



## **Annex A-4**

### **Report: Sawmill Bay Remedial Action Plan with Project Update – PART 2**

## **2 SITE SETTING**

### **2.1 Site Location and Access**

The study area lies on the northeast corner of Leith Peninsula on the McTavish Arm of Great Bear Lake, Northwest Territories. Sawmill Bay (N 65°43'14", W 118°55'14") is located approximately 400 km northwest of Yellowknife, at the eastern end of Great Bear Lake. The site is situated on the edge of the Canadian Shield and comprises approximately 12,400 m<sup>2</sup> (12 ha). The site's main features include a beach landing on the south shore of the bay, a main lodge area, and two intersecting airstrips (see Figures 1-1, 1-2).

### **2.2 Land use History**

#### **2.2.1 Traditional Use of the Area**

The area surrounding the Sawmill Bay site has traditionally been inhabited by the Sahtu Dene First Nations - the Bear Lake people. Within living memory, the Déljñę people of Great Bear Lake have lived a nomadic life, following fish and game with the seasons. Many still supplement their diets by hunting, fishing and trapping for at least a portion of the year. Many homes in Déljñę feature a traditional lodge or tipi used to smoke meat and fish. During winter months, the Déljñę residents cross the frozen lake and set nets for herring, grayling, loche, northern pike, whitefish and lake trout. It is inferred that the Sawmill Bay site is part of the traditional Déljñę hunting, fishing, and trapping region.

A Traditional Knowledge (TK) study was completed by the community in 2010. The outcomes of the TK study were incorporated in the development of the RAP.

#### **2.2.2 Commercial/Industrial/Military Use of the Area**

The Sawmill Bay site was used for commercial/industrial/military activities from the 1930s to the 1980s. The primary historical uses of the site that have contributed to cumulative environmental impacts include: 1) timber sawmills; 2) a barging site and an airfield for the shipment of uranium ore, 3) the construction of the Loran navigation system, 4) the construction of the Distant Early Warning (DEW) Line; 5) air fields and base camps for Royal Canadian Air Force (RCAF) operations and 6) a fishing lodge. Table 2-1 outlines historical use of the Sawmill Bay site.



Table 2-1: Historical Use of the Sawmill Bay Site

Site Use	Approximate Timelines
1. Sawmills – timber supply for Port Radium mine site and construction activities on Great Bear Lake.	1930s to 1940s
2a. Barge and Air Transportation of uranium pitchblende ore (from Port Radium). Sawmill Bay to Edmonton and Port Hope. Perhaps military use.	Mid 1940s to 1960
2b. Airfield and base camp for Loran Navigation System	1947-1950
2c. Refuelling and Supply Support Airfield Photographic Operations – RCAF- aerial mapping	Late 1940s to early 1950
3. Airstrip and Lodge in support of the military construction of the DEW Line stations	1954 to 1957
4. Great Bear Lake Lodge – fishing camp	Late 1950s to 1987

The above activities have involved manipulating and/or generating the following contaminants:

- diesel fuel to power generators, boats, small planes, heavy vehicles
- heating oil for furnace(s)
- uranium ore in transit
- gasoline to fuel vehicles, boats and small planes
- hydraulic oil and engine oil for machinery
- highly refined oil for use in transformers
- lead and some PCBs in exterior and interior paint throughout the site
- asbestos used in insulation
- domestic wastes buried or otherwise disposed of on site.

### 2.3 Site Features

Sawmill Bay is now considered an abandoned site. Recent photographs are presented in Figure 2-1. The site covers an area of approximately 2,038 Ha (20 km<sup>2</sup>), including six main areas: (1) two intersecting airstrips (Figure 2-2); (2) the former Great Bear Lake Lodge (main lodge area, Figure 2-3); (3) the former fishing dock area (Figure 2-4); (4) the main barrel cache, containing approximately 7,870 empty barrels (Figure 2-5); (5) the beach landing and former Arctic Enterprises Lease area (Figure 2-6) and (6) the former sawmill site (Figure 2-7). Other smaller, outlying areas, including small barrel caches, landfills and waste dumps, a communication tower and building, and remnants of shacks or former small camps are dispersed throughout the site (Figures 2-8 and 2-9). Roads and trails connect all areas of the site. Each of the six areas listed above has been designated as an area of environmental concern (AEC) or an area of potential environmental concern (APEC), based on previous investigations. Off-site areas where background soil, surface water and sediment samples were collected are shown in Figure 2-10.

To clarify the nomenclature used in this and previous reports, Table 2-2 below explains how the area designations used in this report and the detailed ESA (dESA - FRANZ, 2008) relate to those used in the Phase IIIA report (FRANZ/EcoMetrix 2008a).

Table 2-2: AECs, APECs and Former Area Designations

Location	Detailed ESA (2008)	Phase IIIA (2007)	Figure(s)
Background	Background	n/a	2-10
Airstrip Area	AEC 1 a, b, c: 1 a – terminal building and vicinity (including former APECs 3 and 10) 1b – barrel cache at NW end of unused airstrip 1c – waste dump SE of terminal	APEC 3 (uranium ore-impacted area) APEC 10 (small barrel cache 200 m NW of terminal building)	1-3 2-2, 2-8, 2-9, 2-11 3-1 and 3-18
Main Lodge Area	AEC 2: 2a - Main lodge (Building A, including former APEC 2) 2b - Kitchen/dining room (Building B) 2c - Storage/ workshop (Building C) 2d - Old accommodation (Building D) 2e - Boilerhouse (Building E) 2f - Guide house (Building F) 2g -Vehicle maintenance (Building G) 2h - Powerhouse (Building H) 2i – barrel cache south of powerhouse 2j – lodge dumps 2k - barrel fence 2l – barrel cache west of perimeter 2m – communications building	APEC 2 (uranium ore-impacted area) APEC 7 a through k: 7a – main lodge (Building A) 7b – kitchen/dining room (Building B) 7c – storage/workshop (Building C) 7d – vehicle maintenance (Building G) 7e – old accommodation (Building D) 7f – boiler house (Building E) 7g – guide house (Building F) 7h – powerhouse (Building H) 7i – barrel cache south of powerhouse 7j – lodge dumps 7k – barrel fence APEC 8 – barrel cache west of perimeter APEC 9 – communications building	1-3 2-3, 2-8, 2-9, 2-11 3-1 to 3-6 and 3-18
Fishing Dock, Airplane Fuselage and Barrel Cache	AEC 3 a & b: 3a – (hut, 1000-g AST, fishing dock) 3b – (130 barrel cache, plane fuselage) 3c – new camp	“Great Bear Lodge Landing” APEC 6a (hut, 1000-g AST, fishing dock) APEC 6b (130 barrel cache, plane fuselage)	1-3 2-4, 2-8, 2-9, 2-11 3-7 to 3-10 and 3-18
Main Barrel Cache and Dump	AEC 4 a & b: 4a – main barrel cache 4 b – dump area	APEC 5b/c (8500 barrel cache)	1-3 2-5, 2-8, 2-9, 2-11 3-11 and 3-18
Beach Landing and	AEC 5 a & b:	APEC 1 (uranium ore-impacted)	1-3

Location	Detailed ESA (2008)	Phase IIIA (2007)	Figure(s)
Arctic Enterprise Lease Area	5a – beach landing 5b – A.E. lease area	area) APEC 4 (A.E. Lease Area) APEC 5a (landing area)	2-6, 2-11 3-12 to 3-15
Old Sawmill	APEC 6	n/a	1-3 2-7, 2-11 3-16

A brief description of each of the main areas is provided below.

### **Airstrip Area (AEC 1, Figure 2-2)**

The old airstrips consist of two cleared areas running northwest by southeast and east by west (approximately). The runways are constructed of medium to coarse grain sand and are 1,200 m and 1,500 m in length. There is a small terminal building located at the intersection of the two airstrips at the southeastern end (AEC 1a). Scattered debris and smaller barrel caches are found along the runways. A cache of approximately 50 barrels is located at the north end of the unused runway (AEC 1b), and a small waste dump is located southeast of the terminal building (AEC 1c). Approximately 1,710 empty barrels, 1,456 m<sup>2</sup> of waste dumps and 1,140 m<sup>3</sup> of soil contaminated with metals, radiation and PHCs have been reported in this area.

### **Main Lodge Area (AEC 2, Figure 2-3)**

The former Great Bear Lake Lodge is surrounded by a barrel fence approximately 500 m in length, waste dumps (including vehicles, scrap metals, wood, and other building materials), and a smaller barrel cache (AEC 2L, approximately 250 barrels). Two towers and a communication Quonset hut are located north of the lodge, and one tower is located within the lodge complex. Within the barrel fence there are eight structures, including a powerhouse, vehicle maintenance, guide house, boiler house, main lodge, storage/workshop, kitchen/dining room, and an old accommodation building. Abandoned vehicles, barrel caches, former building foundations, four ASTs, fallen transformers, and debris are also located within the fence. Relic materials from lodge operations inside and outside of the buildings are significant. Approximately 2,275 empty barrels, at least 3,400 m<sup>2</sup> of waste dumps and 5,263 m<sup>3</sup> of contaminated soil (metals, radiation or PHCs) have been reported in this area.

### **Fishing Dock, AST and Airplane Fuselage (AEC 3, Figure 2-4)**

Approximately 400 m east of camp and 100 m west of the lake is a fishing boat landing point for the lodge (AEC 3a - Figure 2-4). The area features a shack, an empty 1,000-gallon heating fuel AST, and a dilapidated dock. Roughly 80 m south of this area is a small barrel cache and the fuselage from a crashed airplane (AEC 3b), and another 200 m southeast of this location are the remains of an old encampment (AEC 3c). Altogether, approximately 144 barrels and 108 m<sup>3</sup> of PHC-impacted soil, as well as a painted wooden boat, large pieces of dock materials, water

pipes and 2-3 collapsed shacks were present in this area, in addition to the remaining erect hut, plane fuselage and AST.

### **Main Barrel Cache and Surrounds (AEC 4, Figure 2-5)**

A large barrel dump containing approximately 7,870 empty fuel barrels is located on the south side of the road, approximately 250 m west of the beach landing. The gradient of the surrounding terrain is relatively steep as it extends approximately 50 m south towards the lake. Two large dumps along with smaller debris piles are located uphill (south) of the barrels. Debris consists mostly of metals (cans, vehicle parts, strapping) and wood (crates and beams). Waste dumps covering an approximate area of 255 m<sup>2</sup>. The total volume of PHC-impacted soil in this area is estimated to be 271 m<sup>3</sup>.

### **Beach Landing and former Arctic Enterprises Lease (Figure 2-6)**

The beach landing is a flat area covering approximately 2,250 m<sup>2</sup>. The ground cover is predominantly cobble and gravel, with medium to coarse grain sand. The area is relatively devoid of vegetation other than a narrow riparian zone (<2 m) made up of willows, grasses, sedges, and fireweed. A sunken barge is visible immediately adjacent to the remains of the wooden loading pier. Other debris is scattered about the site, including barrels, a truck, wooden debris, and what appears to be a wooden chassis. Of note is an approximately 200-g pressure tank lying on the shore roughly in the middle of the beach landing area. This tank is largely hidden from view by shrubs and can best be located from the water. It is marked on historical topographic maps and mentioned in previous reports as a possible AST, but it is a pressure tank, likely used in the past to fill the reservoirs of steam barges with water. No paint remains on the tank.

Approximately 50 m east along the shoreline of Great Bear Lake is the former Arctic Enterprises lease. Three small shacks (accommodation, cooking, and maintenance) and six fishing boats are found onsite. Small amounts of metal debris, building materials, barrels, and chemical containers are scattered throughout. The ground cover is mainly sand, with coarser materials along the shoreline.

There are a total of 53 barrels in AEC 5 (a and b), and the total volume of contaminated soil is estimated at 6,680 m<sup>3</sup>. Of this total, 6,580 m<sup>3</sup> are located in AEC 5a, of which approximately 1,250 m<sup>3</sup> are co-contaminated with PHCs, metals and radiation.

### **Sawmill (Figure 2-7)**

The site of the former sawmill is located approximately 1 km east of the beach landing area. Timber sawmills were established at Sawmill Bay (hence the name) during the 1930s. This operation was probably active throughout the 1930s and 1940s, supporting the lumber

requirements of the Port Radium mine and other construction on Great Bear Lake. Mining for radium at the Port Radium site stopped in 1940 due to falling prices for naturally produced radium, and this would have reduced the demand for wooden construction materials.

An old steam tractor, in very good condition, remains in place next to the shore. Piles of sawdust and wood debris also remain. Overlooking the Sawmill site is the grave site of an aboriginal moose hunter who died nearby and was buried at the top of the rise behind the sawmill in 1962.

Soils in this area were uncontaminated.

## **2.4 Natural Environment**

### **2.4.1 Climate**

The climate of Sawmill Bay is typical of the semi-arid Subarctic (Köppen Climate Classification). The area is characterized by brief warm summers and long, cold winters. The closest Environment Canada weather station (at similar latitude) is located at Norman Wells, approximately 350 km west of the site. Between 1971 and 2007, the average daily temperature for Sawmill Bay (per Norman Wells data) is expected to be -5.5°C, with maximums occurring in July (17.0°C) and minimums in January (-26.5°C). Snow and ice cover the area 6-8 months of the year. The average annual precipitation for 1971-2007 is calculated as 166 mm. ([www.climate.weatheroffice.ec.gc.ca](http://www.climate.weatheroffice.ec.gc.ca))

### **2.4.2 Background Conditions**

#### **2.4.2.1 Topography and vegetation**

The study area lies on the northeast corner of Leith Peninsula on the McTavish Arm of Great Bear Lake, Northwest Territories. Elevations range from 156 m above sea level (asl) at Great Bear Lake and rise gradually to the west, to 183 m at the Sawmill Bay site. The site covers a relatively flat area west of Sawmill Bay. The entire site, including the old airstrip, the main lodge area (i.e. Great Bear Lodge), the fishing dock, the main barrel cache, the beach landing area, the former Arctic Enterprises lease area, and the former sawmill area are generally of low relief with elevations less than 200 m asl. The study area topography and drainage are presented in Figure 2-11.

The study area is located within the Great Bear Lake Plain of the Taiga Plains Ecoregion. Ground cover at the site is a combination of cobble, gravel, sand, grass, lichens and trees, with coarser materials and less vegetation prevailing closer to the shore. Vegetative cover was observed to consist predominantly of black spruce, tamarack, dwarf birch, willow, alder, cottongrass, lichen, grasses, moss and flowering plants. Secondary populations of white spruce and areas of low shrub may also be present.

#### **2.4.2.2 Geology**

The study area is located within the Interior Platform Geological Province. The Platform is comprised of Precambrian rocks (identical to the Canadian Shield) overlain by beds of younger, flat-lying Cretaceous shale and Devonian limestone strata. The surface is covered by a thick and continuous till blanket (GSC “A” Series Map, 1880A) consisting of glacial drift and outwash deposits. The site falls within a zone of extensive discontinuous permafrost (50-90% coverage) considered to have low to medium ground ice content.

#### **2.4.2.3 Hydrology and Hydrogeology**

Groundwater is not used as a source of drinking water at the site or in the general area of Sawmill Bay. Surface water has been used for drinking water at the site throughout the active years of its occupation (FRANZ/EcoMetrix, 2008a).

The major surface water body within the study area is Great Bear Lake, which has a total area of 31,150 km<sup>2</sup>. Sawmill Bay is situated in the Mackenzie watershed, Great Bear Lake Sub-basin. Great Bear Lake flows from the Keith Arm through the Great Bear River. The Great Bear River flows west to the Mackenzie River, to eventually drain into the Arctic Ocean. The natural drainage around the study area is influenced by the bedrock structure and numerous smaller lakes to the south. These smaller lakes probably do not receive drainage from the Sawmill Bay site.

Locally, there is one ravine situated within the general area, located south of the airfield and extending through the main lodge area, and then draining into Sawmill Bay. The ravine is inferred to act as an intermittent creek, draining surface water and water from inland lakes eastward towards the bay.

The distance between the approximate limits of the site and the nearest downgradient surface water (i.e., Sawmill Bay, the lakes, and/or the ravine) ranges from 0 km (e.g. the beach landing, Arctic Enterprises lease area and the fishing dock area (AECs 5a, 5b and 3a, respectively), which are all located immediately adjacent to Sawmill Bay) to approximately 1.5 km (i.e., the airstrip, which is approximately 1.5 km inland from Sawmill Bay).

Surface water flow and groundwater flow at the site are expected to follow the general topography. Surface waters from the lodge and airstrip areas can generally be expected to flow eastward, with discharge into the creek and Sawmill Bay. Other areas are closer to the water, therefore it is assumed that surface water flows immediately downgradient into the bay.

### 2.4.3 Ecological Receptors

Environment Canada's State of the Environment Infobase lists the following species as common wildlife local to the Sawmill Bay area: caribou, moose, black bear, wolf, red fox, marten, lynx, snowshoe hare, arctic fox and beaver. Bird species listed include spruce grouse, raven, osprey, willow ptarmigan and waterfowl. This area is also used in summer by migratory birds such as the sandhill crane. Great Bear Lake is considered highly productive, stocking large quantities of mature lake trout, arctic grayling, walleye and northern pike. Field observations in 2008 confirmed the presence of many of the above wildlife species, including caribou, moose, black bear, arctic fox, beaver, raven, ptarmigan, various kinds of ducks and waterfowl, arctic grayling and lake trout, as well as a bald eagle. Benthic invertebrates were observed during sediment sampling, and included several small Gammarus- and Pontoporeia-type crustaceans, oligochaete worms and sea lamprey larvae. Several small sea lamprey (approximately 15 cm long) could be seen attached to a large lake trout swimming in front of the AE lease area. With the exception of the sea lamprey larva, these observations are in line with the benthic invertebrates reported by Johnson (1975) to inhabit the sediments of Great Bear Lake.

### 2.4.4 Species at Risk

Of the mammal and bird species that may potentially occur specifically within the project area, seven have been designated as "species at risk" in Canada (see Table 2-3). Assessments for candidate species are conducted by the Committee on the Status of Endangered Species in Canada (COSEWIC), which provides recommendations on the levels of protection needed to allow the recovery of declining species. Candidate species are listed under specific classifications, depending on their numbers and the health of the populations, as follows (Macdonald 2004):

<i>Extinct:</i>	<i>a species no longer exists</i>
Extirpated:	a species no longer exists in the wild in Canada, but occurs elsewhere
Endangered:	a species faces imminent extirpation or extinction
Threatened:	a species likely to become endangered if limiting factors are not reversed
Special Concern:	a species that may be particularly sensitive to human activities or natural events

Species protected under the *Species at Risk Act* (SARA) are listed on Schedule 1 of SARA. SARA also includes endangered and threatened species on Schedule 2, and species of concern on Schedule 3 that are under review for inclusion on Schedule 1.

Table 2-3: Terrestrial Species at Risk Potentially Occurring within the Project Area

<b>Terrestrial species at risk potentially within project area<sup>1</sup></b>	<b>COSEWIC Designation</b>	<b>Schedule of SARA</b>	<b>Government organization with primary management responsibility<sup>2</sup></b>
Eskimo Curlew <sup>3</sup>	<i>Endangered</i>	Schedule 1	EC
Woodland Caribou (Boreal population)	Threatened	Schedule 1	Government of NT
Peregrine Falcon ( <i>anatum-tundrius</i> complex <sup>4</sup> )	<i>Special Concern</i>	Schedule 1 ( <i>anatum</i> ) Schedule 3 ( <i>tundrius</i> )	Government of NT
Short-eared Owl	<i>Special Concern</i>	Schedule 3	Government of NT
Wolverine (Western population)	<i>Special Concern</i>	Pending	Government of NT
Grizzly Bear	<i>Special Concern</i>	Pending	Government of NT
Rusty Blackbird <sup>5</sup>	<i>Special Concern</i>	Pending	Government of NT

<sup>1</sup>The Department of Fisheries and Oceans has responsibility for aquatic species.

<sup>2</sup>Environment Canada has a national role to play in the conservation and recovery of Species at Risk in Canada, as well as responsibility for management of birds described in the *Migratory Birds Convention Act* (MBCA). Day-to-day management of terrestrial species not covered in the MBCA is the responsibility of the Territorial Government. Therefore, for species within their responsibility, the Territorial Government is best suited to provide detailed advice and information on potential adverse effects, mitigation measures, and monitoring.

<sup>3</sup>There have been no reliable sightings of Eskimo Curlew since 1998 and the National Recovery Team for this species has determined that recovery is not feasible at this time.

<sup>4</sup>The *anatum* subspecies of Peregrine Falcon is listed on Schedule 1 of SARA as threatened. The *anatum* and *tundrius* subspecies of Peregrine Falcon were reassessed by COSEWIC in 2007 and combined into one subpopulation complex. This subpopulation complex was listed by COSEWIC under the Special Concern category.

<sup>5</sup>Newly listed by COSEWIC in April 2006.

None of the above species-at-risk were observed on the site during the field investigations carried out in 2007 and 2008. Although wolverines were known to be present around the more northerly parts of the lake, no evidence was observed of their presence at Sawmill Bay.

## 2.5 Nearest Community and Human Receptors

Sawmill Bay is considered a vacant site and is not part of any community agglomeration. The site is currently vacant and has not been used extensively since 1987; however it is still occasionally accessed by air, land (i.e., all terrain vehicle (ATV) and snowmobile). Traffic at the site is infrequent, irregular, and of short duration. The closest community, Délı̨nę, is more than 200 km southwest. Délı̨nę has a population of approximately 650 habitants ([www.deline.ca](http://www.deline.ca)), most of whom are descended from the Sahtu Dene First Nations - the Bear Lake people who have lived in this area for many generations. Visits to the site are made mostly by adults of the general public and First Nation communities. Children might occasionally visit the site. Visits from infants and toddlers are very unlikely but possible considering the traditional usage of the lands by First Nation communities.

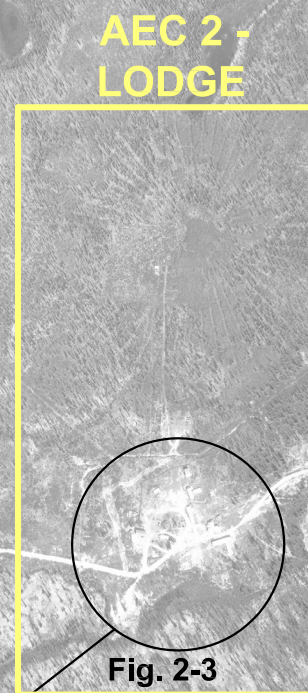
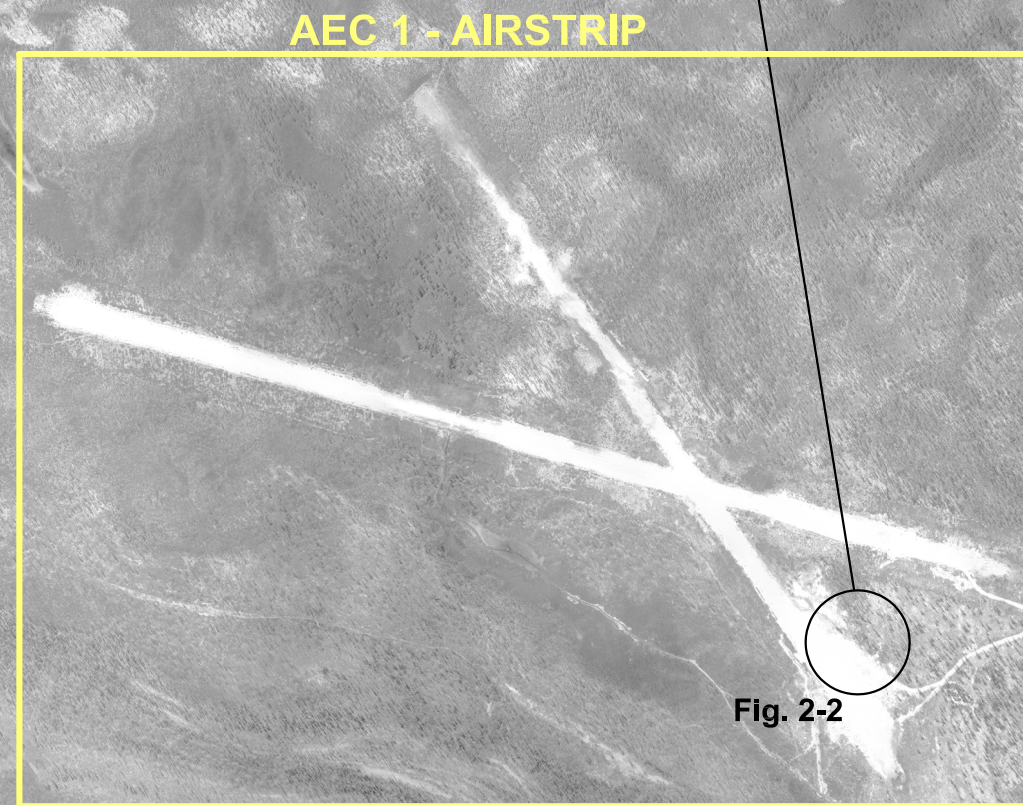


Annually, approximately 350 people visit the Great Bear Lake region to participate in sport fishing. The Great Bear Lake Lodge is the nearest ecotourism outfitter, located more than 100 km north of the site, along the Dease Arm of Great Bear Lake. It has a capacity of approximately 40-50 guests and employees (PAL, 2007). Visitors to the Sawmill Bay site primarily come from this outfitter for daily fishing and hunting activities.

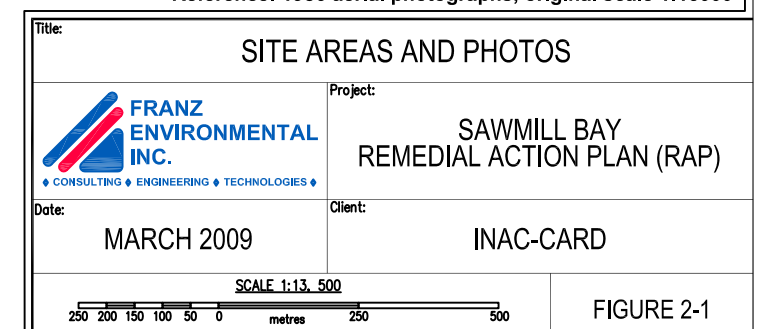
Due to increased demand for mineral commodities in a global market, geological exploration has risen significantly in the region in recent years, and will likely continue to rise steadily in the foreseeable future. This heightened activity brings several hundred people to the region annually.

## FIGURES

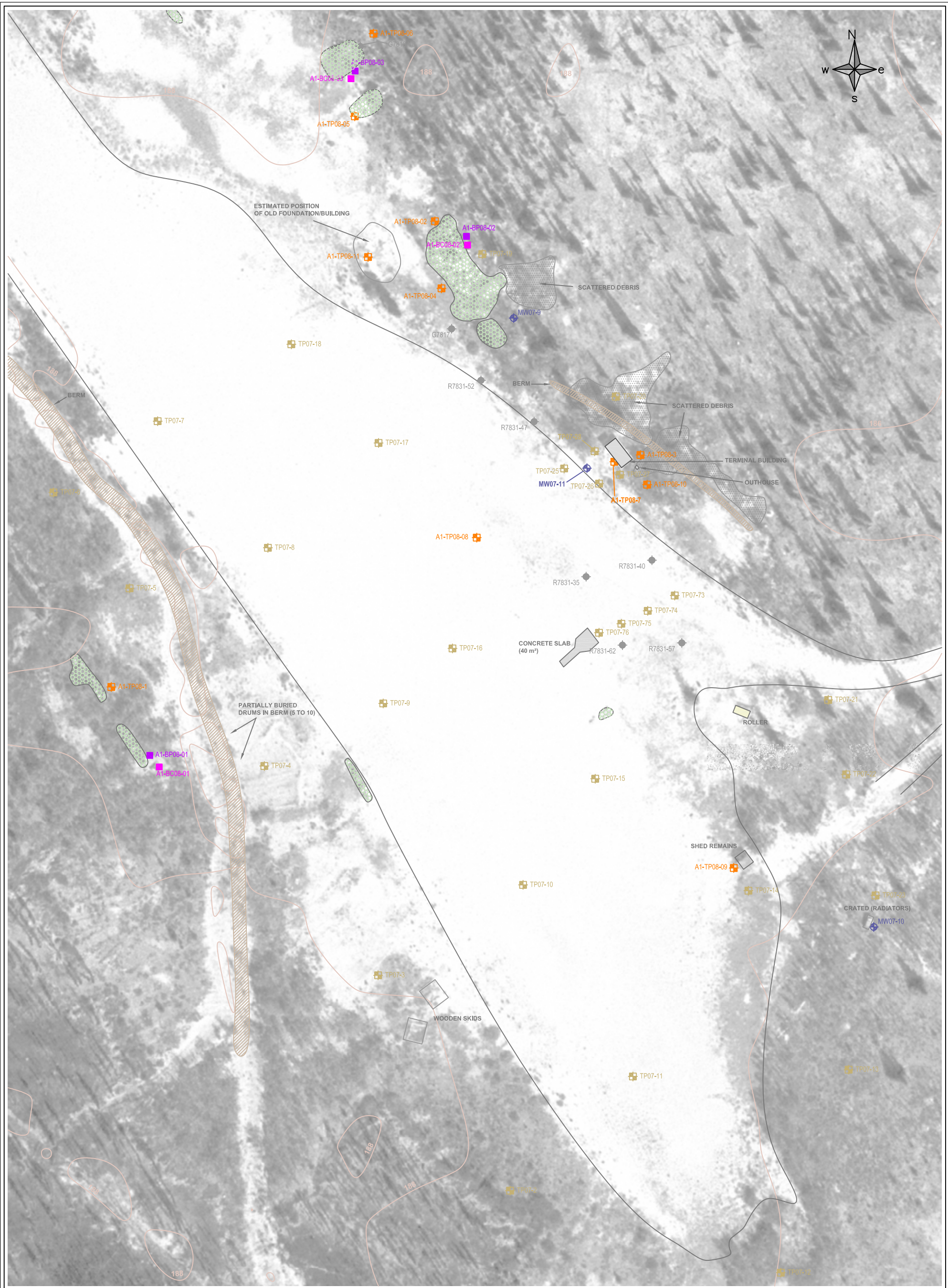




Reference: 1986 aerial photographs, original scale 1:15000







**LEGEND:**

- SOIL SAMPLE LOCATION (FRANZ/ECOMETRIX 2007)
- TP07-1 (2007)
- SOIL SAMPLE LOCATION (FRANZ 2008)
- A1-TP08-1 (2008)
- BARREL CONTENT SAMPLE LOCATION (FRANZ 2008)
- A2-BP08-1
- BARREL PAINT SAMPLE LOCATION (FRANZ 2008)
- A2-BP08-1
- GROUNDWATER SAMPLING INSTALLATIONS (FRANZ 2007)
- MW07-1 (2007)
- PREVIOUS SAMPLE LOCATION (ESG RMC, 1996)
- G78802
- EXISTING BUILDINGS/CONCRETE

- VEHICLE
- BARRELS
- DEBRIS/DUMP SITES
- TOPOGRAPHIC CONTOUR LINES (2 m contour interval)
- 188

REFERENCE: 1986 aerial photographs, original scale 1:15000

Title:

AEC 1 – AIRSTRIP FEATURES AND INSTRUMENTATION



Project:

SAWMILL BAY  
REMEDIAL ACTION PLAN (RAP)

Date:

MARCH 2009

Client:

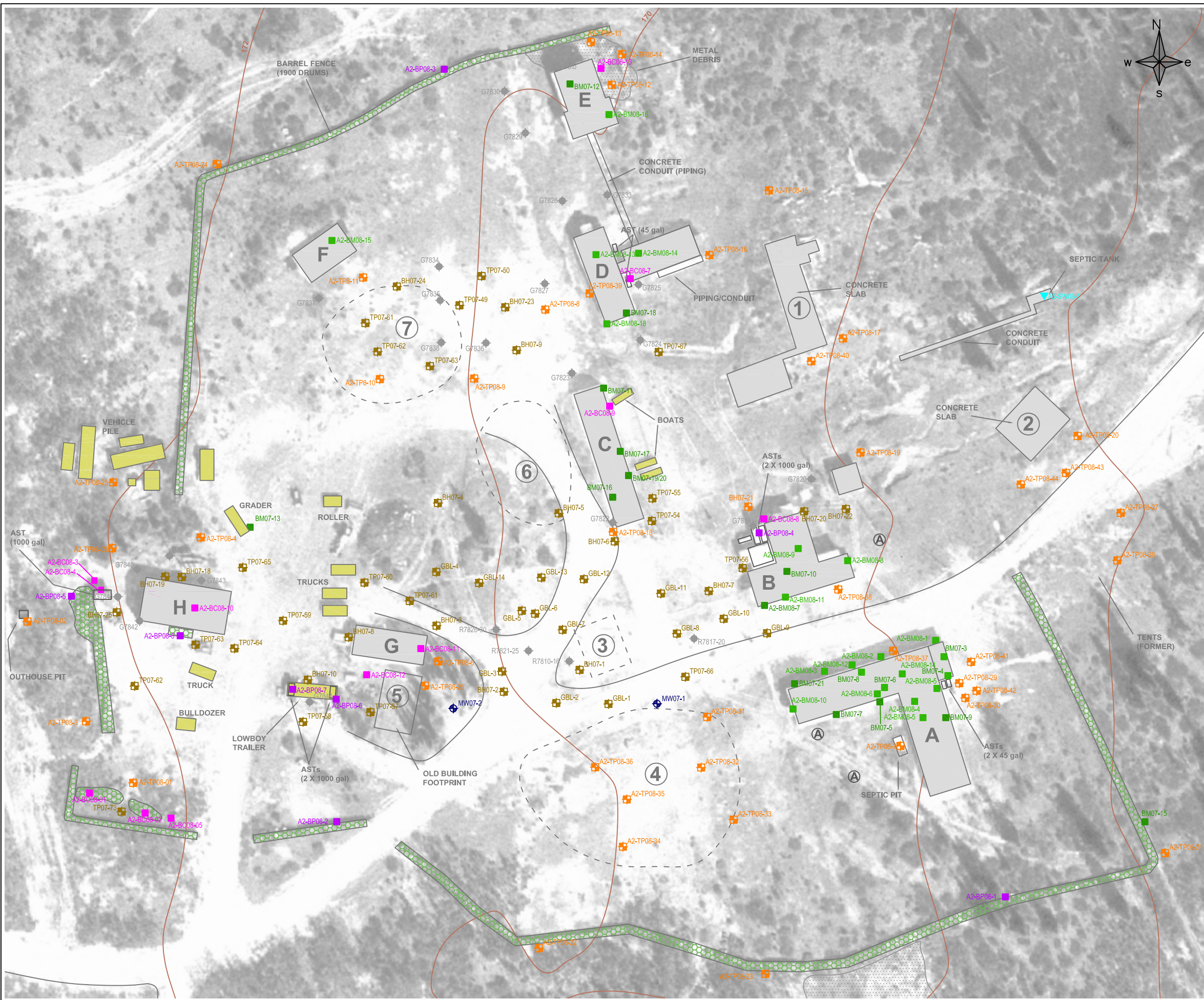
INAC-CARD

SCALE 1:1000

25 20 15 10 5 0 metres 25 50

FIGURE 2-2





**LEGEND:**

- SOIL SAMPLE LOCATION (FRANZ/ECOMETRIX 2007)**
- BH07-1, TP07-1, GBL-1 (2007)
  - SOIL SAMPLE LOCATION (FRANZ 2008)
  - A2-TP08-1 (2008)
- BUILDING MATERIAL SAMPLE LOCATION (FRANZ 2007/2008)**
- BM07-1 (2007), A2-BM08-1 (2008)
- BARREL CONTENT SAMPLE LOCATION (FRANZ 2008)**
- A2-BC08-1
- BARREL PAINT SAMPLE LOCATION (FRANZ 2008)**
- A2-BP08-1
- SURFACE WATER SAMPLE LOCATION (FRANZ 2008)**
- A2-SW08-1 (2008)
- GROUNDWATER SAMPLING INSTALLATIONS (FRANZ 2007)**
- MW07-1 (2007)
- PREVIOUS SAMPLE LOCATION (ESG RMC, 1996)**
- G78802
- EXISTING BUILDINGS/CONCRETE (SEE LIST BELOW)**
- ANTENA
  - VEHICLE
  - BARRELS
  - DEBRIS/DUMP SITES
  - TOPOGRAPHIC CONTOUR LINES (2 m contour interval)

**EXISTING BUILDINGS:**

- A MAIN LODGE
- B KITCHEN/DINING BUILDING
- C STORAGE/WORKSHOP
- D OLD ACCOMMODATIONS
- E BOILER HOUSE
- F GUIDE HOUSE
- G VEHICLE MAINTENANCE
- H POWERHOUSE
- I COMMUNICATION HUT

**HISTORICAL BUILDINGS:**

- 1 Former admin./recreation & mess
- 2 Storage barn - removed
- 3 Former workshop
- 4 Storage shed and storage lot (former)
- 5 Former powerhouse
- 6 Tents/huts (former)
- 7 Tents/huts (former)

REFERENCE: 1986 aerial photographs, original scale 1:15000

Title: AEC 2 - LODGE AREA FEATURES AND INSTRUMENTATION



Date: MARCH 2009

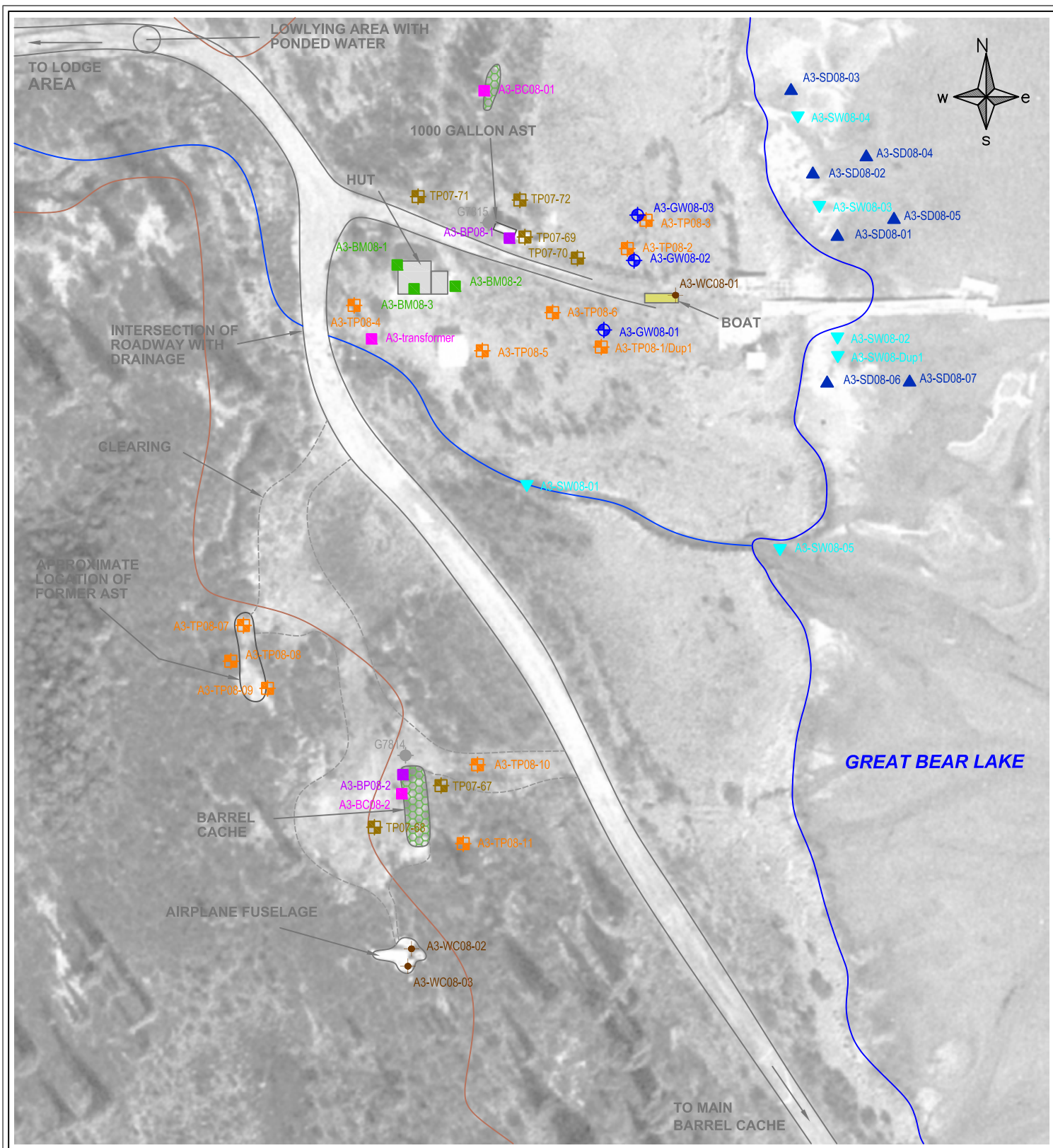
Project: SAWMILL BAY  
REMEDIAL ACTION PLAN (RAP)

Client: INAC-CARD

SCALE 1:800  
20 10 0 metres

FIGURE 2-3





#### LEGEND:

<ul style="list-style-type: none"> <li>SOIL SAMPLE LOCATION (FRANZ/ECOMETRIX 2007)</li> <li>TP07-1, (2007)</li> <li>SOIL SAMPLE LOCATION (FRANZ 2008)</li> <li>A3-TP08-1 (2008)</li> <li>BUILDING MATERIAL SAMPLE LOCATION (FRANZ 2008)</li> <li>A2-BM08-1 (2008)</li> <li>BARREL CONTENT SAMPLE LOCATION (FRANZ 2008)</li> <li>A2-BC08-1</li> <li>BARREL PAINT SAMPLE LOCATION (FRANZ 2008)</li> <li>A2-BP08-1</li> <li>SURFACE WATER SAMPLE LOCATION (FRANZ 2008)</li> <li>A3-SW08-1</li> <li>GROUNDWATER SAMPLING INSTALLATIONS (FRANZ 2008)</li> <li>A3-GW08-1</li> <li>SEDIMENT SAMPLING LOCATIONS (FRANZ 2008)</li> <li>A3-SD08-1</li> </ul>	<ul style="list-style-type: none"> <li>PREVIOUS SAMPLE LOCATION (ESG RMC, 1996)</li> <li>G78802</li> <li>EXISTING BUILDINGS/CONCRETE</li> <li>BARRELS</li> <li>DEBRIS/DUMP SITES</li> <li>TOPOGRAPHIC CONTOUR LINES (2 m contour interval)</li> </ul>
--	---

REFERENCE: 1986 aerial photographs, original scale 1:15000

#### Title:

AEC 3 – FISHING DOCK FEATURES AND INSTRUMENTATION



#### Date:

MARCH 2009

#### Project:

SAWMILL BAY  
REMEDIAL ACTION PLAN (RAP)

#### Client:

INAC-CARD

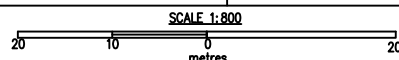
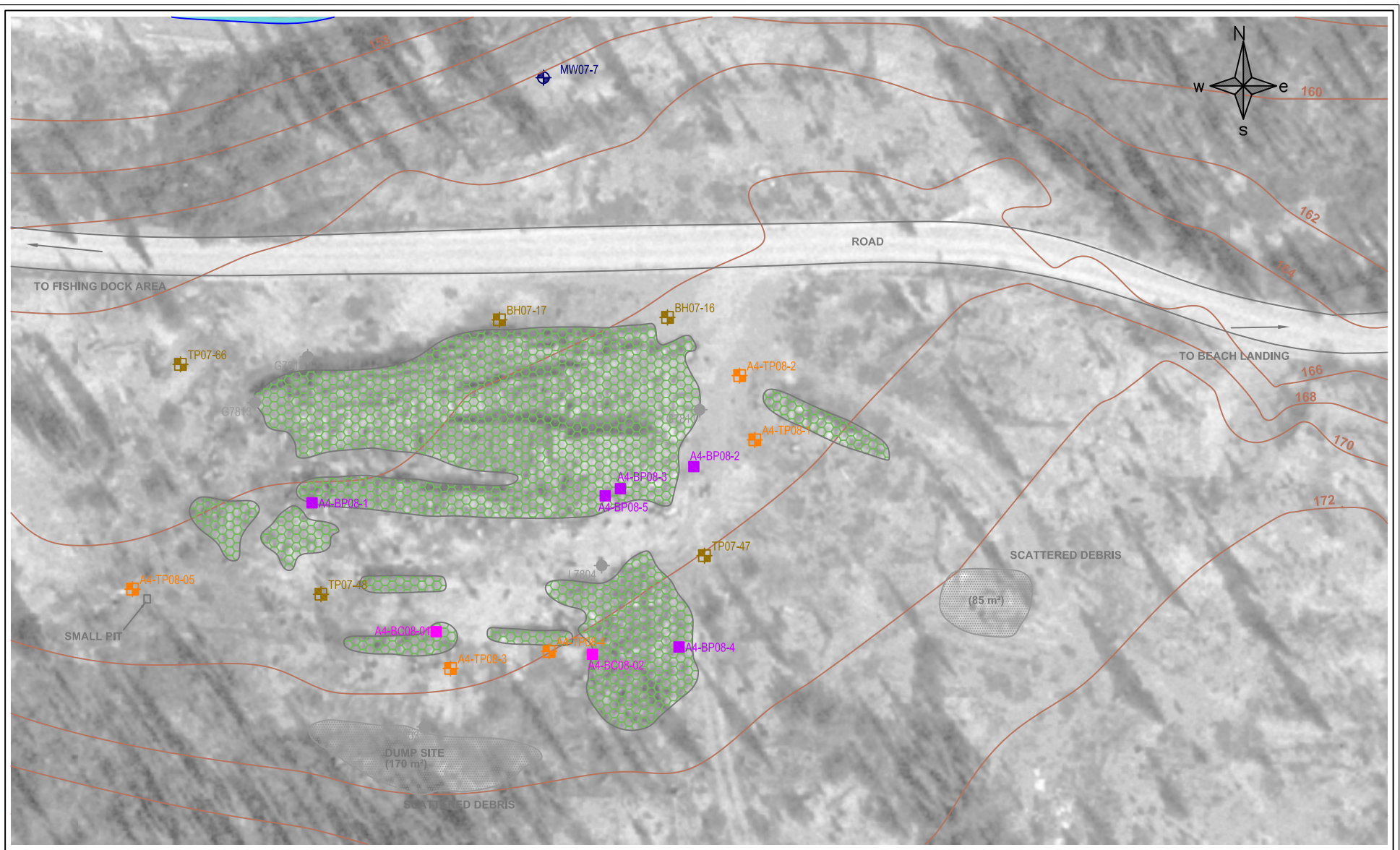


FIGURE 2-4



#### LEGEND:

SOIL SAMPLE LOCATION (FRANZ/ECOMETRIX 2007)

BH07-1, TP07-1, (2007)

SOIL SAMPLE LOCATION (FRANZ 2008)

A4-TP08-1 (2008)

BARREL CONTENT SAMPLE LOCATION (FRANZ 2008)

A2-BC08-1

BARREL PAINT SAMPLE LOCATION (FRANZ 2008)

A2-BP08-1

GROUNDWATER SAMPLING INSTALLATIONS (FRANZ 2007)

MW07-1 (2007)

PREVIOUS SAMPLE LOCATIONS (ESG RMC, 1996)

G78802

BARRELS



DEBRIS/DUMP SITES



EXTENTS OF IMPACTED SOILS



TOPOGRAPHIC CONTOUR LINES (2 m contour interval)



158

REFERENCE: 1986 aerial photographs, original scale 1:15000

Title:

## AEC 4 - MAIN BARREL CACHE FEATURES AND INSTRUMENTATION



Date:

MARCH 2009

Project:

SAWMILL BAY  
REMEDIAL ACTION PLAN (RAP)

Client:

INAC-CARD

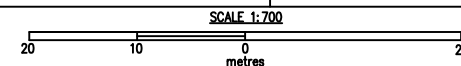
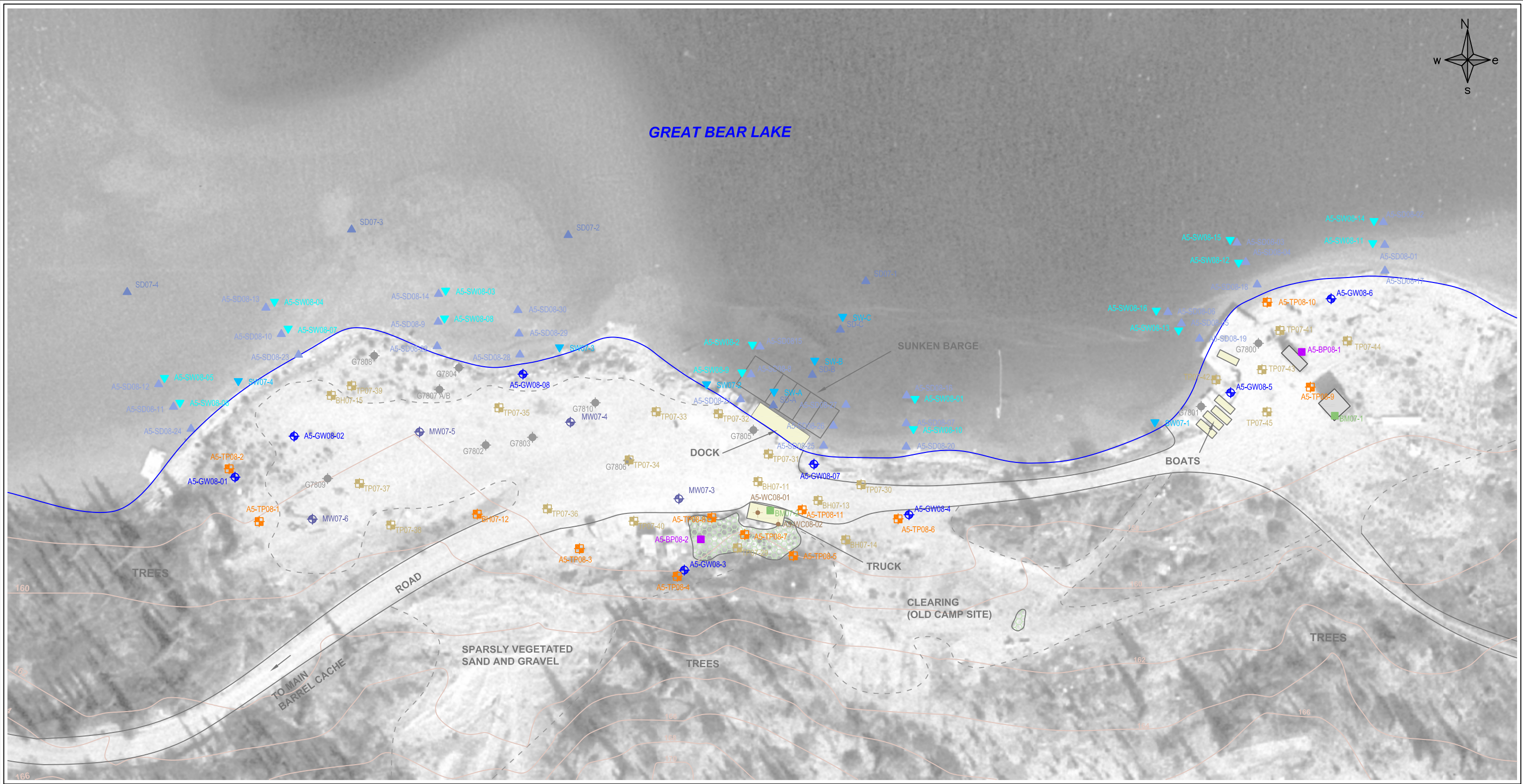


FIGURE 2-5

Z:\Projects\2008\1511-0801 Sawmill RAP\1511-0801 Sawmill RAP\Figures






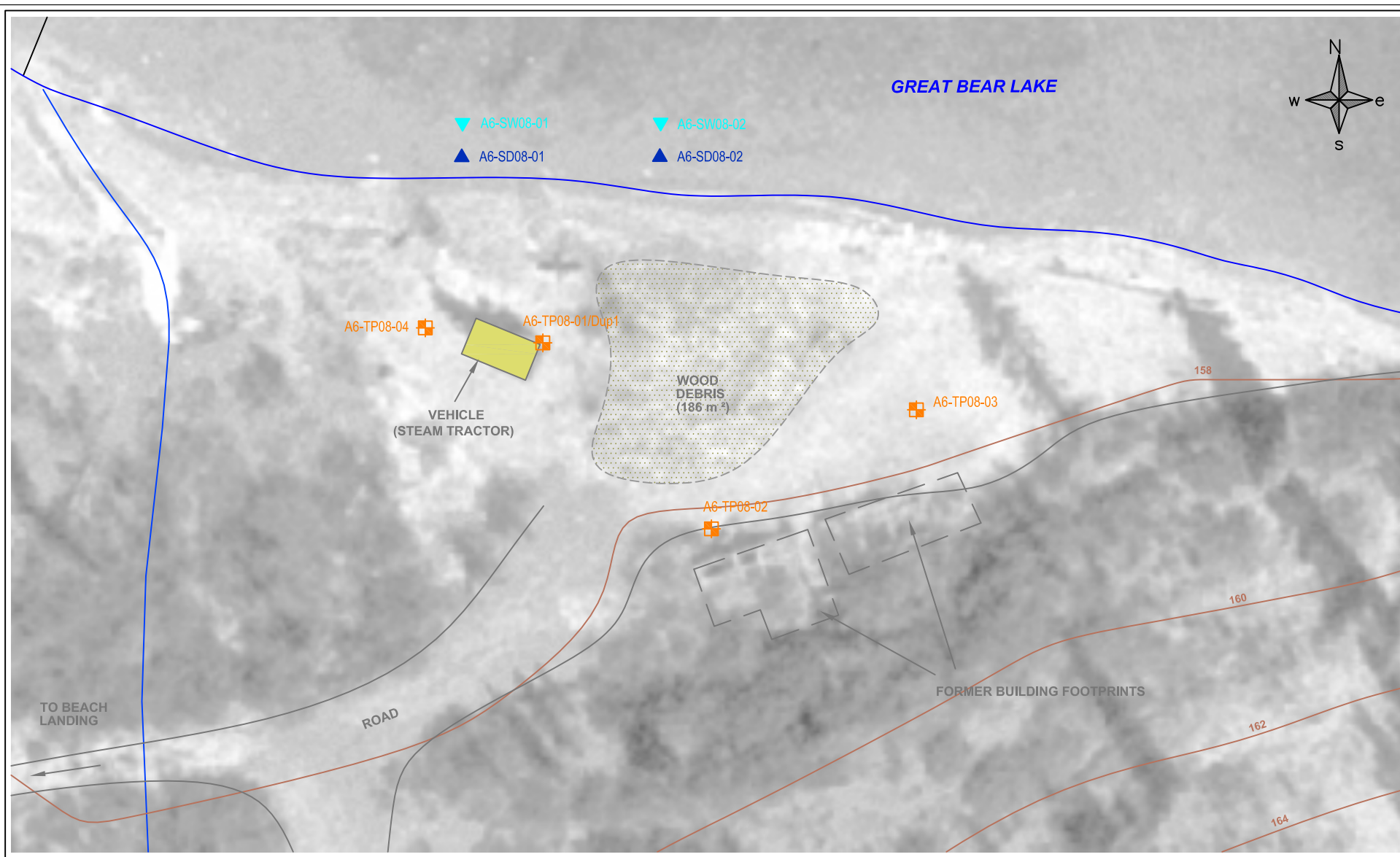
**LEGEND:**

- SOIL SAMPLE LOCATION (FRANZ/ECOMETRIX 2007)
- BH07-1, TP07-1, GBL-1 (2007)
- SOIL SAMPLE LOCATION (FRANZ 2008)
- A2-TP08-1 (2008)
- BUILDING MATERIAL/WASTE CLASSIFICATION SAMPLE (FRANZ 2007/2008)
- BM07-1 (2007) A5-WC08-02 (2008)
- BARREL CONTENT SAMPLE LOCATION (FRANZ 2008)
- A2-BC08-1
- BARREL PAINT SAMPLE LOCATION (FRANZ 2008)
- A2-BP08-1
- SURFACE WATER SAMPLE LOCATION (FRANZ/ECOMETRIX 2007/2008)
- SW07-1 (2007), A2-SW08-1 (2008)
- SEDIMENT SAMPLE LOCATION (FRANZ/ECOMETRIX 2007/2008)
- SD-A, SD07-1 (2007), A5-SD08-1 (2008)
- GROUNDWATER SAMPLING INSTALLATION (FRANZ 2007)
- MW07-1 (2007)
- GROUNDWATER SAMPLING INSTALLATION (FRANZ 2008)
- A5-GW08-1 (2008)
- PREVIOUS SAMPLE LOCATION (ESG RMC, 1996)
- G7802
- VEHICLE
- BARRELS
- CLEARING EDGE
- TOPOGRAPHIC CONTOUR LINES (2 m contour interval)

REFERENCE: 1986 aerial photographs, original scale 1:15000

Title: AEC 5 - BEACH LANDING AND ARCTIC ENTERPRISE FEATURES AND INSTRUMENTATION	
 CONSULTING • ENGINEERING • TECHNOLOGIES	Project: SAWMILL BAY REMEDIAL ACTION PLAN (RAP)
Date: MARCH 2009	Client: INAC-CARD
SCALE 1:700 20 10 0 20 metres	
FIGURE 2-6	





#### LEGEND:

SOIL SAMPLE LOCATION (FRANZ 2008)

✚ A6-TP08-1

SURFACE WATER SAMPLE LOCATION (FRANZ 2008)

▼ A6-SW08-1

SEDIMENT SAMPLE LOCATION (FRANZ 2008)

▲ A6-SD08-1

DEBRIS/DUMP SITES



TOPOGRAPHIC CONTOUR LINES (2 m contour Interval)

158

FORMER BUILDING FOUNDATIONS (WOODEN)



REFERENCE: 1986 aerial photographs, original scale 1:15000

#### Title:

**APEC 6 - OLD SAWMILL FEATURES AND INSTRUMENTATION**



#### Project:

**SAWMILL BAY  
REMEDIAL ACTION PLAN (RAP)**

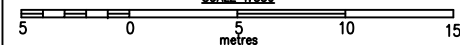
#### Date:

**MARCH 2009**

#### Client:

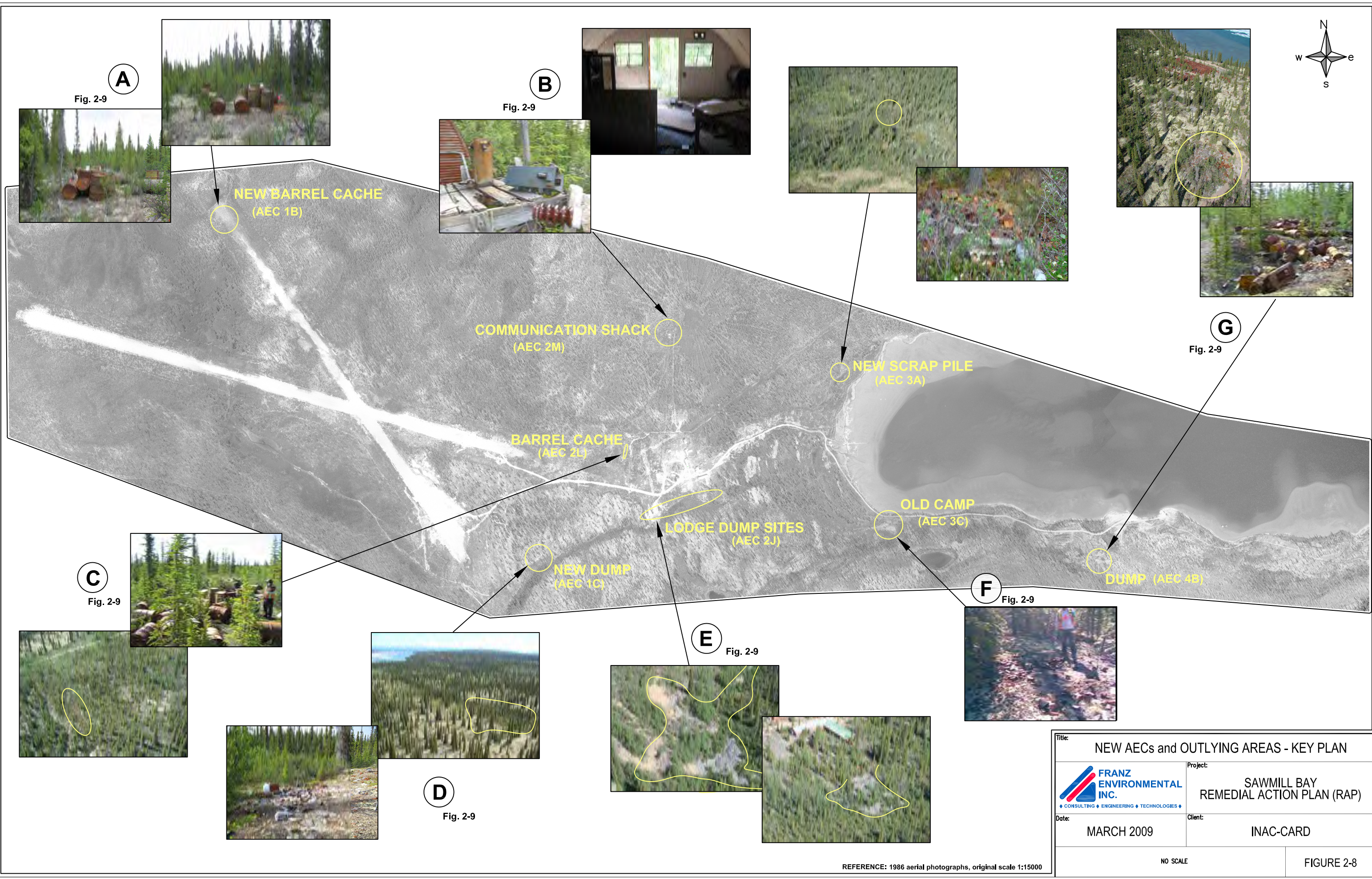
**INAC-CARD**


SCALE 1:350



**FIGURE 2-7**

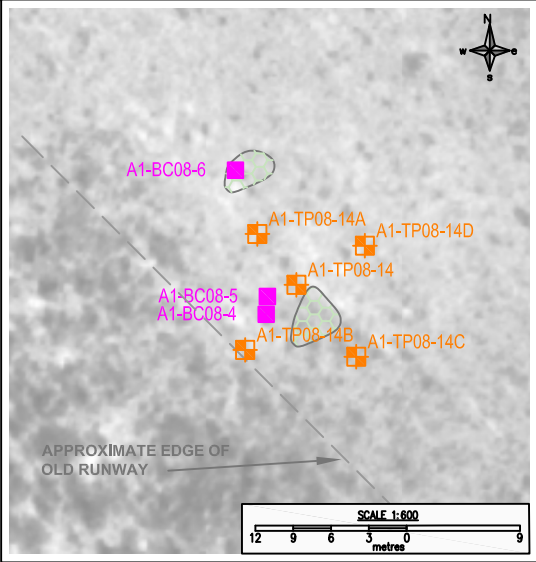




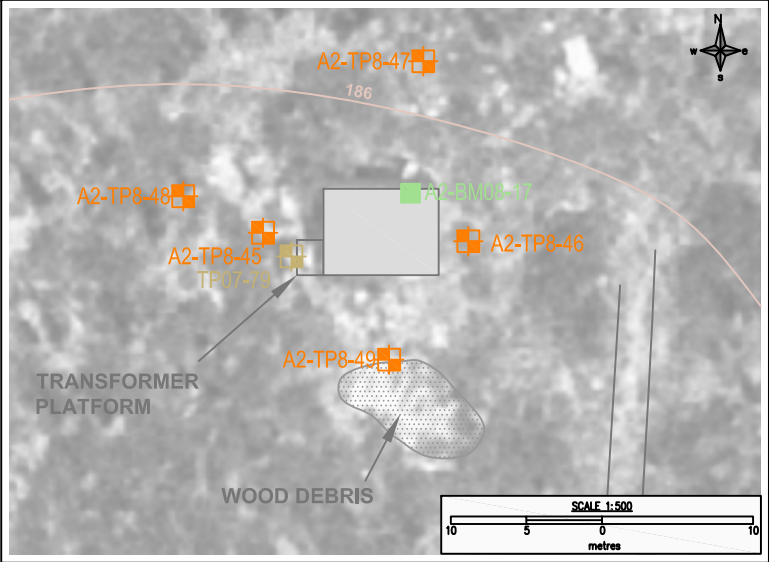
Title: NEW AECs and OUTLYING AREAS - KEY PLAN			
 <b>FRANZ ENVIRONMENTAL INC.</b> CONSULTING • ENGINEERING • TECHNOLOGIES	Project: SAWMILL BAY REMEDIAL ACTION PLAN (RAP)		
	Client: INAC-CARD		
Date: MARCH 2009	NO SCALE		
			FIGURE 2-8



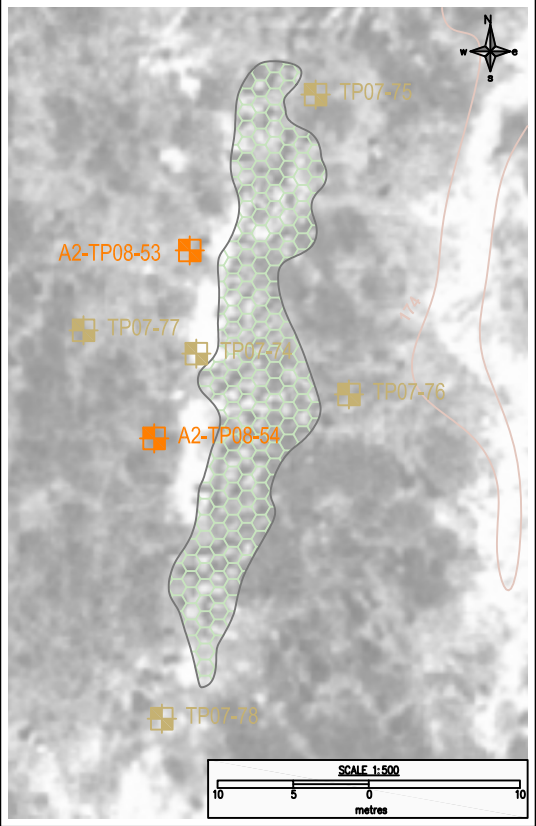
A. NEW BARREL CACHE (AEC 1B)



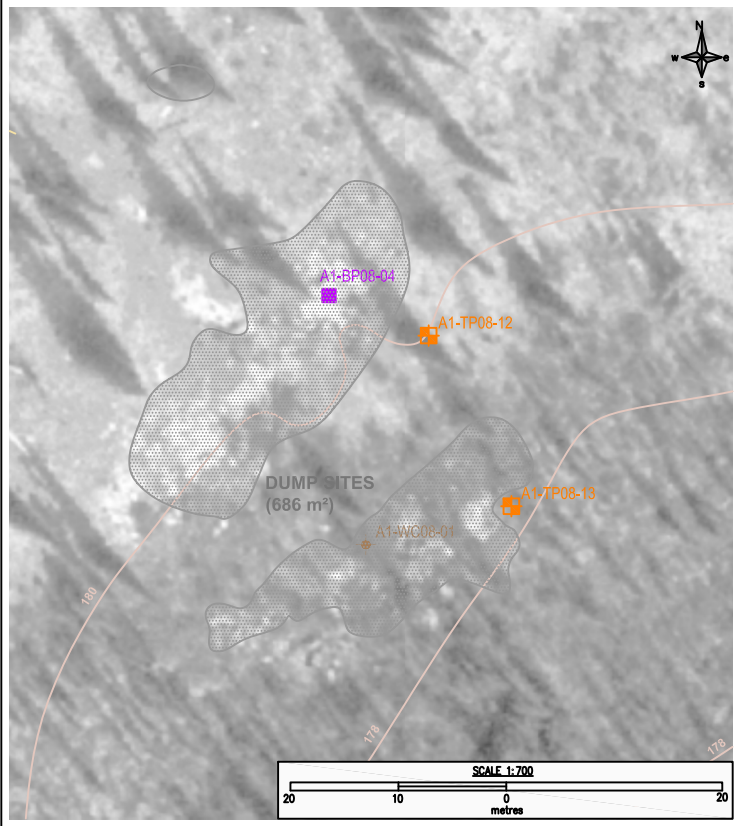
B. COMMUNICATION SHACK (AEC 2M)



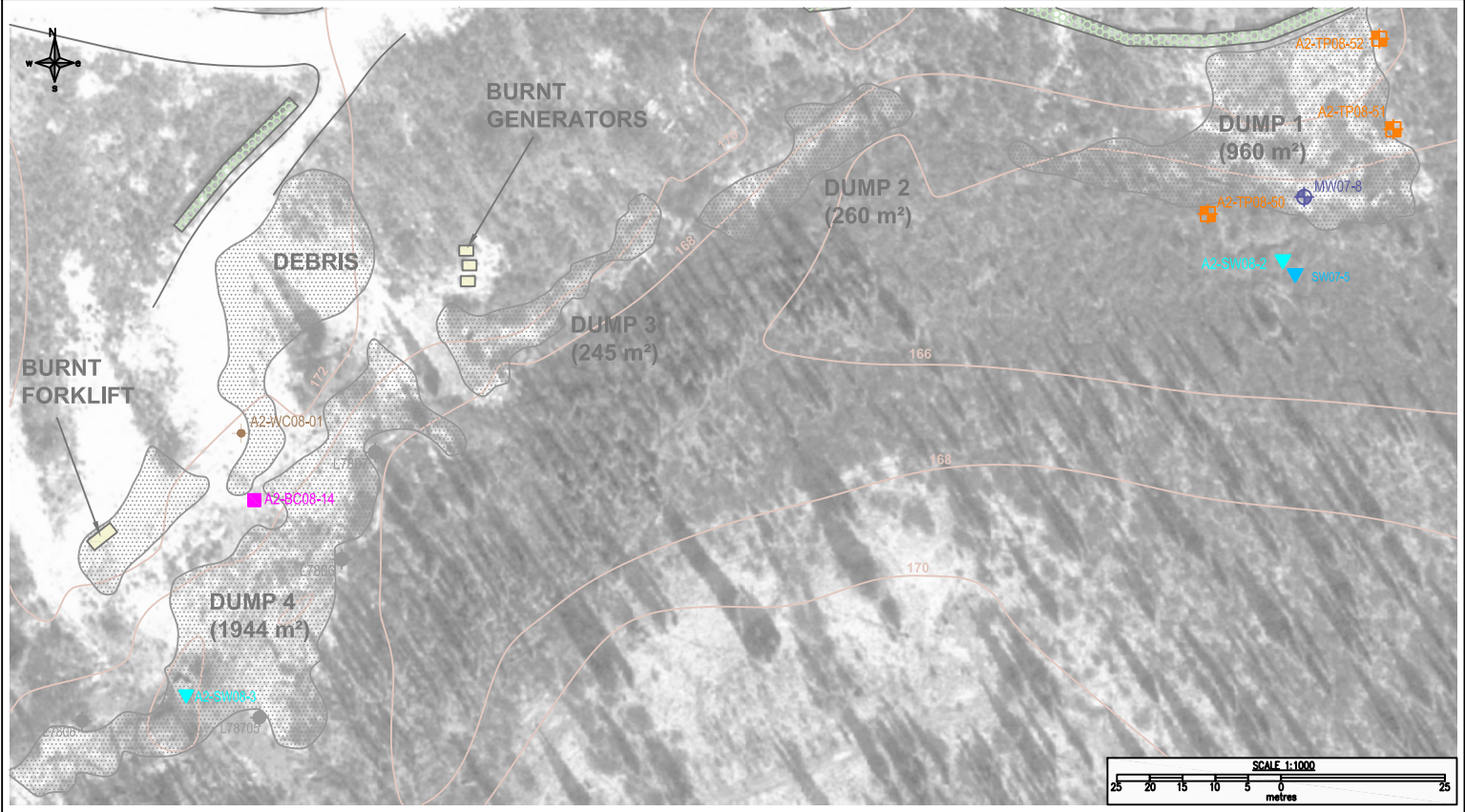
C. BARREL CACHE (AEC 2L)



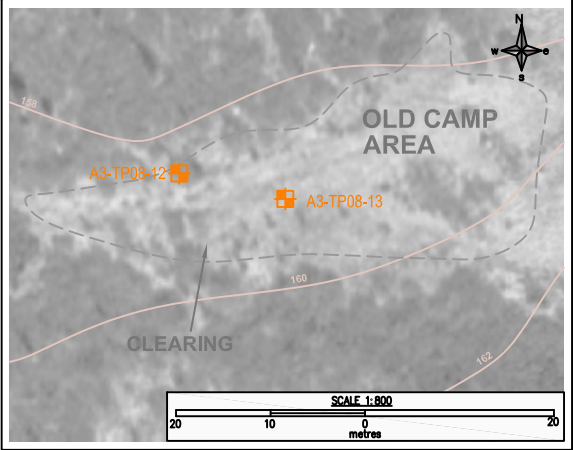
D. NEW DUMP SITE (AEC 1C)



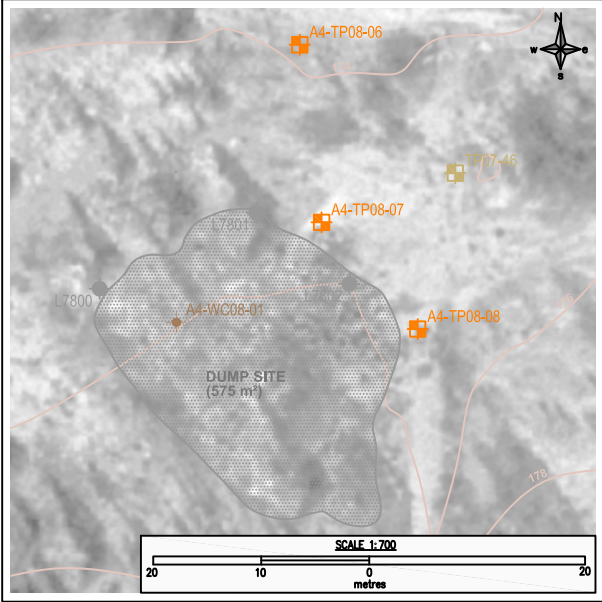
E. LODGE DUMP SITES (AEC 2J)



F. OLD CAMP AREA (AEC 3C)



G. BARREL CACHE DUMP SITE (AEC 4B)



REFERENCE: 1986 aerial photographs, original scale 1:15000


LEGEND:

- SOIL SAMPLE LOCATION (FRANZ/ECOMETRIX 2007)
  - BH07-1, TP07-1, GBL-1 (2007)
- SOIL SAMPLE LOCATION (FRANZ 2008)
  - A2-TP08-1 (2008)
- BUILDING MATERIAL SAMPLE LOCATION (FRANZ 2007)
  - BM07-1 (2007)
- BARREL CONTENT SAMPLE LOCATION (FRANZ 2008)
  - A2-BC08-1
- BARREL PAINT SAMPLE LOCATION (FRANZ 2008)
  - A2-BP08-1
- SURFACE WATER SAMPLE LOCATION (FRANZ/ECOMETRIX 2007/2008)
  - SW07-1 (2007), A2-SW08-1 (2008)

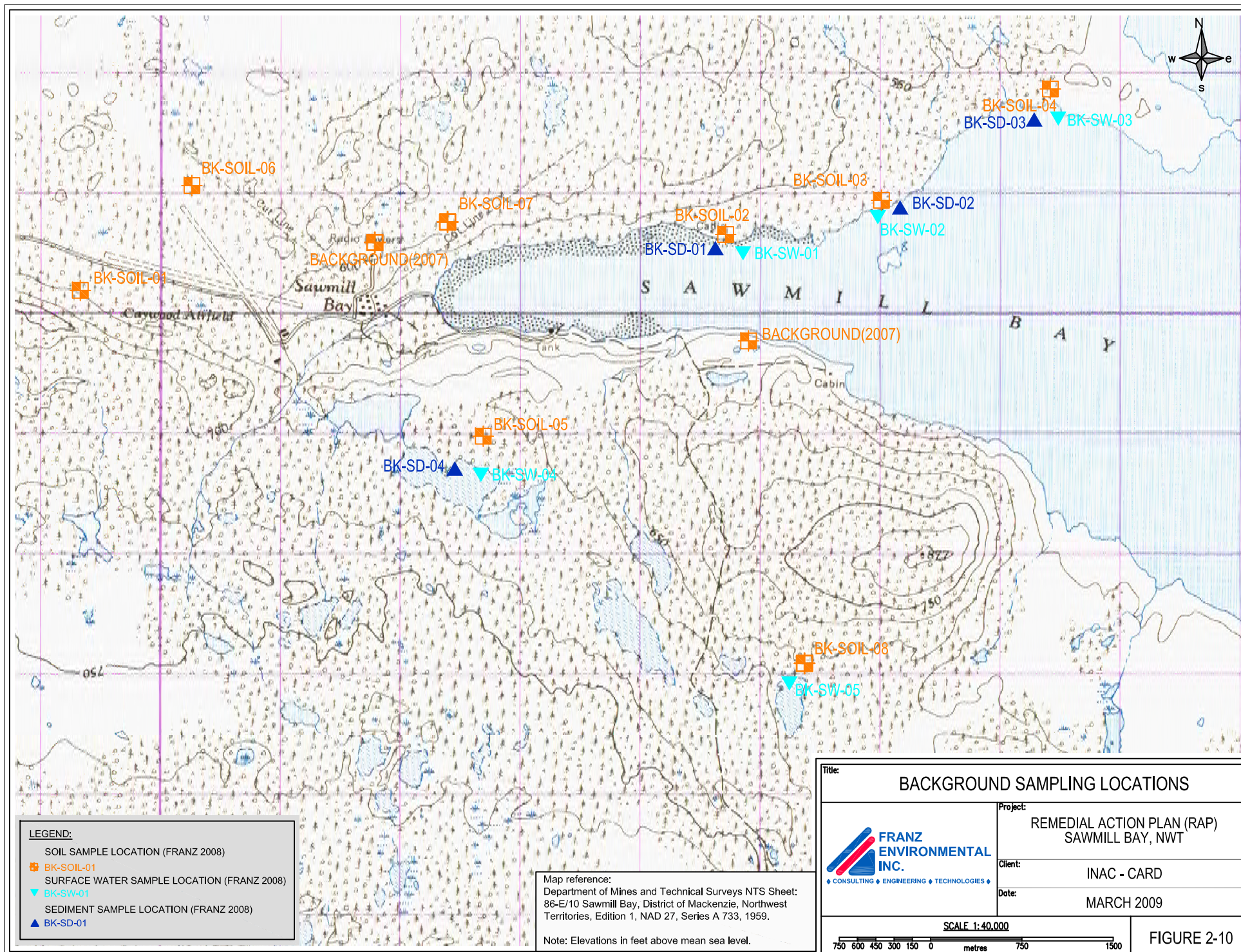
- GROUNDWATER SAMPLING INSTALLATIONS (FRANZ 2007)
  - MW07-1 (2007)
- PREVIOUS SAMPLE LOCATION (ESG RMC, 1996)
  - G78802
- EXISTING BUILDINGS/CONCRETE (SEE LIST BELOW)
  - VEHICLE
  - BARRELS
  - DEBRIS/DUMP SITES

TOPOGRAPHIC CONTOUR LINES (2 m contour Interval)

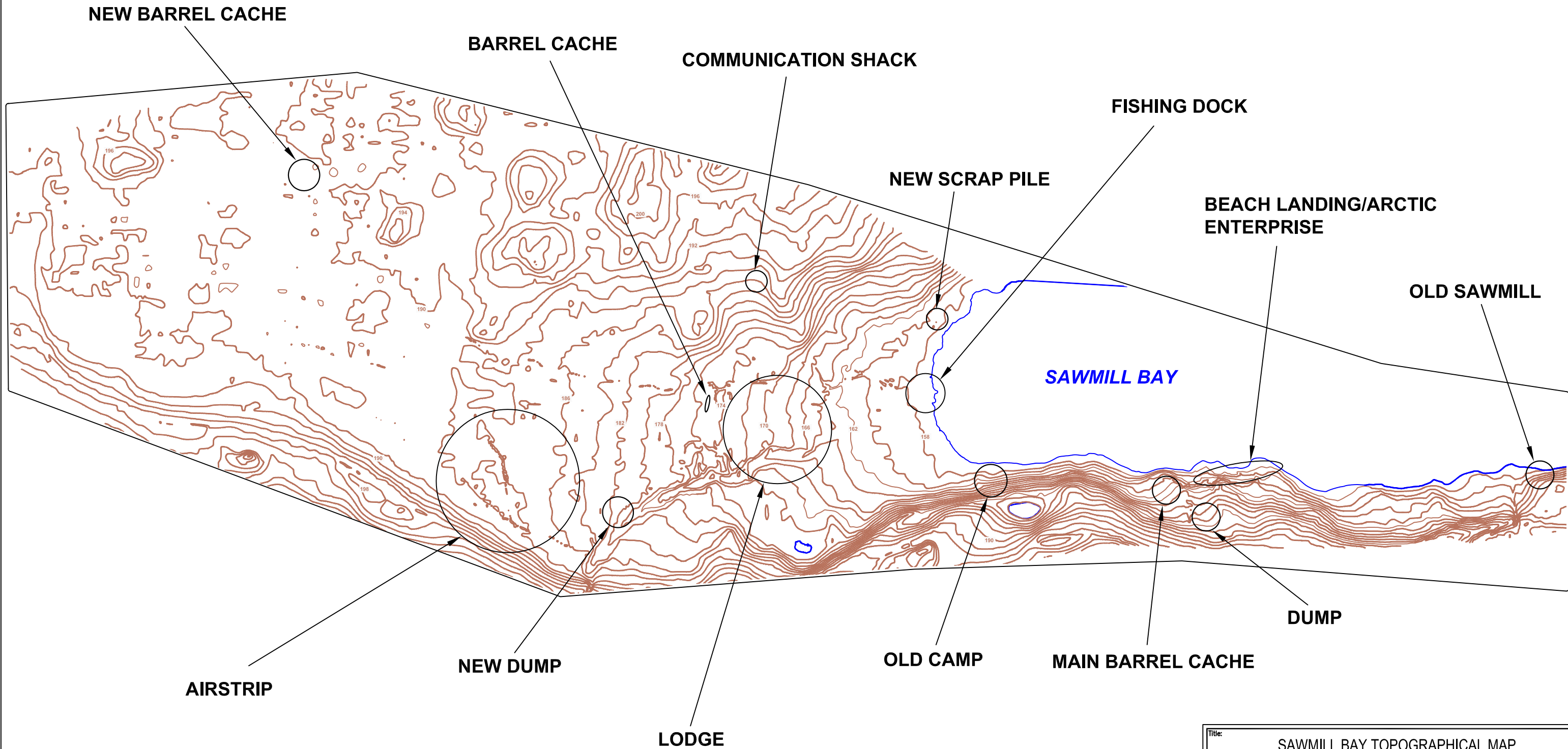
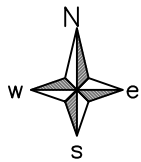
186

Title: OUTLYING AREAS CHEMICAL FEATURS AND INSTRUMENTATION	
 CONSULTING ♦ ENGINEERING ♦ TECHNOLOGIES ♦	Project:  SAWMILL BAY REMEDIAL ACTION PLAN (RAP)
Date:  MARCH 2009	Client:  INAC-CARD
SCALES AS SHOWN	
FIGURE 2-9	










**LEGEND:**

158      CONTOUR ELEVATION (METRES ABOVE SEA LEVEL)

NOTES:  
CONTOUR INTERVAL = 2 m  
LAKE ELEVATION/SHORELINE = 156 m

Title: <b>SAWMILL BAY TOPOGRAPHICAL MAP</b>	
 FRANZ ENVIRONMENTAL INC. CONSULTING • ENGINEERING • TECHNOLOGIES	Project: <b>SAWMILL BAY REMEDIAL ACTION PLAN (RAP)</b>
	Client: <b>INAC-CARD</b>
Date: <b>MARCH 2009</b>	
SCALE 1:13,000 250 200 150 100 50 0 metres 250 500	
<b>FIGURE 2-11</b>	