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Nunavut Water Board
NUNAVUT IMALIRIYIN KATIMAYINGI

WATER LICENCE APPLICATION FORM

Application for: (check one)
__ **New** __ **Amendment** X **Renewal** __ **Assignment**
Current Project Water Licence Permit No. **NWB5RES9803**

LICENCE NO: (for NWB use only)	
1. NAME AND MAILING ADDRESS OF APPLICANT/LICENSEE Indian and Northern Affairs Canada Nunavut Regional Office P.O. Box 100 Iqaluit, NU X0A 0H0 Phone: 867-975-4556 Fax: 867-975-4585 e-mail: platon@inac-ainc.gc.ca	**2. ADDRESS OF CORPORATE OFFICE IN CANADA** (if applicable) Indian and Northern Affairs Canada Nunavut Regional Office P.O. Box 100 Iqaluit, NU X0A 0H0 Phone: 867-975-4556 Fax: 867-975-4585 e-mail: platon@inac-ainc.gc.ca

3. **LOCATION OF UNDERTAKING** (describe and attach a topographical map, indicating the main components of the Undertaking)

Cape Warwick, Resolution Island (BAF-5), southeastern tip of Baffin Island, 310 km southeast of Iqaluit, Nunavut, outside of Frobisher Bay

Latitude: 61° 35' N Longitude: 64° 40' W NTS Map No. 025H10 Scale: 1/50,000

4. **DESCRIPTION OF UNDERTAKING** (attach plans and drawings)

Clean up and remediation of abandoned USAF military radar station (BAF-5)

5. **TYPE OF UNDERTAKING** (A supplementary questionnaire must be submitted with the application for undertakings listed in **"bold"**)

__ Industrial
__ Mine Development
__ Advanced Exploration
__ Exploratory Drilling
__ Remote/Tourism Camps
__ Municipal
__ Power
X Other (describe) Environmental site clean up

6. **WATER USE**

X To obtain water

__ To modify the bed or bank of a watercourse

__ To alter the flow of, or store, water

X To cross a watercourse

__ To divert a watercourse

__ Flood control

__ Other (describe): _____

7. **QUANTITY OF WATER INVOLVED** (litres per second, litres per day or cubic metres per year, including both quantity to be used and quality to be returned to source)

20,000 litres/day to be used; no water returned to source

8. **WASTE** (for each type of waste describe: composition, quantity, methods of treatment and disposal, etc.)

Sewage
Composition: waste water from camp sanitary facilities and kitchen.
Quantity: 400 m^3/month. *Treatment*: discharged to non-aerated lagoon.

Solid Waste
Composition: waste from camp operations and maintenance, discarded packaging.
Quantity: 3 metric tonnes/month.
Treatment: combustible material incinerated, ashes and non-combustible material disposed in engineered landfill.

Hazardous
Composition: batteries, antifreeze, oil and gas filters, from vehicle and heavy equipment maintenance.
Quantity: 400 kg/year
Treatment: off-site shipment and disposal in authorized facility in Southern Canada.

Waste Oil
Composition: lubricating oil from maintenance of gensets, heavy equipment and vehicle engines.
Quantity: 350 litres/year. *Treatment*: on-site incineration.

X Sewage

X Solid Waste

X Hazardous

__ Bulky Items/Scrap Metal

X Waste oil

__ Greywater

__ Sludges

__ Other (describe) _____

9. **PERSONS OR PROPERTIES AFFECTED BY THIS UNDERTAKING** (give name, mailing address and location; attach if necessary)

'one

Land Use Permit

DIAND	X Yes __ No	If no, date expected _____
Regional Inuit Association	__ Yes __ No	If no, date expected _____
Commissioner	__ Yes __ No	If no, date expected _____

10. **PREDICTED ENVIRONMENTAL IMPACTS OF UNDERTAKING AND PROPOSED MITIGATION MEASURES** (direct, indirect, cumulative impacts, etc.)

Refer to enclosed Environmental Screening Report, 1998, revision 1, 2003

NIRB Screening _X_ Yes __ No If no, date expected _____

(Note: the transport and off-site disposal of PCB contaminated soils from Resolution Island was also screened by NIRB)

11. INUIT WATER RIGHTS

Will the project or activity substantially affect the quality, quantity, or flow of water flowing through Inuit Owned Lands and the rights of Inuit under Article 20 of the Nunavut Land Claims Agreement?

No

11. (Continued)

If yes, has the applicant entered into an agreement with the Designated Inuit organization to pay compensation for any loss or damage that may be caused by the alteration. If no compensation agreement has been made, how will compensation be determined?

N/A

12. CONTRACTORS AND SUB-CONTRACTORS (name, address and functions)

Contractor:	1)Qikiqtaaluk Corporation P.O Box 1228, Iqaluit, NU, X0A 0H0 Tel.: 867-979-8400 Fax.: 867-979-8433
Contact:	Harry Flaherty
Functions:	Earth works, Clean up, Camp Operation and Maintenance, Catering.
Contractor:	2)Queen's University School of Environmental Studies Biosciences complex Kingston, On, K7L 3N6 Tel.: 613-533-2642 Fax.: 613-533-2897
Contact:	Dr. John Poland
Functions:	Environmental testing, scientific advisor

Sub-Contractor:	Sinanni Inc. 3333 Queen Mary, suite 580 Montréal, QC, H3V 1A2 Tel.: 514-940-3332 Fax.: 514-940-3435
Contact:	Philippe Simon
Functions:	Engineering, planning, and site supervision
Sub-Contractor:	Stabilis Environment Inc. 3333 Queen Mary, suite 580 Montréal, QC, H3V 1A2 Tel.: 514-940-1230 Fax.: 514-940-3435
Contact:	Jacques Dion
Functions:	Technical adviser, waste management
Sub-Contractor:	Others, determined on a yearly basis by tendering process
Functions:	Marine shipping, charter helicopter, health and safety officer, medic, geotechnical engineering consultant

13. STUDIES UNDERTAKEN TO DATE (list and attach copies of studies, reports, research, etc.)

The number of studies conducted on environmental issues at Resolution Island is fairly large. Therefore, these reports are not provided with this permit application, however, copies could be provided on request. A list of available documents is presented below:

Baffin Region Ocean Disposal Investigation: Seabed Debris and Contaminant Inputs near Iqaluit, Resolution Island, Cape Dyer and Kivitoo, Department of National Defence, April 1995.

Clean Up Options for Resolution Island, prepared by Qikiqtaaluk Corporation and LDS Consultants Inc. for the Department of Indian Affairs and Northern Development (DIAND), December 1997.

Engineering Study - BAF-5 Clean-up, Resolution Island, N.W.T., Construction Engineering Unit, 90-CEU-57, November 1990.

Environmental Study of a Military Installation at Resolution Island, BAF-5-Volume Four, prepared by Queen's University Analytical Services Unit (ASU) for DIAND, March 1997.

Environmental Study of a Military Installation at Resolution Island, BAF-5-Volume Three, prepared by Royal Military College's Environmental Sciences Group (ESG) for DIAND, March 1996.

Environmental Study of a Military Installation at Resolution Island, BAF-5-Volume Two, prepared by Queen's University ASU for DIAND, March 1995.

Environmental Study of a Military Installation at Resolution Island, BAF-5, prepared by Royal Roads Military College's ESG for DIAND, March 1994.

Environmental Risk Assessment for Resolution Island, Northwest Territories, prepared by Golder Associates Ltd and Royal Roads University for DIAND, May 1997.

PCB Testing Program: BAF-5 - Resolution Island, prepared by Bond Architects & Engineers Ltd. for DIAND, September 1988.

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

esolution 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 1998.

14. THE FOLLOWING DOCUMENTS MUST BE INCLUDED WITH THE APPLICATION FOR THE REGULATORY PROCESS TO BEGIN

Supplementary Questionnaire (where applicable: see section 5) __ Yes _X_ No
If no, date expected N/A

Inuktitut/English Summary of Project _X_ Yes __ No
If no, date expected _____

Application fee $30.00 (c/o of Receiver General for Canada) _X_ Yes __No
If no, date expected _____

15. PROPOSED TIME SCHEDULE

__ Annual (or) _X_ Multi Year

Start Date: 2003-06-15 Completion Date: 2008-09-15

Natalie Plato Contaminants Specialist _____
Name (Print) Title (Print) Signature Date

For Nunavut Water Board use only

APPLICATION FEE Amount: $_____ Receipt No.:_____

WATER USE DEPOSIT Amount: $_____ Receipt No.:_____

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SORRY
HARBOUR

AIRFIELD
CONDITION
UNKNOWN

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Cape
Warwick

PIPELINE
ABAND

BREWER
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PIPELINE
ABAND

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318

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280

270

354

230

166

274

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45′ 40′ 35′

CAPE WARWICK

DISTRICT OF FRANKLIN DISTRICT DE FRANKLIN

EST TERRITORIES TERRITOIRES DU NORD-OUEST

Scale 1:50 000 Échelle

0 1000 2000 3000 4000 Mètres

ALTITUDES EN MÈTRES

ÉQUIDISTANCE DES COURBES . . . 10 MÈTRES

SYSTÈME DE RÉFÉRENCE GÉODÉSIQUE NORD-AMÉRICAIN 1983

PROJECTION TRANSVERSE DE MERCATOR

POUR TOUT RENSEIGNEMENT CONCERNANT LES REPÈRES DE NIVELLEMENT ET LES BORNES GÉODÉSIQUES, PRIÈRE DE S'ADRESSER À LA DIVISION DES LEVÉS GÉODÉSIQUES, CENTRE CANADIEN DES LEVÉS, OTTAWA.

ÉTABLIE PAR LE CEN
MINISTÈRE DE L'ÉNER
RENSEIGNEMENTS À JC

CES CARTES SONT EI
CANADA, MINISTÈRE
RESSOURCES, OTTAWA

RESOLUTION ISLAND

DISTRICT OF FRANKLIN DISTRICT DE FRANKLIN

NORTHWEST TERRITORIES TERRITOIRES DU NORD-OUEST

Transverse Mercator Projection
North American Datum 1927
Contour Interval 200 feet
Elevations in feet above Mean Sea Leve

Scale 1:250 000 Échelle

Miles 5

CONVERSION SCALE FOR ELEVATIONS ÉCHELLE DE

Resolution Island Remediation and Clean-up Plan - 2003

The proposed cleanup plan will remediate the site according to a combination of CCME guidelines and DEW line clean up criteria and protocols. The use of these guidelines and protocols is consistent with INAC Contaminated Sites Management Framework.

The major activity required is the excavation of PCB contaminated soils. The excavation of CEPA (concentration >50 ppm PCB) soils, which were a major part of the legal compliance project, requires completion. The largest volume of CEPA soil that still needs to be excavated is at the S1/S4 beach. This area is not easy to access and the soils are on a very steep incline that will make excavation difficult. Some soil will have to be left because of the extreme hazard involved in the excavation. Smaller amounts of CEPA soil still need to be excavated from the S1/S4 valley, the DND helipad, and the airstrip dump. All CEPA soils will be containerized and shipped south for destruction.

The Tier II and Tier I soils were not included in the initial legal compliance project. Large volumes of these soils (*i.e.,* approximately 20,000 m^3) will be excavated in this project. Most soils are PCB contaminated but some metal contaminated soils (*i.e.,* lead, mercury, and cobalt) will also be excavated and landfilled on site. The Tier II soils will be placed in an engineered lined landfill specifically designed for the Arctic. The landfill will be located at the site of the current Main PCB storage facility. Construction of this landfill will therefore require removal of the PCB soil presently in the facility and demolition of the building. Large amounts of gravel and clean fill will be required to cover the landfill and build the required berms. The Tier I soils will be placed in non-hazardous landfills as intermediate fill. Small amounts of inaccessible Tier I soils will be left in place without being covered. Because all contaminated soil cannot be removed from crevices in rock, barriers will be designed and installed in the S1/S4 drainage pathway (*i.e.,* valley and beach areas).

In addition to the excavation of soils described above, some remaining work on dumps is required. The largest of these tasks will be the remediation of the airstrip dump. CEPA soil and visible drums containing petroleum products will be removed prior to covering the entire dump with clean fill. Minor excavation of non-hazardous debris and Tier I and II soils will be required at the two beach dumps, the maintenance dump, the PCL dump and the north slope dump. Soils contaminated by heavy petroleum hydrocarbons (*i.e.,* lubricating oil and grease) will be excavated, and disposed on site or shipped off-site. Soils contaminated with lighter petroleum products (*i.e.,* diesel fuel and gasoline) are to be identified, excavated and landfarmed. Some of the other tasks that are included in the new remediation plan are the incineration and shipping south of remaining drum contents and remediation of an Asbestos lined water line.

Table 1 below summarizes the major activities required to complete the new remediation plan.

Table 1: Summary of Major Tasks in the New Remediation Plan

Area	Materials		Soil (m^3)		
	Non-Hazardous	Hazardous	CEPA[a]	Tier II[b]	Tier I[c]
S1/S4 Buildings and Valley	Install barriers; Remove Tier I and II debris	Remove S4 building floor	300	6,000	5,000
Core Camp and Vicinity (DND Helipad, PCL and North Slope Dumps)	Close two landfills; Demolish/move core camp	Remove old barrier material for off site disposal	10	255	200
Maintenance Area	Demolish maintenance buildings; Remove debris from toe of dump	Containerise CEPA soil in storage facility; Construct Tier II landfill; Excavate fuel contaminated soil	-	50	-
Airstrip	Barrels	Remediate Dump	50	-	-
Beach Area	Excavate remaining debris in dumps; Close non-hazardous landfill	Excavate oily soil from barrel cache valley and cotton grass area and fuel contaminated soil from near POL tanks	-	500	300
S1/S4 Beach Area	Build road and stream crossing; Install barrier		2,100	3,000	4,000
Other	Gravel production; Remove Asbestos from water line	Incinerate/ship waste grease/fuel from remaining drums			

[a] CEPA soils to be placed in steel conical containers and shipped off site;
[b] Tier II soil to be placed in engineered, lined Tier II landfill;
[c] Tier I soils to be placed in non-hazardous landfills or used in Tier II landfill construction.

INDIAN AND NORTHERN AFFAIRS CANADA
NUNAVUT REGIONAL OFFICE

ENVIRONMENTAL SCREENING REPORT

for the

RESOLUTION ISLAND PROJECT

BAF-5 : ABANDONED POLE VAULT MILITARY RADAR STATION

Prepared by:

Sinanni Inc.

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QIKIQTAALUK CORPORATION

March 1998
revision 1 - February 2003

EXECUTIVE SUMMARY

The proposed project to clean up the abandoned military radar station located at Resolution Island in the Canadian Arctic has been screened pursuant to the Canadian Environmental Assessment Act (CEAA). The lead responsible Authority has been identified as Indian and Northern Affairs Canada.

The general objective of the project is to reduce the negative environmental impacts from past occupation that has contributed to soil contamination, in violation of the Canadian Environmental Protection Act (CEPA), as well as to unstable waste dumps. The Project started in 1998 and has been on-going ever since. Revisions to the initial screening report were deemed necessary based on the planning of new clean up activities.

The project involves the removal, containerization and temporary storage of CEPA soils (PCB levels > 50 ppm) for off-site shipping and disposal as well as management of other contaminated soils exceeding generic criteria and remaining drum contents (waste petroleum products). A remote construction camp is operated and managed to accommodate the work crew. For the purpose of assessing socio-economical and environmental impacts, the project has been divided into its major activities. The impacts and recommended mitigative measures are summarized in Table 1.

Community consultations were not conducted as part of the screening but were carried out in Kimmirut in May 1998, prior to the beginning of the clean up activities, as well as in Iqaluit and Kimmirut in September 2000. Various interested parties participated in these consultations.

Based on the information given in this screening report, the proposed project is not likely to cause significant adverse environmental effects and the project may proceed with the assurance that mitigating measures will be implemented.

Table 1: Summary of Activities, Impacts and Mitigative Measures

Impacts	Mitigative Measures
7.1 Site Access	
Rutting and Erosion Heavy equipment and vehicles can damage soil integrity.	*Vehicles or heavy equipment shall not be operated off-roads after heavy rain or melting snow conditions. Such restrictions shall apply until the soil has dried sufficiently so that excessive rutting can be prevented.*
Habitat Disturbances Seabirds are known to be vulnerable during their nesting period. Some species may be affected by low-flying aircraft and close approaches by marine vessels.	*Pilots shall be advised to maintain an altitude of at least 500 metres above ground or water when passing over areas where birds are concentrated. Pilots shall not be permitted to do low-level flights to observe and/or photograph wildlife.*
Habitat Degradation Large volumes of fuel will be required at the site to run both equipment and generators. The fuel is expected to be transported to the site on a barge or supplied by tanker ships. There is the possibility of accidental spillage at the site which would result in the contamination of soils and/or water in the surrounding environment.	*Transportation of fuel, as well as any other hazardous materials brought to the site, shall be done in compliance with the Transportation of Dangerous Goods Act and Regulations requirements. Fuel will be kept in double walled steel tanks. Valves on fuel tanks should have receptacles placed beneath them to catch any leaked fuel.*
7.2 Construction Camp	
Aesthetic and Safety Solid waste produced at the camp may cause both an aesthetic and safety concern at the site. Animals are attracted to solid waste disposal sites and have the possibility of becoming a nuisance as well as a safety concerns to personnel.	*Waste bins used at the site shall be animal proof and emptied on a frequent basis. Non-hazardous combustible wastes are to be burned daily, in a forced air fuel-fired incinerator. Ash and non-combustible non-hazardous wastes should be buried within the upper non-hazardous landfill. Hazardous wastes shall be stored in a proper manner and transported from the site in accordance with the Transportation of Dangerous Goods Act and Regulations.*
Health Sewage disposal from the camp may cause a health problem for both humans and wildlife.	*A sewage lagoon located near the camp shall be used for the disposal of sewage water. Hazardous materials shall not be discharged in this lagoon. A warning sign shall be posted near the lagoon, and the lagoon shall be fenced off to prevent accidents.*

Table 1: Summary of Activities, Impacts and Mitigative Measures

Impacts	Mitigative Measures
Habitat Degradation Fuel used in equipment and camp generators is needed in large quantities and must be transported to the site via sealift, and then trucked to the upper site. Fuel spillage can result in both soil and surface water contamination.	*A spill contingency plan was prepared for fuel storage as well as any other hazardous liquids used at the site. Fuel storage is to be located at least 12 metres above the high water mark of the nearest water body, on flat stable terrain or in a natural depression and is to be stored and dispensed in accordance with the CCME Environmental Code of Practice for Above ground Storage Tank Systems and fire code requirements. Secondary containment is required for any fuel storage container with a capacity of 4,000 litres or more. Any contamination created at the site should be remediated. Fuel spills shall be reported and cleaned up immediately.*
Fire There is the possibility of a fire occurring at the site as a result of camp related activities.	*Adequate attention to fire safety and prevention is required by the camp operator and workers. Fire alarms and fire fighting equipment suitable for the size of the camp are maintained on-site. A Fire Emergency Plan is in place.*
7.3 Fuel Handling and Storage	
Habitat Loss/Alteration Some habitat loss or alteration may occur if a fuel spill occurs.	*Emergency spill equipment including fuel pumps, empty drums, containment booms and other sorbent materials are available on site. Enough equipment are on-site to clean up a 1,000 litre spill at the fuel tank farm or any other fuel storage locations.*
Fire There is the possibility of a fire occurring at the site as a result of accidents (*i.e.*, ignition sources).	*Smoking is prohibited within 5 metres of the fuel storage facilities. Appropriate signs are posted. Fire-fighting equipment are available for immediate access near the tank farm and at all fuel storage locations.*
7.4 Heavy Machinery and Vehicle Management	
Wildlife Stress Wildlife can be affected by vehicle movements although it is expected that this will have a minimal impact.	*Mobile equipment and vehicle operators shall not operate vehicles in a manner to disturb any wildlife species.*