



**ASSESSMENT AND REMEDIATION OF ABANDONED MINING  
EXPLORATION SITES IN NUNAVIK**

**PROGRESS REPORT  
FOR YEAR 2005-2006 OF THE PROJECT**

**Kativik Regional Government  
Renewable Resources Department**

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## 1. INTRODUCTION

This progress report presents the activities carried out as a follow-up to the *Assessment and Prioritization of Abandoned Mining Exploration Sites in Nunavik* study conducted by the Kativik Regional Government (KRG) and the Makivik Corporation in 2001 and 2002. The study reveals that there remain 403 non-validated abandoned mining exploration sites in northern Quebec. Based on projections from the fieldwork, it is expected that an additional 7 major, 68 intermediate and 95 minor sites, based on the criteria adapted from the National Classification System for Contaminated Sites, will be located. The four-year contribution agreement will make it possible to complete the assessment of these sites. The methodology used will be that recommended in the March 2003 report.

Following the KRG's two-year inventory report recommendations, a remediation plan was prepared and conducted on one abandoned mining exploration site. The site KAW-35 located in the Schefferville area, on the shores of Blue Lake, has been validated and characterized as a major site with a high prioritization for remediation. Clean-up procedures were developed and equipment purchased to carry out the restoration of the site. This report presents the co-ordination of the work and describes all the remedial measures carried out on the site KAW-35 during July 2005. Considering the immediate threat to the environment of Blue Lake, this experimental project is a prelude to a more ambitious clean-up project of abandoned mining exploration sites found throughout the Northern Quebec territory.

Participants directly involved in the remedial measures of the site KAW-35 were contacted during spring 2005. The Naskapi Nation Council of Kawawachikamach, and the Innu Nation of Matimekush-Lac John, the air charter NORPAQ, which provided transportation logistics, soil remediation experts from the Ministère du Développement durable, Environnement et Parcs du Québec (MDDEP), Adoschaouna Naskapi Services suppliers for remedial measures equipment, and chemical products treatment centers were all informed and aware of the remedial project. The coordination of the pilot project for the major site KAW-35 involved a remediation team of six (6) people hired within the Naskapi community of Kawawachikamach and two (2) from Innu Nation of Matimekush-LacJohn for a total of ten (10) workers on site, including the project co-ordinator and the Environment Canada advisor. The remediation team, the project coordinator and environmental advisor from Environment Canada conducted a 20-day fieldwork campaign, from July 4<sup>th</sup> to July 23<sup>rd</sup> 2005, in order to safely and effectively remove hazardous materials from the site in accordance with applicable laws and regulations. During this first phase of the clean up work, the technicians received training and instructions on hazardous material handling as well as equipment operation. All of the hazardous materials and debris collected were transported by air charter and properly stored in the local northern community of Schefferville. The hazardous materials were then transported by train to an authorized hazardous waste management centre in southern Quebec.

The Economic Development Department of the Makivik Corporation communicated with the KRG in June 2005 concerning the intention of Cruise North Expeditions (CNE) to be involved in abandoned mining site remediation efforts in Nunavik. One of the more accessible sites (PJ-17) was designated and on September 9<sup>th</sup>, a voluntary team of 21 passengers of the CNE vessel got to the site and participated in the removal of hazardous materials and barrels. All the residual materials collected were brought on the vessel where they were stored until their final destination in St-John, Newfoundland,

for proper disposal. The KRG project coordinator was on-site to participate in the clean-up work and provide the proper tools and equipment in order manage the residual materials.

An up-date of the inventory of abandoned mining exploration sites was done in the Kangiqsujuaq-Salluit sector. Local informants indicated 125 potential abandoned mining exploration sites during the 2001-2002 assessment and a subsequent site assessment phase, carried out during summer 2005, consisted of validating the information regarding these potential sites. New orphan sites were identified with the collaboration of currently active mining exploration companies and organizations working in the area. The KRG also documented the cleanup efforts carried out by mining exploration companies working in Nunavik, particularly in the Salluit-Kangiqsujuaq sector. Anglo American Exploration Canada produced a report following the remedial work done on an abandoned site located close to one of their active exploration camps. Canadian Royalties Inc. also carried out cleanup activities on sites distributed on their mining properties.

In addition, a first edition of a guide called, *Cleaning and Handling Hazardous Products in Abandoned Mining Exploration Sites in Nunavik*, was produced with the collaboration of the MDDEP and has been distributed to the local communities of the region. One person at the MDDEP is now assigned for this file in order to bring technical assistance in the hazardous material handling and management in Northern Quebec. The objective of the guide is to ensure that the proper support is provided and proper procedures respected regarding the management and safe handling of hazardous materials during their removal from abandoned mining exploration sites. This guide and its subsequent editions are specifically addressed to the Nunavik communities concerned by the presence of contaminated sites located in their region.



## **2. CONTRIBUTION AGREEMENT**

On December 2004 a contribution agreement was negotiated and signed between the KRG and Environment Canada (EC). Before March 2008, both parties agree to develop an understanding by Inuit and First Nation peoples of the impacts of contamination on ecosystems as well as the capacity of Aboriginals to conduct such research, to complete the inventory and characterization of the abandoned mining exploration sites located north of the 55<sup>th</sup> parallel. The objectives of the agreement also allow the KRG to evaluate the impacts of the abandoned mining exploration sites and develop remedial measures to minimize those impacts to environment and public health. One crucial objective is to respond to the requests made by Inuit, Naskapi and Innu communities to assess environmental impacts of abandoned mining exploration sites in Northern Quebec.

## **3. REMEDIATION PILOT PROJECT AND REMEDIAL MEASURES**

This section presents the remedial measures carried out during the pilot project conducted on the KAW-35 site. It also provides a summary of the clean up work, performed during summer 2005, on other abandoned mining exploration sites located in Nunavik.

### **3.1 Site KAW-35**

The major site KAW-35, situated on the shores of Blue Lake at about 65 km E-N-E of Kawawachikamach community (Fig.1), was assessed during the KRG 2001-2002 inventory and was designated as a priority for cleanup according to the content of the material found, the level of contamination and the threat they posed to the surrounding environment. This site represented an excellent target to carry out a remediation pilot project and verify methodological procedures and remedial measures. Such an experimental project will be a prelude to a more ambitious clean-up project of abandoned mining exploration sites found throughout the Northern Quebec territory.

#### *Background*

La Fosse Platinum Group Inc. (LFPG) was the mining exploration company that began operating on the Blue Lake site in 1987 (Vachon et al.). LFPG began underground exploration in 1988, excavating a ramp of a projected length of 320 m at a depth of 50m. All ore and sterile material excavated were placed in stockpiles nearby the ramp entrance. The exploration camp held over forty (40) people working on the site and was comprised of various infrastructure and equipment. Three sectors were identified during the 2001-2002 KRG abandoned mining sites inventory. The sites include house trailers with equipment (beds, toilets, furnaces, water heater tanks, fire extinguishers etc.) and nine (9) others buildings containing different debris and hazardous materials. Approximately 1,000 barrels are found on the site, including six (6) full of hydrocarbons and at least 200 barrels containing residues. The characterization of the site resulted in a high prioritization in a perspective of remediation for public and environment

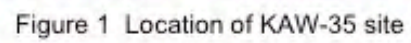


Figure 1 Location of KAW-35 site

Since LFPG was dissolved years ago and the site has been abandoned without any restoration, the Ministère des Ressources naturelles et de la Faune du Québec (MRNF) has jurisdiction over the site, given that it has been officially declared orphaned. In 2005, the MRNF signified to the KRG that it was prepared to contribute financially towards the completion of the abandoned mining exploration sites assessment project. An amount of 150,000\$ over the next three years was provided for the completion of the global inventory project and the realization of a pilot-project. The MRNF's first financial contribution for the initial phase of fieldwork was used exclusively for the pilot project, the co-ordination, the hiring of local human resources, the purchasing of equipment, the transportation of materials and general logistics that such a project entails.

#### *Coordination of remedial measures*

The remediation work plan was developed based on the KRG inventory done during 2001-2002, considering the hazardous materials and debris found on-site. The first phase of the remediation pilot project principally consisted of collecting and evacuating all the hazardous materials assayed on the site during the inventory. Another main objective of the clean up work was to remove as many barrels as possible within the project duration.

#### *Hazardous materials*

Barrels that still contained hydrocarbon (diesel and Jet-B fuel) residues were opened and their content transferred into good-condition barrels for removal from the site by floatplane. A total of 1,640 liters (eight (8) barrels) of diesel and 1,435 liters (seven (7) barrels) of Jet-B fuel were collected and removed from the site. Proper equipment and safe procedures were used while handling the barrels and transferring the hydrocarbons in new drums.

The remedial team also collected various hazardous materials scattered on the site. Along with the hydrocarbon residues contained in barrels, solvent products, batteries, HF acid containers, corrosive acids, oil filters, paints and spray cans were carefully removed, placed in safe containers, properly packaged and identified for their definitive removal from the site. All the hazardous material handling and packaging were done by or under the supervision of the scientist advisor of Environment Canada present on-site. Furthermore, dangerous materials were properly characterized and identified following Transport Canada regulations. Appropriate environmental remedial measures were carried out during every step of hazardous materials handling and management.

#### *Residual material (barrels)*

Once the barrels emptied, they were "de-headed", washed and decontaminated with a sodium carbonate/sodium metasilicate solution (VYTAC ACX product) and chemical absorbents. Then, the clean barrels were cut in half, stowed (4 to 6 barrels in one) and taken out of from the site by floatplane. Appendix A of this report presents pictures showing remedial measures undertaken for the handling of the barrels. A total of 426 empty barrels were moved out from the KAW-35 to the Adoschaouna storage site in Schefferville before being definitely transported to an authorized disposal centre in Montreal. All the hazardous and residual materials collected and removed from the KAW-35 site are listed in Table 1.

### *Soil sampling*

During the remediation project, the Environment Canada advisor systematically sampled potentially contaminated soil areas on the KAW-35 site. A total of 22 soil samples were collected on different locations likely to contain anomalous hydrocarbons concentrations ( $C_{10}$ - $C_{50}$ ) and APH (aromatic polycyclic hydrocarbons). Four (4) water samples were also collected in the lake, close to the lakeshore where piles of barrels were located for analysis.

Out of the 22 soil samples, only 5 samples showed significant contamination above regulation standards. Anomalous samples delineate two specific zones. The first zone (samples S-2, S-3) corresponds to the area under a generator where the assay results exceed the  $C_{10}$ - $C_{50}$  concentrations limit for an residential land use (Rf.: *Règlement sur la protection et la réhabilitation des terrains* du Gouvernement du Québec). The area around the generator floor was surveyed. It is suspected that an equivalent contamination level should be found not only around floor edges but also underneath the generator floor. If this is the case the contaminated surface is estimated to 48m<sup>2</sup> and soil remediation should be performed on this area during a following remediation phase of the pilot project.

The second contaminated area is located under the piles of barrels observed near the lakeshore. Three samples (S-6, S-8, S-9) collected near the site's dock showed traces of petroleum products (diesel, Jet-B fuel) contamination slightly above the limit for residential land use (Rf.: *Règlement sur la protection et la réhabilitation des terrains* du Gouvernement du Québec). The  $C_{10}$ - $C_{50}$  concentrations are higher a few centimeters deep in the soil than they are on the surface. The contaminated surface is limited and not continuous. It affects an area of approximately 20 m<sup>2</sup> and is strictly localized under the barrels observed on the lakeshore.

No trace of hydrocarbon concentrations has been detected in the water of the Blue Lake nor under the five (5) 4,400L reservoirs located along the trail leading to the mine and at the excavated gallery. During a previous soil sampling survey carried out in 2002 where scattered batteries were observed, no trace of metal concentrations had been observed either. The five anomalous soil samples numbers (S-2, S-3, S-6, S-8, S-9) locations and values for the 2005 survey on the KAW-35 site are presented in Table 2. The complete analysis report of the twenty-two (22) soil samples is presented in Appendix H. Analysis results of the four (4) water samples taken in the Blue Lake are also presented in the report; no anomalous trace of hydrocarbon was detected.

**TABLE 1**  
**Hazardous materials collected and evacuated from the Blue Lake (KAW-35) site**

Designation	UN identification	Quantity	Container
Hydrofluoric acid (4%)	UN 1790	12X500 ml	Sealed plastic container
Batteries (electrolytic acids)	UN 2794	3 X (2 ft <sup>3</sup> ) 2 X (1,5 ft <sup>3</sup> ) 5 X (1 ft <sup>3</sup> )	Wooden palette with chemical absorbents
Corrosive acid (liquid)  (NSA; identification impossible)	UN 3264	1X 4 L	Sealed plastic container
Paints	UN 1263	1 X 20L 2 X 4L	Original containers
Electrical detonator	UN 0267	1	No container
Spray cans  (1 X paint 2 X engine starting liquid 1 X NSA liquid 1 X paint solvent 1 X insecticide 1 X engine oil)	UN 1950	7 X 1L	Sealed plastic container
Diesel	UN 1202	8 X 205L	Metallic barrels
Gas	UN 1203	7 X 205L	Metallic barrels
<b><i>Other materials found on-site and evacuated</i></b>			
Oil filter		17	Sealed plastic container
Fire extinguisher		6	No container

**TABLE 2**  
**Assay results of soil samples collected on site KAW-35**

	<b>Sample #</b>	<b>Location (Long/Lat)</b>	<b>Description</b>	<b>Depth (cm)</b>	<b>Measured Parameter</b>	<b>Results (mg/kg)</b>	<b>Qty exceeding acceptable limit (mg/kg)</b>
	S-2	55.23244 N 66.12341 W	Underneath 4400 L reservoir (generator area)	0-5	C <sub>10</sub> -C <sub>50</sub>	3,200	700*
	S-3	55.23244 N 66.12341 W	Underneath 4400 L reservoir (generator area)	0-5	C <sub>10</sub> -C <sub>50</sub>  1,3 dimethyl-naphtalene	10,000  2,9	3,500**  1*
	S-6	55.23280 N 66.12109 W	Underneath pile of barrels (3 m from lake)	0-5	C <sub>10</sub> -C <sub>50</sub>	780	700*
	S-8	55.23280 N 66.12110 W	Underneath pile of barrels (5 m from lake)	3-5	C <sub>10</sub> -C <sub>50</sub>  1,3 dimethyl-naphtalene  2,3,5-Trimethyl-naphtalene	1,900  18  6,8	700*  10**  1*
	S-9	55.23280 N 66.12109 W	Under sample #6	5-10	C <sub>10</sub> -C <sub>50</sub>	1,100 and 740	700*

Measured parameters: Petroleum products (C<sub>10</sub>-C<sub>50</sub>), APH (aromatic polycyclic hydrocarbons).

\* Results exceeding the limit for residential land use (Rf.: *Règlement sur la protection et la réhabilitation des terrains* du Gouvernement du Québec).

\*\* Results exceeding the limit for residential and commercial land use (Rf.: *Règlement sur la protection et la réhabilitation des terrains* du Gouvernement du Québec).

### *Transportation, storage and elimination of hazardous materials*

All hazardous materials were transported out of the site by floatplane to Schefferville where they were temporarily and securely stored at the Adoschaoua site before being transported by train to a treatment centre in Montreal (Appendix A, photos 14-20). A *Shipper's declaration of dangerous goods* form was attached to the hazardous materials, in accordance with the applicable Dangerous Goods regulation.

An authorized treatment centre, Onyx Industries Inc., was contacted and informed of the nature and quantity of hazardous materials collected on the KAW-35 site. The materials left Schefferville by train to Sept-Îles and conveyed to the company's treatment centre in Montreal. Hydrocarbon residues contained in barrels were kept in Schefferville to be filtered and re-used by Adoschaoua as furnace combustible.



### *Study for the location of a potential non-combustible material deposit site.*

During the remediation pilot project, searches to find proper site to bury non-combustible material were conducted. Such a site must be, amongst other things, located at a minimal distance of 150m from any water sources and 500m of any water sources for human consumption. An appropriate site was located south-east of the Blue Lake camp (N 55° 23' 22.4", W 66° 12' 24.8"). The location of the deposit site complies with the *Règlement sur l'enfouissement et l'incinération de matières résiduelles, Section lieux d'enfouissement en milieu nordique, Loi sur la qualité de l'environnement, Québec, L.R.Q. c. Q-2 r.3.2.*

### *Project expenses*

Table 3 presents an account of the expenses related to the remedial pilot project carried out on the KAW-35 site, and in accordance to the conditions stipulated in the contribution agreement between KRG and EC for the 2005-2006 year of the project.

### *Recommendations*

Despite the clean up work carried out at the major site KAW-35 in July 2005, its remediation is not entirely complete. There are presently forty (40) barrels ready to be taken out by floatplane. Two hundreds (200) more barrels have also been left on site but have been properly piled on-site. These barrels still contain a certain amount of hydrocarbon residues that weren't removed during the July 2005 pilot project. A next phase of remedial measures should include the clean up of these residues and barrels as well. Many others barrels are scattered on two other identified sectors in the 2001-2002 KRG inventory report. These sectors are located more inland (Sector 2: N 55° 13.70' W 66° 07.42' and Sector 3: N 55° 13.65' W 66° 08.76' ). Hazardous products were also listed in these sectors during the 2005 pilot project and subsequent clean up efforts should include the removal and transportation of these materials to an authorized disposal centre. Table 4 provides the description of the hazardous materials found in these two sectors close to the KAW-35 site.

The condition of the buildings and dwellings observed on-site is poor, in deterioration and may eventually leads to issues of public health and safety. Unstable metallic antennas, suspended wires and unsafe trailers could pose a serious threat (Appendix B, photos 1-3). The second phase of remedial measures on the KAW-35 site should also involve the stabilization and/or demolition of these buildings and the dismantling of any hazardous wires and antennas. All metallic and non-combustible debris should be collected and gathered in the above-mentioned projected non-combustible materials deposit. Finally, combustible debris should be burned on site according to MENV regulations.

**TABLE 3**  
**Detailed expenditures for remediation pilot project on KAW-35.**  
**(period extending from July 4th to July 23rd 2005)**

<b>REVENUE</b>	
NEI income	\$19,000.00
MRNF income ( <i>pilot project and sites inventory</i> )	\$50,000.00
Naskapi Band Council	\$6,000.00
<b>Total revenues</b>	<b>\$75,000.00</b>
<b>EXPENDITURES</b>	
<b>Salaries</b>	
8 technicians@150\$/dayX20 days (incl. social benefits...)	\$24,467.14
Project co-ordinator	\$7,000.00
<b>Purchase of equipment</b> (camp materials...)	\$1,686.36
<b>Equipment rental</b> (tents, tools, generators, stoves...)	\$3,850.00
<b>Equipment storage</b>	\$200.00
<b>Supplies, groceries</b>	\$4,725.00
<b>Purchase of lumber</b>	\$1,850.00
<b>Misc.</b> (gloves, chain saw oil, repairs...)	\$529.12
<b>Fuel</b> (camp generator)	\$389.07
<b>Transportation logistics</b> (Transportation of workers, barrels and equipment including fuel costs)	\$14,693.31
<b>Transportation, shipping of hazardous material</b> (From Schefferville to Sept-Îles by train)	\$4,450.00
<b>Disposal of hazardous materials at treatment center</b>	\$1,484.40
<b>Travel expenses</b> (project co-ordinator)	\$2,179.64
<b>Report production</b> (including translation costs)	\$500.00
<b>Communications</b>	\$500.00
<b>Total expenditures</b>	<b>\$68,504.04</b>



**TABLE 4**  
**Remaining hazardous materials assessed at the Blue Lake (KAW-35) site**

Designation	UN identification	Quantity	Container
Batteries - electrolytic acids (Sector #3)	UN 2794	4 X (2 ft <sup>3</sup> )	No container
Terpinolene (deodorant cleaning product)	UN 2541	1 X 20L	Plastic container
Ethyl alcohol (Methyl hydrate P)	UN 1170	4 X 20L	Plastic container
Diesel oil	UN 1202	1 X 20L (half-full)	Plastic container

Other products to be removed and transported to a disposal centre.

Oil filters		6	No container
Calcium chloride (77%) Empty barrels (+residual debris)		7 bags X 40 kg approx. 200 barrels	Bags

### 3.2 Sites PJ-17, PJ-17A, PJ-18 (CNE-1)

During the period of September 9 to 13, 2005, the Cruise North Expeditions (CNE) with the cooperation and support of Makivik Corporation and the KRG took part in the cleaning of three different sites located in the Aupaluk area. The clean-up initiative was a voluntarily contribution from the CNE personnel, the R/V Ushuaia crewmembers and the corporate sponsors and passengers participating in the cruise expedition.

The site PJ-17, designated as a major site (KRG, 2001-2002) is located in the Hopes Advance Bay about ten kilometers north-west from the community of Aupaluk (Figure 2). This site well known by informants was the most accessible for the CNE cruise vessel due to its location near to the shore. Less than 5 kilometers east of PJ-17, the intermediate site PJ-17A presented another accessible site for the CNE clean-up crew. In addition, the voluntary team carried out the cleaning of one potential abandoned mining site not validated within the KRG's site assessment report but also located on the shore of Hopes Advance Bay. The site identified PJ-18 (CNE-1), is found at the west end of the bay. All hazardous and residual materials collected from the different sites were loaded onto the CNE vessel where they were securely stored and transported to in St-John, Newfoundland for proper disposal.

#### *Coordination of remedial measures*

The 21 passengers aboard the Cruise North Expeditions vessel completed the removal of all the barrels found on the site PJ-17A. The 64 empty barrels piled on a rock cap, 10 meters from Hopes Advance Bay, were transported aboard the CNE cruise ship.

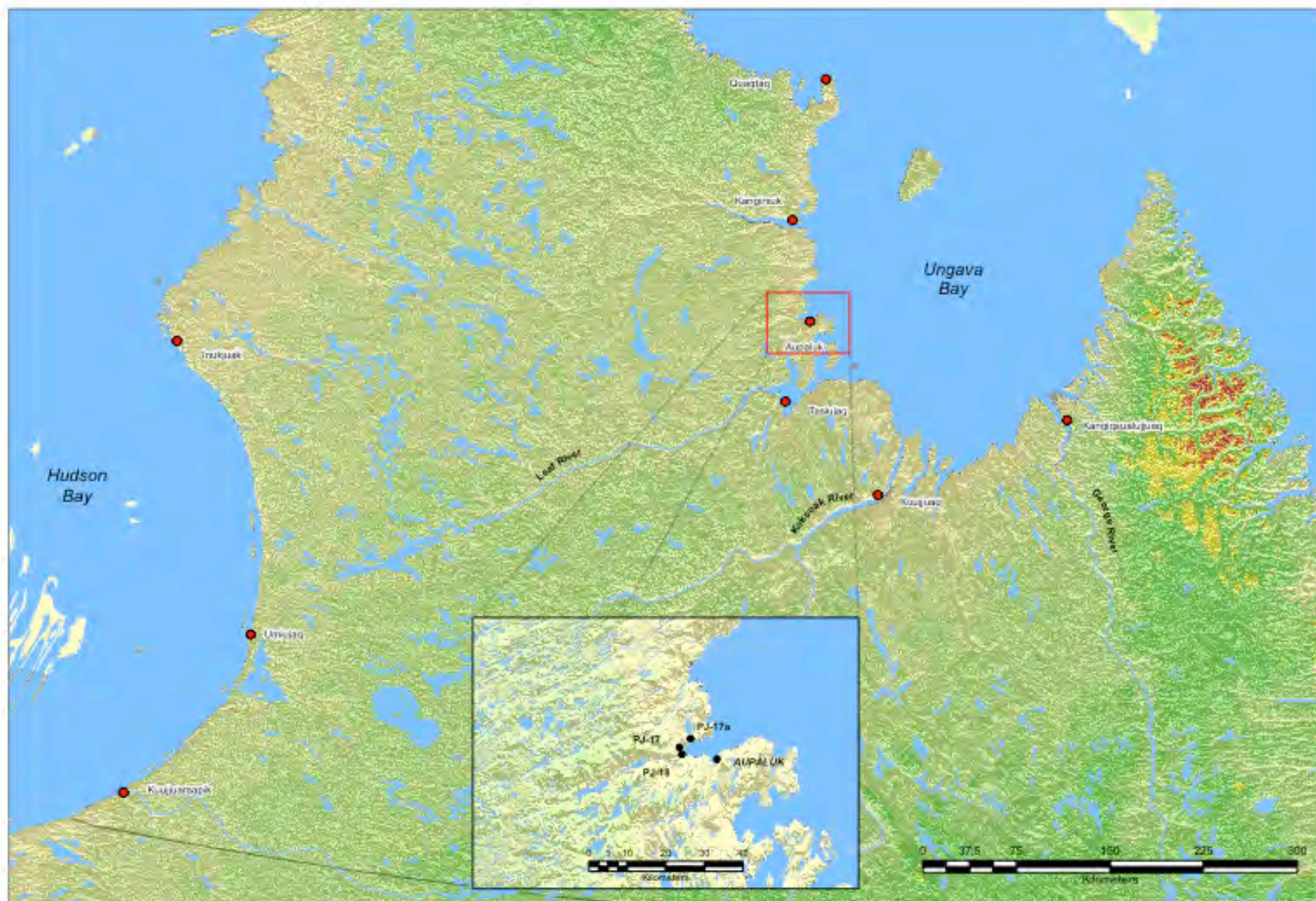


Figure 2 Location of PJ-17, PJ-17a and PJ-18 sites

The major site PJ-17 made up the exploration base of the Ungava Iron Ores Company, which was working in the area during the 1950's. The site contains two buildings, an electrical line and transformers, heavy equipment, barrel storages, scattered waste, including batteries, propane tanks and pails of grease. Soil contamination is visible inside the main building under barrels of diesel. The contaminated area is approximately 125 m<sup>3</sup>. Barrels found on-site contain diesel residues, which total an estimated 500 liters.

Taking into account the times and heights of the tides in the area, the clean-up team collected scattered residual materials into eight (8) different piles on the site. The team also removed 46 barrels, 11 electrolytic batteries, 7 propane tanks and various waste materials (1 full 205-litre barrel) away from the PJ-17 site. In addition, a total of 15 empty fuel drums (3 of which were cut and stowed inside 2 empty drums) and 3 propane tanks (1 full) were moved down the access road to shoreline. These materials could not be loaded onto the ship due to low tides and were left on the shores, away from the high tides, for future collection.

During the CNE clean-up team operations, a non-validated site, PJ-18 (CNE-1) was identified and assessed. The site contains old buildings and a significant amount of waste materials scattered around the area. Steel pipes, motor oil containers, aerosol cans, kerosene heaters and other types of hazardous materials were reported by the clean-up team. About 95% of the debris was collected into one large pile (approximately 3 m<sup>3</sup>). The team could remove from the site eight (8) barrels, which three (3) contained diesel residues. Steel antenna sections and 1 m<sup>3</sup> of waste material were collected and packed in an empty barrel. The Table 5 presents a list of all the residual materials collected by the CNE team on the three different sites in the Aupaluk area. Pictures of the clean-up work carried out on the three different sites are presented in Appendix C.

The remedial project realized by CNE proved the volunteer program effective in the clean up of abandoned mining sites located in Nunavik. This year, CNE brought a considerable contribution for the cleaning of the abandoned sites in the Aupaluk sector. CNE wishes to reiterate the experience over the next years, developing a multi-year program with the support of additional corporate sponsors and concerned institutions to complete the remedial work for the three above-mentioned sites.

**TABLE 5**  
**Hazardous and residual materials collected from PJ-17 and PJ-17a sites**

Designation	Quantity	Notes
205 L barrels	110	4 barrels with diesel residues
Batteries (electrolytic acids)	11	
Propane tanks	7	2 partially full of propane
Metal debris, misc.		collected in one 205 L barrel

**Residual materials collected and evacuated from PJ-18 (CNE-1) site**

Designation	Quantity	Notes
205 L barrels	8	3 with diesel residues
Metallic antenna	9	sections of 8 to 12' long
Metal debris, misc.		collected in three 205L barrels

### 3.3 Site SW-55

During June 2005, Anglo-American Exploration Canada (AAEC) re-activated their temporary mining exploration camp (Belanger) in the Kangiqsujaq-Salluit sector. The camp management team reported to the KRG barrels, which contained hydrocarbons, at the abandoned mining site SW-55 located within the mining properties of AAEC, on the shores of a lake (UTM 508727 E, 6806791 N), two kilometers west of Duas Lake.

The site SW-55, previously classified as a minor site with less than 15 barrels, included in fact more than 100 barrels from which hydrocarbon leaks were considered to be imminent, thus posing an important threat to the environment. All possible leaking drums were immediately confined by AAEC; the hydrocarbon fluids were transferred to safe hermetic barrels. A total of 30 drums of fuel (6 diesel, 24 gas) and 75 empty barrels and propane cylinders were removed from the site by helicopter to AAEC's Belanger camp for proper storage and eventual transportation to authorized disposal centre. Materials such as aluminum tent structures and wooden platforms are now the only debris left on the site.

Appropriate environmental remedial measures and procedures were followed by AAEC to carry out the SW-55 site clean up. Proper equipment and safety procedures were used while handling the barrels and transferring the hydrocarbons in new drums. AAEC's clean up work report is presented in Appendix D.

### 3.4 Site NEW-1

During 2004 fall season, Qekeirriaq Landholding Corporation of Akulivik and Anglo-American Exploration Canada validated an abandoned site located about 75 kilometers east of Akulivik. The site was classified as a major site and designated as NEW-1 in the KRG progress report, *Assessment and remediation of abandoned mining exploration sites in Nunavik* produced in March 2005. Inscriptions found on the barrels indicated that they had been brought in the Akulivik sector during a geodesic survey of Natural Resources Canada (NRCAN) in 1984.

The Geodetic Survey Division of NRCAN was contacted by the KRG in June 2005 in order to inform them about the presence of materials left on the site and to discuss their eventual removal. The Environmental Management office of NRCAN contacted the community to let them know their intention of removing the material and cleaning up the site within the year. The NRCAN Environmental Office also ensured that the community would be directly involved in the remediation of the site by contracting out the removal of the abandoned materials.

## 4. ABANDONED SITES INVENTORY UP-DATE

The following section describes the up-dated information on potential abandoned sites and the status of assessed abandoned mining exploration sites in the Kangiqsujuaq-Salluit, Kangirsuk-Aupaluk, Kuujuaq and Kawawachikamach sectors. The coding for the potential sites (SW-24, K-1...) originates from the 2002 GETIC group inventory report. Each code represents the informant's village abbreviation or map NTS (National Topographic System) code followed by a chronological number. The potential site locations and coding of the GETIC report correspond accurately to the locations designated by the informants during the two-year inventory project conducted by the KRG.

With the help and collaboration of organizations working in Nunavik and currently active mining exploration companies, particularly in the Kangiqsujuaq-Salluit sector (also known as the Ungava Trough), a preliminary validation of some potential abandoned sites was conducted (Rf.: Kativik Regional Government, Progress report, March 2005). The up-dated information was mostly related to the sites located within or around the properties and exploration camps where the companies are operating. Charter companies, which flew over the targeted area, were also contacted to confirm the existence of these potential sites.

The *Validated potential mining exploration sites in Nunavik* maps (Map 1-4 in Appendix E) show the distribution of the abandoned mining exploration sites indicated by informants in the different sectors. During the Summer 2005, the validation and updating activities continued and new confirmed sites were indicated by different organizations. The mining exploration companies, governmental organizations, and charter companies involved for this include:

- **Environmental Services of Raglan**
- **Falconbridge-Noranda Ltd., Exploration Department**
- **Novawest Resources Inc.**
- **Anglo-American Exploration Canada**

- **Canadian Royalties Inc.**
- **Nunavik Rotors**
- **Cruise North Expeditions**
- **Ministère des Ressources naturelles et de la Faune du Québec**

### **Kangiqsujaq-Salluit sector**

On September 19<sup>th</sup> 2005, during a visit by a KRG representative to the Canadian Royalties (CR) exploration camps, several areas were flown over and validated as abandoned mining exploration sites. Other sites assessed as potential abandoned proved to be active mining exploration sites. The validated abandoned sites descriptions listed in the next table are not exhaustive. A more comprehensive characterization and prioritization of these sites are still to be done, in order to identify and evaluate the quantity of debris, the hazardous material residues and soil contamination that may be present on-site.

Nine (9) potential sites were visited within an area delineated by the CR exploration camps in the Salluit-Kangiqsujaq sector. The sites include the intermediate site I-14 and the minor site P-35H11-8 (Map 1), which mainly contain barrel piles, propane tanks, drilling equipment and old exploration camp debris (Appendix F). The minor sites corresponding to P-35H12-14 and P-35H12-16 comprise an old drill platform and contain less than 20 barrels. Located less than 5 kilometers west of the latter sites, obsolete drilling equipment is found on sites K-42 and K-45. The intermediate site I-8, situated close to CR's Mequillon exploration camp, contains about 100 empty old and recent barrels gathered in one large pile. The barrels are to be collected and removed by CR once their exploration survey and drilling activities are completed. One new intermediate site, identified as NEW-4 (Map 1), was observed. The site is located 2 kilometers north of the site P-35H12-14 and contains about 50 barrels left on the shoreline of a lake. Finally, the validation of the potential site K-30 corresponds to an abandoned site located about 3 kilometers north-west of the major site K-61. The site K-30 couldn't be visited and assessed, but debris and piled barrels could be seen from a distance and evaluated as an intermediate site. Classification of validated potential abandoned sites, descriptions and locations are provided in the following Table 6.

#### *Up dated status of sites located on Canadian Royalties inc. mining properties.*

On November 2<sup>nd</sup> 2005, CR came to Kuujuaq to meet with KRG representatives to present the company profile and its mining exploration activities in Nunavik. During the presentation, CR provided updated information regarding clean up efforts carried out on orphan sites located on their mining properties for the period of the 2005 exploration campaign.

In addition to the major abandoned exploration camp site identified K-61 (rehabilitated by CR as their active Expo camp), barrels, heavy equipment and debris assessed in nearby sites were brought to the Expo camp or gathered in piles. A series of minor and intermediate abandoned sites distributed within CR mining properties were partially cleaned. Barrels, drilling equipment and debris have been collected and properly piled in central, accessible locations to facilitate their eventual definite removal. The Table 6 also lists the abandoned sites where CR carried out clean up work.



**TABLE 6**  
**Up-dated information on potential abandoned mining exploration**  
**sites in Kangiqsujaq-Salluit sector**

Site code	Location					Classification	Description
	Map	Grid	Zone	Coordinates			
I-8	35H12	UTM	18	567450E	6820610N	intermediate	>100 barrels to be removed by C-R
K-30	35H12	UTM	18	580592E	6826868N	intermediate	Barrels, debris, drilling equipment
P-35H11-8	35H11	UTM	18	595320E	6826760N	minor	18 piled barrels
P-35H12-14	35H12	UTM	18	571000E	6820000N	minor	Less than 20 barrels
P-35H12-16	35H12	UTM	18	578730E	6823840N	minor	less than 20 barrels, drill platform
NEW-4	35H12	UTM	18	570340E	6821625N	major	~50 barrels
SW-55	35G06	UTM	18	508025E	5806367N	cleaned	75 empty and 30 full barrels, propane cylinders, camp debris.

**Abandoned sites partially cleaned by Canadian Royalties inc.**

I-14	35H11	UTM	18	595000E	6827300N	intermediate	55 barrels, propane tanks, metal debris, 1 jerry can, wood debris.
K-41	35H12	Long/Lat	18	73 44.74' W	61 30.79' N	minor	13 barrels gathered in one pile (with KAN-42)
K-42	35H12	UTM	18	566399E	6819079N	minor	Drilling equipment (hoses)
K-45	35H12	UTM	18	566633E	6819397N	minor	Drilling equipment (hoses)
KAN-2	35H12	Long/Lat	18	73 31.11' W	61 32.51' N	intermediate	Gathered drill equipment, barrels, debris
KAN-4	35H12	Long/Lat	18	73 40.18' W	61 30.92' N	intermediate	75 collected barrels

**TABLE 6 (cont'd)**  
**Up-dated information on potential abandoned mining exploration**  
**sites in Kangiqsujaq-Salluit sector**

**Abandoned sites partially cleaned by Canadian Royalties inc.**

Site code	Location						Classification	Description
	Map	Grid	Zone	Coordinates				
KAN-5	35H12	Long/Lat	18	73	45.28' W	61 30.19' N	minor	>60 barrels, wood platforms, 2 propane tanks
KAN-8	35H12	Long/Lat	18	73	45.45' W	61 30.55' N	minor	30 barrels collected
KAN-10	35H10	Long/Lat	18	72	49.3' W	61 31.58' N	intermediate	1 dwelling, 25 barrels, 1 propane tank, debris

**Active mining exploration sites in the Salluit-Kangiqsujaq sector.**

Site code	Location						Classification	Description
	Map	Grid	Zone	Coordinates				
K-61	35H11	Long/Lat	18	73	27'06" W	61 33'16" N	active site	C-R Expo camp
K-24	35H11	UTM	18		590033E	6833906N	active site	C-R Blue Lake camp
K-28	35H11	UTM	18		591290E	6822119N	active site	C-R Mesamax drilling site
P-35H12-13	35H12	UTM	18		566399E	6819079N	active site	C-R Mequillon camp
P-35G08-1000	35G08	UTM	18		528080E	6817080N	active site	Novawest camp
WB-9	35G07	UTM	18		524480E	6812920N	active site	C-R Kenty Lake camp
SW-44	35G08	UTM	18		528000E	6811640N	active site	C-R Kenty drilling site
SW-40	35G06	UTM	18		495280E	6801800N	active site	Anglo-American Belanger Lake camp



Seven potential and designated abandoned sites visited in the Kangiqsujuaq-Salluit sector and located on CR mining properties proved to be active mining exploration sites. These active sites correspond to mining exploration camps or exploration drilling sites and are also listed in Table 6 and located on Map 1 (Appendix E).

### **Kangirsuk-Aupaluk sector**

One potential abandoned site located in Hopes Advance Bay, in the Aupaluk area, was validated and classified as an intermediate site in September 2005. The site, identified as PJ-18, was part of an initial clean up effort initiative led by Cruise North Expedition (see previous section). Additional remedial measures on site PJ-18 (CNE-1) should be performed in 2006.

In the Kangirsuk area, the potential site G-24M/16-1 (Appendix E, Map 2) was validated as an intermediate site that contains approximately 100 empty barrels collected in one pile. The site was observed and confirmed by the KRG Parks Section crew during a helicopter journey, on September 23<sup>rd</sup>, 2005. The description and locations of the validated sites in Kangirsuk-Aupaluk sector are listed in Table 7.

### **Kuujuaq-Tasiujaq sector**

Map 3 (Appendix E) shows the location of potential abandoned mining exploration sites and the location of two confirmed abandoned sites observed in the Kuujuaq-Tasiujaq sector. The validation of the site P-24E/16-1 was transmitted by the KRG Land use Planner, on a helicopter visit west of Kuujuaq, during August 2005. The minor site, located on the east shore of Lake Imbeault, contains about 20 empty scattered barrels, a few propane tanks and camp wood debris.

Another site located on the shore of Lake Gerido, approximately 75 kilometers west of Kuujuaq (Appendix E, Map 3), was validated as an intermediate abandoned site. The site P-24F13-5 comprises camp debris, core boxes and about 50 empty barrels that are scattered near the lake shoreline (see Appendix F for picture 11). Approximately 30 barrels full of fuel are still on-site. Informants from Nunavik Rotors communicated that all the barrels will be collected and re-used within upcoming mining activities during summer 2006. Table 8 presents the description of the debris and materials observed on both validated sites.

### **Kawawachikamach sector**

A new abandoned mining exploration site (NEW-6) was reported by representatives of the Ministère des Ressources naturelles et de la Faune (MRNF), Secteur Faune Québec. The site situated on Lake Leber (Appendix E, Map 4) is classified as a major site as it contains over 250 barrels (some piled near the shoreline), a 4,400 litre fuel tank, metal and wood debris. Table 9 presents the location and a brief description of the site NEW-6.

The classification of the validated abandoned sites is based mainly on general descriptions given by the informants or companies on the number of buildings, materials and debris observed. Available pictures of some sites also help to assess the nature and quantity of debris and to classify the sites (see Appendix F). Once again, a more thorough assessment of these validated sites will have to be carried out in order to

**TABLE 7**  
Up-dated information on potential abandoned mining exploration  
sites in Kangirsuk-Aupaluk sector

Site code	Location					Classification	Description
	<b>Map</b>	<b>Grid</b>	<b>Zone</b>	<b>Coordinates</b>			
PJ-18 (CNE-1)	24N05	UTM	19	456900E	6575500N	intermediate	< 20 barrels, hydrocarbons residues, spray cans, dwellings, metal debris
G-24M/16-1	24M16	UTM	19	443700E	6644050N	intermediate	>50 barrels in a pile

**TABLE 8**  
Up-dated information on potential abandoned mining exploration  
sites in Kuujuaq sector

Site code	Location					Classification	Description
	<b>Map</b>	<b>Grid</b>	<b>Zone</b>	<b>Coordinates</b>			
P-24F13-5	24F13	UTM	19	459600E	6427000N	intermediate	50 empty barrels, 30 full barrels, camp debris
P-24E/16-1	24E16	UTM	19	429055E	6419850N	minor	20 barrels, <10 propane tanks, camp debris

**TABLE 9**  
Up-dated information on potential abandoned mining exploration  
sites in Kawawachikamach sector

Site code	Location					Classification	Description
	<b>Map</b>	<b>Grid</b>	<b>Zone</b>	<b>Coordinates</b>			
NEW-6	23N01	Lat/Long	19	55	11'40" N 68 06'50"W	major	250 barrels, 4400L tank, camp and metal debris

characterize and accurately categorize them following the criteria used for the classification and prioritization of abandoned mining sites (Kativik Regional Government, 2003).

## **Recommendations**

The newly validated abandoned mining exploration sites should comprise a more precise description and characterization. Detailed pictures along with an accurate inventory of the nature and quantity of materials, equipment, as well as the estimated volume of contaminated soil on each site would allow their classification, their prioritization and ultimately, the development of an efficient large-scale remedial measures methodology.

Furthermore, the assessment and validation of the potential abandoned mining exploration sites is not complete since many other locations indicated by informants haven't been visited yet. A follow up of the assessment should focus on the remaining potential sites within the next year of the project according to the contribution of agreement between the KRG and the NEI. A systematic aerial survey of these remaining potential sites would allow a more comprehensive and complete database.

## **5. UPCOMING ACTIVITIES-SCHEDULE FOR YEAR 3 (April 1, 2006- March 31, 2007)**

The following activities will be undertaken during Year 3 of the project :

- Continuation of remedial measures on site KAW-35;
- Continuation of remedial measures on site PJ-17, PJ-17a, PJ-18;
- Assessment of the remaining major and intermediate sites as well as the minor sites not included in the 2001 and 2002 projects;
- Transportation of materials and debris from sites to accessible authorized disposal centers;
- Production of progress report describing site re-assessment and remedial measures including compilation of all debris, removed and remaining, hydrocarbons collected, records of impacts, operations costs, pictures and recommendations;
- Production of a report recapitulating designated and newly validated sites, remedial measures, cleaned sites, participants involved and recommendations for upcoming remediation projects on other abandoned mining exploration sites.

The Table 10 presents a preliminary account of expenditures for the Year 3 of the project (April 1<sup>st</sup>, 2006 to March 31<sup>st</sup>, 2007).

**TABLE 10**  
**Preliminary account of expenses for Year 3 of the project**  
**(April 1st, 2006 to March 31st, 2007)**

<b>REVENUE</b>	
Revenue Northern Ecosystems Initiative	\$50,000.00
Revenue Ministère des Ressources naturelles et de la Faune du Québec (MNRFAQ)	\$50,000.00
<b>Total revenues</b>	<b>\$100,000.00</b>
<b>EXPENDITURES</b>	
<i>Blue Lake remedial pilot project (Phase II-summer 2006)</i>	
<b>Salaries</b>	
Community technicians	\$20,000.00
Coordinator	\$7,000.00
<b>Purchase equipment and storage</b>	\$2,000.00
<b>Rental of equipment</b>	\$4,000.00
<b>Supplies</b> (groceries)	\$7,000.00
<b>Training costs</b>	\$1,500.00
<b>Transportation logistics</b> (team, equipment and materials from the :	\$15,000.00
<b>Transportation of hazardous materials to treatment centre</b>	\$2,000.00
<b>Disposal of hazardous materials</b>	\$2,000.00
<b>Coordinator travel expenses</b> (airfare, lodging, expenses)	\$4,000.00
<b>Report production</b> (including translation costs)	\$1,000.00
<b>Communication</b>	\$500.00
<i>Update of abandoned mining exploration sites inventory</i>	
<b>Salaries</b>	
Co-ordinator	\$5,000.00
Technical assistants	\$5,000.00
<b>Helicopter airfare</b> (sites assessment)	\$20,000.00
<b>Travel expenses</b> (airfare, lodging)	\$2,500.00
<b>Report production</b> (including translation costs)	\$1,000.00
<b>Communication</b>	\$500.00
<b>Total expenditures</b>	<b>\$100,000.00</b>

## **6. PRACTICAL GUIDE FOR REMEDIAL MEASURES ON ABANDONED MINING EXPLORATION SITES**

A contact person, Mr. Mathieu Marchand, was assigned by the Regional Direction of the MDDEP to provide information and assistance to the KRG regarding hazardous and residual materials management. Mr. Marchand will also provide comments and bring certain clarifications to the content of the practical guide (see Appendix G) distributed by the KRG Renewable Resources Department to the communities of Nunavik.

A second edition of the guide will be produced in 2006, in order to inform and transfer knowledge to local communities on how to properly and safely manage and handle hazardous materials found on such sites. The main objectives of the guide distributed to Northern Quebec communities are:

- To carry out safe and effective remedial measures of abandoned exploration mining sites in accordance with applicable laws and regulations;
- To reduce threats to the fragile arctic ecosystem, particularly where it impacts the food chain and human health;
- To remove as much debris and hazardous materials from the land as environmentally and logistically feasible. Any debris left from mining exploration activities counters Inuit and Naskapi respect for the land;
- To treat contaminated areas with the help of experts in order to restore their bio-diversity and life;
- To transfer an expertise, build capacity and to bring support to concerned communities in the coordination, the prioritization and the carrying out of remedial efforts;

## 7. LITERATURE

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## **APPENDIX A**

**Pictures of remediation pilot project  
at site KAW-35**



Picture 1. Barrels pile near the lakeshore.



Picture 2. Scattered barrels on site KAW-35.



Picture 3. Batteries and debris near lake.



Picture 4. Barrels “deheading” station.



Picture 5. Electrical barrel “deheader”.



Picture 6. Manual barrel “deheader”.





Picture 7. Hydrocarbon transfer, decontamination and washing station.



Picture 8. Cutting barrels



Picture 7. Stowed barrels.



Picture 8. Loading empty barrels on floatplane.



Picture 9. Loading barrels into floatplane.



Picture 10. Remaining barrels properly piled.





Picture 11. Clean up result on Blue Lake shores (see picture 1).



Picture 12. Lakeshore sector, contaminated soil sampling station.



Picture 13. Generator sector, contaminated soil sampling station.



Picture 14. Empty barrels (426) collected on site KAW-35.



Picture 15. Hydrocarbons residues collected on site KAW-35.



Picture 16. Secure storage of hazardous materials in Schefferville.



Picture 17. Proper identification and labeling of hazardous materials collected. (HF acid 4%, UN 1790, 12X500ml)



Picture 18. Extinguishers collected from site KAW-35.



Picture 19. Paint related products (UN 1263).



Picture 20. Corrosive acids (UN 3264) and oil filters securely stored in Schefferville before definitive disposal.

## **APPENDIX B**

**Pictures of remaining material and installations  
at site KAW-35**





Picture 1. Trailers and debris on site  
KAW-35.



Picture 2. Hazardous metal and wood  
debris.



Picture 3. Hazardous suspended wires.



Picture 4. Waterheater inside trailer.



Picture 5. View inside one trailer.



Picture 6. Damaged structures of trailer.



Picture 7. View inside office trailer.



Picture 8. View inside room of a dormitory trailer.



Picture 9. Various debris in dormitory trailer.



Picture 10. Inside kitchen trailer.





Picture 11. Fairly good-condition building on site KAW-35.



Picture 12. Generator houses and debris on site KAW-35.



Picture 13. Various debris left on sector # 2 (mine tailings in background).



Picture 14. 4,400 L tank and residual materials on sector #2.



Picture 15. Scattered empty barrels observed inland.



Picture 16. Scattered empty barrels and buildings on site KAW-35.



Picture 17. Various debris and chemical products inside one of the van trailer (sector #3).



Picture 18. Debris and materials inside second van trailer (sector #3).



Picture 19. Empty barrels and dwelling in lake (south end of Blue Lake).



Picture 20. Propane cylinder in southern discharge of the Blue Lake.



## **APPENDIX C**

**Pictures of remedial measures at  
sites PJ-17, PJ-17a and PJ-18**



Picture 1. Site PJ-17 (dwellings in background)



Picture 2. Collapsed building and empty barrels (site PJ-17)



Picture 3. Empty barrels on site PJ-17.



Picture 4. Empty barrels handling.



Picture 5. Electrical barrel “deheader”.



Picture 6. Cutting barrels.



Picture 7. Stacking empty barrels in one another.



Picture 8. Moving empty barrels to shoreline for evacuation.



Picture 9. Loading barrels in zodiac.



Picture 10. Metallic debris gathered in piles.



Picture 11. Remaining empty barrels on site PJ-17.



Picture 12. Barrels and debris collected.





Picture 13. Truck and debris inside garage.



Picture 14. Remaining equipment and debris on PJ-17.



Picture 15. Site PJ-17a



Picture 16. Dwellings and infrastructures on PJ-17a.



Picture 17. Removal of metallic antenna on site PJ-17a.



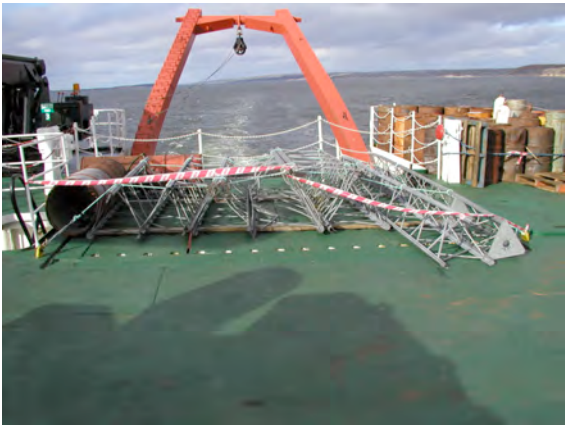
Picture 18. Removal of empty barrels from site PJ-17a.



Picture 19. Site PJ-18 (CNE-1).



Picture 20. Residual materials and debris collect on PJ-18.



Picture 21. Residual materials loaded onto CNE cruise vessel.



Picture 22. Empty barrels and propane cylinders collected from sites PJ-17, PJ-17a and PJ-18.

## **APPENDIX D**

### **Report on the Clean-up Work of the Abandoned Camp near Lac Dumas, Nunavik, Québec**

**Report on the Clean-up Work of the  
Abandoned Camp near  
Lac Dumas, Nunavik, Québec**



**October 20, 2005**

## **Introduction**

This report summarized the events that lead up to and the efforts Anglo American Exploration (Canada) Ltd. (AAEC) undertook to clean-up a historical fuel cache located at an abandoned campsite near Lac Dumas, Nunavik, Québec. The reported state and location of the rusted fuel drums, abandoned since the mid 1980's, prompted the Québec Ministry of Renewable Resources as well as the QC Ministry of Natural Resources, Wildlife and Parks to request of AAEC to aid in the evaluation and clean-up of the site during the summer 2005 exploration program.

## **Background**

On April 22, 2005, Anglo American Exploration (Canada) Ltd. (AAEC) and Goldbrook Ventures Inc. (GBK) entered into an Option and Joint Venture Agreement whereby AAEC may earn an interest in GBK's Belanger and Nuvilik properties, Cape Smith Belt, Nunavik, Québec. Since after the signing of the Agreement, AAEC became the operator of the 2005 exploration program for the Belanger and Nuvilik properties, and that the old fuel cache was reported to lie upstream from the Belanger exploration camp, it was in AAEC's best interest (and the environments) to evaluate the status of the site and if warranted, attempt to mitigate the situation.

In mid May 2005, AAEC's Manager of the Goldbrook Project (and author of this report) first became aware of a potential environmental problem with the abandoned camp from a contractor who had worked in the immediate area during 2004 while employed by Goldbrook Ventures Inc. Verbal reports were that an old Québec government camp (circa mid 1980's), located near Lac Dumas, contained several old drums of fuel that were in poor condition and that they posed a potential threat to local water courses.

In early June, the Project Manager received a copy of some email correspondence between the then Mayor of Salluit (Michael Cameron) and Jean-Marc Séguin, Project Manager with the Québec Department of Renewable



Resources – Kativik region, describing the location of and current state of the site. The email notes that the fuel drums were stamped with “Mines Québec – 1984” and that this department was attempting to acquire funding from the QC Ministry of Natural Resources for a general clean-up.

In July 2005, a letter from the QC Ministry of Natural Resources was received by Jamie Lavigne, VP Exploration for Goldbrook Ventures Inc., requesting of Goldbrook, the current registered claim holders on which the site lies, to “...transfer(s) the hydrocarbons into new barrels...”. This letter was passed to the Goldbrook Project manager in August 2005.

On Monday September 12, the Project Manager received a phone call at the Belanger exploration camp from Ms. Michele Gauvin of the QC Ministry of the Environment to discuss the condition of the site and our plans for remediation. Ms. Gauvin was provided with a verbal update and was assured that a written account of the clean-up effort would be distributed when completed.

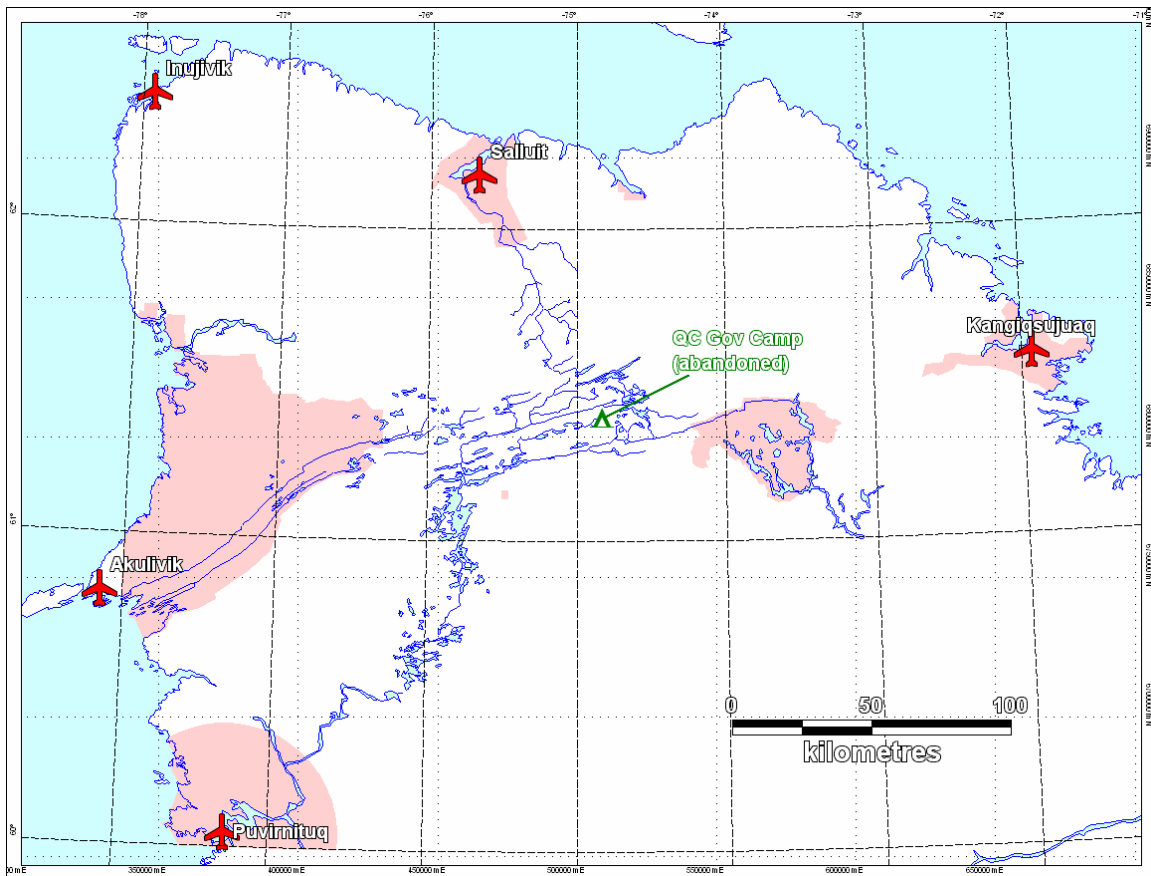
### **Location**

The abandoned historical campsite and fuel cache are located approximately 100km SE of Salluit and 12km NE of the Belanger exploration camp at longitude -74° 49' 32", latitude 61° 23' 51" and 6 807 087N & 509 319E (UTM Zone 18, NAD 83), near the centre of 50K topographic sheet NTS 035G07 and just west of Lac Dumas along the same water course as the Belanger exploration camp (Figure 1). The site is located on a NE-SW trending esker along the north side of a body of water that is west and downstream from Lac Dumas, the centre of which is some 2.5km to the east of the site (Figure 2). The body of water on which the campsite & fuel cache lie flows westward past the Belanger exploration camp and then south, eventually flowing into Lac Allemand and into the Povungnituk River system, past Puvirnituk and out into Hudson Bay (Figure 1).

### **2005 Site Visit and Clean-up**

G. DeSchutter, manager of the Goldbrook project and author of this report,

visited the site on July 7<sup>th</sup> 2005 to make a preliminary assessment. During this brief visit, it was noted that the cache of ~100 fuel drums and propane cylinders was situated very close to the shore (within 5m) and that there were three erected aluminum tent frames sitting on wooden floors (Photos 1-3). The general condition of the site was messy and littered with old garbage and the ground was largely water-saturated, causing a number of drums to be partially submerged. Even though many drums were bloated, swollen and badly rusted, there was no evidence of any hydrocarbon spill, significant leaks or obvious soil contamination. An old fire extinguisher was date stamped “1986” confirming that the camp was likely used in the mid 1980’s.



**Figure1.** Location of the abandoned campsite and fuel cache (green symbol) in relation to major communities in Nunavik. Parks indicated by shaded pink areas.

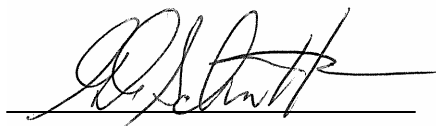
Over the course of the 2005 summer, from approximately early August to mid September, personnel from AAEC’s Belanger exploration camp transferred the contents of 30 old fuel drums (6 gas, 24 diesel) into new drums and brought the

drums to Belanger camp (Photos 4-6). Along with the full drums, approximately 75 old empty drums and several empty 100 lbs propane cylinders were also brought to Belanger camp by helicopter for storage and eventual transfer to an appropriate disposal facility down south (Photo 7). AAEC's intent is to utilize the old fuel for general camp consumption at Belanger camp in 2006 (camp incinerator, heating oil stoves, etc).

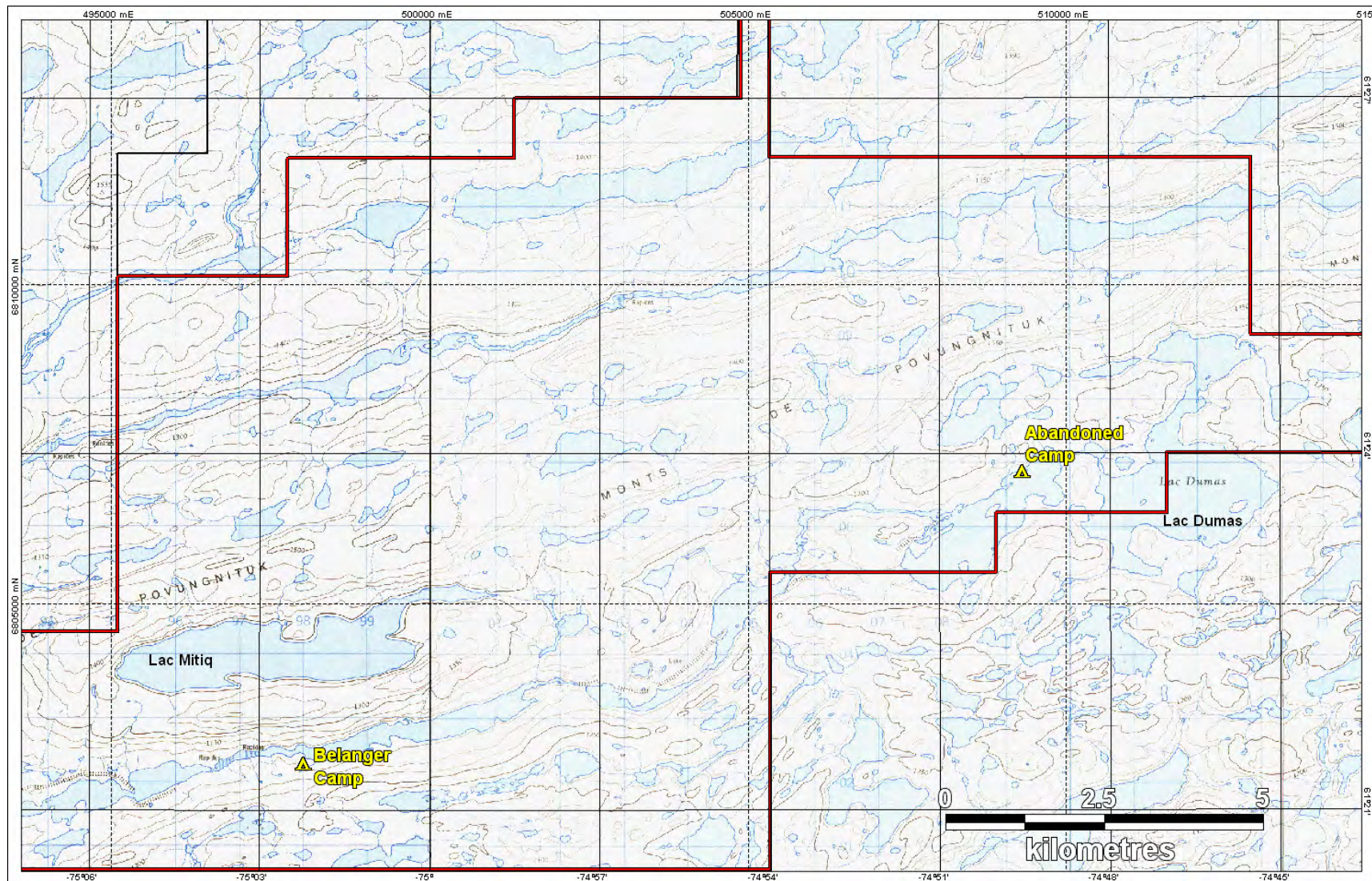
Proper environmental and personal protective equipment were used at all times while handling the drums and fuel. This included the use of spill kits, absorbent matting and saudades, rubber gloves and safety glasses. A hand "wobble" pump was used to transfer the fuel to the new drums.

Limited time and resources as well as poor weather during the summer 2005 exploration program at Belanger Camp prevented the site from being 100% cleaned-up. The main objective of this year's effort was to mitigate the potential fuel hazard from the area and this was achieved. The old tent floors and general debris were left on site however the aluminum tent frames were taken down and stacked. Should time and resources permit, Anglo American will attempt to complete the site clean-up during the summer 2006 exploration program.

Anglo American Exploration (Canada) Ltd. is committed to preserving the environment and preventing pollution in areas where it explores and works. Through active environmental stewardship, we strive to maintain a high degree of environmental sensitivity and awareness and look forward to cooperating with local communities and regulatory bodies to help minimize impacts on the environment.

A handwritten signature in black ink, appearing to read 'G. DeSchutter', is written over a horizontal line.

Gary DeSchutter  
Senior Project Geologist  
Anglo American Exploration (Canada) Ltd.



**Figure 2.** Location of the abandoned campsite & fuel cache near Lac Dumas, Nunavik, QC.





**Photo 1.** Aerial photo of historical abandoned camp near Lac Dumas, Nunavik, before commencement of clean-up efforts. Note large cache of fuel drums at left, tent floors and tent frames in center of photo. View looking north, July 7<sup>th</sup>, 2005.





**Photo 2.** Aluminum tent frames and old fuel drums at the abandoned camp near Lac Dumas, Nunavik, before commencement of clean-up efforts. View looking east, July 7<sup>th</sup>, 2005.



**Photo 3.** Pile of old fuel drums at the abandoned camp near Lac Dumas, Nunavik, before commencement of AAEC's clean-up effort. A total of 30 drums of fuel were transferred to new drums (6 gas, 24 diesel) and 75 empty drums were brought to Belanger camp in 2005. View looking west, July 7<sup>th</sup>, 2005.



**Photo 4.** Paul Tayara, Salluit resident and Goldbrook project employee, prepares to transfer fuel to a new drum – abandoned camp, near Lac Dumas, Nunavik, September 5<sup>th</sup>, 2005.







**Photo 6.** 206L (LongRanger) slinging empty fuel drums from old camp near Lac Dumas to Belanger camp, September 5<sup>th</sup>, 2005

**Photo 5.** Kevin Girard transfer fuel to new 45 gallon drum— abandoned camp, near Lac Dumas, Nunavik, September 5<sup>th</sup>, 2005.





**Photo 7.** Aerial photo of abandoned camp near Lac Dumas, Nunavik, after AAEC's clean-up effort. Note all old fuel drums have been removed from site, and all tent frames have been taken down. A total of 30 drums of fuel were transferred to new drums (6 gas, 24 diesel) and 75 empty drums were brought to Belanger camp in 2005. View looking south, September 5<sup>th</sup>, 2005.

-----Original Message-----

From: Jean Marc Seguin [mailto:jmseguin@krg.ca]  
Sent: Wednesday, June 01, 2005 7:44 AM  
To: mayor@nvsalluit.ca  
Subject: Abandoned site near Salluit

Good morning again,

Here's the information concerning the site we talked about:

The site is located at 0508025 E  
5806367 N

It contains more than 70 barrels, of which 22 of them are full of Jet-B. The condition of these barrels is miserable and water contamination is imminent as the barrels are within a 20 meters range from a water source, which is used by the Anglo American consultant's camp, 3-4 km away. The latter is ready to participate actively in the clean-up of the site. They could provide good-condition barrels, transfer the fuel and store them away from the water. The barrels could be picked up by the Salluimmiut the next winter and be used as heating fuel...We had the "permission" from the Environment Quebec for thqt scenario.

Since the barrels are indicating "Mines Québec - 1984" I'm trying to get funding for the clean-up procedures from MNRF (Ministère des Ressources Naturelles Québec). It should cover the helicopter services, the labor for the fuel transfer in good barrels and for the transportation to Salluit.

More details coming soon.

Regards,

--

Jean-Marc Séguin  
Chargé de projet  
Département Ressources Renouvelables  
Administration régionale Kativik  
C.P. 9  
Kuujjuaq (Qué.)  
J0M 1C0  
Tél.: 819-964-2961 ext. 2333  
Fax: 819-964-0694  
jmseguin@krg.ca

Ministère des  
Ressources naturelles,  
de la Faune  
et des Parcs

Québec 

Service du développement et du milieu miniers

Quebec, July 6 2005

Mr Jamie Lavigne  
Vice-president, exploration  
Goldbrook Ventures inc.  
802-700 West Pender  
Vancouver, BC Canada V6C 1G8

Object : Damaged barrels near Lake Dumas in Nunavik

Sir,

The ministère des Ressources naturelles et de la Faune du Québec (MRNF) has been informed of the storing of twenty or so damaged barrels, containing hydrocarbons, near Lake Dumas in Nunavik. The poor condition of these barrels could lead to an eventual leak in the surroundings. The barrels are stored on one of the following claims : CDC 1108930, 31, 34 ou 35. These claims are held by Goldbrook Ventures since Decembre 18 2002.

Your corporation is likely to do works in this remote area. Consequently, we appreciate that your corporation transfers the hydrocarbons into new barrels (if physically possible). We remain available for all supplementary information.

We thank you for your cooperation.

Regards,

Denis Blackburn, p. eng.

c. c. M. André Jean

5700, 4<sup>e</sup> Avenue Ouest, C-  
408  
Charlesbourg (Québec)  
G1H 6R1  
Téléphone : (418) 627-  
6365  
Télécopieur : (418) 643-  
3803

Ministère des  
Ressources naturelles,  
de la Faune  
et des Parcs

Québec

Service du développement et du milieu miniers

Québec, le 6 juillet 2005

Monsieur Jamie Lavigne  
Vice-président exploration  
Goldbrook Ventures inc.  
802-700 West Pender  
Vancouver, BC Canada V6C 1G8

Objet : Barils endommagés près du Lac Dumas au Nunavik

Monsieur le Vice-Président,

Le ministère des Ressources naturelles et de la Faune du Québec (MRNF) a été avisé de la présence d'une vingtaine de barils endommagés, contenant des hydrocarbures, près du Lac Dumas au Nunavik. Le mauvais état des barils laisse craindre une éventuelle fuite dans le milieu environnant. Les barils seraient entreposés sur un des claims suivants : CDC 1108930, 31, 34 ou 35. Ces claims sont détenus par votre compagnie depuis le 18 décembre 2002.

Compte tenu que votre société est susceptible de faire des travaux dans ce secteur isolé, nous vous saurions gré de procéder, dans la mesure du possible, au transvassage du contenu des barils dans des contenants en bon état. Nous demeurons disponibles pour toutes informations complémentaires.

En souhaitant votre collaboration, je vous prie d'accepter, Monsieur le Vice-Président, l'expression de mes sentiments les meilleurs.



Denis Blackburn, ing.

c. c. M. André Jean

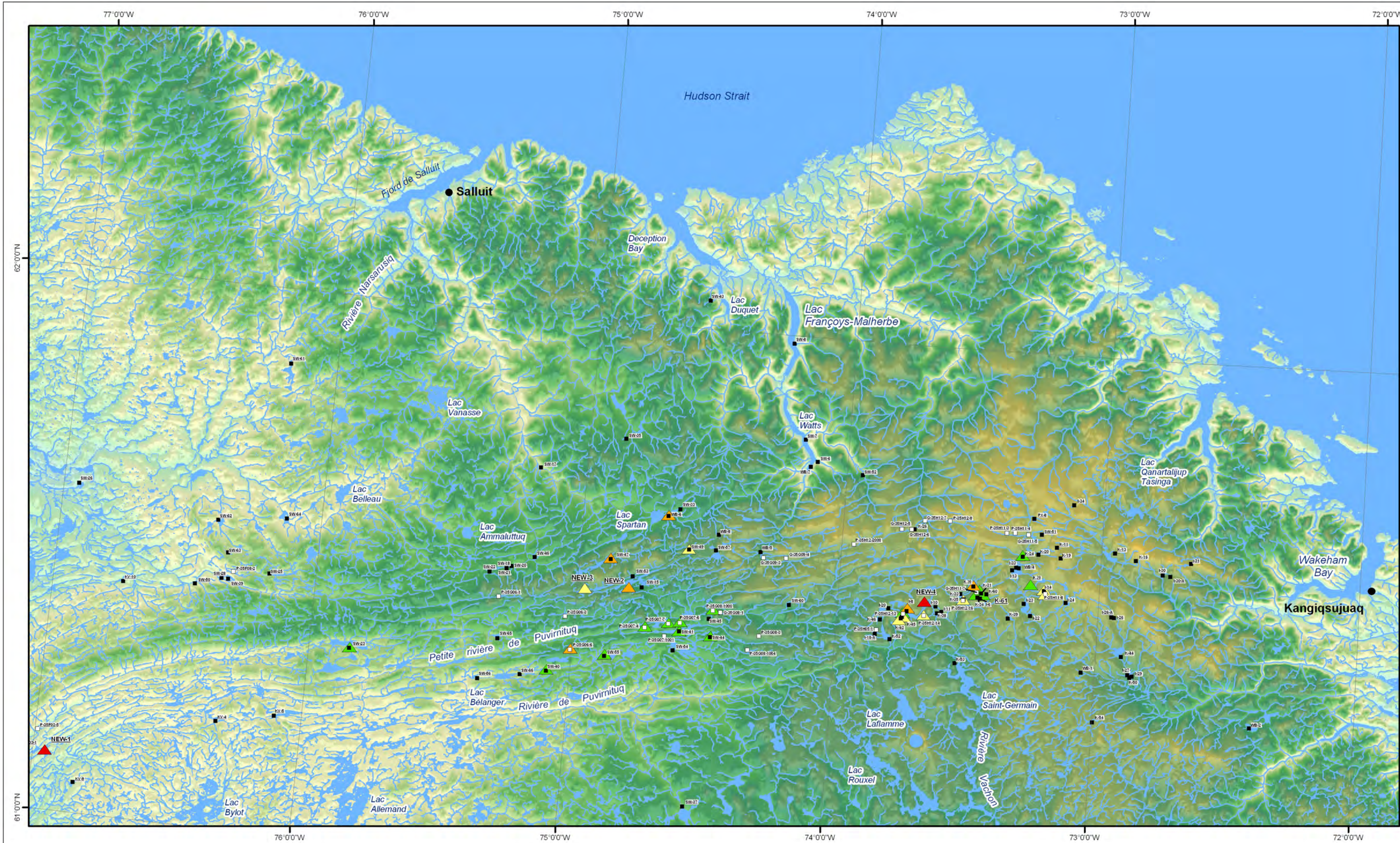
5700, 4<sup>e</sup> Avenue Ouest, C-  
408  
Charlesbourg (Québec)  
Q1H 6R1  
Téléphone : (418) 627-  
6365  
Télécopieur : (418) 643-  
3803

## **APPENDIX E**

**Validated potential abandoned mining exploration sites**

**(Maps 1 to 4)**





**Map 1.**  
Validated potential abandoned mining  
exploration sites in  
Kangirsujuq - Salluit sector



**Validated potential sites**

- ▲ Major sites
- ▲ Intermediate sites
- ▲ Minor sites
- ▲ Cleaned and active sites

**Potential sites**

- Informants
- Archives

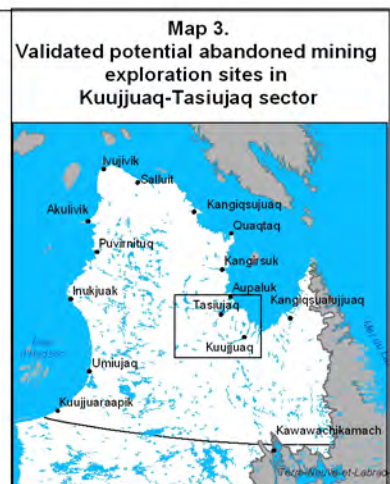
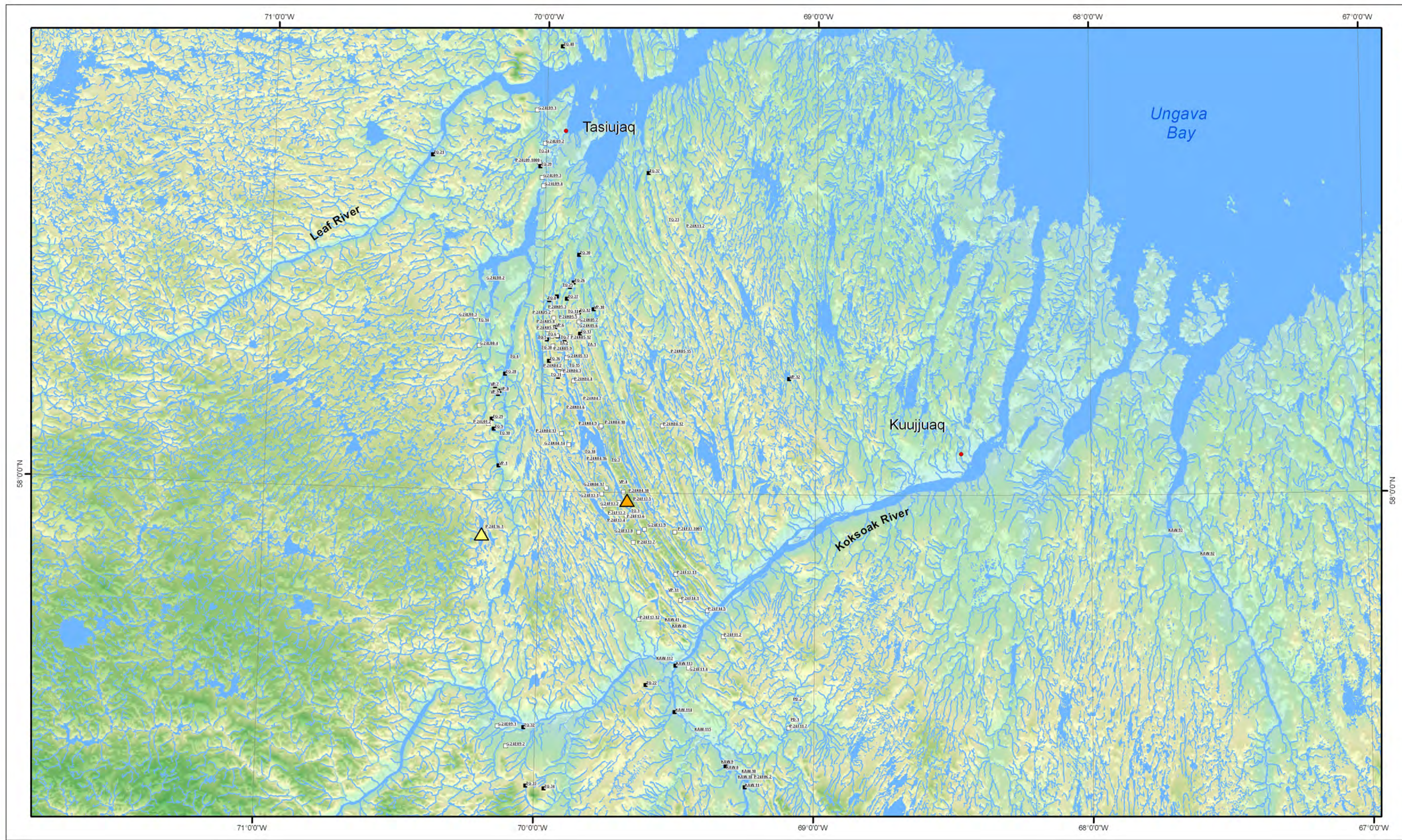


NTDB, 1 : 250 000, Permission from NRCan  
Assessed and prioritized sites : Environment  
Canada, 2001 and 2002; Potential sites :  
Environment Canada, 2000  
Lambert conformal conic projection. NAD83

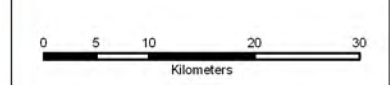






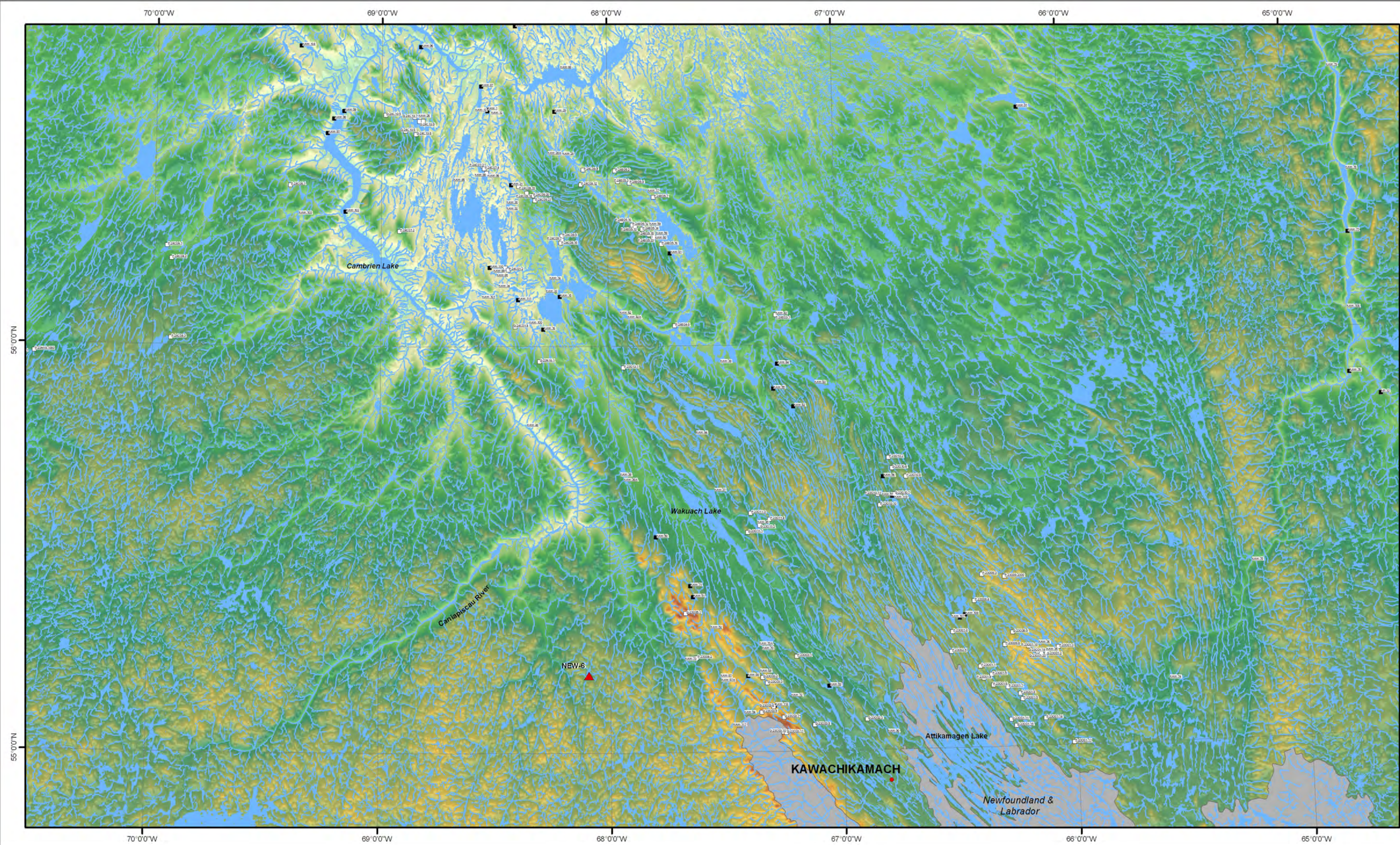


- Validated potential sites**
- ▲ Major sites
  - ▲ Intermediate sites
  - ▲ Minor sites
  - ▲ Cleaned sites
- Potential sites**
- Informants
  - Archives



NTDB, 1 : 250 000, Permission from NRCan  
Assessed and prioritized sites : Environment  
Canada, 2001 and 2002; Potential sites :  
Environment Canada, 2000  
Lambert conformal conic projection. NAD83





**Map 4.**  
Validated potential abandoned mining  
exploration sites in  
Kawachikamach sector



**Validated potential sites**

- ▲ Major sites
- ▲ Intermediate sites
- ▲ Minor sites
- ▲ Cleaned sites

**Potential sites**

- Informants
- Archives



NTDB, 1 : 250 000, Permission from NRCan  
Assessed and prioritized sites : Environment  
Canada, 2001 and 2002; Potential sites :  
Environment Canada, 2000  
Lambert conformal conic projection. NAD83



December 2005



## **APPENDIX F**

**Pictures of validated potential abandoned mining exploration sites  
during Summer 2005**

**New validated abandoned mining exploration sites  
in Salluit-Kangiqsujaq sector (pictures taken in September 2005).**



Picture 1. Pile of barrels at abandoned site I-14.



Picture 2. Wood debris and barrels at site I-14.



Picture 3. Minor site P-53H11-8.



Picture 4. Minor site K-28 (barrels, drill equipment) near C-R active drill site.



Picture 4. Canadian Royalties Expo camp (formerly major site K-61).

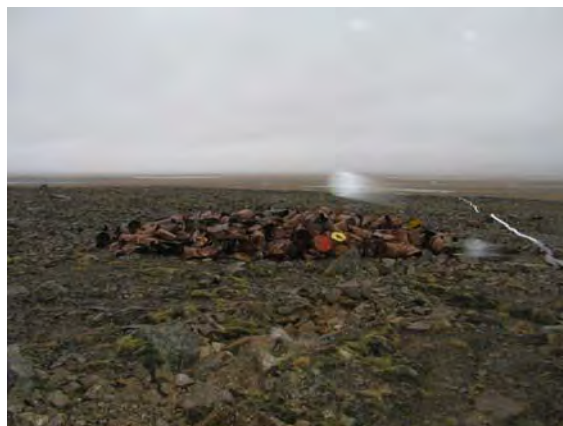


Picture 5. Barrels and debris collected at Expo camp.

**New validated abandoned mining exploration sites  
in Salluit-Kangiqsujuaq sector (pictures taken in September 2005).**



Picture 6. Heavy equipment, barrels and various debris gathered at Expo camp.



Picture 7. Old barrels and pails pile at Expo camp.



Picture 8. Pile of empty barrels at site I-8



**New validated abandoned mining exploration sites  
in Kuujjuaq-Tasiujaq sector.**



Picture 9. Intermediate site PJ-18  
(initial clean up work by CNE, September 2005).

**New validated abandoned mining exploration sites  
in Kuujjuaq-Tasiujaq sector.**



Picture 10. Minor site P-24E/16-1 at Lake Imbeault, August 2005  
(camp, wood debris).

**New validated abandoned mining exploration sites  
in Kuujjuaq-Tasiujaq sector.**



Picture 11. Intermediate site P-24F13-5 located on the shoreline of Lake Gerido, August 2005.



Picture 12. Barrels and camp equipment  
at site P-24F13-5, August 2005.

**New validated abandoned mining exploration sites  
in Kawawachikamach sector (July 2005).**



Picture 13. Aerial view of major site  
NEW-6 at Lake Leber.



Picture 14. Pile of barrels and camp  
remains.



Picture 15. Closer view of a pile of  
empty barrels and camp platform.



Picture 16. Another pile of empty barrels  
at site NEW-6.

## **APPENDIX G**

### **Practical Guide: Cleaning and Handling Hazardous Products in Abandoned Mining Exploration Sites In Nunavik**

## **APPENDIX H**

### **Soil samples and water samples analysis report**