution Island.

Access to the Island is by sea via Brewer Bay, by air using a helicopter or a Twin Otter aircraft via the runway located northwest of the summit.

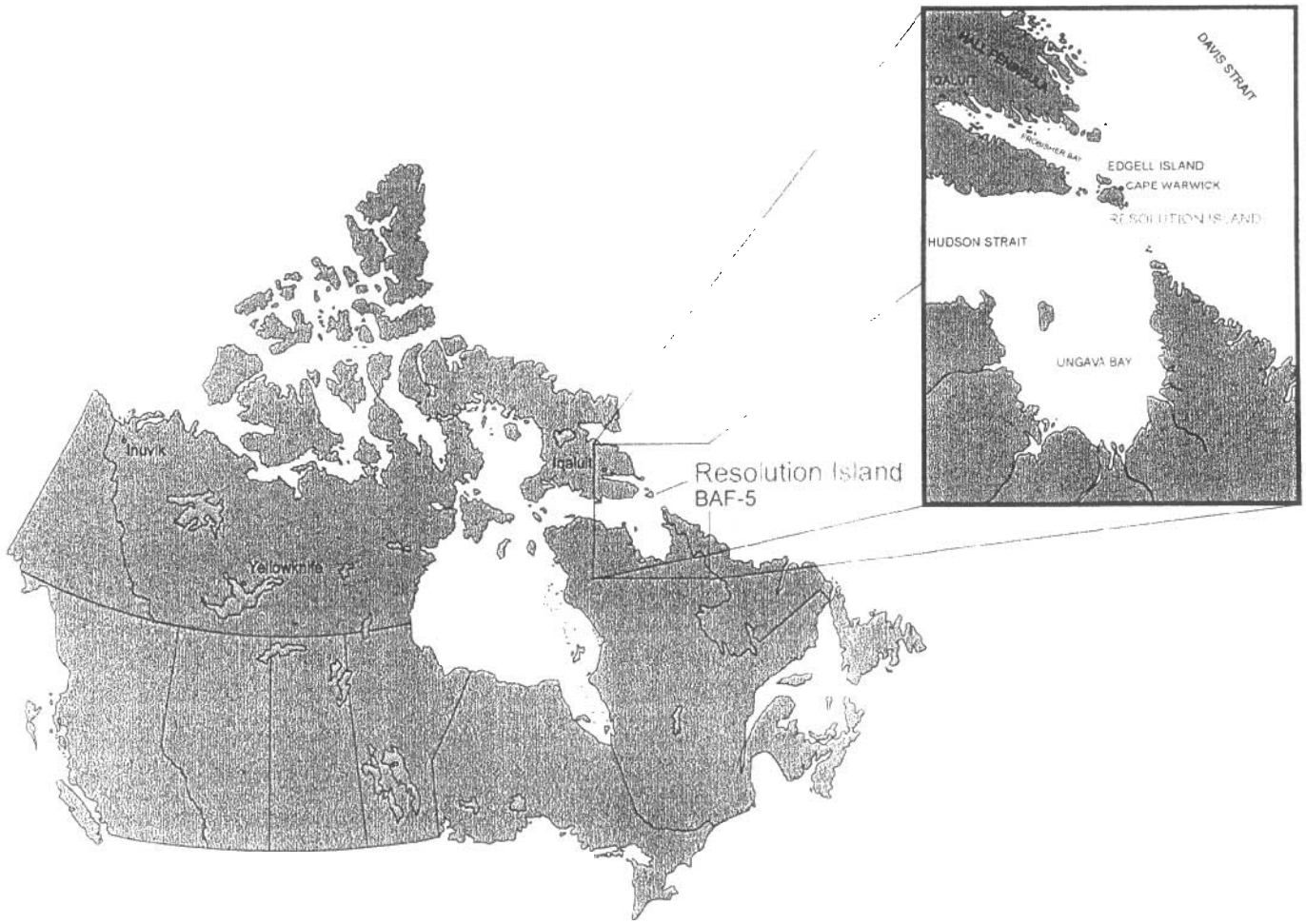

Figure 3.1: Location of the abandoned military radar site (BAF-5) at Resolution Island.

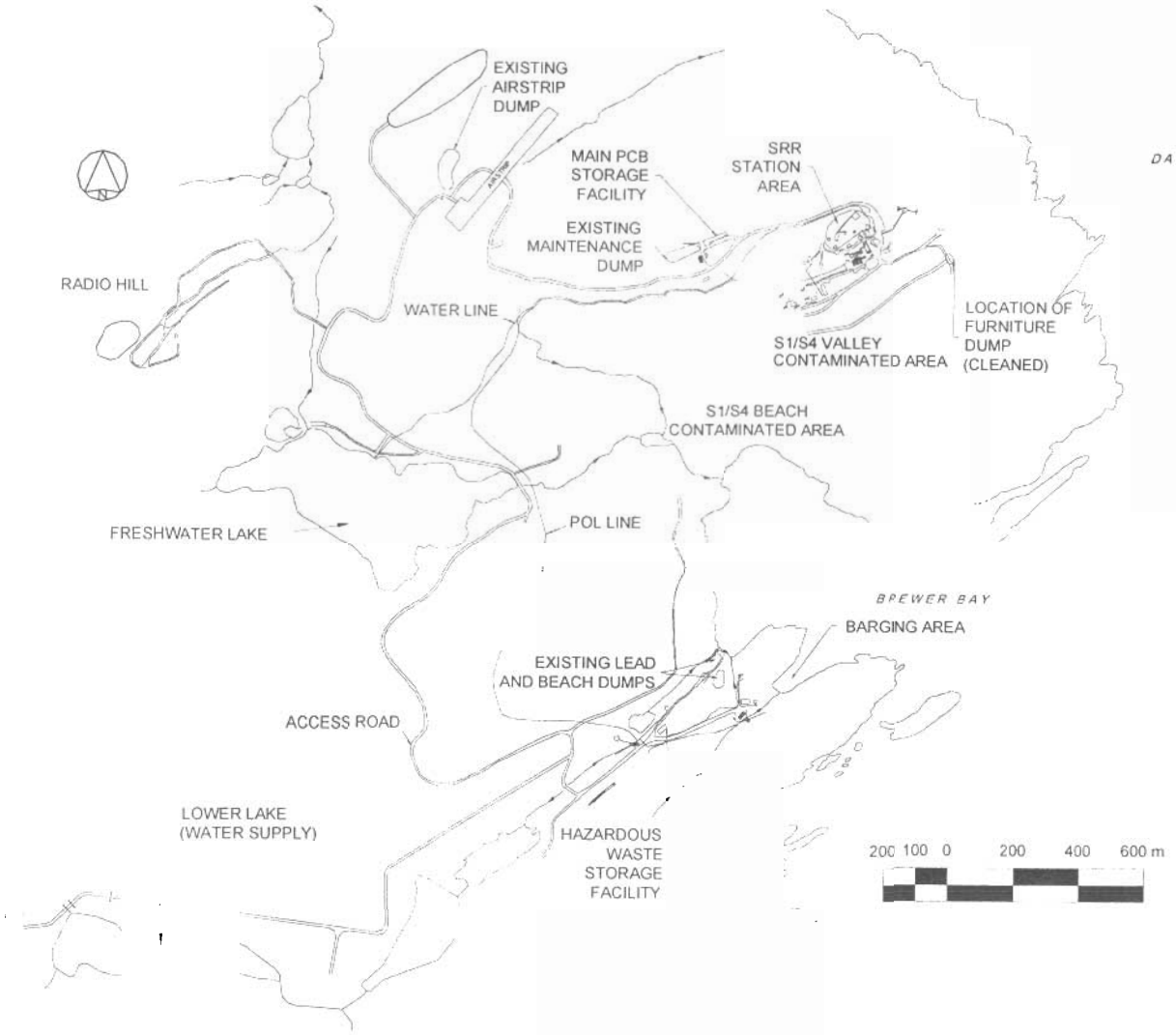

Figure 3.2: General layout of the Resolution Island abandoned military radar site.

4.0 PROJECT ACTIVITIES

The activities at BAF-5 were initially based on the decision by Indian and Northern Affairs Canada (INAC) to clean up the site according to a risk-based approach. This decision was taken following the evaluation of recent studies: site assessments conducted by ESG and ASU, risk assessment performed by Golder Associates (8), and clean up options submitted by Qikiqtaaluk Corporation (QC) and Legault, Desjardins, Simon Consultants Inc. (LDS) (10). Since 2002, this approach has been changed towards a criteria based approach using the CCME Canadian Environmental Quality Guidelines. Based on this new approach, the clean up activities at Resolution Island will include the removal, containerization and off-site shipment of all CEPA soils, as well as the removal and on-site disposal of other contaminated soils. The following sections describe the major activities to be performed during the clean up of the Resolution Island site. Remediation work carried out thus far (*i.e.,* between 1997 and 2002) is presented at the end of this section.

The major clean up activities include the following:

- site access;
- operation of a construction camp;
- fuel handling and storage;
- equipment and vehicle use, storage and maintenance;
- water supply;
- waste management;
- asbestos abatement;
- demolition work;
- construction and maintenance of roads
- excavation of contaminated soil;
- construction of engineered non-hazardous waste landfill;
- construction of engineered lined landfill;
- on site treatment of hydrocarbon contaminated soils;
- disposal of hazardous material;
- temporary storage of CEPA soils
- disposal of non-hazardous materials;
- POL incineration
- landfill closure;
- development of granular borrow areas,
- installation of migration barriers;
- site grading; and

- winterization and demobilization.

4.1 Site Access

Access to the Resolution Island site is to be by helicopter, chartered aircraft and/or via sealift. Iqaluit is one of the closest communities to the site and the most convenient centre to organize logistics. On site, local access to construction, demolition, clean up and other work areas is to be through the existing road network. Graded areas, located near the beach landing area and storage facility, the maintenance buildings and airstrip areas and/or in the vicinity of the summit area, is to be used for temporary storage of materials.

4.2 Construction Camp

A remote construction camp will have to be operated during clean up activities. The existing camp, repaired and operated during the 1997 season and which can accommodate approximately 50 persons, will have to be used to meet the needs of workers, other personnel, and visitors.

4.3 Fuel Handling and Storage

Fuel will is transported to the site and stored in approved facilities to supply all equipment required for clean up activities including camp generators, heavy equipment, vehicles, and a helicopter. A tank farm was set up to store fuel on-site.

4.4 Heavy Machinery and Vehicle Management

Equipment and vehicles were and/or are to be transported to the site, stored in approved locations and used only for contracted work. All heavy equipment, machinery, and vehicles will have to be maintained and operated as suggested by warranties given by manufacturers.

4.5 Water Supply

At the beach area, a water supply lake is used as a potable water source. Drinking water is provided to the camp tank using a truck (pumping). As a contingency measure, potable water could be provided to the camp using a helicopter system.

4.6 Camp Waste Management

Appropriate waste management procedures is implemented for all facilities and operations at all times during the clean up activities at Resolution Island. Domestic wastewater is discharged in the dedicated lagoon located approximately 140 metres away from the camp.

Non-hazardous solid wastes generated as part of the operation of the construction camp are incinerated and/or disposed on site in an existing non-hazardous landfill. Domestic non-hazardous waste are incinerated and ashes are disposed of as described above. Refuse which are not to be landfilled or incinerated includes waste oil and liquids containing hazardous materials.

4.7 Asbestos Abatement

Asbestos material (mainly pipe insulation) was removed from remaining buildings located at the upper site. Asbestos was double-bagged and landfilled on-site within a non-hazardous waste disposal site. A separate cell within the non-hazardous landfill site was used to dispose asbestos containing materials. The location of this cell was surveyed and the coordinates recorded. Asbestos abatement was completed in the buildings that are being used and in those that were demolished. Asbestos may still be present (in waste site to be excavated, in outdoor water pipes and in cladding panels of the troposcanner).

4.8 Demolition Work

The Main PCB storage building will need to be demolished to make way for the construction of the Tier II landfill. Demolition work shall include the removal and disposal of structural steel, sheet metal cladding, fibreglass insulation, and concrete. Hazardous materials shall be removed from the building prior to demolition. Workers will have to wear appropriate personal protective equipment when handling these materials. Non-hazardous materials will have to be disposed in a suitable on-site non-hazardous landfill. Granular material will have to be placed over the waste and compacted within the non-hazardous landfills to minimize settlement.

4.9 Construction and Maintenance of Roads

A new road will have to be constructed (completed) to provide heavy machinery access to the S1/S4 beach area. This road will have to cross a small creek which does not sustain fish habitat and culverts will have to be installed. A temporary road will need to be constructed to access the