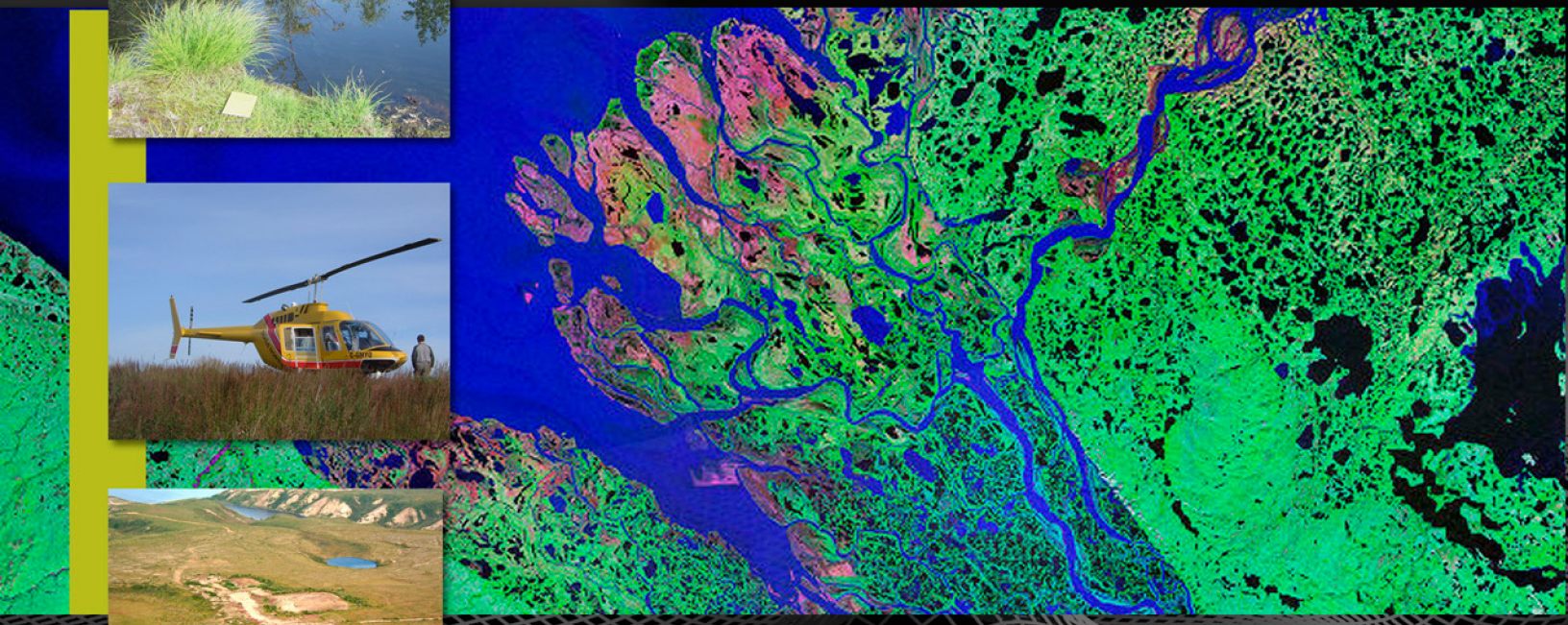
Inuvialuit Settlement Region Drilling Waste Disposal Sumps Study



submitted to:
Government of Canada
Environmental Studies Research Funds
ESRF-04-046

submitted by:
AMEC Earth & Environmental

February 2005
CE02993

INUVIALUIT SETTLEMENT REGION
DRILLING WASTE DISPOSAL
SUMPS STUDY

Submitted to:

Environmental Studies Research Funds
ESRF-04-046

Submitted by:

AMEC Earth & Environmental
Calgary, Alberta

February 2005

CE02993

23 February 2005
CE02993

Ms. Kym Hopper-Smith
ESRF Program Coordinator
Environmental Studies Research Funds
c/o Operations Business Unit
National Energy Board
444 – 7th Avenue SW
Calgary, AB T2P 0X8

Dear Ms. Kym Hopper-Smith:

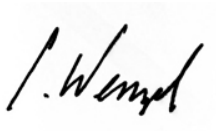
Re: Solicitation No. ESRF-04-046 – Regional Sump Study Project

AMEC Earth & Environmental (AMEC) is pleased to submit this report describing the development and conduct of the field program undertaken in August 2004 to characterize drilling waste disposal sumps at selected sites in the Inuvialuit Settlement Region. This report describes the execution of site selection and sump survey work and presents the resulting characterization data on a series of tables and aerial photographs.

We appreciate the opportunity to present this report and look forward to reviewing the contents with you. If you have any questions or comments, please feel free to contact the undersigned at 403-569-6593 / chris.wenzel@amec.com.

Yours truly,

AMEC Earth & Environmental



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EXECUTIVE SUMMARY

The Environmental Studies Research Funds (ESRF) is a research program that sponsors environmental and social studies. It is designed to assist in the decision-making process related to oil and gas exploration and development on Canada's frontier lands. The ESRF Management Board determined that the funding for this work would be allocated to the Inuvialuit Settlement Region (ISR). The purpose of this study is *"To inventory, and test a protocol to assess environmental conditions of drilling waste sumps in the ISR."*

AMEC Earth & Environmental (AMEC) was contracted to conduct an assessment of drilling waste disposal sumps located in the ISR. These sump assessments were to be conducted at a limited number of sites. Initially, these assessments were to be conducted at sites for which a current owner could not be identified (orphan well sites).

The objectives of the project were as follows:

1. Conduct an inventory of all known drilling sump locations within the ISR.
2. Utilizing protocol developed by the ESRF Technical Advisory Group (TAG), conduct site assessment at limited number of orphan sump locations.

The review of literature and supplementary data associated with the subject sites and drilling waste disposal issues included:

- physiographic region;
- surficial materials;
- climate;
- permafrost;
- active layer;
- ground temperatures; and
- sump abandonment issues and mitigation.

The survey protocol contained the following components:

- soil and water sampling and analysis;
- vegetation surveys;
- digital photography;
- site description;
- survey of active-layer thickness;
- on the ground location and data logging;

- development of digital data maps; and
- ground conductivity (EM38) surveys.

The well inventory was to identify wells for which no current owners could be identified (orphan wells). Industry response to well ownership inquiries was limited with only six companies (Shell, Murphy, Devon, EnCana, BP and Japex) claiming ownership of a total of 33 wells (10.6% of the ISR well total). Preliminary ownership of the remaining 277 wells was assigned based on owner information recorded at the time of well completion. This historic data showed that currently solvent companies (either majority or minor interest holders) are associated with all of the onshore wells drilled in the ISR. As a result, no obvious orphan wells were identified.

Because no obvious orphan wells were identified, the ESRF Technical Advisory Group canvassed member companies to "volunteer sites" for detailed drilling waste sump assessment. ConocoPhillips, Petro-Canada and Shell volunteered sites to the project. These sites and associated owner companies are shown on Table ES-1.

Table ES-1: Drilling Waste Disposal Sump Study Sites

Well Owner	Well Name
Unknown (B.A. SHELL IOE consortium)	Reindeer D-27
ConocoPhillips	Siku C-55
ConocoPhillips	Ya-Ya P-53
ConocoPhillips	Atigi O-48
ConocoPhillips	Toapolok H-24
ConocoPhillips	Ya-Ya M-33
ConocoPhillips	Kikoralok N-46
ConocoPhillips	Tununuk F-30
ConocoPhillips	Ogruknang M-31
Petro-Canada	Kurk M-15

AMEC's summary of observations and recommendations for the subject sites are presented on Table ES-2

Table ES-2: Summary of Observations and Recommendations

Site	Summary of Observations				Recommendations[1]		
	Has the sump cap subsided below original ground level?	Does surface water associated with the sump contain elevated salts?	Does exposed soil associated with the sump contain elevated salts?	Does evidence suggest that drilling fluids have migrated beyond the immediate lease area?	Additional field investigations would be prudent	The site should be monitored	No intervention necessary
REINDEER D-27	Yes	Yes	Yes	No			
SIKU C-55	Yes	Yes	Yes	No			
YA-YA P-53	Yes	Yes	Yes	No			
ATIGI O-48	Yes	Yes	Yes	No			
TOAPOLOK H-24	No	Yes	Yes	No			
YA-YA M-33	No	Yes	Yes	No			
KIKORALOK N-46	No	NA	NA	No			
TUNUNUK F-30	No	No	Yes	No			
OGRUKNANG M-31	No	No	No	No			
KURK M-15	No	No	Yes	No			

[1] Source: ESRF Technical Advisory Group, Protocol for the Assessment of Drilling-Mud Sumps.

AMEC recommends future monitoring of drilling waste disposal sumps at six of the subject sites. Sump caps are largely intact at these sites however data suggest that sump fluids have migrated to the surface and have impacted soil and/or water. Future monitoring should focus on ensuring that further degradation of the sump cover is not occurring.

Additional field investigations would be prudent at four of the subject sites. Sump caps at these sites have failed and data suggest that sump fluids have migrated to the surface and have impacted soil and/or water. Additional field investigations should focus on determining the most appropriate methods for re-establishment of a sump cover. Alternatively, these studies may focus on management options available for leaving sumps in an open condition.

RÉSUMÉ

Le Fonds pour l'étude de l'environnement (FÉE) est un programme de recherche qui parraine des études environnementales et sociales. Il a pour objet d'aider à la prise de décisions en matière d'exploration et de mise en valeur du pétrole et du gaz dans les régions pionnières du Canada. Le Conseil d'administration du FÉE a établi que les fonds attribués à ce genre de travaux seraient consacrés à la région désignée des Inuvialuit (RDI), où on veut dresser un inventaire des puisards servant au stockage des résidus de forage et mettre à l'essai un protocole pour l'évaluation des conditions environnementales.

C'est l'entreprise AMEC Earth & Environmental (AMEC) qui a été retenue pour réaliser cette étude. Elle devait pour ce faire évaluer un certain nombre de sites et concentrer ses efforts, au départ, sur les sites dont les propriétaires étaient inconnus (sites de puits abandonnés).

Les objectifs visés étaient les suivants :

1. Répertorier tous les puisards connus dans la RDI;
2. Au moyen du protocole mis au point par le groupe consultatif technique du FÉE, procéder à l'évaluation d'un certain nombre de puisards abandonnés.

L'entreprise a consulté toute une série de documents et de données supplémentaires se rapportant aux sites et aux enjeux liés au stockage des résidus de forage, et notamment à ce qui suit :

- région naturelle;
- matériau de surface;
- climat;
- pergélisol;
- couche active;
- températures du sol;
- enjeux liés à l'abandon de puisards et mesures d'atténuation.

Le protocole établi renfermait les éléments suivants :

- analyse des échantillons de sol et d'eau prélevés;
- étude de la végétation;
- photographie numérique;
- description des sites;
- examen de l'épaisseur de la couche active;
- localisation sur le sol et enregistrement des données;

- production de cartes de données numériques;
- étude de la conductivité du sol (EM38).

L'exercice visait à relever les puits pour lesquels aucun propriétaire ne pouvait être identifié (puits abandonnés). Les réponses reçues de l'industrie aux demandes de renseignements sur les droits de propriété à l'égard de ces puits ont été limitées; en effet, seules six entreprises (Shell, Murphy, Devon, EnCana, BP et Japex) ont réclamé la propriété d'un total de 33 puits (10,6 % du total des puits de la RDI). Les droits de propriété préliminaires des 277 autres puits ont été établis en fonction des renseignements sur la propriété consignés au moment de la complétion des puits. Ces données révèlent que les sociétés qui sont solvables à l'heure actuelle (qu'elles détiennent un intérêt mineur ou majeur) sont associées à tous les puits côtiers creusés dans la RDI. Par conséquent, aucun puisard abandonné comme tel n'a pu être identifié.

Le Groupe consultatif technique du FÉE a donc demandé aux sociétés membres d'« offrir des sites » afin que l'on puisse y évaluer en profondeur les puisards servant au stockage des résidus de forage. ConocoPhillips, Petro-Canada et Shell ont offert des sites aux fins du projet. Vous trouverez la liste des sites et des propriétaires au tableau ES-1.

Tableau ES-1 : Puisards servant au stockage de résidus de forage

Propriétaire	Nom du puits
Inconnu (consortium B.A. SHELL IOE)	Reindeer D-27
ConocoPhillips	Siku C-55
ConocoPhillips	Ya-Ya P-53
ConocoPhillips	Atigi O-48
ConocoPhillips	Toapolok H-24
ConocoPhillips	Ya-Ya M-33
ConocoPhillips	Kikoralok N-46
ConocoPhillips	Tununuk F-30
ConocoPhillips	Ogruknang M-31
Petro-Canada	Kurk M-15

Le tableau ES-2 contient le résumé des observations et des recommandations faites par l'AMEC au sujet des sites à l'étude.

Tableau ES-2 : Résumé des observations et recommandations

Site	Observations				Recommandations[1]		
	Le couvercle du puisard s'est-il affaissé en deçà du niveau du sol d'origine?	L'eau de surface associée au puisard a-t-elle des concentrations élevées de sel?	Le sol exposé associé au puisard comporte-t-il des concentrations élevées de sel?	Les données recueillies démontrent-elles que de la boue de forage a débordé du périmètre de la concession?	Il serait prudent de procéder à des études supplémentaires sur le terrain	Le site devrait faire l'objet d'une surveillance	Aucune intervention nécessaire
REINDEER D-27	Oui	Oui	Oui	Non			
SIKU C-55	Oui	Oui	Oui	Non			
YA-YA P-53	Oui	Oui	Oui	Non			
ATIGI O-48	Oui	Oui	Oui	Non			
TOAPOLOK H-24	Non	Oui	Oui	Non			
YA-YA M-33	Non	Oui	Oui	Non			
KIKORALOK N-46	Non	s.o.	s.o.	Non			
TUNUNUK F-30	Non	Non	Oui	Non			
OGRUKNANG M-31	Non	Non	Non	Non			
KURK M-15	Non	Non	Oui	Non			

[1] Source : Groupe consultatif technique du FÉE, Protocole pour l'évaluation des puisards servant au stockage des résidus de forage.

AMEC recommande d'assurer la surveillance future des puisards de stockage dans six des sites à l'étude. Les couvercles des puisards sont en grande partie intacts à ces endroits, mais les données recueillies laissent suggérer que de la boue de forage est remontée à la surface et qu'elle y a modifié la composition du sol et/ou de l'eau. Les mesures de surveillance devront viser à empêcher que les couvercles ne se détériorent davantage.

Il serait prudent de procéder à d'autres enquêtes sur le terrain dans quatre des sites à l'étude. Les couvercles y sont en mauvais état et les données recueillies laissent suggérer que de la boue de forage est remontée à la surface et qu'elle a modifié la composition du sol et/ou de l'eau. Ces enquêtes devront viser à trouver les méthodes qui conviennent le mieux pour remettre un couvercle sur les puisards. Elles pourraient aussi porter sur les mesures de gestion qui pourraient être adoptées si les puisards étaient laissés ouverts.

1.0 INTRODUCTION

The Environmental Studies Research Funds (ESRF) is a research program that sponsors environmental and social studies. It is designed to assist in the decision-making process related to oil and gas exploration and development on Canada's frontier lands. The ESRF Management Board determined that the funding for this work would be allocated to the Inuvialuit Settlement Region (ISR). The purpose of this study is *"To inventory, and test a protocol to assess environmental conditions of drilling waste sumps in the ISR."* The ESRF's request for proposals to conduct this work is provided in Appendix A.

Oil and gas exploration began in the Inuvialuit Settlement Region (ISR) of the Northwest Territories in 1961 with the drilling of Winter Harbour No.1 (A-09) on Melville Island by Dome Petroleum (currently BP). Since then, 309 exploratory wells have been completed. Of these, 216 were drilled onshore and 94 were drilled offshore. The majority (298) of these wells have been plugged and abandoned. Ten wells are currently suspended and there are two producing wells located near Inuvik. By 1986, 280 (90%) of the current wells in the ISR were completed. Eleven wells have been completed since 2000.

Figure 1 shows the location of all known wells drilled within the boundaries of the ISR.

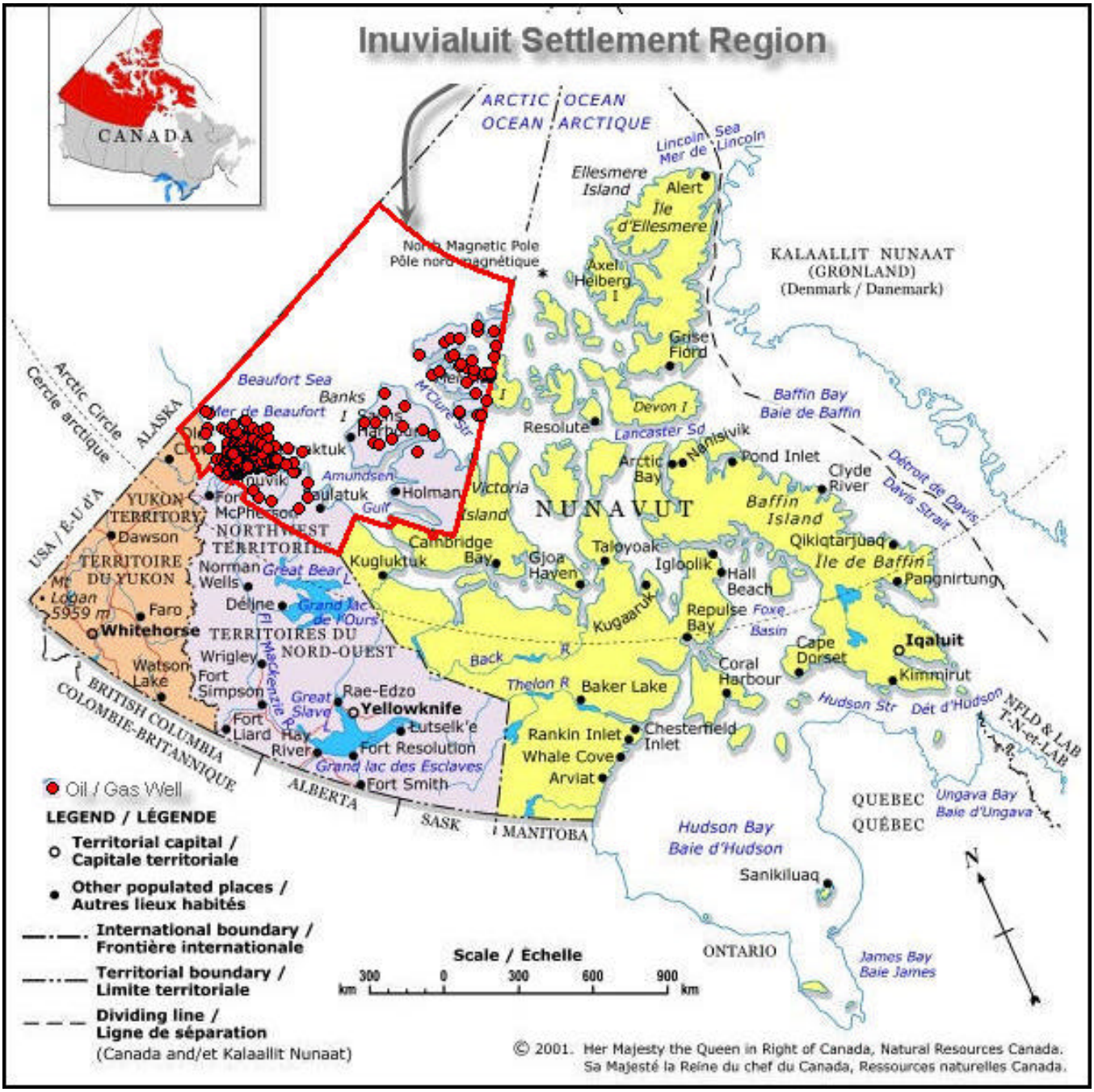
Historic practices for disposal of waste drilling fluids from onshore wells located in the ISR included containment in an on-site sump, which is backfilled after completion of the well. The location of drilling waste disposal sumps is typically adjacent to the wellhead.

AMEC Earth & Environmental (AMEC) was contracted by Environmental Studies Research Funds (ESRF) to conduct an assessment of drilling waste disposal sumps located in the ISR. These sump assessments were to be conducted at a limited number of sites. Initially, these assessments were to be conducted at sites for which a current owner could not be identified (orphan well sites).

1.1 Project Objectives

The objectives of the project were:

1. Conduct an inventory of all known drilling sump locations within the ISR. The inventory was to include:
   - location (lat/long and/or UTM) of well and sump;
   - last known operator of record;
   - spud and sump closure date for associated well;
   - identification of orphan locations;
   - well description including well depth, drilling mud used; and
   - conduct a review of literature and document supplementary data – literature review to include: ground temperatures, ground-ice conditions, surficial materials, physiographic region, abandonment issues and mitigation.



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Government of Canada
Environmental Studies Research Funds
(ESRF-04-046)

Inuvialuit Settlement Region
Drilling Waste Disposal Sumps Study

Project Location Showing Inuvialuit Settlement Region Wells

Drawn: ECW	Scale: N/A	Date: Nov 2004	Project No.: CE02993	**Figure: 1**

2. Characterize drilling waste disposal sumps using the protocol developed by the Technical Advisory Group (TAG).
3. Utilizing protocol developed by TAG, conduct site assessment at limited number of orphan sump locations.

1.2 Scope of Work

The Scope of Work for this project is described in ESRF Solicitation No. ESRF-04-046 (RFP) dated 12 May 2004. The RFP indicated the following deliverables:

- Regional Sump Inventory with associated information as listed in objectives;
- field report with analysis of each orphaned site;
- summary report of site assessments utilizing protocol developed by TAG;
- GIS database of sites and information including assessment data; and
- paper and electronic copies of reports.

1.3 Document Scope

This document describes:

- the design, execution and results of the Regional Sump Inventory program undertaken in July 2004; and
- the design, execution and results of the field program undertaken in August 2004 to assemble drilling waste disposal sumps characterization data for a limited number of wells.

2.0 REGIONAL SUMP INVENTORY

2.1 Methods

The objective of the Regional Sumps Inventory was to identify all recorded oil and gas wells in the ISR, provide relevant data associated with these wells and to identify the current owners of these wells. The well inventory was to identify wells for which no current owners could be identified (orphan wells). In the upstream oil and gas industry, typically an orphan is a well, pipeline, facility or associated site which has been investigated and confirmed as not having any legally responsible or financially able party to deal with its abandonment and reclamation. Any orphan wells identified would be candidate sites for visitation and application of the sump assessment protocol.

The inventory was completed in two phases:

- utilizing public records (NEB, INAC, etc) to determine operator of record; and
- working with company representatives to determine final site ownership.

On 7 July 2004, AMEC received a digital well list from the National Energy Board Exploration and Production Department. The well list contained 1576 unique well locations with associated data as follows:

1. WID (NEB well identifier).
2. CONSORTIUM (companies involved in well ownership at time of development).
3. WELL NAME (unique name associated with the well).
4. UWI (universal well indicator).
5. CLASS (exploratory, development, delineation, etc.).
6. LAT (latitude, NAD 27).
7. LONG (longitude, NAD 27).
8. REGION (as designated by NEB; Mackenzie Delta - onshore, Northwest Territories – Mainland, etc.).
9. ORIGINAL SPUD_DATE (original date that drilling commenced).
10. ORIGINAL RR DATE (original date that drilling rig was released).
11. DEPTH (depth of well in metres).
12. SPUD RE DATE (re-entry date).
13. RIG RELEASE DATE (rig release for the re-entry work).
14. STATUS (plug and abandoned, producer, etc.).

The NEB reported that the well information provided was current to July 2004.

Wells located within the boundaries of the Inuvialuit Settlement Region were extracted from the NEB well list using the wells location (latitude and longitude). The ISR boundary was determined using boundary descriptions provided in "A Guide to Regulatory Approval Processes for Oil and Natural Gas Exploration and Production in The Inuvialuit Settlement Region" as follows:

> *The Inuvialuit Settlement Region (ISR) extends along the Arctic coast from the Alaska border on the west to the boundary with the new territory of Nunavut on the east. The ISR spans both land and water within its borders. It is bounded on the south by the Gwich'in and Sahtu Settlement Areas of the Mackenzie Valley and extends to the north across the Beaufort Sea to include Banks Island, parts of Victoria Island and the western Queen Elizabeth Islands.*

The NEB well list identified companies involved in well ownership at time of development. As a result of name changes, mergers or asset sales some of these companies may no longer exist. AMEC used the "2nd QTR'04 Oil & Gas Index" to determine current potential owners.

Well lists containing only wells within the ISR were prepared for each "current owner" and distributed (via fax and/or email) to knowledgeable personnel at each company. The list provided details regarding any name changes, mergers or asset sales. Recipients of this data were requested to confirm ownership of wells on the list. Distributed well lists are attached in Appendix B.

The well lists were further refined to include only onshore wells and associated drilling waste disposal sumps. This was accomplished using well region data provided by the NEB. Well data was queried and tables prepared using Microsoft Excel and OziExplorer.

2.2 Results

2.2.1 Well Ownership

Industry response to well ownership inquiries was limited with only six companies (Shell, Murphy, Devon, EnCana, BP and Japex) claiming ownership of a total of 33 wells (10.6% of the ISR well total). Preliminary ownership of the remaining 277 wells was assigned based on NEB owner information recorded at the time of well completion. This historic data showed that currently solvent companies (either majority or minor interest holders) are associated with all of the onshore wells drilled in the ISR. As a result, no obvious orphan wells were identified. The methodology used to assign well ownership was based solely on the project definition of 'orphan' and is not intended to be a legal opinion regarding company responsibility or ownership.

Based on the above assignment, fifteen companies own major interests in wells in the ISR. Companies owning a relatively large number of wells include Imperial Oil (106 wells), ConocoPhillips (65 wells), BP (44 wells), Petro-Canada (25 wells) and Shell Canada (23 wells). A breakdown of well ownership by company is provided on Table 1. The distribution of onshore

wells and associated drilling waste disposal sumps in the ISR is shown on Figure 2. Detailed information for each well is provided on Tables in Appendix B.

Table 1: ISR Well Counts by Owner

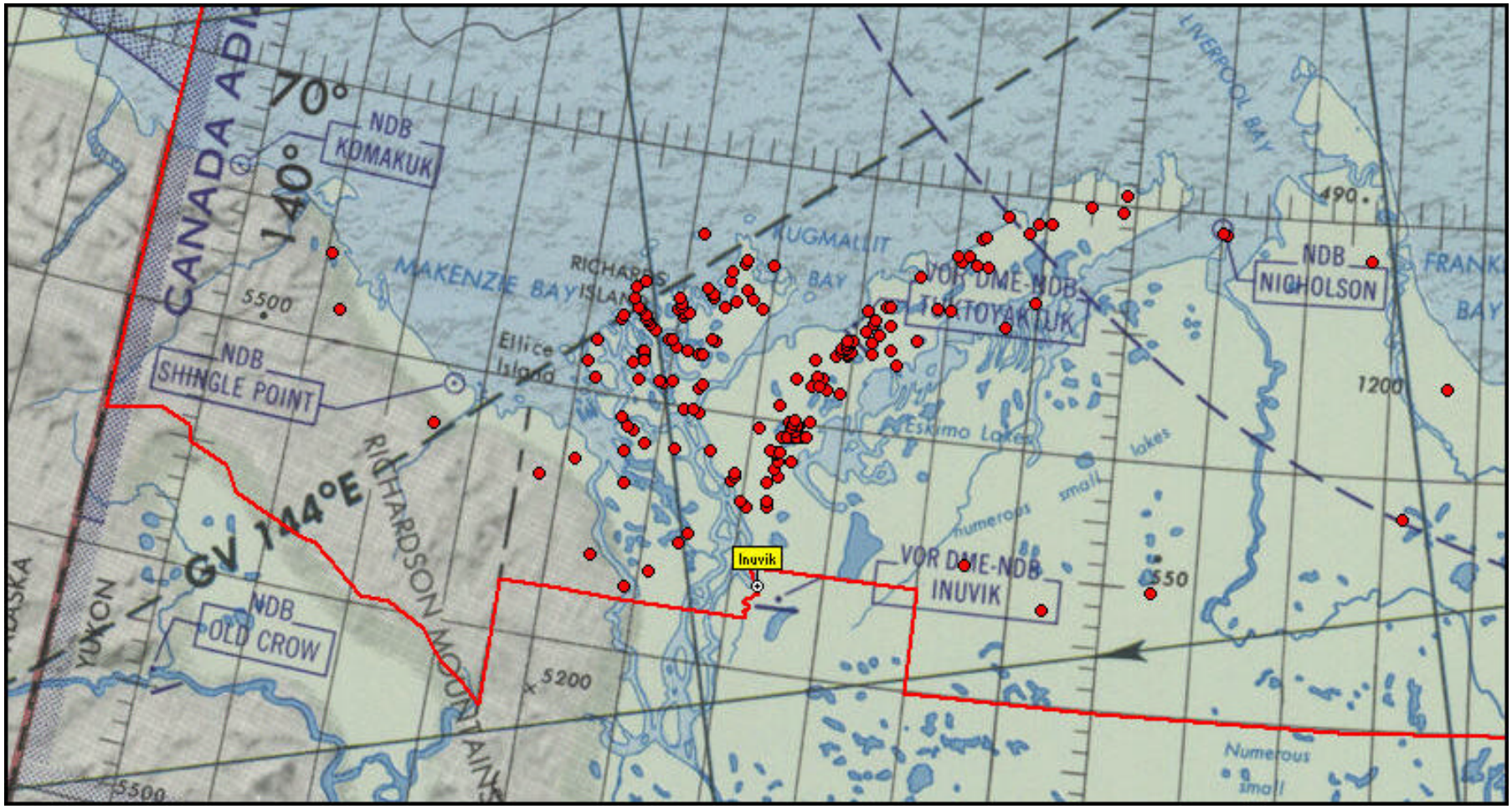
Company	Onshore Wells	Offshore Wells	Total Wells	Percent
Imperial	75	31	106	34.2
ConocoPhillips	44	21	65	21.0
BP	12	32	44	14.2
Petro-Canada	20	5	25	8.1
Shell	23	0	23	7.4
Husky	14	0	14	4.5
Chevron	10	1	11	3.5
Suncor	2	3	5	1.6
JAPEX	4	0	4	1.3
Navigo	3	0	3	1.0
Devon	3	0	3	1.0
Anadarko	3	0	3	1.0
EnCana	2	0	2	0.6
Murphy	1	0	1	0.3
Apache	0	1	1	0.3
TOTAL	**216**	**94**	**310**	**100**

2.2.2 Well Location

Table 2 shows the current distribution of wells in the ISR by region as designated by The National Energy Board (NEB). Land based wells utilize drilling waste disposal sumps and were therefore taken into consideration in the site selection process. Table 2 shows that 216 wells in the ISR have been completed on land. Proximity to Inuvik was also considered during the site selection process. Candidate sites included those within about 1 hour flying time (150 km) of the helicopter base in Inuvik. There are about 100 land-based sites within 150 km of Inuvik.

Table 2: ISR Well Counts by Region

NEB Region Designation	No. of Wells
Arctic Islands Offshore	6
Beaufort Sea – Artificial Islands	31
Beaufort Sea – Caisson Retained Islands	15
Beaufort Sea – Floating Units	42
Northwest Territories – Arctic Islands – Onshore	**41**
Northwest Territories – Mackenzie Delta – Onshore	**169**
Northwest Territories – Mainland	**3**
Yukon Onshore	3
TOTAL	310



amec		**Inuvialuit Settlement Region** **Drilling Waste Disposal Sumps Study**		
Government of Canada **Environmental Studies Research Funds** **(ESRF-04-046)**		**Wells Located on Land in the Inuvialuit Settlement Region**		
Drawn: ECW	Scale: N/A	Date: Nov 2004	Project No.: CE02993	**Figure: 2**

2.2.3 Site Selection

Because no obvious orphan wells were identified, the ESRF Technical Advisory Group (TAG) canvassed member companies to "volunteer sites" for detailed drilling waste sump assessment. The selection of these sites was limited to land based wells within 150 km of Inuvik. ConocoPhillips, Petro-Canada and Shell volunteered sites to the project. These sites and associated owner companies are shown on Table 3.

Table 3: Industry Volunteer Sites

Well Owner	WID	Well Name
Unverified (B.A. SHELL IOE consortium)	275	Reindeer D-27
ConocoPhillips	693	Kilagmiotak F-48
ConocoPhillips	730	Siku C-55
ConocoPhillips	760	Ya-Ya P-53
ConocoPhillips	894	Atigi O-48
ConocoPhillips	909	Ya-Ya A-28
ConocoPhillips	923	Toapolok H-24
ConocoPhillips	958	Ya-Ya M-33
ConocoPhillips	959	Ya-Ya I-17
ConocoPhillips	964	Kikoralok N-46
ConocoPhillips	982	Red Fox P-21
ConocoPhillips	984	Kilagmiotak M-16
ConocoPhillips	1029	Tununuk F-30
ConocoPhillips	1072	Ogruknang M-31
Petro-Canada	1901	Kurk M-15

3.0 SUPPLEMENTARY DATA

AMEC conducted a review of literature and supplementary data associated with the subject sites and drilling waste disposal issues in the ISR. The review included:

- physiographic region;
- surficial materials;
- climate;
- permafrost;
- active layer;
- ground temperatures; and
- sump abandonment issues and mitigation.

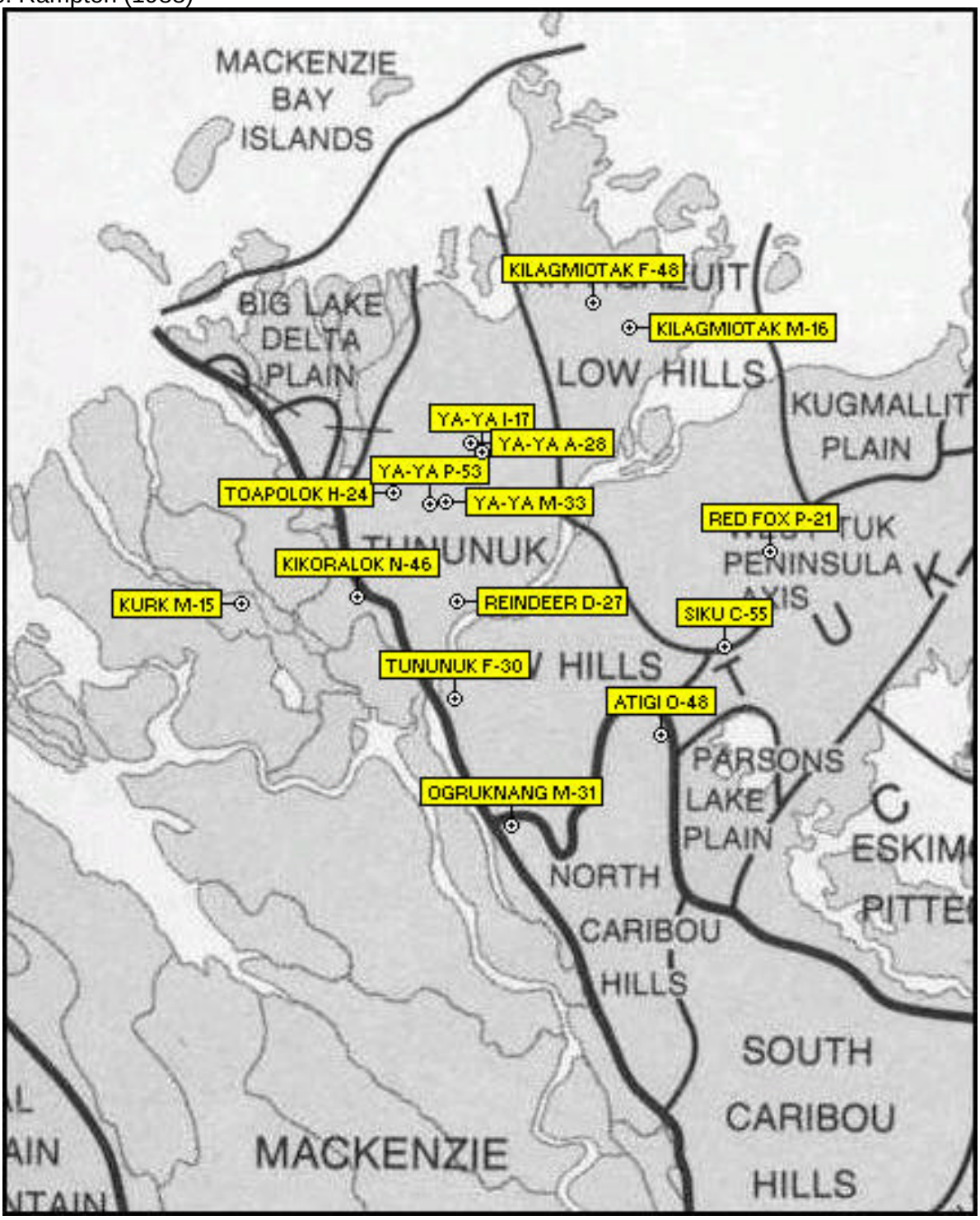
3.1 Physiographic Regions for ESRF Sump Sites

There are fifteen well sites with associated sumps included in this study. Two of the well sites are located within the Mackenzie Delta Division and eleven of the well sites are located within two subdivisions of the Tuktoyaktuk Coastland Division, namely Tununuk Low Hills (six sites) and Kittigazuit Low Hills (four sites). These divisions are part of the Arctic Coastal Plain region (Rampton, 1988). Two of the well sites are located within the North Caribou Hills subdivision of the Anderson Plain Division within the Interior Plains Region (Rampton, 1988) (Figure 3).

Table 4: Wells by Physiographic Region

Well Name	Physiographic Region
Siku C-55	Kittigazuit Low Hills
Kilagmiotak F-48	Kittigazuit Low Hills
Red Fox P-21	Kittigazuit Low Hills
Kilagmiotak M-16	Kittigazuit Low Hills
Kurk M-15	Mackenzie Delta
Kikoralok N-46	Mackenzie Delta
Ogruknang M-31	North Caribou Hills
Atigi O-48	North Caribou Hills
Tununuk F-30	Tununuk Low Hills
Ya-Ya P-53	Tununuk Low Hills
Ya-Ya M-33	Tununuk Low Hills
Toapolok H-24	Tununuk Low Hills
Reindeer D-27	Tununuk Low Hills
Ya-Ya A-28	Tununuk Low Hills
Ya-Ya I-17	Tununuk Low Hills

Source: Rampton (1988)



amec		**Inuvialuit Settlement Region** **Drilling Waste Disposal Sumps Study**		
Government of Canada **Environmental Studies Research Funds** **(ESRF-04-046)**		**Physiographic Regions**		
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3.1.1 Mackenzie Delta

Subject Sites: Kikoralok N-46, Kurk M-15

The Mackenzie River Delta, the largest in Canada, is classified as a north to northeast trending estuarine delta, measuring 200 kilometers (km) long and 65 km wide and is underlain by a thick layer of deltaic sediments (Rampton, 1988). Flooding occurs in all parts of the delta (Rampton, 1988). Continual channel shifting has created an intricate network of channels and lakes on the surface, which are separated by reverse deltas, sandy point bars and tidal mudflats (4, Rampton, 1988). Lake coverage is in the range of 30% in the upper portion, 15-30% in the middle and less than 15% in the lower portion (Rampton, 1988). Other distinguishing landforms include low-lying islands, pingos and upland tundra (4). Thick permafrost and thermokarst lakes are most common on the upper part of the delta and due to warming temperatures, degradation of this permafrost causes land subsidence and the formation of lakes (Rampton, 1988). These lakes further add to continual permafrost degradation and lake expansion (Rampton, 1988). Lakes can also become infilled with sediment brought in by breaching channels (Rampton, 1988).

3.1.2 Tuktoyaktuk Coastlands

Subject Sites: Reindeer D-27, Siku C-55, Ya-Ya P-53, Toapolok H-24, Ya-Ya M-33, Kilagmiotak F-48, Red Fox P-21, Kilagmiotak M-16, Ya-Ya A-28, Ya-Ya I-17

The Tuktoyaktuk Coastlands include the Coastal Arctic Plain between the Mackenzie Delta and the Amundsen Gulf (Rampton, 1988). Thick unconsolidated sediments, few bedrock outcrops, pingos, massive ice, retrogressive-thaw flow slides and a 30% coverage by lakes characterize this area (Rampton, 1988). Thermokarst activity has lead to portions of the Tuktoyaktuk Coastlands to be poorly drained with irregular drainage patterns (Rampton, 1988).

3.1.2.1 Tununuk Low Hills

Subject Sites: Reindeer D-27, Ya-Ya P-53, Toapolok H-24, Ya-Ya M-33, Ya-Ya A-28, Ya-Ya I-17, Tununuk F-30

The Tununuk Low Hills comprise the west part of Richards Island and adjacent land to the south of Mackenzie River East channel (Rampton, 1988). This area is characterized by rolling topography underlain by clay to sandy gravel textured sediment, irregularly shaped and orientated lakes and ridges and poorly drained broad depressions (Rampton, 1988).

3.1.2.2 Kittigazuit Low Hills

Subject Sites: Siku C-55, Kilagmiotak F-48, Red Fox P-21, Kilagmiotak M-16

The Kittigazuit Low Hills are characterized by deep inset, northeast trending lakes with moderately steep slopes on ridges that are well drained (Rampton, 1988). These ridges are formed by thick, brown, fine grained sands capped by thin surface tills (Rampton, 1988).

3.1.3 Anderson Plain

Subject Sites: Atigi O-48, Ogruknang M-31

The Anderson Plain is characterized by a bedrock controlled topography with bedrock outcrops in escarpments and steep slopes (Rampton, 1988). The plain is imperfectly drained due to gentle slopes, broad basins and valleys and permafrost (Rampton, 1988).

3.1.4 North Caribou Hills

Subject Sites: Atigi O-48, Ogruknang M-31

The North Caribou Hills project 80 km to the northwest between the Mackenzie Delta and Tuktoyaktuk Coastlands and rise steeply above surrounding areas (Rampton, 1988). The major landforms are bedrock controlled with the perimeter marked by bedrock escarpments (Rampton, 1988). This area is characterized by a radial drainage pattern with a thin layer of unconsolidated deposits (Rampton, 1988). Except for small depressions on flat-crested hills, the area is well drained (Rampton, 1988).

3.2 Climate

A continental subarctic climate characterizes the Mackenzie Delta. Winters are long and cold lasting from October to April and summers are cool and brief. Strong winds occur during the fall and winter and stronger temperature inversions than along the coast are seen.

Low precipitation in the Mackenzie Delta is due to the rain-shadow effect of the Cordillera with annual precipitation between 300 mm and 400 mm decreasing along the delta to 250 mm at Inuvik and 125 mm at Tuktoyaktuk. Inuvik has an average of 40 days per year where there is less than 0.2 mm of rain, 0.13 days where there is 10 to 25 mm of rain and individual rainfalls are less than 5 mm. Rainfall that does occur in Inuvik falls in July with a monthly mean of 40 mm. In November, all precipitation falls as snow with the snow pack reaching maximum depth by March. Mean monthly snowfall is highest in the fall and limited thawing compensates for the decrease in snowfall that occurs thereafter (Dyke, 2000).

The Mackenzie Delta is also characterized by complex wind patterns due to the mountainous terrain west of the delta. Winds are of a northwest to southeast trend due to the channelling effect of the valley, while Inuvik and Tuktoyaktuk have winds predominantly from the east (Dyke, 2000).

Monthly climate records for 2003 and 2004 obtained from Environment Canada's website (http://www.climate.weatheroffice.ec.gc.ca/climateData/canada_e.html) are shown on Table 5.

Table 5: Inuvik Climate Data – 2003 and 2004

Month	Mean Max Temp °C	Mean Temp °C	Mean Min Temp °C	Total Precip mm
Jan/2003	-23.5	-27.1	-30.7	2
Feb	-20.7	-24.7	-28.7	14
Mar	-19.1	-23.4	-27.6	8.5
Apr	-3.9	-8.8	-13.7	9
May	3.8	-0.3	-4.3	18.5
Jun	16.7	10.4	4.1	1
Jul	19.5	14.2	9	38.5
Aug	15.1	10.1	5.1	33.5
Sep	6.5	3	-0.6	32.5
Oct	0.8	-2.6	-6	13
Nov	-13.7	-17.4	-21.1	28.5
Dec	-21.6	-24.6	-27.6	20
Jan/2004	-25.5	-29.6	-33.7	25.5
Feb	-26.3	-30.5	-34.6	10
Mar	-21.3	-26.9	-32.5	15
Apr	-5.7	-11.6	-17.4	9
May	3.3	-1.4	-6.1	4.5
Jun	20.7	14	7.3	11.5
Jul	20.3	14.9	9.4	22
Aug	16.9	11.4	5.8	21.5
Sep	6.2	2.4	-1.5	16
Oct	-5.1	-7.9	-10.7	7.5

3.3 Climate Change

Over the last 30 years, significant warming has occurred in the Mackenzie Delta causing rapid melting of the Arctic sea ice (Environment Canada, 2003b). It is anticipated that any effects of climate change will be more significant in the Arctic than the rest of the world (Government of Canada, 2004; Environment Canada, 2003b). The effects of climate change may include the thawing of ground ice leading to ground subsidence, increases in slope failures, thaw lake formation and silt deposition in water bodies (Dyke, 2000; Harris, 1987). Reduction in the extent and distribution of permafrost and in permafrost-related geomorphic processes along with a northward shift in the southern limits of the permafrost zones due to melting of ground ice may occur. An increase in the active layer may occur leading to the drainage of small lakes and ponds. Warming temperatures may also decrease the load-bearing strength of the permafrost decreasing the stability of roads, airstrips, pipelines and building foundations (Dyke, 2000; Harris, 1987).

3.4 Vegetation

The southern portion of the Mackenzie Delta is dominated by dense white spruce stands and balsam poplar (Rampton, 1988). Shrubs include willow and alder and are important in plant succession following alluvium deposition (Rampton, 1988). Willow and alder characterize the

central portion of the delta with low areas being dominated by marshy vegetation (Rampton, 1988). Poplars have also extended into this region (Rampton, 1988). Due to constant flooding and the cooling effects of the Beaufort Sea, outer areas of the delta are covered by sedges and willows (Rampton, 1988). These sedges and willows were often difficult to traverse during site assessment surveys at the subject sites.

The Tuktoyaktuk Coastlands are dominated by low arctic tundra vegetation, which include dwarf birch, willow, numerous heaths and sedges (Rampton, 1988). The southern periphery of the Coastlands is dominated by tundra-forest vegetation with clumps of trees scattered within the dense shrub layer of scrub birch, willow and heaths (Rampton, 1988). Anderson Plain is also covered by low arctic tundra vegetation as described above (Rampton, 1988).

3.5 Permafrost and Active Layer

Permafrost occurs when the ground temperature is below 0ºC for a two year period (Harris, 1987). Soil moisture within permafrost occurs as ground ice, which comprises a significant portion of the upper ground and can form ice wedges and layers up to several meters thick (Geologic Survey of Canada, 2000; Harris, 1987). Moisture contents of more than 1000% by volume are common in silts and peats in the lower Mackenzie Delta and if allowed to thaw, ponding followed by lake formation and expansion will occur. Lake expansion will continue until it intersects a drainage-way or is impeded by dry permafrost (Harris, 1987). Permafrost soils are easily damaged and are sensitive to changes in temperature (Pembina Institute, 2004).

The Mackenzie Delta is in an area of intermediate discontinuous permafrost (35 to 65% of area underlain by frozen ground) (Kokelj and GeoNorth Ltd., 2002; Geologic Survey of Canada, 2000; Rampton, 1988). Permafrost thickness varies in this area from 600 m in the Tuktoyaktuk Peninsula to 74 to 80 m in the Mackenzie Delta and Inuvik area (Rampton, 1988). Thin permafrost in the Delta is attributed to warmer ground temperatures caused by shifting channels and the thermal effects of snow cover associated with willow growth (Kokelj and GeoNorth Ltd., 2002). Vegetation plays an important role on permafrost and permafrost re-establishment because accumulated snow is insulating, warming ground temperatures (Geologic Survey of Canada, 2000).

The active layer is defined as the top layer of ground subject to annual thawing and freezing in areas underlain by permafrost. The thickness of the active layer depends on climate, vegetative cover and soil properties (Geological Survey of Canada, 2000; Harris, 1987). The active layer in vegetated areas is 0.2 m to 0.5 m deep and is thicker on barren areas (Rampton, 1988). In summer, the active layer thaws resulting in a wet surface. This is due to frozen underlying layers preventing the downward percolation of melted snow and ground ice water (Harris, 1987).

The Geologic Survey of Canada has studied the active layer conditions and ground temperatures of over 60 sites within the Mackenzie Region. It was discovered that increases in both thaw depth and ground subsidence occurred during the 1990s. In 1998 at Taglu, large increases in thaw depth and active layer were observed and in the Mackenzie Delta, thaw penetration data showed an increase of 12 to 23 cm from 1991 to 1992. Ground subsidence in

the Mackenzie Delta also increased in 1998 compared with observations in previous years. Strong El Nino conditions in 1998 resulted in mean annual air temperatures increasing 3 to 5ºC and ground surface temperatures increasing 1 to 4ºC. The active layer thawed earlier in the spring of 1998 due to spring temperatures rising to above 0ºC. During the 1999-2000 year, winter ground surface temperatures were 5 to 10 degrees higher than during the previous 10 years. This variability is related to variations in air temperature and snow cover (Smith et al., 2001).

Active layer data obtained from the Geological Survey of Canada (GSC) Canadian Permafrost Monitoring Network web site (http://www.canpfnetwork.com/activelayersites.html) was reviewed and mapped to determine if any of the sites are in close proximity to sites selected for the waste disposal sumps survey (Figure 4). Generally, active layer data is available for locations from 10 to 50 km from the subject sites and was therefore not used. It should be noted that the GSC database contains various records for a number of subject sites including:

- Atigi O-48;
- Ogruknang M-31;
- Tununuk F-30;
- Siku C-55;
- Reindeer D-27;
- Ya-Ya M-33;
- Ya-Ya P-53;
- Toapolok H-24; and
- Kikoralok N-46.

However, available information does not include active layer data.

3.6 Ground Temperature Database

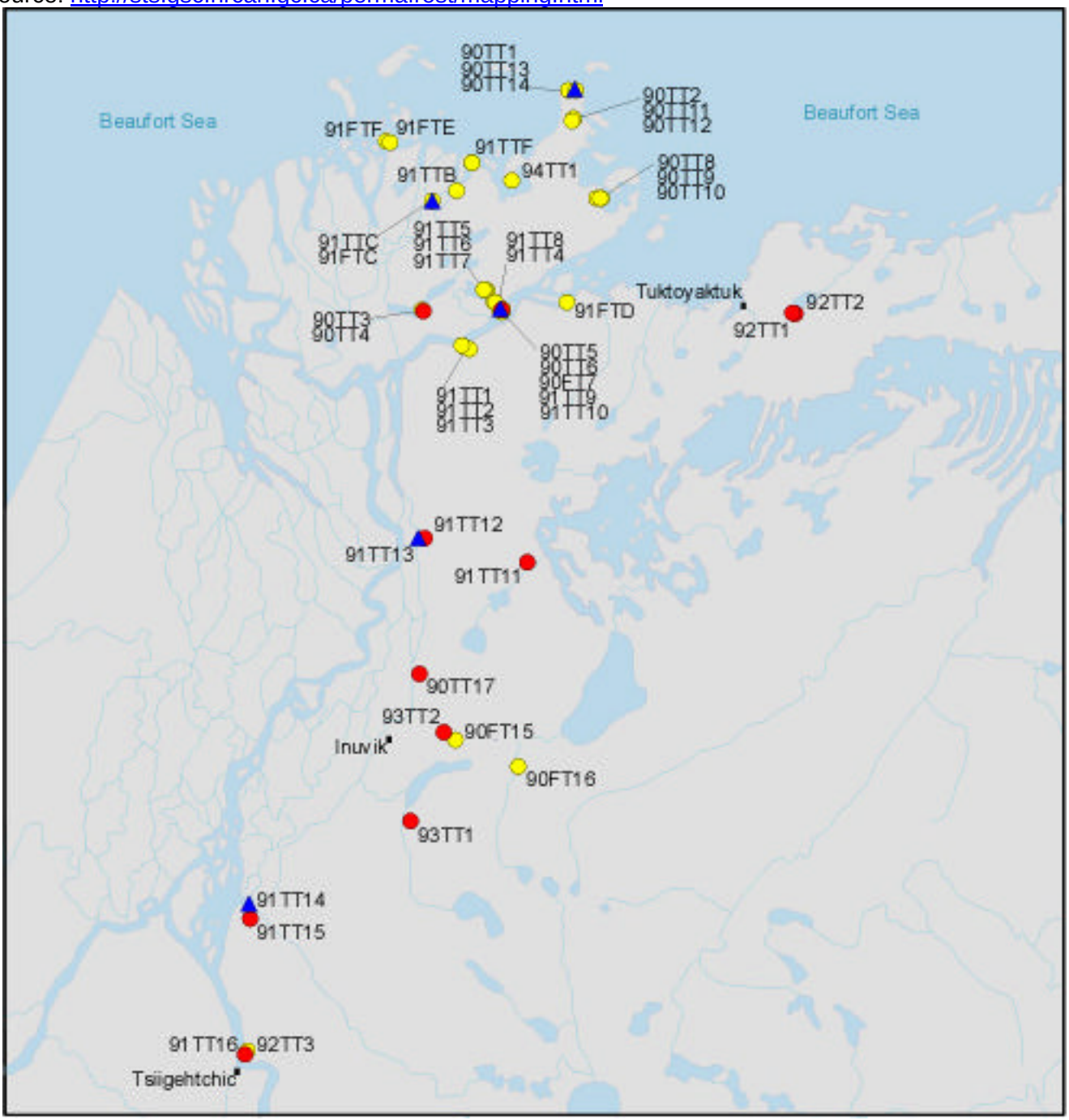
Publicly available data from published and unpublished sources have been compiled to produce a summary ground temperature database for northern Canada. The majority of the sites in this database are inactive. Ground temperature maps developed by the GSC and presented on their website (http://sts.gsc.nrcan.gc.ca/permafrost/permafrostdatabases/national_permafrost_database.html#active) were reviewed (Figure 5). The ground temperature database, available at http://sts.gsc.nrcan.gc.ca/mapviewers/permafrost.asp was reviewed to determine if any data are in close proximity to sites selected for the waste disposal sumps survey. It should be noted that the GSC database contains ground temperature records for a number of subject sites including:

- Atigi O-48;
- Ogruknang M-31;
- Tununuk F-30;

- Siku C-55;
- Reindeer D-27;
- Ya Ya M-33;
- Ya Ya P-53;
- Toapolok H-24; and
- Kikoralok N-46.

However, near surface information is not available. Most of the available ground temperature data is for depths greater than 125 m.

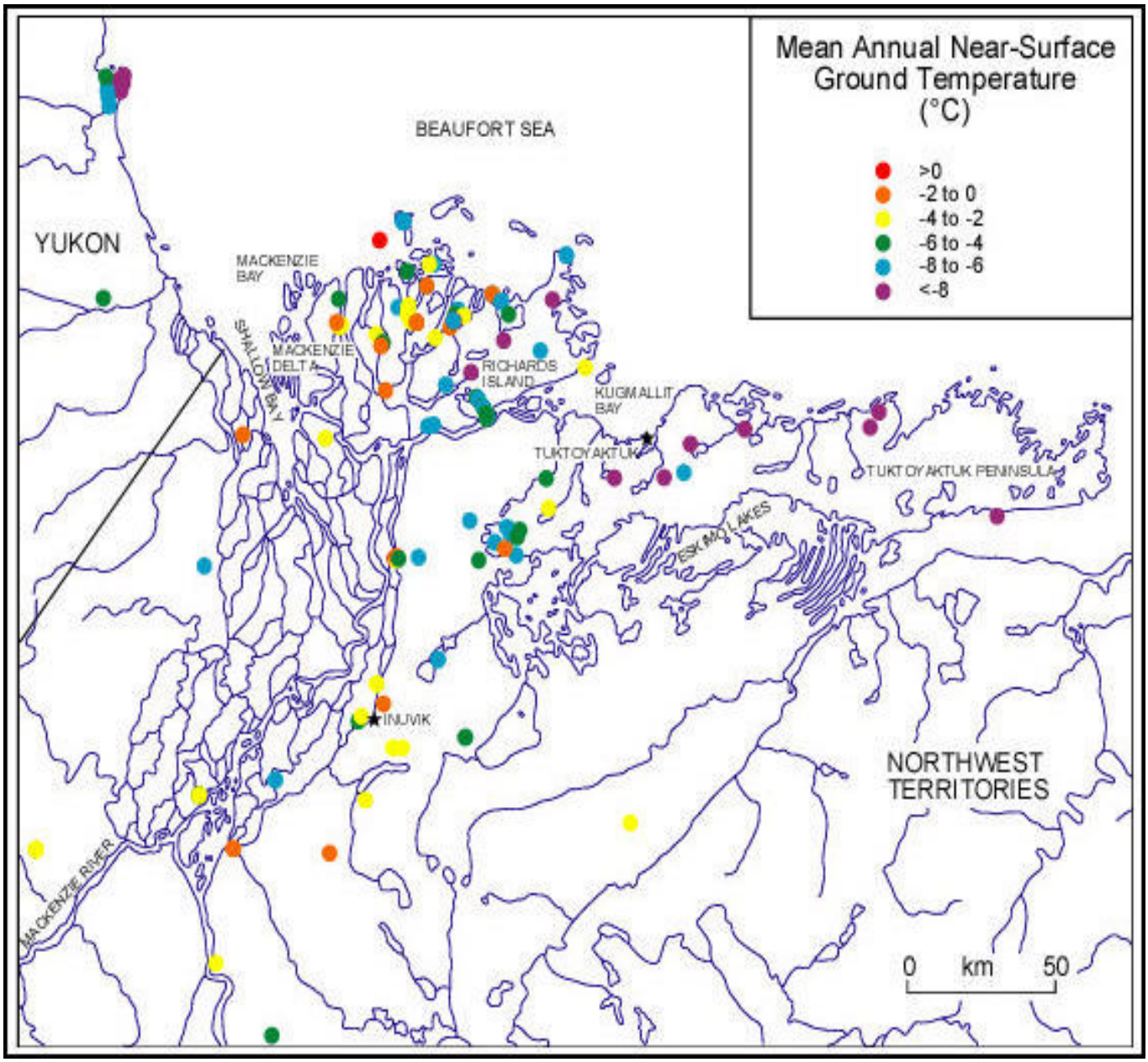
Source: http://sts.gsc.nrcan.gc.ca/permafrost/mapping.html



Thaw depth monitoring sites in the Mackenzie Delta area. Yellow dots correspond to active layer monitoring sites and the red dots are sites with air and ground temperature record.

amec		**Inuvialuit Settlement Region** **Drilling Waste Disposal Sumps Study** **Active Layer Survey Data**		
Government of Canada **Environmental Studies Research Funds** **(ESRF-04-046)**				
Drawn: ECW	Scale: N/A	Date: Nov 2004	Project No.: CE02993	**Figure: 4**

source:http://sts.gsc.nrcan.gc.ca/permafrost/permafrostdatabases/national_permafrost_database.html#active



amec

Government of Canada
Environmental Studies Research Funds
(ESRF-04-046)

Inuvialuit Settlement Region
Drilling Waste Disposal Sumps Study

Ground Temperature Data

Drawn: ECW	Scale: N/A	Date: Nov 2004	Project No.: CE02993	**Figure: 5**

3.7 Drilling Muds

Drilling fluids include components and additives that remove rock cuttings, control formation pressures, protect productive formations, cool and lubricate, stabilize the hole, and protect against corrosion (Kokelj and GeoNorth Ltd., 2002; ESRF, 1988). The northern regions of Canada use three types of mud systems, namely brine, fresh water and oil-based (The Pembina Institute, 2004; ESRF 1988). Generally, drilling muds are prepared and stored in tanks on site. Drilling muds in permafrost regions must be cooled before use to reduce the chance of thawing (The Pembina Institute, 2004).

Brine-based muds are used primarily in the north because they can be cooled to below 0ºC (The Pembina Institute, 2004; Kokelj and GeoNorth Ltd., 2002). They are also used when drilling commences below 2000 m (ESRF, 1988). Fresh water muds are used in holes less than 2000 m deep. Oil-based muds are used infrequently in the north because (Kokelj and Geonorth Ltd. 2002; ESRF, 1988; and The Pembina Institute, 2004):

- Sump disposed is prohibited.
- Effluents cannot be released.
- The presence of diesel oil renders the mud toxic.

Drilling muds typically include polymers to help with viscosity and density, bentonite (montmorillonite clay) to increase viscosity, caustic soda (sodium hydroxide) to control pH and remove calcium, potassium chloride (potash) to reduce the freezing point and barite to increase weight when abnormal formation pressures are encountered (ESRF, 1988). Other additives such as lime, salt, sawdust, and quickseal are used to reduce viscosity and water loss, to help with flocculation and thinning and to prevent loss of circulation (ESRF, 1988). Additives used to lubricate pipe connections are often the most toxic components of drilling muds (The Pembina Institute, 2004).

3.7.1 Waste Effluent

Waste drilling fluids or waste effluent are comprised of waste muds, drilling muds, altered drilling muds, completion fluids, organic bactericides, organic and inorganic compounds, detergents used in rig washing, waste cement, water with oil, grease and dirt, biocides and drill cuttings in a chemically treated suspension (ESRF, 1988). If rock cuttings are added to the drilling muds, the chemical composition of the muds is significantly altered (ESRF, 1988). It is common to deposit waste cement from the hole into the sump to help decrease the chance of leaching fluids since the cement sets before it freezes. The amount of cement deposited is typically small compared to the size of the sump. The concern generated by waste effluents is the potential for environmental degradation resulting from the release of any toxic constituents (ESRF, 1988).

3.7.2 Volume and Chemical Composition

Researchers have found that a typical 3000 m deep well produces 4000 m^3 of drilling waste (ESRF, 1988). Relatively large quantities of drilling waste were generated by the 1970s Arctic

wells because they were comparatively deep (ESRF, 1988). Chemical analysis of drilling waste found suspended solids, insoluble salts such as gypsum and barite, bentonite clays, potash, caustic soda, heavy metals (e.g., chromium, mercury, zinc, iron and lead), phosphorus, organic carbon, and oil and grease (The Pembina Institute, 2004; ESRF, 1988). Caustic soda and potash cause the high specific conductivities that are often associated with sumps (The Pembina Institute, 2004; ESRF, 1988).

3.7.3 Sump Placement and Construction

Sump placement is predominantly determined by terrain, subsurface geology, the extent of permafrost and well site location (Kokelj and GeoNorth Ltd., 2002; ESRF, 1988). Sumps are generally located on level high ground, away from drainage ways and at least 30 m away from streams, terrain permitting (ESRF, 1988). If the terrain near the well site is unsuitable for sump construction a remote sump, located within a few kilometers, is typically constructed (ESRF, 1988). Construction of sumps in permafrost zones are cleared of snow and then blasted, ripped and excavated with the excavated material stockpiled until covering of the sumps occurs (Kokelj and GeoNorth Ltd., 2002; ESRF, 1988). If sumps constructed in permafrost zones are to be left open during the summer, sloping of the walls can reduce potential sloughing into the sump during thawing (ESRF, 1988).

Sump size is determined by the depth of the hole to be drilled, the expected duration of drilling and experience from previous wells (ESRF, 1988). If the sump is to be open in the summer, the sump size is increased to handle an increase in fluid volume due to summer run off (ESRF, 1988).

3.7.4 Drilling Waste Fluid Disposal

Drilling waste fluids are discharged directly into sumps during drilling (ESRF, 1988). This method of disposal has been employed by the oil and gas industry in the north since the 1960s and there are now about 1800 sumps in the Canadian Arctic (Environment Canada, 2002). The design of these sumps assumes that drilling wastes will be contained over the long term by the permafrost environment (Environment Canada, 2002). Reuse of waste fluids is typically not employed in the Arctic since most operations occur in the winter and fluids freeze soon after being expelled into the sumps (ESRF, 1988). Treatment of waste fluids in the sump can be done to reduce toxicity and is most successful with simple compositional wastes (ESRF, 1988). Flocculation, dilution and pH adjustments are three ways to treat these wastes (ESRF, 1988). If oil-based drilling muds are used, controlled use and removal of hydrocarbons can reduce toxicity (ESRF, 1988).

Annual flooding creates a particular concern for sumps in the Mackenzie Delta because of the increased potential for contact between flood waters and sump fluids (Kokelj and GeoNorth Ltd., 2002; ESRF, 1988). Sump success is also limited in the Mackenzie Delta since the surface is characterized by poor drainage (Kokelj and GeoNorth Ltd., 2002). This results in extensive ponding which, in turn, increases permafrost thawing because water acts as a heat sink (Kokelj and GeoNorth Ltd., 2002). The success of using permafrost as a containment medium is usually

a function of construction practices, site operations and abandonment practices (Kokelj and GeoNorth Ltd., 2002).

3.7.5 Sump Abandonment

On termination of drilling, sumps are allowed to freeze and then backfilled with excavated material from the pit to form a cap (Kokelj and GeoNorth Ltd., 2002; ESRF, 1988). Cap thicknesses are selected to counteract thawing in the backfill and sump contents (ESRF, 1988). Although small depressions may form in the cap, they are typically constructed to keep the surface above the original ground (ESRF, 1988). Thawing of waste fluids is minimized by excavating sumps below the active layer (ESRF, 1988).

Once the sump has been capped, it is seeded or left to revegetate naturally (Kokelj and GeoNorth Ltd., 2002; ESRF, 1988). Seeding in the Mackenzie Delta, however, must be completed after spring flooding (ESRF, 1988).

Recent sump assessments have indicated that 12 of 24 assessed drilling sumps located in the Mackenzie Delta region were collapsing or had already collapsed (The Pembina Institute, 2004; Kokelj and GeoNorth Ltd. 2002). The degradation of sump caps suggests that the drilling wastes may no longer be contained within the permafrost. In addition, disturbance of surrounding terrain has led to ponding and thermal disturbances that may result in sump collapse. Frequent flooding and warm permafrost temperatures are also contributed to collapsing sumps in the Mackenzie Delta Region (Kokelj and GeoNorth Ltd. 2002).

4.0 DRILLING WASTE DISPOSAL SUMPS ASSESSMENT

4.1 Methods

Subject sites were assessed during August 2004. The field crew consisted of two AMEC site assessment personnel accompanied by a local assistant and helicopter pilot.

The surveys were conducted in accordance with an execution plan developed prior to field mobilization. The field Project Execution Plan addressed:

- field team responsibilities;
- program logistics;
- the survey protocol;
- program health and safety plans; and
- regulatory approval requirements.

4.1.1 Survey Protocol

The survey protocol developed by TAG is attached in Appendix A. The protocol was finalized and presented to AMEC on 20 July 2004 (after award of contract on 25 June 2004). The survey protocol contains the following components:

- soil and water sampling and analysis;
- vegetation surveys;
- digital photography;
- site description;
- survey of active-layer thickness;
- on the ground location and data logging;
- development of digital data maps; and
- ground conductivity (EM38) surveys.

Site Assessment Forms

Prior to site visitation, paper and digital forms specifically designed to record information related to each of the survey components were developed using the survey protocol developed by TAG. Survey information was entered in row and column format using Microsoft Excel. An automated process was developed to present the data on site assessment forms for each site.

Site Photography

Digital photographs obtained during the course of the survey were described in terms of location (latitude and longitude). The location of selected photographs was plotted on site maps. Digital aerial photos were obtained prior to landing at each site. Photographs were obtained from various angles and elevations. These were often limited by weather conditions and by helicopter safety issues.

Active Layer Survey

Active layer (AL) measurements were conducted using a graduated 2 m long 1 cm diameter steel rod. Generally, background areas and areas on and adjacent to the sumps were surveyed. AL measurements were often limited by difficult terrain conditions, wetlands and hard surficial soil materials (e.g., gravel). These limitations resulted in fewer AL measurements than called for by the protocol. AL measurements were obtained for at least several locations in each of the areas specified in the protocol. These areas included:

- sump cap;
- lease; and
- undisturbed terrain.

All AL measurement locations were geo-referenced and recorded on computer dataloggers in the field. Digital photographs were obtained at many AL measurement locations.

EM Survey

Ground conductivity surveys were conducted using a Geonics EM38 survey meter. The areas on and immediately adjacent drilling waste disposal sumps were surveyed by foot on a 10 m grid. This grid was refined to more closely examine areas of elevated conductivity. Ground conductivity data was used to identify potential soil sampling locations.

Soil and Water Sampling

Twenty soil and fourteen water samples were collected and analyzed. AMEC's laboratory conducted the analytical work. Water samples were collected from known sumps, ponds and from background locations. Soil samples were collected only if areas exhibited anomalous ground conductivity or lack of vegetation and from background locations.

Representative background soil samples were difficult to obtain because permafrost prevented penetration of sampling equipment (hand auger) below the active layer. Truly representative samples would be obtained from depths of 2 to 4 m because soil from these depths was used as capping material for the sumps.

The following analytical tests were conducted on water samples:

- conductivity;
- pH;

- turbidity;
- colour; and
- soluble anions and cations.

Where hydrocarbon impacts (i.e., staining, odour) were suspected, the tested parameters also included BTEX and extactable petroleum hydrocarbons.

Water sampling was conducted following measurement of electrical conductivity (EC) and salinity in ponded water on the lease and in adjacent undisturbed watercourses. Field tests including pH, EC, total dissolved solids and temperature were conducted using a Hanna HI991301 meter.

Where several ponds were present, a water sample was obtained from the pond where the highest EC was measured. Field testing was not conducted in shallow ponds containing abundant algae. Generally, AMEC conducted field tests and sampled the larger ponds directly associated with the sump.

The following analytical tests were conducted on soil samples:

- conductivity;
- pH;
- sodium absorption ratio (SAR);
- salinity; and
- metals scan.

Soil salinity parameters included sodium, calcium, potassium, magnesium, chloride, sulphate, bicarbonate and sodium absorption ratio (SAR). Where hydrocarbon impacts (i.e., sheen, odour) were suspected, the parameters also included BTEX and CCME PH F1, F2, F3 and F4 fractions.

Chain of custody records and original lab reports are included in Appendix F.

4.1.2 Data Logging and Mapping

AMEC used several technologies to facilitate the process of locating a variety of sampling points within a mapped area and producing maps from the resulting data. The following equipment and software was used to carry out the survey and to deliver and process site survey information:

- Trimble Power GPS Survey System;
- Trimble TSC1 Data Logger;
- Trimble Reconn Pocket PC;
- GPS Pathfinder Office ver. 3;

- Dell Model PP01L Laptop Computer;
- Sony Digital Camera;
- EM 38 Survey Meter;
- OziExplorer GPS Mapping Software;
- Surfer Surface Mapping Software;
- ARCGIS ver 8.2;
- Microsoft Excel;
- Microsoft Access; and
- Adobe Acrobat.

The Trimble GPS survey system was used in navigation mode and in combination with OziExplorer moving map software to navigate to each site location. Moving map software was pre-loaded with appropriately scaled map coverage of the entire study area.

The Trimble GPS survey system was used to collect and map coordinate information for important site features such as disturbed areas, shorelines, sample locations, active layer survey points, photographs and vegetation observations.

GPS survey data was downloaded to a laptop computer on a daily basis while in the field. GPS Pathfinder Office software was used to differentially correct survey points. Differential correction utilized existing base stations in Yellowknife to correct coordinate data to sub-metre accuracy.

4.1.3 GIS Mapping

For each of the well sites visited, numerous GPS coordinates were collected in a decimal degree format (e.g., 136ºW and 68ºN) and an array of oblique aerial photographs were taken from a helicopter. Field GPS coordinates were obtained for:

- active layer survey points;
- photographs;
- water sample locations;
- soil sample locations;
- EM survey grids; and
- site features (i.e., wellhead, sump perimeter, roads, gravel pads, piles).

In order to further utilize this data it was necessary to convert the GPS points into a metric coordinate system. For this project, the coordinate system selected was Universal Transverse Mercator (UTM) Zone 8 used in conjunction with the 1983 North American Datum (NAD83). With neither true aerial photographs nor ortho-rectified aerial photographs available, the best possible oblique aerial photograph for each well site was selected from all of those captured from the helicopter. The criteria used to determine the best possible photograph considered its

degree of nadir (perpendicular to the earth's surface being best) and its relative coverage (does it contain the entire lease area etc.).

Once the best photo for each site was identified, a georeferencing process was used to rectify each photograph into a real-world coordinate system, namely, UTM Zone 8 NAD83. The rectification process was performed on-screen using relevant GPS data points to identify particular landmarks on each photograph. By referencing up to 10 unique landmarks per site, the photograph could be warped/stretched to closely approximate that of an actual ortho-photo (a process often referred to as rubber-sheeting). The georeferenced photographs allowed for a much more accurate portrayal of visited sample sites as well as more accurate area calculations. It is expected that varying levels of optical and area distortion will be present at the edge of the georeferenced photographs. All data manipulation and subsequent mapping was completed using ArcGIS 8.2 by ESRI.

4.1.4 Regulatory Approvals

Some of the sites are located on Inuvialuit owned lands and therefore required an access permit from the Inuvialuit Land Administration. AMEC was granted this permit on 15 August 2004. A copy of the permit is attached in Appendix C.

The NWT Scientists Act requires that all research conducted in the NWT must be licensed. The Scientists Act was passed as a response to the conduct of northern research without the consultation of local people. In some cases, land or artifacts of special value were treated inappropriately by researchers. In other situations, local participants involved in studies became frustrated at giving out information without receiving the results of the research. To avoid these problems, the Scientists Act requires researchers to consult with residents in or around research locations as part of the licensing process. Researchers are required to submit a brief, nontechnical report of any research activities by June 30th of the year following the research. The licensing process in the western NWT is administered by the Aurora Research Institute.

The requisite license was issued on July 30, 2004. A copy of the license is included in Appendix C.

4.2 Results

4.2.1 Assessed Sites

Assessments were conducted at well sites shown in Table 6.

Table 6: Drilling Waste Disposal Sump Study Sites

Well Owner	WID	Well Name
Unknown (B.A. SHELL IOE consortium)	275	Reindeer D-27
ConocoPhillips	730	Siku C-55
ConocoPhillips	760	Ya-Ya P-53
ConocoPhillips	894	Atigi O-48
ConocoPhillips	923	Toapolok H-24

Well Owner	WID	Well Name
ConocoPhillips	958	Ya-Ya M-33
ConocoPhillips	964	Kikoralok N-46
ConocoPhillips	1029	Tununuk F-30
ConocoPhillips	1072	Ogruknang M-31
Petro-Canada	1901	Kurk M-15

Aerial reconnaissance was conducted at Kikoralok N-46. Unsafe conditions including tall vegetation and adjacent wetland areas prevented landing on or near the site. Due to available and budgeted field time related constraints, the following four volunteer sites were not surveyed:

- Kilagmiotak F-48;
- Ya-Ya I-17;
- Red Fox P-21; and
- Kilagmiotak M-16.

4.2.2 Sump Volume and Mud Additives

Table 7 shows well depth, estimated sump volume, mud systems and sump size. Estimated volume was calculated using a ratio of 1.3 m^3 sump volume for 1 m of well depth (ESRF 1988).

Table 7: Sump Size and Summary of Mud Types

Well Name	Well Depth (m)	Estimated Sump Volume (m^3)	Type of Mud System Used	Sump Size (Survey Data) m^2
Reindeer D-27	3,861	5,020	GelChem	2,750
Siku C-55	4,507	5,858	GelChem, Diesel	5,750
Ya-Ya P-53	3,033	3,943	Unknown	3,847
Atigl O-48	1,981	2,576	GelChem	1,766
Toapolok H-24	2,623	3,410	GelChem, Diesel	3,238
Ya-Ya M-33	2,789	3,626	Unknown	4,794
Kikoralok N-46	1,885	2,451	GelChem	NA
Tununuk F-30	3,642	4,735	GelChem	5,945
Ogruknang M-31	4,429	5,758	GelChem	7,264
Kurk M-15	3,093	4,021	Records not available	1,357

A detailed breakdown of additives used in the drilling muds at each location is provided in Appendix D.

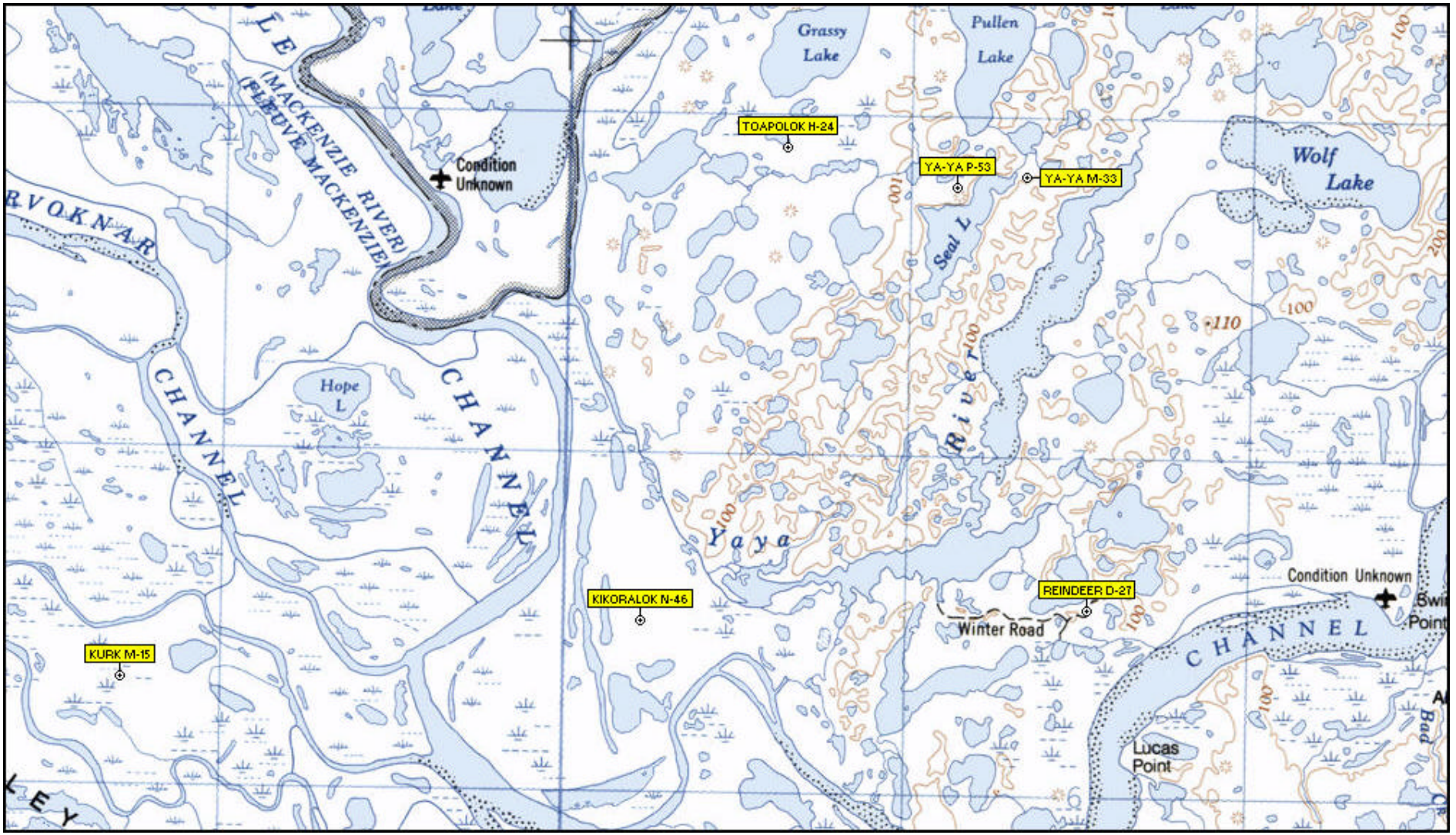
4.2.3 Sump Assessment Results Presentation Format

The location of information related to assessed sites is as follows:

- completed site assessment forms and related Tables are attached in Appendix D;
- site photographs referred to in Section 4 and on site Figures are attached in Appendix E;
- laboratory reports and chain of custody records are attached in Appendix F;

- all digital data including tables, lab reports, documents, figures, photographs, GPS data, GIS data and related information is provided on a CD attached in Appendix G; and
- soil and water analytical data is presented at the end of this section (Tables 8 and 9).

The location of the subject sites is presented on 1:250,000 scale NTS maps (Figures 6, 7 and 8).



amec

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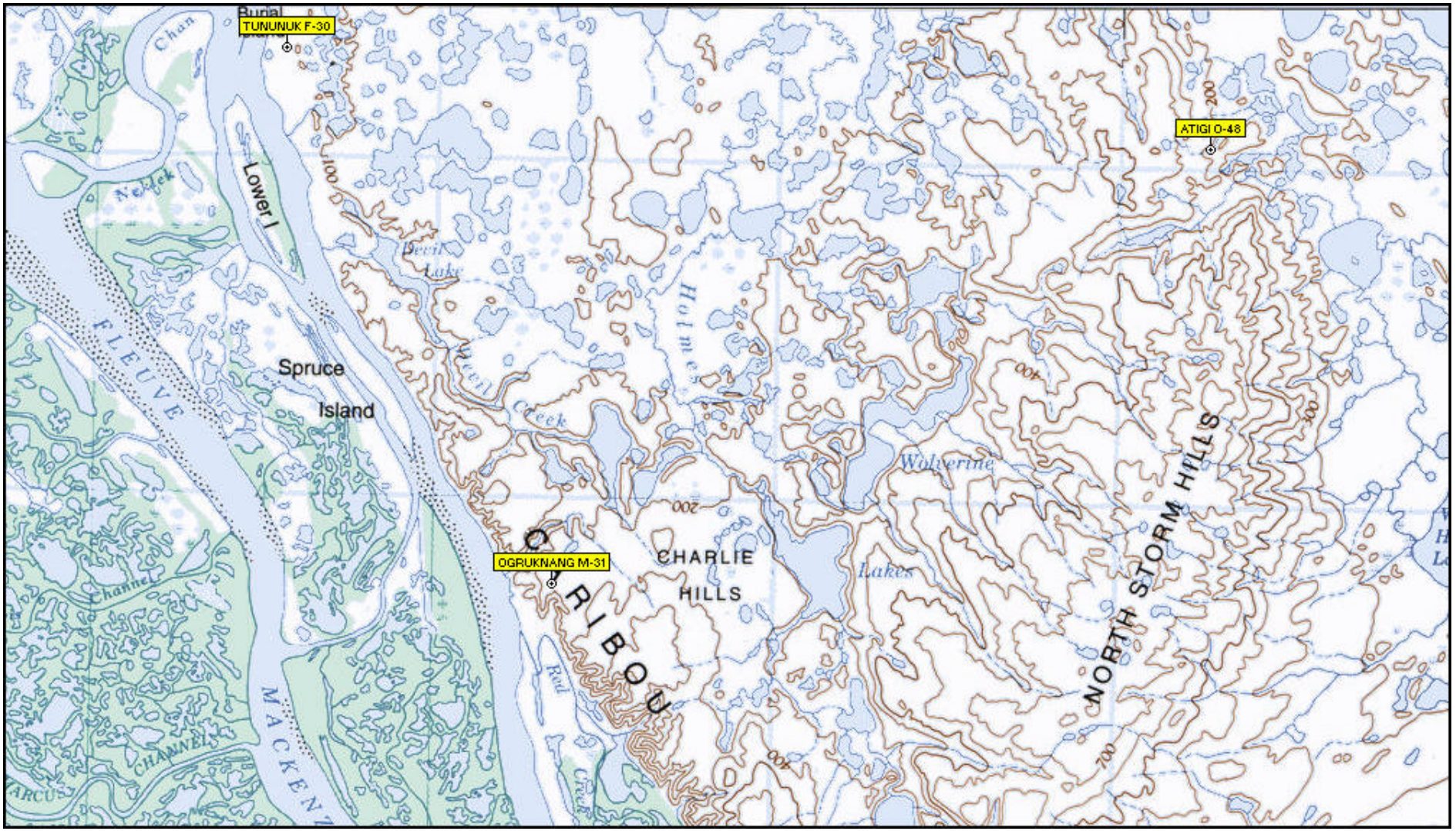
Environmental Studies Research Funds
(ESRF-04-046)

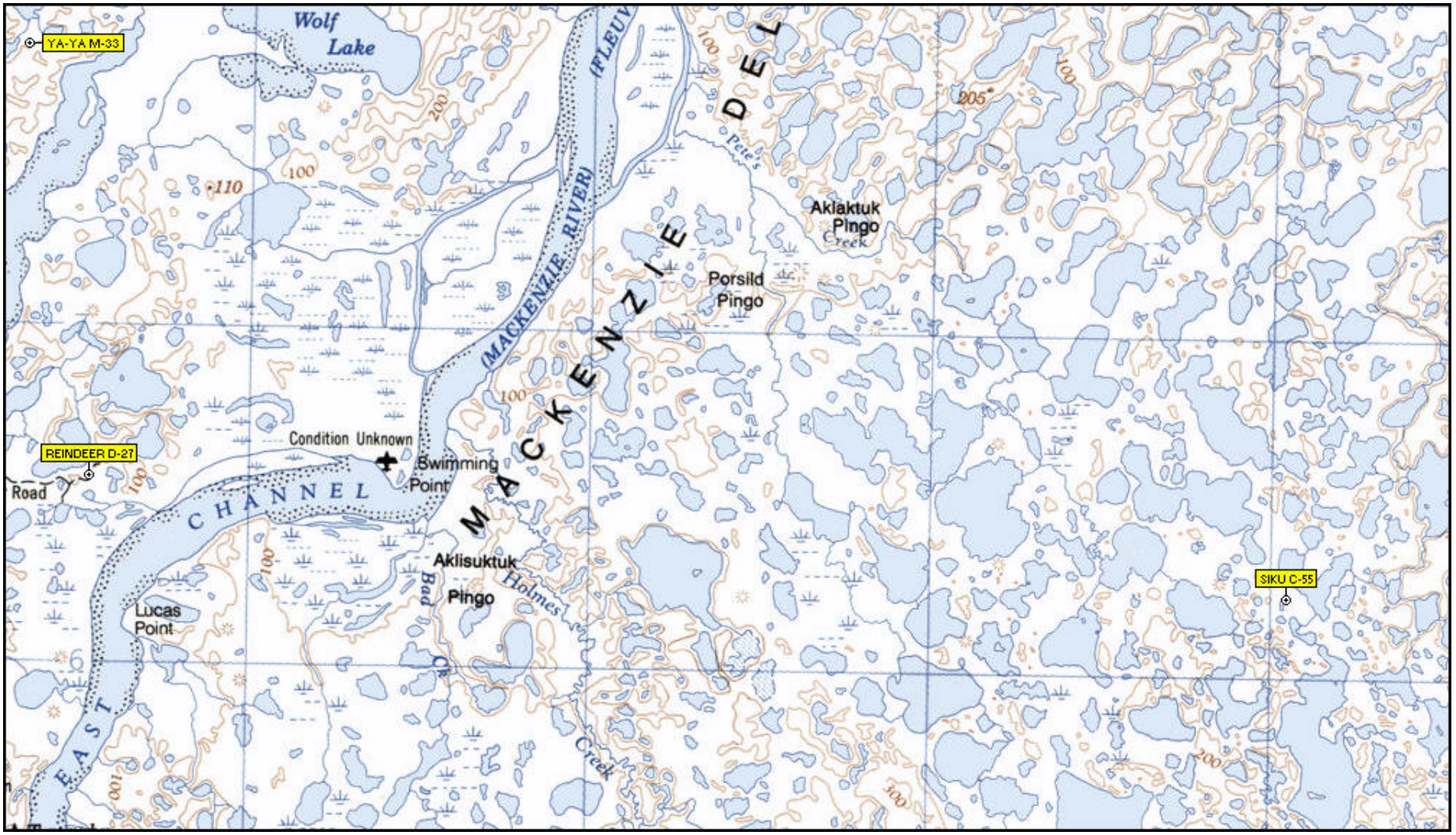
Inuvialuit Settlement Region
Drilling Waste Disposal Sumps Study

Site Locations (A)

Drawn: ECW	Scale: N/A	Date: Nov 2004	Project No.: CE02993	**Figure: 6**



amec		**Inuvialuit Settlement Region** **Drilling Waste Disposal Sumps Study**		
Government of Canada **Environmental Studies Research Funds** **(ESRF-04-046)**		**Site Locations (B)**		
Drawn: ECW	Scale: N/A	Date: Nov 2004	Project No.: CE02993	**Figure: 7**



amec		Inuvialuit Settlement Region Drilling Waste Disposal Sumps Study		
Government of Canada Environmental Studies Research Funds (ESRF-04-046)		Site Locations (C)		
Drawn: ECW	Scale: N/A	Date: Nov 2004	Project No.: CE02993	**Figure: 8**

4.2.4 Reindeer D-27

Reindeer D-27 is located at the end of a winter road on the Ya-Ya gravel pit. The elevation in this area is 25 masl. The East Channel of the Mackenzie River is located 2.5 km northwest of the site. A lake (140 ha) is located 290 m northwest of the site.

Drilling at Reindeer D-27 was conducted 8 July 1965 to 5 January 1966. The well is currently plugged and abandoned. Gravel extraction has exposed a 1 m section of the well casing (Photos 18 and 20).

The sump (Figure 9) is located at the base of a ridge of gravel that likely served as a drilling pad. Much of the original sump cap has subsided resulting in ponding over 75% of the sump area. Five small islands are present in the pond. Submerged willow (Photos 16 and 19) along the perimeter of these islands and the along the perimeter of the sump suggest that at least some subsidence has occurred recently. Soil cracking and sloughing along the south and east perimeter of the sump also provide evidence of recent and ongoing subsidence. The presence of soil berms along the east, west and south perimeter, suggest that the original outline of the sump is as shown on Figure 9.

Active layer thickness of 0.85 to 1.0 m adjacent to and within the sump area is roughly 0.5 m greater than that in the surrounding undisturbed area.

Potassium, sodium and bicarbonate in sump water are elevated to roughly three times background concentrations. The conductivity of sump water (0.263 mS/cm) compares with that of background water (0.243 mS/cm). The pond supports abundant aquatic and shore vegetation. Background water was sampled from a pond located approximately 200 m north of the wellhead.

The west side of the sump is above ground and exhibits no cracking or sloughing (Photo 17). A soil sample obtained from this area exhibited elevated sodium adsorption ratio (SAR) of 30.4, conductivity 3.64 mS/cm, pH 8.26 and barium 760 µg/g. These concentrations suggest that the material sampled may contain drilling mud. Salt crystals are present on the surface and the sampled area was barren, supporting very little vegetation. EM 38 survey in this area was hampered by buried metallic debris (Photo 23). EM survey around the perimeter of the pond and in adjacent areas indicated no evidence of ground conductivity anomalies. A background soil sample was not obtained because hand auger penetration was not possible in permafrost beneath the active layer.

515100 515200 515300

7665500 7665400

N

Gravel Pad

22 24

1 0.5 0.35

D-27 Sump 23

D-27 Sump

Sump Cap

Sump Pond

0.85 0.45

0.90 0.70

0.55 0.85 0.35

0.30 0.5

0.55 0.30

Legend

Wellhead

Sample Type

Soil

Water

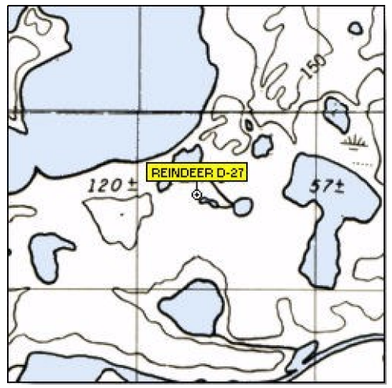
Active Layer Depth (m)

Report Photo

CD Photo

Feature Boundary

Helicopter Landing Area



10 5 0 10 20 30 40

Metres

Scale 1:1,000

CLIENT:

Government of Canada

Environmental Studies Research Fund

PROJECT:

ESRF-04-046 Drilling Waste Disposal Sumps Study

Reindeer D-27 Well Site

DATE: November, 2004	ANALYST: CMP	**Figure 9**
JOB No: CE02993	QA/QC: CW	PDF FILE: Site_D-27 11-24-04.pdf
GIS FILE: Site_D-27.mxd		
PROJECTION: UTM Zone 8	DATUM: NAD83	amec

4.2.5 Siku C-55

Siku C-55 is located 75 m east of a small (3.5 ha) lake at an elevation of 53 masl.

Drilling at Siku C-55 was conducted 7 May 1972 to 8 November 1972. The well is currently plugged and abandoned (Photo 6). Cement is present over an area of several meters squared around the wellhead (Photo 5). Log piles used to support the drilling platform are present (Photos 5 and 13). Metallic debris is present in the sump (Photos 4 and 12) and is buried along the south shore of the sump.

The sump (Figure 10) is located north of the wellhead. Much of the original sump cap has subsided resulting in ponding over 54% of the sump area. Portions of the sump that are not submerged include a central island, a bridge at the east end of the sump and an elevated area at the west end of the sump. Submerged willow (Photos 8 and 9) along the sump and island perimeters suggest that at least some subsidence has occurred recently. Soil cracking and sloughing (Photos 3 and 10) on the land bridge also suggest recent and ongoing subsidence.

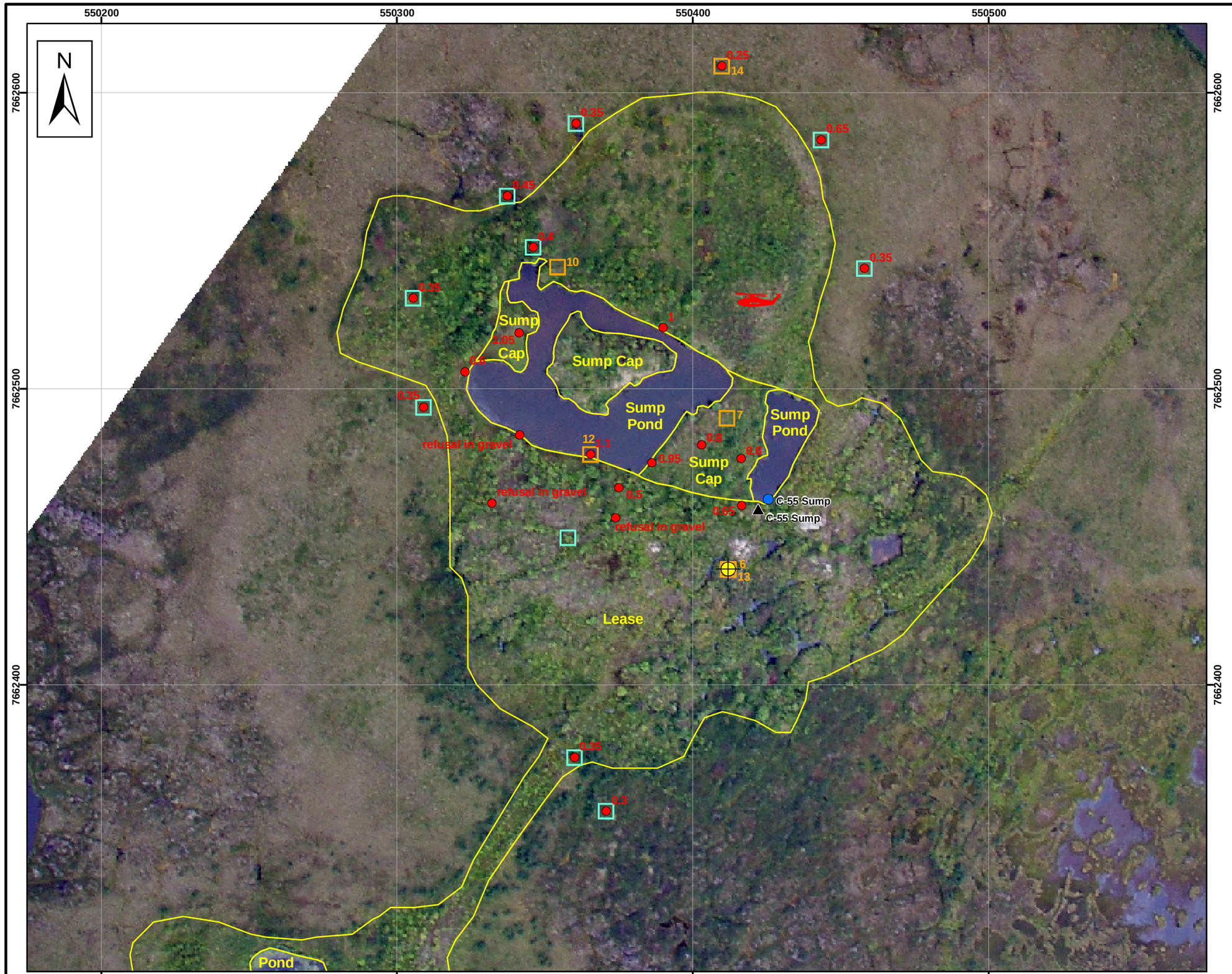
Active layer thickness of 0.8 to 1.1 m adjacent to and within the sump area is roughly 0.5 m greater than that in the surrounding undisturbed area (Photo 14).

Minerals present in sump water, including calcium, magnesium, potassium, sodium, chloride, sulphate and bicarbonate are elevated to roughly ten times background concentrations. The conductivity of sump water (0.774 mS/cm) is also elevated above that of background water (0.116 mS/cm). The background water sample was obtained from a small lake located approximately 200 m north of the site. The sump ponds support abundant aquatic and shore vegetation. A muskrat was observed in the west pond at the time of survey.

Drilling records show that 2,900 litres of diesel fuel were used in the drilling muds at Siku C-55. There was no evidence of hydrocarbon sheens or odours on surface water or on soil at this site.

EM survey around the perimeter of the pond and in adjacent areas provided no evidence of widespread ground conductivity anomalies. An area of elevated ground conductivity occurs between the wellhead and the sump; likely the location of the mud trough used during the drilling operation. A soil sample obtained from this area exhibits elevated salts in concentrations up to ten times greater than background. The sampled area is barren over an area of roughly 50 m^2, supporting very little vegetation. The background soil sample was obtained approximately 150 m north of the site.

Salt crystallization is evident at the northeast corner of the west pond (Photo 11). This area also exhibits eroded ground cracking and sloughing.

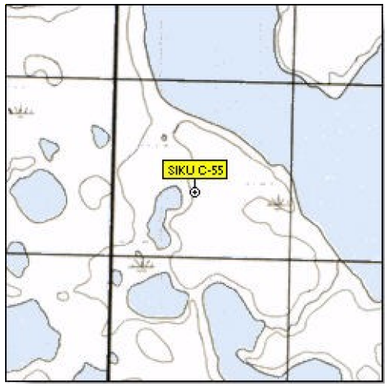


Legend

- Wellhead

Sample Type

- Soil
- Water
- Active Layer Depth (m)
- Report Photo
- CD Photo
- Feature Boundary
- Helicopter Landing Area



10 5 0 10 20 30 40
Metres
Scale 1:1,250

CLIENT: Government of Canada
Environmental Studies Research Fund

PROJECT: ESRF-04-046 Drilling Waste Disposal Sumps Study

Siku C-55 Well Site

DATE: November, 2004	ANALYST: CMP	**Figure 10**
JOB No: CE02993	QA/QC: CW	PDF FILE: Site_C-55 11-24-04.pdf
GIS FILE: Site_C-55.mxd		
PROJECTION: UTM Zone 8	DATUM: NAD83	amec

4.2.6 Ya-Ya P-53

Ya-Ya P-53 is located 400 m west of Seal Lake at an elevation of 40 masl.

Drilling at Ya-Ya P-53 was conducted 8 December 1972 to 20 March 1973. The well is currently plugged and abandoned (Photo 86). NEB records show that the well was re-entered on 11 March 1986.

The sump (Figure 11) is located southeast of the wellhead and between two lakes (Photo 93). Most of the original sump cap has subsided resulting in ponding over roughly 90 % of the sump area (Photo 85). Portions of the sump that are not submerged include a ridge at the southwest end of the sump. This area may extend over an adjacent grassy area evident on Photo 94.

Peaty soil cracking and sloughing (Photos 88 and 89) indicate recent and ongoing subsidence. The large pond southwest of the sump is surrounded by peaty soils supporting grass vegetation (Photo 92) unlike that of surrounding undisturbed areas. This suggests that the area may have been used to store excavated sump soil and that all of the available soil may not have been used in cap construction. During sump capping some of the original ground surface in this area may have been over-scraped or otherwise disturbed. This exposure of the ground surface may have resulted in deepening of the active layer and melting of ground ice. Over time, this would result in ground subsidence and pond creation.

Active layer thickness of 0.65 to 0.8 m adjacent the sump area is roughly 0.5 m greater than that in the surrounding undisturbed area (Photos 91 and 92).

Minerals present in sump water, including calcium, magnesium, potassium, sodium, chloride, nitrate, sulphate and bicarbonate are elevated up to seven times background concentrations. The conductivity of sump water (0.367 mS/cm) is elevated above that of background water (0.154 mS/cm). The pond supports abundant aquatic and shore vegetation. Muskrats and waterfowl were observed in the pond at the time of survey.

EM survey around the perimeter of the pond and in adjacent elevated areas provided no evidence of widespread ground conductivity anomalies. Elevated ground conductivity (up to two times background) is present on the southeast edge of the sump in an area devoid of vegetation. This soil in this area is peaty and saturated. A soil sample obtained from this area exhibits elevated mineral salts in concentrations up to thirty times greater than background. The sampled area is barren over an area of roughly 50 m^2, supporting very little vegetation (Photo 90). Other barren areas on the southeast side of the sump exhibited no ground conductivity anomalies.

511200 511300 511400 511500

7678200 7678100 7678000

N

Sump Pond

Sump Cap

P-53 Sump

P-53 Sump

P-53 Background

P-53 Background

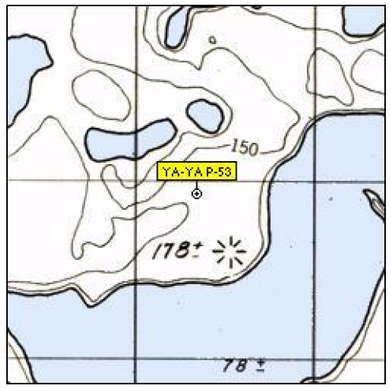
0.35 0.35 91 0.4 0.4 0.5 0.35 87 0.75 0.8 0.4 0.75 90 89 0.65 0.55 0.4 0.35 92 0.55 0.4 0.35 0.35

Legend

- Wellhead

Sample Type

- Soil
- Water
- Active Layer Depth (m)
- Report Photo
- CD Photo
- Feature Boundary
- Helicopter Landing Area



10 5 0 10 20 30 40

Metres

Scale 1:1,250

CLIENT: Government of Canada
Environmental Studies Research Fund

PROJECT: ESRF-04-046 Drilling Waste Disposal Sumps Study

Ya-Ya P-53

DATE: November, 2004	ANALYST: CMP	**Figure 11**
JOB No: CE02993	QA/QC: CW	PDF FILE: Site_P-53 11-24-04.pdf
GIS FILE: Site_P-53.mxd		
PROJECTION: UTM Zone 8	DATUM: NAD83	amec

4.2.7 Atigi O-48

Atigi O-48 is located at the northern edge of the North Storm Hills at an elevation of 66 masl. Intermittent stream channels are located about 500 m north and south of the site. A smaller channel draining into one of these streams begins at the northeast corner of the site.

Drilling at Atigi O-48 was conducted 9 January to 28 February 1974. The well is currently plugged and abandoned (Photo 75).

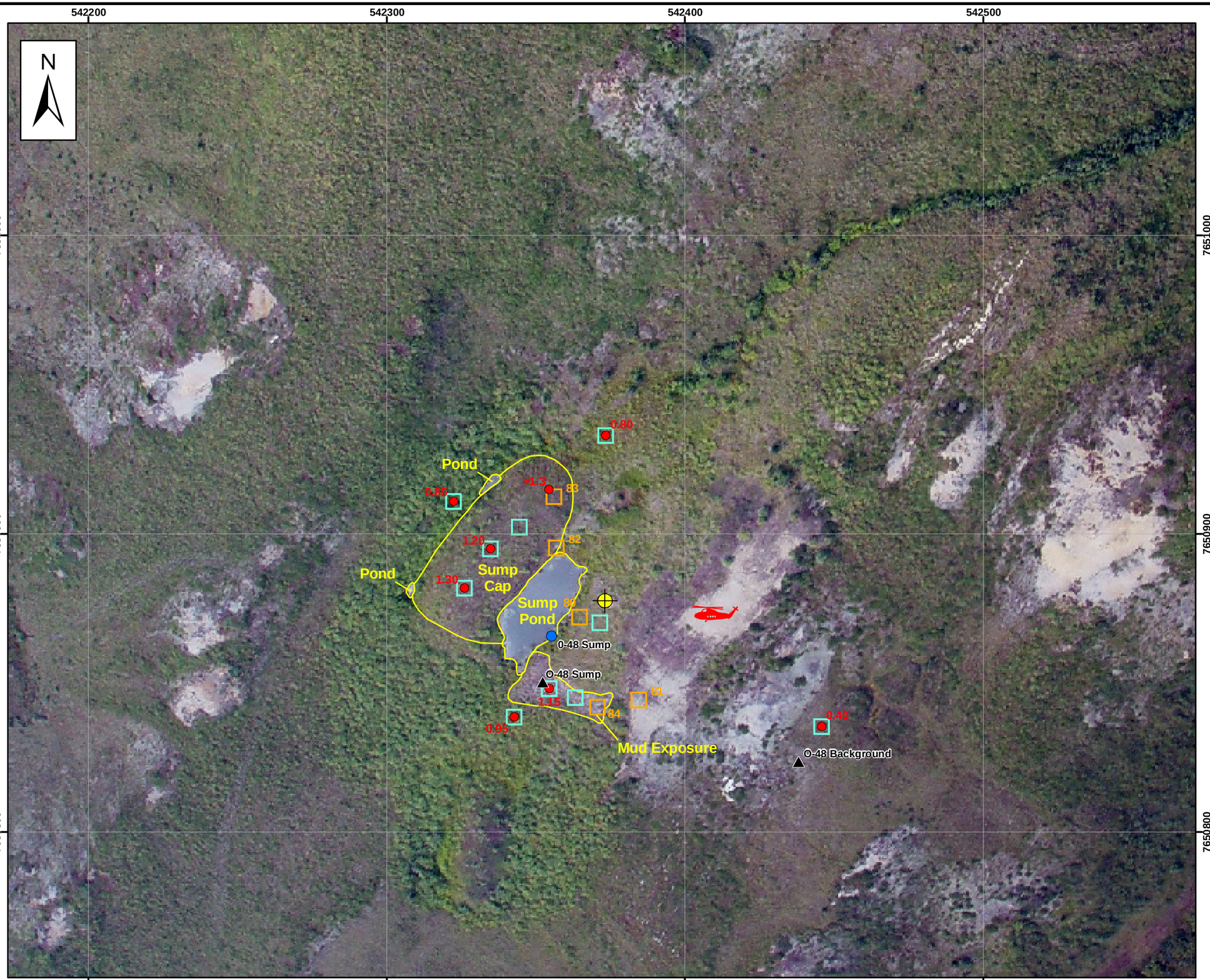
The sump (Figure 12) is located northwest of the wellhead. The area adjacent the sump cap has subsided resulting in a pond forming at the southeast end of the cap. Soil cracking and sloughing (Photos 73 and 83) suggest recent and ongoing subsidence of the sump cap into the adjacent pond.

Active layer thickness of 1.2 on the sump cap is roughly 0.5 m greater than that in the surrounding undisturbed area (Photos 79 and 80). The active layer survey was hindered by hard surficial soil conditions in this area. The elevation of the sump cap is approximately 2 m above the surrounding undisturbed area.

Minerals present in sump water, including calcium, magnesium, potassium, sodium, chloride, sulphate and bicarbonate are elevated above background concentrations evident at similar locations. A background water sample was not obtained because the nearest suitable sampling location is over 500 m from the sump. This distance was considered too far to walk. The conductivity of sump water (1.68 mS/cm) is elevated above that of regional background water. The pond supports abundant aquatic and shore vegetation.

EM survey around the perimeter of the pond and in adjacent areas provided evidence of anomalous ground conductivity southeast and north of the pond. The area southeast of the pond exhibited elevated ground conductivity (2 times background) over an area of 358 m^2; likely containing drilling muds and supporting no vegetation. A soil sample obtained from this area exhibits elevated salts in concentrations two orders of magnitude greater than background and a conductivity of 16.9 mS/cm. Vegetation down-gradient of this area showed evidence of possible salt related stress impacts (Photo 84).

Salt crystallization is evident on the sump cap at the northwest corner of the pond (Photo 82). This area also exhibits eroded ground cracking and sloughing.

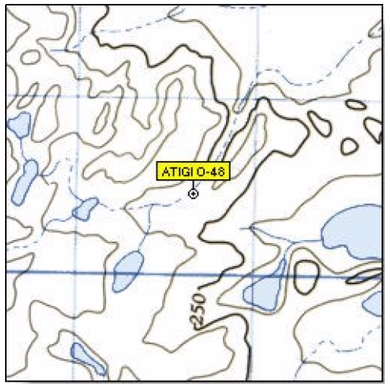


Legend

- Wellhead

Sample Type

- Soil
- Water
- Active Layer Depth (m)
- Report Photo
- CD Photo
- Feature Boundary
- Helicopter Landing Area



CLIENT: Government of Canada
Environmental Studies Research Fund

PROJECT: ESRF-04-046 Drilling Waste Disposal Sumps Study

Atigi O-48 Well Site

DATE: November, 2004	ANALYST: CMP	**Figure 12**
JOB No: CE02993	QA/QC: CW	PDF FILE: Site_O-48 11-24-04.pdf
GIS FILE: Site_O-48.mxd		
PROJECTION: UTM Zone 8	DATUM: NAD83	amec

4.2.8 Toapolok H-24

Toapolok H-24 is located adjacent a 34 ha lake at an elevation of 19 masl (Photo 33).

Drilling at Toapolok H-24 was conducted 21 April to 15 June 1974. The well is currently plugged and abandoned. The wellhead is located at the southeast corner of the sump in a treed area (Photo 34). This area exhibits ground subsidence along original pre-construction patterned ground features (Photos 33 and 34). The gravel pad has an area 15,000 m^2 and is elevated about 1.5 m above the surrounding undisturbed areas. Numerous (several hundred) log piles are present on the pad (Photo 41). Soil mounds present on the top of some of these piles indicate that upheaval due to frost action. A capped sump (presumably the camp sump) is located at the north end of the gravel pad (Photo 36). A 100 m gravel road connects the pad with a lake; likely used as a water source during construction.

The sump (Figure 13) is located east of the wellhead. The 3822 m^2 sump cap is intact and supports abundant vegetation (primarily grasses) (Photo 40). Subsidence of the cap was not observed. A few faint, thin cracks were observed on the southwest corner of the cap. Small ponds are located at the southeast (87 m^2) (Photo 37) and east edge of the cap. Trenching along the south edge of the sump cap contained stagnant water.

Instrumentation (likely thermisters) is present on the north and south edges of the cap (Photo 39). It is not known when nor by whom these were installed or if any related data is available.

Active layer thickness of 0.85 to 1.45 m on the sump cap is roughly 0.5 m greater than that in the surrounding undisturbed area. Active layer probes on the gravel pad indicate a thickness of greater than 1.5 m. The maximum elevation of the sump cap is approximately 2 m above adjacent undisturbed areas.

Minerals present in water obtained from the small pond adjacent the sump cap, including calcium, magnesium, potassium, sodium, chloride, sulphate and bicarbonate are elevated an order of magnitude above those found in background lake water. The conductivity of pond water (2.57 mS/cm) is also elevated above that of lake water. The pond supports abundant aquatic and shore vegetation (Photo 37).

Drilling records show that 21,000 litres of diesel fuel were used in the drilling muds at Toapolok H-24. A water sample obtained from the pond adjacent the sump cap exhibited no elevated hydrocarbon parameters (BTEX, total extractables). There was no evidence of hydrocarbon sheens or odours on surface water or on soil at this site.

EM survey on and around the perimeter of the cap provided evidence of anomalous (2 times background) ground conductivity along the west perimeter; particularly in the area nearest the wellhead and adjacent the pond on the south edge of the cap. A soil sample obtained from the southwest corner of the cap exhibits elevated salts in concentrations up to ten times greater

than background and a conductivity of 7.4 mS/cm. Vegetation in this relatively moist area showed no evidence of salt related impacts. Soil in this area showed no evidence of hydrocarbon impacts (e.g., staining, odours).

506100 506200 506300 506400

7679200 7679100 7679000

N

Camp Sump

H-24 Background

H-24 Background

Gravel Pad

42

Piles

0.5

1.1 1 1.1 1.2 1.2 1.05

Sump Cap

1.45 0.9 0.9

1.25 38 H-24 Sump Cap 0.85 37

1 H-24 Sump 0.9 0.6 0.55

1.3 1.15 1.05 1.05 0.85

H-24 Pond Adj Sump 1.5

Pond

0.4 0.6

0.4

>1.5

>1.5

>1.5

Legend

Wellhead

Sample Type

Soil

Water

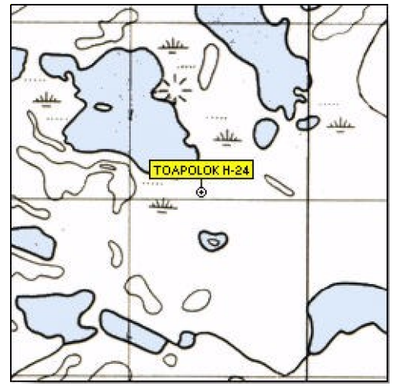
Active Layer Depth (m)

Report Photo

CD Photo

Feature Boundary

Helicopter Landing Area



10 5 0 10 20 30 40

Metres

Scale 1:1,250

CLIENT: Government of Canada
Environmental Studies Research Fund

PROJECT: ESRF-04-046 Drilling Waste Disposal Sumps Study

Toapolok H-24 Well Site

DATE: November, 2004	ANALYST: CMP	**Figure 13**
JOB No: CE02993	QA/QC: CW	PDF FILE: Site_H-24 11-24-04.pdf
GIS FILE: Site_H-24.mxd		
PROJECTION: UTM Zone 8	DATUM: NAD83	amec

4.2.9 Ya-Ya M-33

Ya-Ya M-33 is located about 325 m east of Seal Lake at an elevation of 28 masl.

Drilling at Ya-Ya M-33 was conducted 22 November 1974 to 13 February 1975. The well is currently plugged and abandoned. The wellhead is located at the northwest corner of the sump in a well-vegetated area about 275 m west of a lake (Photo 61). A fox was seen crossing the site prior to landing.

The sump (Figure 14) is located southeast of the wellhead. The 4239 m^2 sump cap is intact and supports abundant vegetation (primarily grasses) (Photo 60). Subsidence of the cap was not observed. Several cracks, up to 0.2 m wide and 2 m long, were observed on the east half of the cap. A small pond (168 m^2) is located at the northeast edge of the sump cap.

Active layer thickness of 1.1 to 1.35 m on the sump cap is roughly 0.7 m greater than that in the surrounding undisturbed area. The maximum elevation of the sump cap is approximately 2 m above adjacent undisturbed areas.

Minerals present in water obtained from the small pond adjacent the sump cap, including calcium, magnesium, potassium, sodium, chloride, sulphate and bicarbonate are elevated an order of magnitude above those found in background lake water (see Ya-Ya P-53). The conductivity of pond water (0.956 mS/cm) is also elevated above that of lake water (0.154 mS/cm). The pond supports abundant aquatic and shore vegetation (Photo 63).

EM survey on and around the perimeter of the cap provided evidence of anomalous (five times background) ground conductivity adjacent the pond and between the wellhead and the sump cap. The EM anomaly adjacent the pond is likely due to the influence of buried metallic debris. The EM38 meter responded erratically and failed to provide consistent readings in this area. A soil sample obtained from the area between the wellhead and the sump cap exhibits elevated potassium, sodium and chloride in concentrations up to sixty times greater than background and a conductivity of 7.5 mS/cm. Sparse vegetation (grass) in this area showed evidence of possible salt related impacts.

513100 513200 513300 513400 513500

7678600 7678500 7678400 7678300

N

0.3
0.35
0.35
64
Pond
63
M-33 Sump
M-33 Sump 1
61
M-33 Sump 2
1.1
66
1.35
M-33 Background
1.1
1
0.9
Pond
1.1
65
Sump Cap
1.25
0.3
0.4
0.4

Legend

Wellhead

Sample Type

Soil

Water

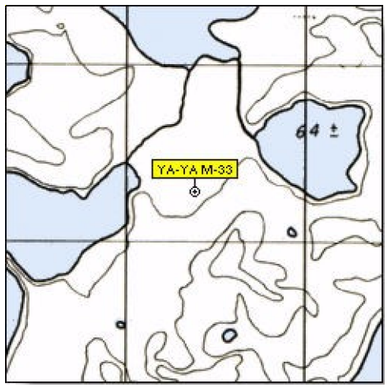
Active Layer Depth (m)

Report Photo

CD Photo

Feature Boundary

Helicopter Landing Area



10 5 0 10 20 30 40

Metres

Scale 1:1,500

CLIENT: Government of Canada
Environmental Studies Research Fund

PROJECT: ESRF-04-046 Drilling Waste Disposal Sumps Study

Ya-Ya M-33 Well Site

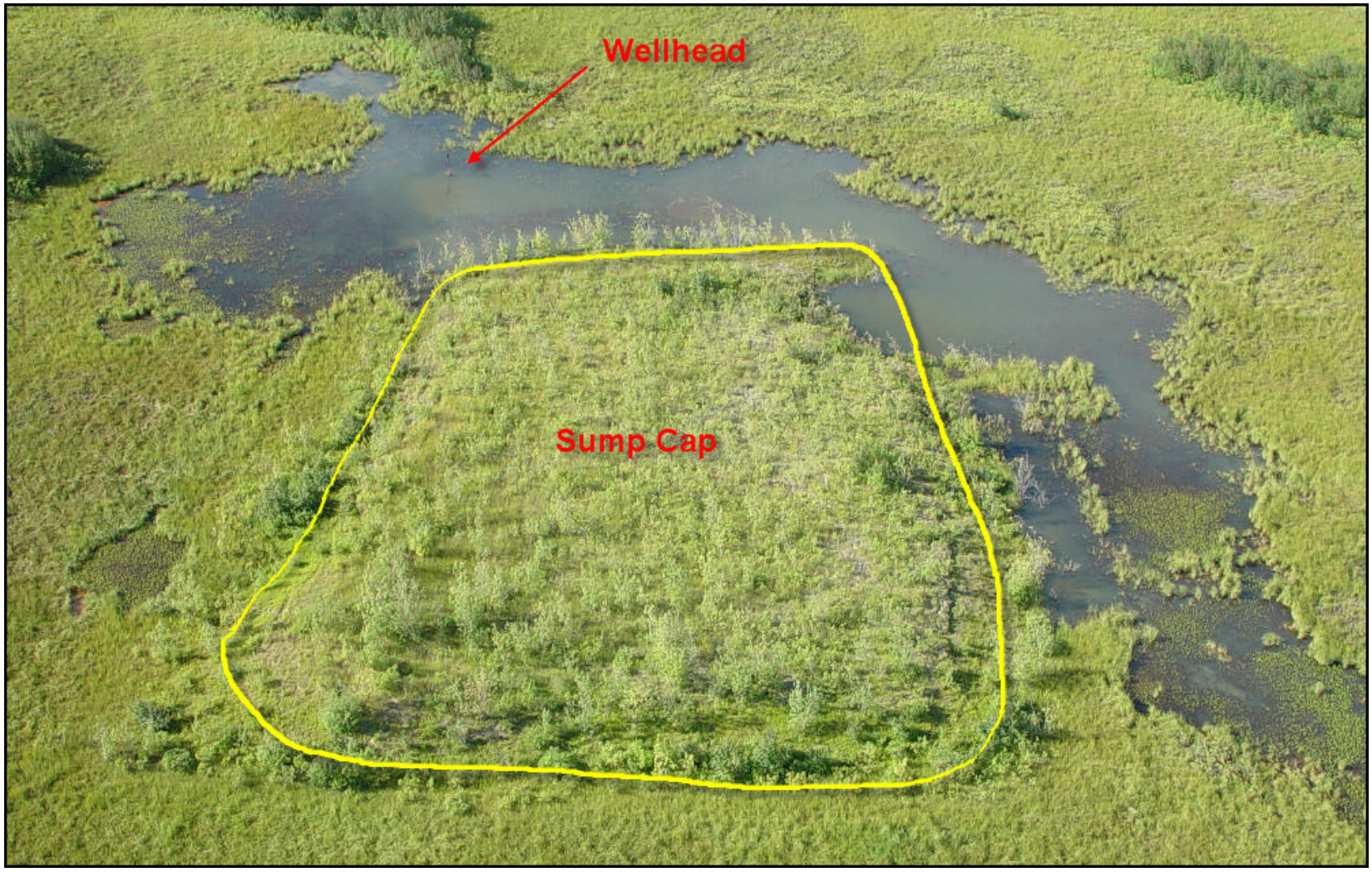
DATE: November, 2004	ANALYST: CMP	**Figure 14**
JOB No: CE02993	QA/QC: CW	PDF FILE: Site_M-33 11-24-04.pdf
GIS FILE: Site_M-33.mxd		
PROJECTION: UTM Zone 8	DATUM: NAD83	amec

4.2.10 Kikoralok N-46

Kikoralok N-46 is located within 2.5 km of the cutting edge of a meander in the Middle Channel of the Mackenzie River. This area is 15 masl and about 12 m above the river.

Drilling at Kikoralok N-46 was conducted 20 December 1974 to 20 January 1975. The well is currently plugged and abandoned. The wellhead is submerged in a pond adjacent the sump (Photo 70).

The orientation of the sump (Figure 15) in relation to the wellhead is not known because the survey crew was unable to land at this site to obtain GPS coordinates. All observations were conducted from the air. Relatively tall and abundant shrubs and trees on the sump cap and extensive surrounding wetlands prevented landing. Submerged upland vegetation (dead shrubs and grasses) along two sides of the cap suggest that subsidence may have occurred over several years. Sloughing was observed along one corner of the cap (evident in Photo 69, lower right and bottom left).



amec

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Environmental Studies Research Funds
(ESRF-04-046)

Inuvialuit Settlement Region
Drilling Waste Disposal Sumps Study

Kikoralok N-46

Drawn: ECW	Scale: N/A	Date: Nov 2004	Project No.: CE02993	**Figure: 15**

4.2.11 Tununuk F-30

Tununuk F-30 is located about 750 m east of the Mackenzie River at an elevation of 29 masl. A small lake is located 400 m east of the site.

Drilling at Tununuk F-30 was conducted 5 April to 6 July 1976. The well is currently plugged and abandoned. The wellhead is located at the north side of the sump in a treed area. A capped sump (presumably the camp sump) is located about 25 m northwest of the drilling mud disposal sump. A gravel road connects the pad with a lake; likely used as a water source during construction (Photo 32). Log piles (about 20) are located near the wellhead (Photos 30 and 31). Soil on top of some of these piles indicates upheaval due to frost action. Shallow ponds containing stagnant water are located in the wellhead area (Photo 31).

The sump (Figure 16) is located south of the wellhead. The 5775 m^2 sump cap is intact and supports abundant vegetation (primarily trees and shrubs) (Photo 26). Subsidence of the cap, sloughing or cracking was not observed. Small ponds are located at the southeast (232 m^2) (Photo 28) edge of the cap and 25 m north of the cap (Photo 27). The pond north of the cap supports abundant aquatic and shore vegetation (Photo 27). The pond adjacent the cap contained algae and stagnant water and was not sampled. Water sampling was not conducted because ponds (other than the stagnant shallow pond shown on the map) clearly associated with the sump were not present.

Active layer thickness of 0.3 to 0.75 m on the sump cap is similar to that in the surrounding undisturbed area. The maximum elevation of the sump cap is approximately 2 m above adjacent undisturbed areas.

EM survey on and around the perimeter of the cap provided evidence of anomalous (<2 times background) ground conductivity in a small (<20 m^2) area adjacent the pond on the southeast corner of the cap. A soil sample obtained from this area exhibited elevated calcium, magnesium, potassium, sodium, chloride, sulphate and bicarbonate and a conductivity of 5.15 mS/cm. Vegetation in this relatively moist area showed no evidence of salt related impacts (Photo 29).

515300 515400 515500

7653300 7653200 7653100

N

0.4 0.4 0.65 0.65 0.55 0.6 31 0.75 30 0.55 1.2 0.5

29 0.2 F-30 Background 0.35

Sump Cap

0.4 0.7 0.75 0.65 0.55 0.6 0.7 0.55 0.35 0.35 0.65 0.2 F-30 Sump 28 0.3 0.55

Stagnant Pond

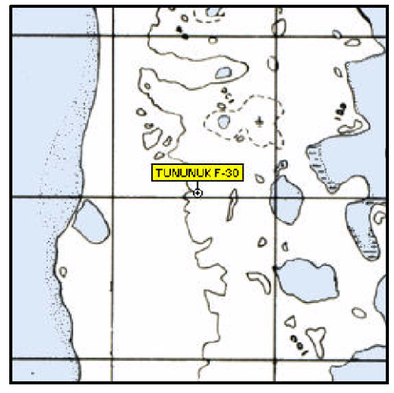
0.35 0.25 0.3 0.25 0.2

Legend

- Wellhead

Sample Type

- Soil
- Active Layer Depth (m)
- Report Photo
- CD Photo
- Feature Boundary
- Helicopter Landing Area



10 5 0 10 20 30 40

Metres

Scale 1:1,000

CLIENT: Government of Canada
Environmental Studies Research Fund

PROJECT: ESRF-04-046 Drilling Waste Disposal Sumps Study

Tununuk F-30 Well Site

DATE: November, 2004	ANALYST: CMP	**Figure 16**
JOB No: CE02993	QA/QC: CW	PDF FILE: Site_F-30 11-24-04.pdf
GIS FILE: Site_F-30.mxd		
PROJECTION: UTM Zone 8	DATUM: NAD83	amec

4.2.12 Ogruknang M-31

Ogruknang M-31 is located on the Charlie Hills at an elevation of 65 masl. The East Channel of the Mackenzie River is located 1.3 km east of the wellhead. A small (0.5 ha) lake is located 280 m northwest of the wellhead (Photo 51).

Drilling at Ogruknang M-31 was conducted 18 April to 1 August 1977. The well is currently plugged and abandoned. The wellhead is located at the south side of the sump in a treed area. A capped sump (presumably the camp sump) is located about 50 m west of the drilling mud disposal sump. A gravel road connects the pad with a lake; likely used as a water source during construction (Photo 51). Log piles (about 20) are located near the wellhead (Photo 58). Soil on top of some of these piles indicates upheaval due to frost action.

Bear scat was observed on the gravel pad and along the road north of the lease.

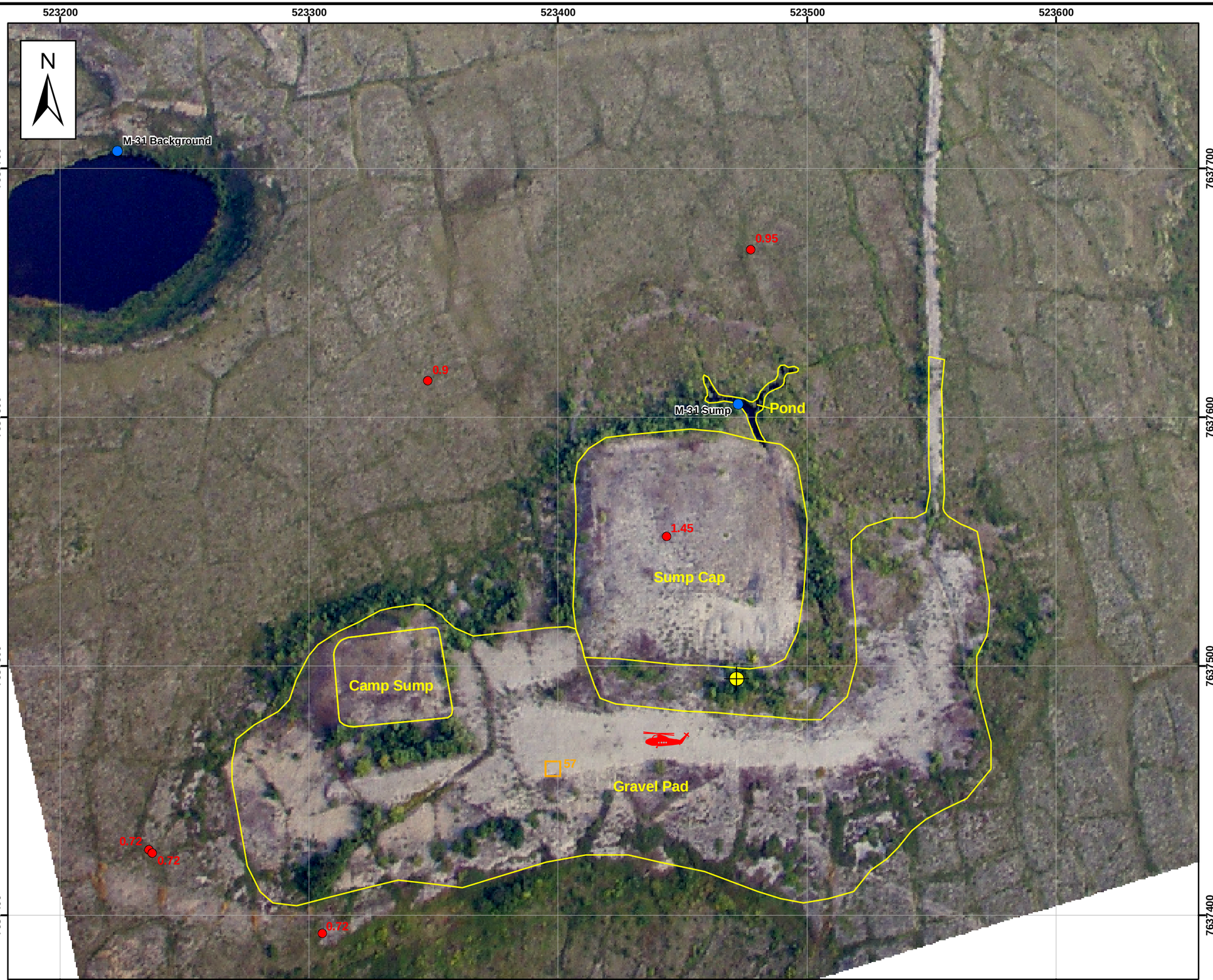
The gravel pad has an area of 21,630 m^2 and is elevated about 1 m above the surrounding undisturbed areas. The lease and associated gravel pad exhibit ground subsidence along original pre-construction patterned ground features. These patterns appear to be emerging along the eastern and northern perimeter of the cap.

The sump (Figure 17) is located north of the wellhead. The 8170 m^2 sump cap is intact and supports sparse vegetation (primarily grasses and forbs) (Photos 52 and 53). Possible shallow subsidence of the cap was observed on the east side (Photo 55). Ponds are located at the northeast (209 m^2) (Photo 56) edge of the cap and along the east edge of the cap (Photo 52). The pond north of the cap supports abundant aquatic and shore vegetation (Photo 56).

Minerals present in water obtained from the small pond adjacent the sump cap, including calcium, magnesium, potassium, sodium, chloride, sulphate and bicarbonate are elevated an order of magnitude above those found in background lake water. The conductivity of pond water (0.339 mS/cm) is also elevated above that of lake water (0.049 mS/cm). The pond supports abundant aquatic and shore vegetation (Photo 56).

Active layer thickness measured on the sump cap is 1.45 m. The maximum elevation of the sump cap is approximately 6 m above adjacent undisturbed areas. Active layer survey was very limited due to gravel use on the lease and difficult to penetrate adjacent areas.

EM survey on and around the perimeter of the cap provided no evidence of anomalous ground conductivity. Soil samples were not collected.

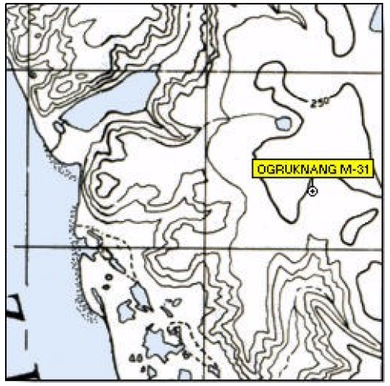


Legend

- Wellhead (no wellhead coordinate provided)

Sample Type

- Water
- Active Layer Depth (m)
- Report Photo
- Feature Boundary
- Helicopter Landing Area



10 5 0 10 20 30 40
Metres
Scale 1:1,500

CLIENT:
Government of Canada
Environmental Studies Research Fund

PROJECT: ESRF-04-046 Drilling Waste Disposal Sumps Study

Ogruknang M-31 Well Site

DATE: November, 2004	ANALYST: CMP	**Figure 17**
JOB No: CE02993	QA/QC: CW	PDF FILE: Site_M-31 11-24-04.pdf
GIS FILE: Site_M-31.mxd		
PROJECTION: UTM Zone 8	DATUM: NAD83	amec

4.2.13 Kurk M-15

Kurk M-15 is located in a wetland area about 1.4 km south of a channel of the Mackenzie River at an elevation of 1 masl. This area is subject to periodic flooding. High water marks and water-caused erosion are present around the perimeter of the cap (Photo 43). These suggest flooding to a depth of about 1 m.

Bear and moose tracks were observed on the along the edges of the cap (Photo 50). Evidence of visitation by waterfowl included broken eggshells, feathers, tracks and droppings.

Drilling at Kurk M-15 was conducted 10 February 2001 to 16 February 2002. The well is currently plugged and abandoned. The wellhead is located about 60 m west of the mud sump cap (Photo 43). A capped sump (presumably the camp sump) is located about 180 m west of the drilling mud disposal sump (Photo 44).

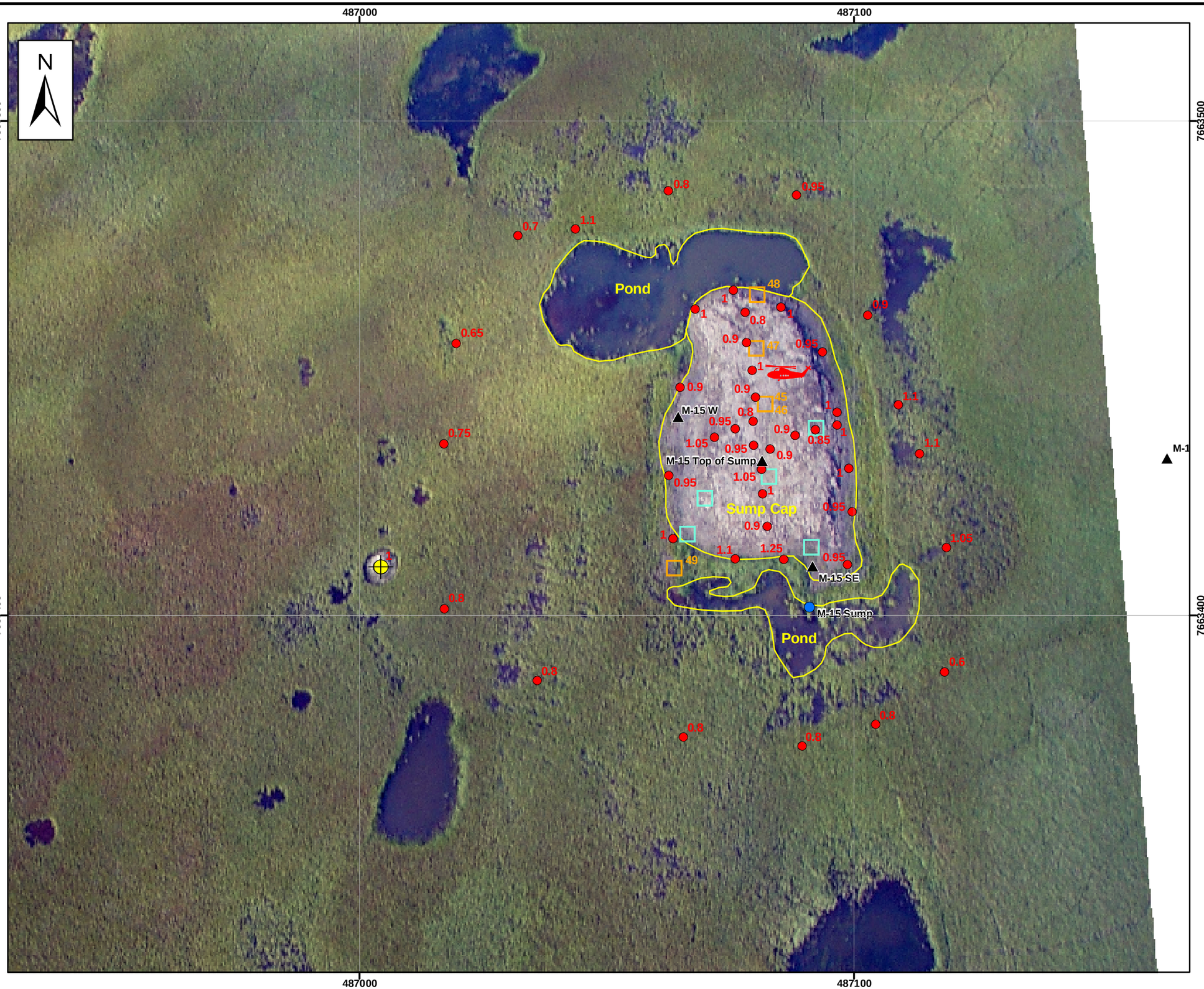
The sump (Figure 18) is located east of the wellhead. The 1357 m^2 sump cap is intact and supports very sparse vegetation (primarily grasses) (Photo 45). Possible shallow subsidence of the cap was observed on the south side. Soil cracking is present along the east and west sides of the cap (Photo 48). This cracking and shallow subsidence may be a result of consolidation of loosely packed cap materials. Ponds are located at the north (860 m^2) (Photo 46) edge of the cap and the south edge of the cap (460 m^2). These shallow ponds support abundant aquatic and shoreline vegetation. The north pond is possibly the storage location for excavated sump materials. During cap placement this area may have been scraped several cm below original ground surface resulting in a pond forming the following spring.

Mineral concentrations present in water obtained from the south pond adjacent the sump cap, including calcium, magnesium, potassium, sodium, chloride, sulphate and bicarbonate are similar to those found in background lake water. The conductivity of pond water (1.15 mS/cm) is also similar to that of background water (0.982 mS/cm). Background water was sampled approximately 70 m east of the east edge of the sump cap.

Active layer thickness measured on the sump cap varies from 0.8 to 1.1 m. The maximum elevation of the sump cap is approximately 2.5 m above adjacent undisturbed areas. The active layer in surrounding undisturbed areas is 0.6 to 1.1 m thick.

EM survey provided evidence of anomalous ground conductivity around the entire perimeter of the cap. These areas exhibited conductivities in the range of 50 to 200 mS/m. Conductivity measured on the top of the sump cap was in the range of 20 to 30 mS/m. Due to flooding in undisturbed wetland areas around the sump cap, background conductivity measurements were not obtained. A soil sample obtained from the area of highest conductivity at the southeast corner of the cap exhibited a conductivity of 9.79 mS/cm and elevated salts including sodium (283 µg/g) and chloride (1550 µg/g). A soil sample obtained from the west side of the cap exhibits a conductivity of 16.9 mS/cm and elevated salts including potassium (197 ug/g), sodium (267 µg/g) and chloride (2630 µg/g). Vegetation is not present on these relatively wet areas. A

soil sample obtained from the top of the cap exhibited mineral salt concentrations similar to those found in background soils. Conductivity on top of sump is 3.83 mS/cm while that of background soil is 1.99 mS/cm. Salt crystals are present on the surface at the top of the sump (Photo 47). Background soil was sampled approximately 70 m east of the east edge of the sump cap.

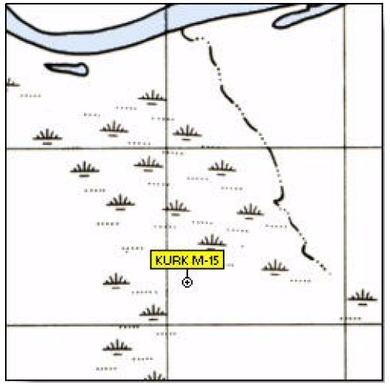


Legend

- Wellhead

Sample Type

- Soil
- Water
- Active Layer Depth (m)
- Report Photo
- CD Photo
- Feature Boundary
- Helicopter Landing Area



6 3 0 6 12 18 24

Metres

Scale 1:750

CLIENT: Government of Canada
Environmental Studies Research Fund

PROJECT: ESRF-04-046 Drilling Waste Disposal Sumps Study

Kurk M-15 Well Site

DATE: November, 2004	ANALYST: CMP	**Figure 18**
JOB No: CE02993	QA/QC: CW	PDF FILE: Site_M-15 11-24-04.pdf
GIS FILE: Site_M-15.mxd		
PROJECTION: UTM Zone 8	DATUM: NAD83	amec

Table 8: ESRF Sumps - Analytical Results - Soil

Parameter and Unit	Aluminum - µg/g (ppm)	Arsenic - µg/g (ppm)	Barium - µg/g (ppm)	Cadmium - µg/g (ppm)	Calcium - µg/g (ppm)	Chromium - µg/g (ppm)	Cobalt - µg/g (ppm)	Copper - µg/g (ppm)	Iron - µg/g (ppm)	Lead - µg/g (ppm)	Magnesium - µg/g (ppm)	Manganese - µg/g (ppm)	Mercury - µg/g (ppm)	Molybdenum - µg/g (ppm)	Nickel - µg/g (ppm)	Phosphorus - µg/g (ppm)	Potassium - µg/g (ppm)	Selenium - µg/g (ppm)	Sodium - µg/g (ppm)	Thallium - µg/g (ppm)	Vanadium - µg/g (ppm)	Zinc - µg/g (ppm)	pH (Sat. Paste)	Conductivity (Sat. Paste) - mS/cm	Calcium - meq/L	Magnesium - meq/L	Potassium - meq/L	Sodium - meq/L	Bicarbonate - meq/L	Chloride - meq/L	Sulphate - meq/L	Saturation - %	Calcium - µg/g (ppm)	Magnesium - µg/g (ppm)	Potassium - µg/g (ppm)	Sodium - µg/g (ppm)	Chloride - µg/g (ppm)	Sulphate - µg/g (ppm)	Bicarbonate - µg/g (ppm)	Sodium Adsorption Ratio (SAR) -
Method Detection Limit	5	0.5	1	0.2	5	0.5	0.5	0.1	5	0.5	1	0.5	0.02	0.5	0.5	5	5	0.5	1	0.5	0.2	0.5	0.01	0.001	0.01	0.01	0.01	0.01	1.0	0.01	0.01	0.1	0.10	0.10	0.10	0.10	0.10	0.10	0.1	0.10
Maximum Concentration	14000	14.4	760	0.4	62900	23.3	11.1	32.5	39500	97.1	20500	648	0.1	4	26.8	746	2670	1	1460	0	40	112	8.26	16.9	0	0	0	0	0	0	0	229	1270	199	232	731	2680	3680	801	30.4
Sample Location																																								
C-55 Background	11800	9.6	232	< 0.2	2380	17.6	11	19.3	35700	10.8	2860	278	0.04	2.1	17.1	507	917	0.6	67	< 0.5	36	75.1	6.77	0.191	0.87	0.30	0.08	0.42	< 1.0	0.92	0.18	43.2	7.5	1.55	1.38	4.2	14.1	3.63	17.1	0.55
C-55 Sump	6600	9	250	0.3	8800	23.3	9.9	32.5	26600	97.1	3000	266	0.1	2.1	23	483	2670	< 0.5	399	< 0.5	20.8	112	7.99	2.33	4.27	1.47	5.86	5.45	4.3	5.19	11.2	56.8	48.6	10.1	130	71.1	104	305	148	3.22
D-27 Sump	2810	6.6	760	< 0.2	5740	7.4	5.7	7.4	11800	40.5	2340	211	0.09	1	13.6	392	356	< 0.5	692	< 0.5	10.4	61.6	8.26	3.64	1.70	1.01	0.59	35.3	3.4	1.55	32.8	33.6	11.5	4.13	7.79	273	18.5	530	70.1	30.4
F-30 Background	10600	8.4	240	< 0.2	3330	13.6	4.6	8.8	33800	40.9	2240	159	0.02	1.5	9.3	325	533	< 0.5	80	< 0.5	37.5	56.4	6.17	0.261	1.69	1.04	0.05	0.43	1.2	0.60	0.31	66.3	22.4	8.37	1.29	6.61	14	9.96	49.8	0.37
F-30 Sump	5670	9.9	140	< 0.2	12300	9.5	7.9	15.2	30900	7.5	3590	623	0.03	1.6	18.1	746	1430	0.6	430	< 0.5	20.6	66.6	6.98	5.15	49.1	9.20	6.40	5.57	1.8	19.8	39.4	89.3	879	99.9	224	114	627	1690	97.2	1.03
H-24 Background	6160	5.7	203	< 0.2	8530	11	3	17.2	11000	8.1	1600	34.4	0.07	2.5	12	379	623	0.8	276	< 0.5	18.7	31.7	6.01	0.405	2.37	0.69	0.07	1.00	< 1.0	1.03	1.83	229	109	19.3	6.37	52.5	84	201	98.9	0.81
H-24 Sump	7150	9.1	199	< 0.2	14900	11.5	8.5	18.8	27600	8.1	6080	351	0.05	1.8	20.5	580	877	< 0.5	647	< 0.5	21.1	77.4	7.18	7.38	43.3	27.9	0.79	16.5	1.9	47.2	38.0	56.3	488	191	17.4	213	942	1030	65.2	2.76
H-24 Sump Cap Duplicate	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	7.14	7.33	59.6	27.8	0.77	16.3	1.7	46.6	39.0	56.1	670	189	16.8	210	928	1050	59.6	2.46
H-24 Sump Cap	7850	9.6	210	0.2	12200	12.7	8.9	21.6	31300	8.9	5850	371	0.05	2.2	21.7	623	874	< 0.5	522	< 0.5	22.8	82.4	7.34	3.76	38.2	14.0	0.63	9.98	1.9	3.61	46.7	56.7	434	96.6	13.9	130	72.5	1270	66.7	1.95
M-15 Background	10700	7.3	286	0.4	22300	15.5	9.5	25.1	36300	10.7	11800	454	0.06	1.9	25.6	622	972	< 0.5	716	< 0.5	27.3	107	7.32	1.99	13.5	3.25	0.08	4.24	2.7	12.7	2.56	86.9	236	34.4	2.67	84.7	392	107	144	1.46
M-15 SE	5940	5.5	349	< 0.2	57200	9	6.1	12.2	19100	6.1	19800	245	0.05	1	15.3	692	809	< 0.5	1460	< 0.5	17.5	67.6	7.29	9.79	66.5	20.4	1.16	25.9	2.0	91.8	4.99	47.6	634	118	21.6	283	1550	114	57.9	3.93
M-15 Top of Sump	6850	6	275	0.3	51800	10	6.4	15.6	24800	6.8	17900	251	0.04	1.2	17	699	768	< 0.5	1070	< 0.5	18.9	75.6	7.49	3.83	30.6	11.2	0.35	7.19	2.2	7.59	32.2	57.9	354	78.6	7.99	95.7	156	895	76.7	1.57
M-15 W	5090	5.2	360	< 0.2	62900	8	5.5	10.8	17300	5.4	20500	228	0.03	0.9	13.9	714	1390	< 0.5	1440	< 0.5	15.4	61.2	7.24	16.9	90.0	30.0	11.0	25.3	1.8	162	1.55	45.8	826	167	197	267	2630	34	50.4	3.27
M-33 Background	14000	4.6	279	< 0.2	4690	18.4	3.1	18.2	26500	10.4	2710	29.3	0.1	1.7	11.9	338	554	0.9	115	< 0.5	40	39.8	6.31	0.248	1.46	0.66	0.05	0.45	< 1.0	0.50	1.11	99.2	29	7.96	1.92	10.2	17.7	52.9	40.3	0.43
M-33 Sump 1	9470	10	278	0.2	29400	15.4	9.7	26.4	36100	10.4	5390	544	0.05	3.1	24.7	678	1250	0.7	783	< 0.5	28.8	93.1	7.44	2.36	23.1	3.91	0.93	3.14	3.1	5.02	19.2	89.4	415	42.6	32.5	64.5	159	823	168	0.85
M-33 Sump 2	9540	14.4	288	< 0.2	14200	15.7	11.1	27.4	39500	11.2	6100	648	0.08	2.3	26.8	696	1460	0.5	582	< 0.5	30.2	98.1	7.27	7.54	63.0	13.6	3.39	12.0	1.2	53.6	28.6	61.3	775	102	81.3	170	1160	843	44.2	1.94
O-48 Background	1340	5.5	158	< 0.2	165	4.1	0.6	3.2	3200	6.3	113	1.7	0.03	0.7	1.1	168	108	< 0.5	10	< 0.5	13.7	4	6.63	0.134	0.53	0.34	0.09	0.30	< 1.0	0.37	0.42	27.8	2.93	1.15	0.96	1.94	3.67	5.55	8.7	0.46
O-48 Sump	7810	10.9	285	< 0.2	4720	13.1	8.6	14.4	31600	8.9	2770	302	0.02	2.1	16.5	422	2160	< 0.5	553	< 0.5	26.2	56.2	6.4	16.9	110	33.8	9.65	28.9	1.1	156	18.8	48.6	1070	199	183	323	2680	439	32.4	3.41
P-53 Background	8040	11.5	127	< 0.2	3980	18.2	4.2	31.6	32300	12.6	2120	61	0.08	4	17.1	509	957	1	101	< 0.5	28.3	38.2	3.94	2.81	32.8	3.11	0.27	1.06	< 1.0	1.05	36.2	97.7	642	37	10.1	23.8	36.2	1700	< 0.1	0.25
P-53 Sump	7880	10.7	70	0.3	13300	16.8	7.5	28.1	29800	17.7	2340	161	0.1	3.1	24.3	578	1350	0.8	1220	< 0.5	24.9	98	6.65	5.4	38.9	5.95	3.66	19.6	8.1	7.50	47.2	162	1270	117	232	731	432	3680	801	4.13

Table 9: ESRF Sumps - Analytical Results - Surface Water

Parameter and Unit	Turbidity- (NTU)	Calcium- (mg/L)	Magnesium- (mg/L)	Potassium- (mg/L)	Sodium- (mg/L)	Bicarbonate- (mg/L)	Chloride- (mg/L)	Nitrate - Nitrogen- (mg/L)	Sulphate- (mg/L)	Conductivity @ 25°C - (mS/cm)	pH @ 25°C	Sodium Adsorption Ratio (SAR)	Colour (True) (Colour Units)	EPH (C10-C60) (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Total Xylenes (mg/L)
Method Detection Limit	1	0.5	0.5	0.5	0.5	1	0.1	0.05	0.5	0.001	0.01	0.10	1	0.030	0.001	0.001	0.001	0.002
Maximum Concentration	25	310	139	43.8	131	415	400	0.18	755	2.57	8.13	2.61	500	< 0.030	< 0.001	< 0.001	< 0.001	< 0.002
Sample Location																		
C-55 Background	2	10.1	3.4	0.6	4.1	56	8.7	< 0.05	2.5	0.116	7.82	0.29	20					
C-55 Sump	3	59.6	28.1	5.7	50.4	246	127	< 0.05	32.3	0.774	8.13	1.35	50					
D-27 Background	2	24.7	8.6	0.7	6.2	70	8.9	< 0.05	52	0.243	7.88	0.27	30					
D-27 Sump	3	19.8	6.3	4.3	22.3	150	10.1	< 0.05	1.4	0.263	8	1.12	100					
H-24 Background	12	26.6	11.8	1.6	16.3	128	35.1	< 0.05	7	0.318	8.04	0.66	30					
H-24 Pond Adj Sump	4	310	139	6.5	131	415	329	< 0.05	755	2.57	7.99	1.56	85	< 0.030	< 0.001	< 0.001	< 0.001	< 0.002
M-15 Background	2	77.5	21	3.5	91.4	280	180	< 0.05	2.3	0.982	8.09	2.38	30					
M-15 Sump	7	90.2	22.9	2	107	303	236	< 0.05	1	1.15	8.03	2.61	30					
M-31 Background	1	4	1.4	< 0.5	0.6	24	2.4	< 0.05	< 0.5	0.049	7.39	< 0.10	50					
M-31 Sump	2	41.2	10.5	4.7	6.4	149	7.5	< 0.05	44.8	0.339	7.94	0.23	50					
M-33 Sump	1	115	17.9	18.7	30.5	156	209	< 0.05	50.1	0.956	7.76	0.7	125					
P-53 Background	13	12.5	4.2	1.9	6	51	10.9	< 0.05	18.6	0.154	7.8	0.37	20					
P-53 Sump	25	25.8	7.1	14.8	22	61	56	0.18	31.7	0.367	7.4	0.99	500					
0-48 Sump	2	134	54.2	43.8	69.5	147	400	< 0.05	31	1.68	8.01	1.28	20					

5.0 SUMMARY

AMEC's summary of observations and recommendations for the subject sites are presented on Table 10. The age and approximate elevation of the sumps are shown for comparative purposes only.

Table 10: Summary of Observations and Recommendations

Site	Age (years)	Elevation (masl)	Summary of Observations: Has the sump cap subsided below original ground level?	Summary of Observations: Does surface water associated with the sump contain elevated salts?	Summary of Observations: Does exposed soil associated with the sump contain elevated salts?	Summary of Observations: Does evidence suggest that drilling fluids have migrated beyond the immediate lease area?	Recommendations[1]: Additional field investigations would be prudent	Recommendations[1]: The site should be monitored	Recommendations[1]: No intervention necessary
REINDEER D-27	39	25	Yes	Yes	Yes	No	■		
SIKU C-55	32	53	Yes	Yes	Yes	No	■		
YA-YA P-53	32	40	Yes	Yes	Yes	No	■		
ATIGI O-48	31	66	Yes	Yes	Yes	No	■		
TOAPOLOK H-24	30	19	No	Yes	Yes	No		■	
YA-YA M-33	30	28	No	Yes	Yes	No		■	
KIKORALOK N-46	30	12	No	NA	NA	No		■	
TUNUNUK F-30	28	29	No	No	Yes	No		■	
OGRUKNANG M-31	27	65	No	No	No	No		■	
KURK M-15	3	1	No	No	Yes	No		■	

[1] Source: ESRF Technical Advisory Group, Protocol for the Assessment of Drilling-Mud Sumps.

AMEC recommends future monitoring of drilling waste disposal sumps at six of the subject sites. Sump caps are largely intact at these sites however data suggest that sump fluids have migrated to the surface and have impacted soil and/or water. Future monitoring should focus on ensuring that further degradation of the sump cover is not occurring. The data collected during these monitoring events should be compared with conditions documented during this study.

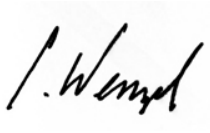
Additional field investigations would be prudent at four of the subject sites. Sump caps at these sites have failed and data suggest that sump fluids have migrated to the surface and have impacted soil and/or water. Additional field investigations should focus on determining the most appropriate methods for re-establishment of a sump cover. Alternatively, these studies may focus on management options available for leaving sumps in an open condition.

6.0 CLOSURE

This report has been prepared for the exclusive use of the client and authorized users for specific application to this project site. This report was prepared in accordance with the proposed work scope prepared for this site, verbal and written requests from the client, and generally accepted assessment practices. No other warranty, expressed or implied, is made. The general limitations of this report are specified in Appendix H.

Respectfully submitted,

AMEC Earth & Environmental



E. Chris Wenzel, R.E.T.
Senior Environmental Technologist

Reviewed by:

Dean K. Wall, M.Sc., P.Eng.
Senior Environmental Engineer

ECW/DW/dl

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Appendix A

ESRF Request for Proposal

Solicitation No. ESRF-04-046 Closing Date and Time: 12 May 2004
12:00 p.m. MST

Enquiries: All enquiries are to be directed to Kym Hopper-Smith, Contract Authority
Telephone: (403) 299-3890
Facsimile: (403) 299-2770

ENVIRONMENTAL STUDIES RESEARCH FUNDS (ESRF)
REQUEST FOR PROPOSAL

Regional Sump Study Project

Issuing Office	Vendor
Environmental Studies Research Funds 444 7th Ave. S.W. Calgary, Alberta T2P 0X8	

BIDDER INSTRUCTIONS AND INFORMATION

1.0 Tender Documents

The Request for Proposal documents identified by solicitation number, including "Appendix A" Statement of Work, "Appendix B" General Conditions and "Appendix C" Supplementary Conditions inclusive by title and number are hereby incorporated into the tender documents and form part of the Request for Proposal and any resulting contract. Submission of a proposal constitutes acknowledgment that the Bidder has read and agrees to be bound by these documents and other documents as listed herein.

Any alteration to the pre-printed or pre-typed sections of the Request for Proposal Form, or any condition or qualification placed upon the proposal, may render the proposal liable to disqualification. Alterations, corrections, changes or erasures made to statements or figures entered on the Request for Proposal Form by the Bidder shall be initialed by the person or persons signing the Request for Proposal document.

2.0 Submission of Proposal

The Request for Proposal Form, duly completed, shall be enclosed and sealed in an envelope, and shall be addressed and submitted to the location designated for the receipt of Proposals. It must be received on or before the specified closing date and time.

Prior to submitting the Proposal, the bidder shall ensure that the following information is clearly printed or typed on the face of the envelope.

.1 Solicitation ID Number
.2 Project Description
.3 Name and Address of Bidder
.4 Closing date and time

3.0 Revisions of Proposals

A Proposal submitted in accordance with these instructions may be revised by letter or facsimile provided the revision is received at the location designated for the receipt of proposals, on or before the date and time set for closing. The facsimile must be on the contractor's letterhead or bear a signature that identifies the contractor.

VENDORS NAME AND SIGNATURE

_____ _____
Name (please print) *Date*

_____
Signature

4.0 Statement of Work

The successful Bidder will be required to perform the Work and to provide the deliverables in accordance with and as set out in the Statement of Work attached hereto as **Appendix "A"** and forming part of this RFP.

5.0 Estimated Contract Award Date

It is estimated that a Contract against this Request for Proposal will be awarded by 2 June 2004. The successful Contractor will be expected to begin work upon award.

6.0 Contract Completion Date

All work required under this contract is to be completed on, or before, 31 December 2004.

7.0 Preparation of Proposals

Bidders shall prepare a proposal addressing all the requirements of this Request for Proposal (RFP). The proposal must be structured in two (2) parts and are **TO BE BOUND SEPARATELY:**

PART A To consist of the Technical and Management Proposal (with no reference to price) and submitted in 5 hard copies **and** electronically in Word or comparable format.

PART B Price Proposal and Method of Payment, submitted in five copies.

Your Technical Proposal should be concise and should address, but not necessarily limited to the rated criteria listed in Section 12.2 included herein. The rated criteria will be used to evaluate the relative merits of your proposal and will be based solely on content. It is essential that the elements contained in your bide be stated in a clear and concise manner. Failure to provide complete information as requested will be to your disadvantage. It is, therefore, recommended that your proposal address the rated criteria in sufficient depth to permit proper and complete evaluation of your submission. Items not addressed will be given a score of zero.

Bids should be submitted in the format requested. If the bidder feels that the terms and conditions of this solicitation will restrict it unnecessarily in any way, it should so state in its bid, any deviations from the stipulated conditions should be given in detail with an explanation as to why they are being proposed. The Contracting authority reserves the right to accept and bid as submitted without prior negotiations. It is the responsibility of the bidder to obtain clarification of the requirement contained herein, if necessary, prior to submitting its bid.

8.0 Contents of a Responsive Proposal

Proposals deemed to be responsive will contain the following information presented in a clear and concise manner:

1. A detailed breakdown of the personnel involved in the completion of the above outlined tasks and their specific responsibilities.
2. Corporate credentials of the firm(s) and directly relevant experience.
3. Proposed methodology and work plan, including any potential difficulties that could impact the project or schedule. The work plan must demonstrate that the Contractor fully understands the objectives of the work and how to achieve them.

4. Proposed budget for each task, including detailed breakdown of fees, disbursement, acquisition or rental of equipment and contingency (if required); and
5. A projected timeline for conducting the research and for writing the progress, draft and final reports.

9.0 Consultation and Study Management

The Scientific Authority for this study will be:

Tim Taylor
Team Leader, Environment
Petro-Canada
P.O Box 2844
150 – 6th Avenue S.W.
Calgary, Alberta T2P 3E3

The contracting Authority for this study will be:

Ms. Kym Hopper-Smith
Coordinator, ESRF Program Coordinator
c/o Operations Business Unit
National Energy Board
444 – 7th Avenue S.W.
Calgary, AB T2P 0X8

Tel: 403-299-3890
Fax: 403-299-2770
E-mail: khoppersmith@neb-one.gc.ca

10.0 Enquiries – Solicitation Stage

All enquiries regarding the bid solicitation must be submitted in writing **to the Contracting Authority** named in this RFP as early as possible within the bidding period. Enquiries should be received no later than 5 calendar days before the closing date of the RFP to allow sufficient time to provide a response. Enquiries received after that time may not be able to be answered prior to the bid closing date.

To ensure consistency and quality of information provided to bidders, the Contracting Authority will provide, simultaneously to all companies to which this solicitation has been sent, nay information with respect to significant enquiries received and the replies to such enquiries without revealing the sources of the enquiries.

11.0 Submission of Proposals

WARNING: ELECTRONIC BIDS WILL NOT BE ACCEPTED. Due to the nature of this solicitation, a complete proposal with supporting information is required to allow a proper evaluation to be conducted. Electronic transmission of this documentation by such means as telex, facsimile or commercial telex is not considered appropriate and, therefore, will not be accepted.

Bidders are requested to include a copy of the first page of this Request for Proposal (RFP) properly completed and signed. When signed, it indicates acceptance of the terms and conditions set out herein. Ensure that your signatory has authority to commit your company by making such a contract offer.

Contractors must submit five (5) hard copes of their proposals **AND** one (1) electronic copy in a Microsoft Word or compatible format by **12:00 noon** Mountain Standard Time on **12 May 2004** to:

Ms. Kym Hopper-Smith
Coordinator, ESRF Program Coordinator
c/o Operations Business Unit
National Energy Board
444 – 7th Avenue S.W.
Calgary, AB T2P 0X8

Tel: 403-299-3890
Fax: 403-299-2770
E-mail: khoppersmith@neb-one.gc.ca

12.0 Evaluation Methodology and Contract Selection Method

Proposals will be evaluated against the rated criteria listed herein. In order to be considered valid, a proposal must achieve the minimum ratings identified and those proposals failing to do so will be considered non-responsive and will not be considered for award of contract.

12.1 Contract Selection Method

The successful Contractor will be selected on the basis of **RATIO OF IMPORTANCE – PRICE TO PROPOSAL** that achieves the minimum pass mark established for each of the rated criteria sections identified herein.

12.2 Evaluation Criteria

Rated Requirements

The following are the rated criteria forming part of this Request for Proposal (RFP).

In order to be considered valid, proposals must achieve a minimum rating of **75%** or better under each of the three (3) rated criteria sections. Those proposals failing to achieve the required ratings will be considered non-responsive and will not be considered for award of contract.

Section 1 Approach and Methodology
Available Points 50 Required Pass Mark 30

1) The bidder should demonstrate a clear understanding of the project, its objectives and the purpose for conducting the workshop. (20 points)

2) The bidder should provide an outline of the proposed methodology and clearly demonstrate how the proposed approach will enable the achievement of the objectives as stated in the RFP. (20 points)

3) The bidder should provide a detailed account of recently completed projects of a similar scope and nature, including the methodology which was used to achieve objectives, and, if applicable, explain any methodology changes being brought to the proposed approach. (10 points)

Section 2 Project Management
Available Points 20 Required Pass Mark 15

1) The bidder should demonstrate through its project management plan: their proposed methodology, a work breakdown structure, including a resource plan; how the project team will be organized; responsibility assignment by personnel; project management and control (time, cost, performance); milestones and deliverables and estimated completion dates for each required task together with any assumptions made in creating the plan. (10 points)

2) The bidder should outline how it intends to keep the Scientific Authority informed of project progress and apprize him of any evolving issues throughout the course of the project. The bidder should clearly indicate the member of the project team who will provide the status reports or identify evolving issues and how they will be communicated. (10 points)

Section 3 Proposed Personnel
Available Points 30 Required Pass Mark 22.5

1) The bidder should identify the proposed project manager, including his/her role, qualifications and experience. (15 points)

2) The bidder should identify key personnel assigned to the project and include their resumes, detailing their roles and responsibilities in similar projects. (10 points)

3) The bidder should demonstrate the ability to substitute personnel (both in terms of assigned personnel and key speakers) with the same qualifications and experience or better in the event of sickness, vacation, etc. to maintain quality and project schedule. No substitutions shall take place without the prior written approval of the Scientific Authority. (5 points)

13.0 COST PROPOSAL

13.1 Proposal And Pre-Award Costs

No payment shall be made for costs incurred in the preparation and submission of a proposal in response to this RFP.

No costs incurred before receipt of a signed contract or specified written authorization from the Contracting Authority can be charged to any resultant Contract.

13.2 Ceiling Price

The price specified of $100,000.00 for the Work is a ceiling price and is subject to downward adjustment so as not to exceed the actual charges and costs reasonably incurred in the performance of the Work and computed in accordance with the Basis of Payment. The requirements of the Statement of Work shall be completed in accordance with the terms and conditions of the Contract and subject to the ceiling price

No increase in the total liability of Canada or in the price of Work resulting from any design changes, modifications or interpretations of specifications, made by the Contractor, will be authorized or paid to the Contractor unless such changes, modifications or interpretations, have been approved, in writing, by the Contracting Authority, prior to their incorporation into the Work. The Contractor shall not be obliged to perform any work or provide any service that would cause the total liability of Canada to be exceeded without the prior written approval of the Contracting Authority.

13.3 Negotiation

Bidders are advised that negotiation of the pricing basis may be required by Canada. Detailed financial data may be requested to support the rates and other charges proposed.

13.4 Evaluation Criteria:

I. Proposal; 100 points maximum
Must achieve a total of 75 points to pass
I. Price; budget estimated at $??k
II. Ration of Importance, Price 20% Proposal 80%
III. Highest score and lowest price receive full rated percentage and others pro-rated accordingly
IV. winner is highest total points established from price and proposal

PASSING BIDS:

	Bid 1 (poits)	**Bid 2 (points)**	**Bid 3 (points)**
Proposal Rating	89	86	82
Price	99.8	99.2	98.1

CALCULATIONS:

Bid 1:	Full rating for highest points in proposal =	80.0
	Price Pro-rating (98.1/99.8) x 20% =	19.7
	TOTAL =	99.7
Bid 2:	Proposal pro-rating, (86./89) x 80% =	77.3
	Price pro-rating, (98.1/99.2) x 20% =	19.8
	TOTAL =	97.1

Bid 3:	Proposal pro-rating (82/89) x 80% =	73.7
	Full Rating for lowest bid =	20.00
	TOTAL =	93.7

WINNER = BID 1

13.5 Method Of Payment

Your price proposal should also indicate the method of payment requested. The following method of payments are listed in the order of preference to the Crown:

(a) One lump sum upon completion and acceptance of all required deliverables.

(b) Progress payments will be made but not more frequently than once a month and will be subject to a 10% holdback. Such payments must be submitted with a deliverable, i.e., progress report

14.0 Validity Of Bid

Any proposal must remain open for acceptance for a period of not less than one hundred and twenty (120) days after the closing date of the RFP. After the RFP closing date, no amendments to the proposal will be accepted.

15.0 Applicable Laws

The Contract shall be interpreted and governed, and the relations between the Parties determined, by the laws in force in the Province of Alberta.

Bidders may, at their discretion, substitute the applicable laws of a Canadian province or territory of their choice without affecting the validity of their bid by deleting the Canadian province or territory specified and inserting the Canadian province or territory of their choice. If no change is made, the Bidder acknowledges that the applicable law specified is acceptable.

16.0 Commercial General Liability

Commercial General Liability insurance shall be effected by the Contractor and maintained in force throughout the duration of the Contract, in an amount usual for a contract of this nature, but, in any case, for a limit of liability NOT LESS THAN $1,000,000 per accident or occurrence. Proof of insurance will be provided upon request.

APPENDIX 'A' *Statement of Work*

1.0 Introduction

The ESRF Management Board determined that the funding for this work would be allocated to the Inuvialuit Settlement Region (ISR). The purpose of this study is *"To inventory, and test a protocol to assess environmental conditions of drilling waste sumps in the Inuvialuit Settlement Region."*

2.0 Organization

The Environmental Studies Research Funds (ESRF) was established under the Canada Petroleum Resources Act " *to finance environmental and social studies pertaining to the manner in which, and the terms and conditions under which, exploration, developmental and production activities on frontier lands under this Act or any other Act of parliament, should be conducted.*"

3.0 Objectives of the Work

1. Conduct an inventory of all known drilling sump locations within the ISR. Inventory to include:
   - Location (lat/long and/or UTM) of well and sump
   - Last known operator of record
   - Spud and sump closure date for associated well
   - Identification of orphan locations
   - Well description including well depth, drilling mud used
   - Conduct a review of literature and document supplementary data – literature review to include: ground temperatures, ground-ice conditions, surficial materials, physiographic region, abandonment issues and mitigation.
2. Develop a protocol based on site assessment and risk ranking process (Note that this portion of the work will be completed by the project Technical Advisory Group (TAG))
3. Utilizing protocol developed by TAG, conduct site assessment at limited number of orphan sump locations.

Suggested Methods Site Assessment

1. Inventory should be completed in two phases:
   - utilizing public records (NEB, INAC, etc) to determine operator of record
   - working with company representatives to determine final site ownership
2. Protocol will be provided to successful contractor by TAG
3. Field methods for site assessment (of selected/orphaned sites) **<u>may</u>** include:
   - Photos of site from air, in summer
   - Photos of site features
   - Site description, including detail of any debris on site, gravel pads, vegetation growth, including detailed vegetation description on sump, wellhead, description of slumping or subsidence of sump cap and the degree of ponding on sump cap and adjacent terrain
   - Vegetation survey with sample plots in adjacent undisturbed terrain, in areas around the sump and on the sump cap
   - Survey of active-layer thickness in adjacent undisturbed terrain, in areas around the sump and on the sump cap
   - Obtain background soil samples - define physical relationship to sump

- Obtain additional samples from areas with visible vegetation stress and from terrain downslope of the sump. Analysis should include salts and a metal screen if drilled before 1990
- Water sample from any ponded areas on or around the sump (pH, chlorides, TSS, EC-basic water tests, if drilled before 1990, should include a metals analysis as well)
- Background water sample from nearest upstream water body - define physical relationship to sump
- Water sample from nearest downstream water body – define physical relation to sump
- Geographical reference including distance and slope to nearest water body, and description of the water body
- EM survey (EM 38 is most appropriate)

4.0 Expected Deliverables and Timing

The successful bidder will be required to provide the following deliverables to the contract authority:

1. Copy of Regional Sump Inventory with associated information as listed in objectives. **Required immediately upon completion**;
2. Field report with analysis of each orphaned site;
3. Summary report of site assessments utilizing protocol and risk analysis of each site;
4. GIS database of sites and information including assessment data; and
5. Paper and electronic copies of reports and maps as required.

5.0 Reporting

The contractor will work closely with the Technical Advisory Group made up of representatives from the ESRF and/or regulatory, scientific, and petroleum communities. A representative of the ESRF Management Board, who will also be the ESRF Scientific Authority for the contract, will chair the team. Upon award of the contract, the successful contractor will meet with representatives of the Advisory Team to finalize the scope of the work. The final report is to be produced in Microsoft Word and in a format acceptable to the Scientific Authority, summarizing the findings of the study and must be provided to the Scientific Authority no later than thirty (30) calendar days following the conclusion of the study. The final report must be accompanied by a publishable paragraph (maximum of 200 words) stating both the intent and final results of the study/workshop. This paragraph will be included in the ESRF Annual Report and on the ESRF Website to promote this study.

APPENDIX 'B' – *General Conditions Services*

GC1 Interpretation

1.1 In the contract,

1.1.1 "contract" means the contract documents referred to in the Articles of Agreement;

1.1.2 "invention" means any new and useful art, process, machine, manufacture of composition of matter, or any new and useful improvement thereof;

1.1.3 "Minister" includes a person acting for, or if the office is vacant, in the place of the Minister and the Minister's successors in the office, and the Minister's or their lawful deputy and any of the Minister's or their representatives appointed for the purpose of the contract;

1.1.4 "work", unless otherwise expressed in the contract, means everything that is necessary to be done, furnished or delivered by the Contractor to perform the Contractor's obligations under the contract;

1.1.5 "prototypes" includes models, patterns and samples;

1.1.6 "technical documentation" means designs, reports, photographs, drawings, plans, specifications, computer software, surveys, calculations and other data, information and material collected, computed, drawn or produced, including computer print-outs;

1.1.7 "A/V" means AudioVisual.

GC2 Successors and Assigns

2.1 This contract shall bind the parties' lawful successors and assigns.

GC3 Assignment

3.1 The contract shall not be assigned in whole or in part by the Contractor without the prior written consent of the ERSF and any assignment made without that consent is void and of no effect.

3.2 No assignment of the contract shall relieve the Contractor from any obligation under the contract or impose any liability upon Her Majesty or the ESRF.

GC4 Time of the Essence

4.1 Time is of the essence of the contract.

4.2 Any delay of the Contractor in performing the Contractor's obligations under the contract which is caused by an event beyond of the control of the Contractor, and which could not have been avoided by the Contractor without incurring unreasonable cost through the use of work-around

plans including alternative sources or other means, constitutes an excusable delay. Events may include, but are not restricted to: acts of God, acts of Her Majesty, acts of local or provincial governments, fires, floods, epidemics, quarantine restrictions, strikes or labour unrest, freight embargoes and unusually severe weather.

4.3 The Contractor shall give notice to the ESRF immediately after the occurrence of the event that causes the excusable delay. The notice shall state the cause and circumstances of the delay and indicate the portion of the work affected by the delay. When requested to do so by the ESRF Representative, the Contractor shall deliver a description, in a form satisfactory to the ESRF, of work-around plans including alternative sources and any other means that the Contractor will utilize to overcome the delay and endeavour to prevent any further delay. Upon approval in writing by the ESRF of the work-around plans, the Contractor shall implement the work-around plans and use all reasonable means to recover any time lost as a result of the excusable delay.

4.4 Unless the Contractor complies with the notice requirements set forth in the contract, any delay that would constitute an excusable delay shall be deemed not to be an excusable delay.

4.5 Notwithstanding that the Contractor has complied with the requirements of GC4.3, Her Majesty may exercise its right of termination contained in GC8.

GC5 Indemnification

5.1 The Contractor shall indemnify and save harmless Her Majesty and the ESRF from and against all claims, losses, damages, costs, expenses, actions and other proceedings, made, sustained, brought, prosecuted, threatened to be brought or prosecuted, in any manner based upon, occasioned by or attributable to any injury to or death of a person or damage to or loss of property arising from any willful or negligent act, omission or delay on the part of the Contractor, the Contractor's servants or agents in performing the work or as a result of the work.

5.2 The Contractor shall indemnify and save harmless Her Majesty and the ESRF from all costs, charges and expenses whatsoever that Her Majesty sustains or incurs in or about all claims, actions, suits and proceedings for the use of the invention claimed in a patent, or infringement or alleged infringement of any patent or any registered industrial design or any copyright resulting from the performance of the Contractor's obligations under the contract, and in respect of the use of or disposal by Her Majesty of anything furnished pursuant to the contract.

5.3 The contractor's liability to indemnify or reimburse Her Majesty under the contract shall not affect or prejudice Her Majesty from exercising any other rights under law.

GC7 Canadian Labour and Materials

7.1 The Contractor shall use Canadian materials in the performance of the work to the full extent to which they are procurable, consistent with proper economy and the expeditious carrying out of the work.

GC8 Termination or Suspension

8.1 The ESRF may, by giving notice to the Contractor, terminate or suspend the work with respect to all or any part or parts of the work not completed.

8.2 All work completed by the Contractor to the satisfaction of Her Majesty before the giving of notice shall be paid for by Her Majesty in accordance with the provisions of the contract and, for all work not completed before the giving of notice, Her Majesty shall pay the Contractor's costs as determined under the provisions of the contract and, in addition, an amount representing a fair and reasonable fee in respect of such work.

8.3 In addition to the amount which the Contractor shall be paid under GC8.2, the Contractor shall be reimbursed for the Contractor's costs incidental to the cancellation of obligations incurred by the Contractor pursuant to such notice and obligations incurred by or to which the Contractor is subject with respect to the work.

8.4 Payment and reimbursement under the provisions of GC8 shall be made only to the extent that it is established to the satisfaction of the ESRF that the costs and expenses were actually incurred by the Contractor and that the same are fair and reasonable and are properly attributable to the termination or suspension of the work or the part thereof so terminated.

8.5 The Contractor shall not be entitled to be reimbursed any amount which, taken together with any amounts paid or becoming due to the Contractor under the contract, exceeds the contract price applicable to the work or the particular part thereof.

8.6 The Contractor shall have no claim for damages, compensation, loss of profit, allowance or otherwise by reason of or directly or indirectly arising out of any action taken or notice given by the ESRF under the provisions of GC8 except as expressly provided herein.

GC9 Termination due to Default of Contractor

9.1 Her Majesty may, by notice to the Contractor, terminate the whole or any part of the work if:

(i) the Contractor becomes bankrupt or insolvent, or a receiving order is made against the Contractor, or an assignment is made for the benefit of creditors, or if an order is made or resolution passed for the winding up of the Contractor, or if the Contractor takes the benefit of any statute for the time being in force relating to bankrupt or insolvent debtors, or

(ii) the Contractor fails to perform any of the Contractor's obligations under the contract, or, in the ESRF's view, so fails to make progress as to endanger performance of the contract in accordance with its terms.

9.2 In the event that Her Majesty terminates the work in whole or in part under GC9.1, Her Majesty may arrange, upon such terms and conditions and in such manner as Her Majesty deems appropriate, for the work to be completed that was so terminated, and the Contractor shall be liable to Her Majesty for any excess costs relating to the completion of the work.

9.3 Upon termination of the work under GC9.1, the ESRF may require the Contractor to deliver and transfer title to Her Majesty, in the manner and to the extent directed by the ESRF, any finished work which was not been delivered and accepted prior to such terminations and any

materials or work-in-process which the Contractor has specifically acquired or produced for the fulfillment of the contract. Her Majesty shall pay the Contractor for all such finished work delivered pursuant to such direction and accepted by Her Majesty, the cost to the Contractor of such finished work plus the proportionate part of any fee fixed by the said contract and shall pay or reimburse the Contractor the fair and reasonable cost to the Contractor of all materials or work-in-process delivered to Her Majesty pursuant to such direction. Her Majesty may withhold from the amounts due to the contractor such sums as the ESRF determines to be necessary to protect Her Majesty against excess costs for the completion of the work.

9.4 The Contractor shall not be entitled to be reimbursed any amount which, taken together with any amounts paid or becoming due to the Contractor under the contract, exceeds the contract price applicable to the work or the particular part thereof.

9.5 If, after the ESRF issues a notice of termination under GC9.1, it is determined by the Board that the default of the Contractor is due to causes beyond the control of the Contractor, such notice of termination shall be deemed to have been issued pursuant to GC8.1 and the rights and obligations of the parties hereto shall be governed by GC8.

GC10 Records to be kept by Contractor

10.1 The Contractor shall keep proper accounts and records of the cost of the work and of all expenditures or commitments made by the Contractor including the invoices, receipts, and vouchers, which shall at reasonable times be open to audit and inspection by the authorized representatives of the ESRF who may make copies and take extracts therefrom.

10.2 The Contractor shall provide facilities for audit and inspection and shall furnish the authorized representatives of the ESRF with such information as the ESRF or they may from time to time require with reference to the documents referred to herein.

10.3 The Contractor shall not dispose of the documents referred to herein without the written consent of the ESRF, but shall preserve and keep them available for audit and inspection for such period of time as may be specified elsewhere in the contract or, in the absence of such specifications, for a period of two years following completion of the work.

GC11 Ownership of Intellectual and Other Property including Copyright

11.1 In this section,

(a) "copyright work" means any work in which a copyright may subsist, produced in or as a result of performing the Contract;

(b) "publication" or "publish" do not include disclosure to an academic supervisor or appraiser, for the sole purpose of academic evaluation.

11.2 Unless otherwise stated herein, intellectual property rights in the data collected and in anything first conceived, developed or reduced to practice by the Contractor in the performance of the Work under the Contract shall vest in the Contractor.

11.3 Copyright in any copyright work vests in Canada but, in any publication of such work by or on behalf of Canada, the contribution of the Contractor and of the author shall be acknowledged. The Board may, upon written request from the Contractor, grant royalty-free, non exclusive

rights to use crown copyrighted material produced as a result of the work. Granting of such rights will not be unreasonably withheld.

11.4 Any copyright work published by or on behalf of the Contractor or the author shall acknowledge that the Work was performed under Contract with ESRF, unless the ESRF Chair gives notice to the contrary.

GC12 Conflict of Interest

12.1 The Contractor declares that the Contractor has no pecuniary interest in the business of any third party that would cause a conflict of interest or seem to cause a conflict of interest in carrying out the work. Should such an interest be acquired during the life of the contract, the Contractor shall declare it immediately to the Contracting Authority.

GC13 Contractor Status

13.1 This is a contract for the performance of a service and the Contractor is engaged under the contract as an independent contractor for the sole purpose of providing a service. Neither the Contractor nor any of the Contractor's personnel is engaged by the contract as employee, servant or agent of Her Majesty. The Contractor agrees to be solely responsible for any and all payments and/or deductions required to be made including those required for Canada or Quebec Pension Plans, Unemployment Insurance, Worker's Compensation, or Income Tax.

GC14 Contract Status Declaration

14.1 It is understood and agreed by the parties hereto that Her Majesty will not be liable for claims in respect of death, disease, illness, injury or disability which may be suffered by the Contractor in carrying out the services as defined herein and the Contractor agrees not to make any claim against Her Majesty in respect of the foregoing contingencies.

GC15 Discharge

15.1 The receipt by the Contractor or any of the Contractor's personnel, of any monies paid by Her Majesty to the Contractor or any of the Contractor's personnel, as the case may be, under or in respect of this contract shall be a complete discharge and release to Her Majesty for and in respect of all monies so paid irrespective of the date when or the party to whom such monies were payable.

GC16 Inspection

16.1 Work is to be performed to the satisfaction of and subject to the acceptance of the ESRF Representative identified herein as the Scientific Authority.

GC17 Warranty by Contractor

17.1 The Contractor warrants that the Contractor is competent to perform the work required under the contract in that the Contractor has the necessary qualifications including the knowledge, skill and ability to perform the work.

17.2 The Contractor warrants that the Contractor shall provide a quality of service at least equal to that which contractors generally would expect of a competent contractor in a like situation.

17.3 Notwithstanding prior acceptance of the finished work, and without restricting any other term of the contract or any condition, warranty or provision implied or imposed by law, the Contractor, if requested by the ESRF to do so at any time within 3 months from the date of delivery, shall replace or make good at its own expense any finished work, excluding Government Issue incorporated therein, which becomes defective or which fails to conform to contract requirements as a result of faulty or inefficient manufacture, material or product development.

GC18 Member of House of Commons

18.1 No member of the House of Commons shall be admitted to any share or part of this contract or to any benefit to arise therefrom.

GC19 Amendments

19.1 No variation, modification, change or amendment to the Contract, nor waiver of any of the terms and provisions hereof, shall be deemed valid unless duly authorized by the Contracting Authority and effected by a written amendment to this Contract and signed by both parties hereto.

GC20 Entire Agreement

20.1 The contract constitutes the entire agreement between the parties with respect to the subject matter of the contract and supersedes all previous negotiations, communications and other agreements relating to it unless they are incorporated by reference in the contract

GC21 Protection of Property

21.1 The Contractor undertakes and agrees to comply with all standing orders or other regulations in force on the site where the Work is to be performed, relating to the safety of persons on the site or the protection of property against loss or damage from any and all causes including fire.

GC22 Licensing

22.1 The services shall be performed in accordance with existing provincial and municipal regulations and by-laws. The Contractor shall be responsible for any charges imposed by such regulations and by-laws.

GC23 Replacement of Personnel

(1) The Contractor shall provide the services of the personnel named in the Contractor's proposal to perform the work, unless the Contractor is unable to do so for reasons that are

beyond its control.

(2) Should the Contractor at any time be unable to provide their services, it shall be responsible, at its costs, for providing replacement persons who shall be of similar ability and attainment and who shall be acceptable to both the Scientific Authority and Contracting Authority. At least thirty (30) days, where possible, in advance of the date upon which replacement persons are to commence work, the Contractor shall notify in writing both the Scientific Authority and the Contracting Authority of:

(a) the reason for the removal of the named personnel from the Work;
(b) the names of the proposed replacement persons; and
(c) the qualifications and experience of the proposed replacement persons.

(3) In no event shall the Contractor allow performance of the Work by unauthorized replacement persons.

(4) Acceptance of a replacement person by the Scientific Authority and the Contracting Authority shall not relieve the Contractor from responsibility for failure to meet the requirements of the contract.

APPENDIX 'C' – *Supplementary Conditions*

SC1 General Clause

1.1 It is a term of this contract that:

1.1.1 No further public office holder who is not in compliance with the post-employment provisions of the Conflict of Interest and Post-Employment Code for Public Office Holders shall derive a direct benefit from this contract;

1.1.2 The Contractor has not been convicted of an offence under Section 121, 124 or 418 of the *Criminal Code*;

1.1.3 No person who has been convicted of an offence under Section 121, 124 or 418 of the *Criminal Code* shall derive a benefit from this contract;

1.1.4 The Contractor is responsible for verifying the accuracy of the personal, educational and employment information related to any of its employees or agents who will be performing work for this contract;

SC2 International Sanctions

2.1 Persons and companies in Canada are bound by economic sanctions imposed by Canada by regulations passed pursuant to the United Nations Act, R.S.C. 1985, c. U-2, the Special Economic Measures Act, S.C. 1992, c. 17, or the Export and Import Permits Act, R.S.C. 1985, c. E-19. As a result , the Government of Canada cannot accept delivery of goods or services that originate, either directly or indirectly, from the countries subject to economic sanctions. At the time of contract award, the following regulations implement economic sanctions.

(a) United Nations Iraq Regulations;
(b) United Nations Libya Regulations;
(c) United Nations Federal Republic of Yugoslavia (Serbia and Montenegro) Regulations.

2.1.1 It is a condition of this Contract that the Contractor not supply to the Government of Canada any goods or services which are subject to economic sanctions as described in paragraph 2.1 above.

2.1.2 During the performance of the Contract should the addition of a country to the list of sanctioned countries or the additions of a good or service to the list of sanctioned goods or services cause an impossibility of performance for the Contractor, the situation will be treated by the Parties as a force majeure. The Contractor shall forthwith inform Canada of the situation; the procedures applicable to force majeure shall then apply.

SC3 Interest on Overdue Accounts

3.1.1 For the purposes of this clause:

"Average Rate" means the simple arithmetic mean of the Bank Rates in effect at 4:00 p.m. Eastern Standard Time each day during the calendar month which immediately precedes the calendar month in which payment is made, where the "Bank Rate" means the rate of interest established from time to time by the Bank of Canada as the minimum rate at which the Bank of

Canada makes short term advances to members of the Canadian Payments Association.

"date of payment" means the date of the negotiable instrument drawn by the Receiver General for Canada and given for payment of an amount due and payable;

an amount is "due and payable" when it is due and payable by the Board to the Contractor in accordance with the terms of the Contract; and

an amount becomes "overdue" when it is unpaid on the first day following the day upon which it is due and payable.

3.1.2 The ESRF shall be liable to pay to the Contractor simple interest at the Average Rate plus 3 percent per annum on any amount that is overdue, from the date such amount becomes overdue until the day prior to the date of payment, inclusive. Interest shall be paid without notice from the Contractor except in respect of payment which is less than fifteen (15) days overdue. No interest will be payable or paid in respect of payment made within such fifteen (15) days unless the Contractor so requests after payment has become due.

3.1.3 The ESRF shall not be liable to pay interest in accordance with this clause if the ESRF is not responsible for the delay in paying the Contractor.

3.1.4 The ESRF shall not be liable to pay interest on overdue advance payments.

Appendix B

ISR Sump Inventory Tables

Environmental Studies Research Funds - Inuvialuit Settlement Region Regional Sump Study Project - Well Stats

	No.	Total
REGION		
Northwest Territories - Mackenzie Delta - Onshore	169	
Beaufort Sea - Floating Units	42	
Northwest Territories - Arctic Islands - Onshore	41	
Beaufort Sea - Artificial Islands	31	
Beaufort Sea - Caisson Retained Islands	15	
Arctic Islands Offshore	6	
Northwest Territories - Mainland	3	
Yukon Onshore	3	**310**

ONSHORE?		
On-shore	216	
Off-shore	94	**310**

OWNER - Preliminary Evaluation		
Imperial	104	
ConocoPhillips	66	
BP	40	
Petro-Canada	26	
Shell	23	
Husky	15	
Chevron	13	
Suncor	7	
Japex	4	
Devon	3	
Inuvialuit Petroleum	3	
Encana	2	
Deminex	1	
Northrock	1	
Apache	1	
Murphy Oil Company Ltd.	1	**310**

YEAR	No. of Wells
2004	1
2003	3
2002	4
2001	3
2000	0
1999	0
1998	3
1997	0
1996	0
1995	0
1994	0
1993	0
1992	2
1991	1
1990	1
1989	5
1988	4
1987	3
1986	15
1985	19
1984	6
1983	12
1982	8
1981	5
1980	7
1979	9
1978	7
1977	15
1976	23
1975	30
1974	25
1973	31
1972	23
1971	16
1970	15
1969	7
1968	3
1967	0
1966	0
1965	1
1964	0
1963	0
1962	2
1961	1
1960	0
	310

ORPHAN WELL DEFINITION and COUNT

In the upstream oil and gas industry, an orphan is a well, pipeline, facility or associated site which has been investigated and confirmed as not having any legally responsible or financially able party to deal with its abandonment and reclamation.

Environmental Studies Research Funds - Inuvialuit Settlement Region Regional Sump Study Project - Orphan Wells

Owner Confirmation of Well Ownership Received	Potential Orphan Based on Minor Interest Holder	Potential Orphan Based on Majority Interest Holder	WID	Current Well Owner (Preliminary)	CONSORTIUM (NEB)	WELL NAME	UWI	CLASS	STATUS	LATITUDE	LONGITUDE	NEB REGION Designation	Onshore or Offshore	ORIGINAL SPUD DATE	ORIGINAL RR DATE	DEPTH (m)	SPUD RE DATE	RIG RELEASE DATE	Environmental Sensitivity	Protected Areas Descriptive	Oil and Gas Dispositions #	Oil and Gas Dispositions - Name	Kokelj and Geonorth 2002 Assessment
Yes			546	Shell	SHELL	AKLAVIK A-37	300A376820135000	Exploratory	Plug and abandoned	68.2708	-135.1296	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	2-Aug-70	13-Oct-70	2584.4	2-Aug-70	13-Oct-70	Not located in environmentally sensitive area	Not located in a protected area	None	None	
Yes			921	Shell	SHELL	NAPOIAK F-31	300F316830134450	Exploratory	Plug and abandoned	68.3403	-134.8969	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	12-Apr-74	17-May-74	1528.6	12-Apr-74	17-May-74	Not located in environmentally sensitive area	Not located in a protected area	EL405	PETRO-CANADA	Drill sump collapsed, camp sump collapsed.
Yes			562	Shell	SHELL	BEAVER HOUSE CREEK H-13	300H136830135301	Exploratory	Plug and abandoned	68.3712	-135.5508	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	23-Nov-70	27-Mar-71	3747.5	10-Sep-95	12-Sep-95	Not located in environmentally sensitive area	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No	Yes	Yes	904	Northrock	UNION	WOLVERINE H-34	300H346830130300	Exploratory	Plug and abandoned	68.3886	-130.6333	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	5-Feb-74	2-Apr-74	2041.6	5-Feb-74	2-Apr-74	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
Yes			1984	Devon	DEVON ET AL	ITIGINKPAK F-29	300F296830134300	Exploratory	Plug and abandoned	68.4718	-134.6088	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	11-Feb-03	16-Mar-03	2000	11-Feb-03	16-Mar-03	Not located in environmentally sensitive area	Not located in a protected area	EL405	PETRO-CANADA	
Yes			407	Encana	CPOG	CROSSLEY LK S K-60	300K606830129150	Exploratory	Plug and abandoned	68.4942	-129.4872	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	28-Aug-68	9-Mar-69	1685.2	28-Aug-68	9-Mar-69	7 (1) (b)	Cape Bathhurst-Husky Lakes Areas (1, 2 and 3)	No Data	No Data	
No			1116	Imperial	ESSO PEX	NAPARTOK M-01	300M01684013430 0	Exploratory	Plug and abandoned	68.5131	-134.5383	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	11-Feb-79	16-Mar-79	1960	11-Feb-79	16-Mar-79	Not located in environmentally sensitive area	Not located in a protected area	EL405	PETRO-CANADA	
Yes			458	Encana	CPOG	KUGALUK N-02	300N026840131300	Exploratory	Plug and abandoned	68.5319	-131.5219	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	2-Apr-69	18-Dec-69	2452.1	2-Apr-69	18-Dec-69	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1075	Chevron	CHEVRON CANADA PEX ET AL	FISH RIVER B-60	300B606840136000	Exploratory	Plug and abandoned	68.6508	-136.2275	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	21-Jun-77	31-Oct-77	3502.2	21-Jun-77	31-Oct-77	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No			523	ConocoPhillips	GULF	SHOLOKPAOQAK P-60	300P606840133300	Exploratory	Plug and abandoned	68.6625	-133.7167	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	17-Mar-70	23-Apr-70	1920.2	17-Mar-70	23-Apr-70	Not located in environmentally sensitive area	Not located in a protected area	EL406	PETRO-CANADA	
No			1493	ConocoPhillips	GULF ET AL	SHAKGATLATAC HIG D-50	300D506840133450	Exploratory	Plug and abandoned	68.6520	-133.9523	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	21-Feb-85	22-Mar-85	2061	21-Feb-85	22-Mar-85	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No			639	ConocoPhillips	GULF MOBIL	IKHIL A-01	300A016850134000	Exploratory	Plug and abandoned	68.6703	-134.0086	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	9-May-71	27-Jun-71	2954.4	9-May-71	27-Jun-71	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
Yes			876	Shell	SHELL	UNAK B-11	300B116850135150	Exploratory	Plug and abandoned	68.6693	-135.3112	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	7-Nov-73	17-Mar-74	3345.2	7-Nov-73	17-Mar-74	Not located in environmentally sensitive area	Not located in a protected area	None	None	
No			1483	ConocoPhillips	GULF ET AL	ONIGAT D-52	300D526850133300	Exploratory	Plug and abandoned	68.6836	-133.7400	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	23-Jan-85	12-Feb-85	1409	23-Jan-85	12-Feb-85	Not located in environmentally sensitive area	Not located in a protected area	EL406	PETRO-CANADA	
Yes			1025	Shell	SHELL	ULU A-35	300A356850135452	Exploratory	Plug and abandoned	68.7339	-135.8825	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	15-Mar-76	22-Sep-76	3919.7	13-Sep-95	13-Sep-95	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No			1839	Inuvialuit Petroleum	IPC	IKHIL J-35	300J356850134002	Delineation	Producer	68.7432	-134.1430	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	27-Feb-98	26-Feb-99	1160	18-Feb-99	26-Feb-99	7 (1) (a), Parks and park withdrawals	Not located in a protected area	PL06	LTAGAS MARKETING	
No			1606	Inuvialuit Petroleum	IPC	IKHIL K-35	300K356850134002	Exploratory	Producer	68.7455	-134.1545	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	27-Feb-86	23-Feb-98	1540	1-Jan-98	23-Feb-98	7 (1) (a), Parks and park withdrawals	Not located in a protected area	PL06	LTAGAS MARKETING	

Owner Confirmation of Well Ownership Received	Potential Orphan Based on Minor Interest Holder	Potential Orphan Based on Majority Interest Holder	WID	Current Well Owner (Preliminary)	CONSORTIUM (NEB)	WELL NAME	UWI	CLASS	STATUS	LATITUDE	LONGITUDE	NEB REGION Designation	Onshore or Offshore	ORIGINAL SPUD DATE	ORIGINAL RR DATE	DEPTH (m)	SPUD RE DATE	RIG RELEASE DATE	Environmental Sensitivity	Protected Areas Descriptive	Oil and Gas Dispositions #	Oil and Gas Dispositions - Name	Kokelj and Geonorth 2002 Assessment
No			981	ConocoPhillips	GULF-MOBIL	OGEOQEOQ J-06	300J066850133450	Exploratory	Plug and abandoned	68.7617	-133.7667	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	21-Feb-75	13-Mar-75	1839.2	21-Feb-75	13-Mar-75	Not located in environmentally sensitive area	Not located in a protected area	EL406	PETRO-CANADA	Drill sump intact, camp sump intact.
No			1840	Inuvialuit Petroleum	IPC	IKHIL N-26	300N266850134000	Delineation	Plug and abandoned	68.7653	-134.1103	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	20-Mar-98	5-Apr-98	1225	20-Mar-98	5-Apr-98	7 (1) (a), Parks and park withdrawals	Not located in a protected area	PL06	LTAGAS MARKETING	
No			537	Imperial	IOE	BLOW RIVER YT E-47	300E476850137150	Exploratory	Plug and abandoned	68.7722	-137.4536	Yukon Onshore	On-Shore	8-May-70	15-Nov-70	4267.2	8-May-70	15-Nov-70	Not located in environmentally sensitive area	Yukon North Slope Special Conservation Area	No Data	No Data	
No			830	ConocoPhillips	GULF MOBIL	IKHIL I-37	300I376850134000	Exploratory	Plug and abandoned	68.7761	-134.1306	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	10-Apr-73	3-Dec-73	4703.7	10-Apr-73	3-Dec-73	7 (1) (a), Parks and park withdrawals	Not located in a protected area	Unknown	Unknown	
No			536	ConocoPhillips	GULF	ONIGAT C-38	300C386850133300	Exploratory	Plug and abandoned	68.7861	-133.6542	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	2-May-70	25-Jun-70	2594.5	2-May-70	25-Jun-70	Not located in environmentally sensitive area	Not located in a protected area	EL406	PETRO-CANADA	
Yes			1623	Shell	SHELL ET AL	UNAK L-28	300L286850135150	Exploratory	Plug and abandoned	68.7940	-135.3684	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	11-Aug-86	13-Dec-86	3259	11-Aug-86	13-Dec-86	Not located in environmentally sensitive area	Not located in a protected area	None	None	
No			1592	ConocoPhillips	GULF ET AL	ONIGAT K-49	300K496850133300	Exploratory	Plug and abandoned	68.8112	-133.6963	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	2-Feb-86	16-Feb-86	1423	2-Feb-86	16-Feb-86	Not located in environmentally sensitive area	Not located in a protected area	SDL032	CONOCO CAN. (NORTH)	
Yes			939	Shell	SHELL	KIPNIK O-20	300O20685013445 0	Exploratory	Plug and abandoned	68.8333	-134.8053	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	14-Jul-74	21-Nov-74	3556.1	14-Jul-74	21-Nov-74	7 (1) (a), Parks and park withdrawals	Not located in a protected area	99	Inuvialuit are surface owners	
Yes			1050	Shell	SHELL	TULLUGAK K-31	300K316900135000	Exploratory	Plug and abandoned	68.8417	-135.1560	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	18-Oct-76	5-Jan-77	2926.1	18-Oct-76	5-Jan-77	Not located in environmentally sensitive area	Not located in a protected area	EL403	SHELL CANADA	
No			1058	ConocoPhillips	GULF MOBIL	PARSONS P-41	300P416900133301	Exploratory	Plug and abandoned	68.8474	-133.6745	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	29-Dec-76	9-Mar-92	3555.5	9-Mar-92	9-Mar-92	Not located in environmentally sensitive area	Not located in a protected area	SDL032	CONOCO CAN. (NORTH)	
No			1072	ConocoPhillips	GULF MOBIL	OGRUKNANG M-31	300M316900134150	Exploratory	Plug and abandoned	68.8478	-134.4140	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	18-Apr-77	1-Aug-77	4429.4	18-Apr-77	1-Aug-77	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No			1066	ConocoPhillips	MOBIL GULF	SADENE D-02	300D026900126450	Exploratory	Plug and abandoned	68.8503	-126.7875	Northwest Territories - Mainland	On-Shore	8-Mar-77	6-May-77	1857.8	8-Mar-77	6-May-77	7 (1) (b)	Not located in a protected area	No Data	No Data	
No			1570	ConocoPhillips	GULF ET AL	PARSONS E-02	300E026900133300	Exploratory	Plug and abandoned	68.8544	-133.5362	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	21-Dec-85	23-Jan-86	1270	21-Dec-85	23-Jan-86	7 (1) (b)	Not located in a protected area	EL406,99	PETRO-CANADA. Inuvialuit are surface owners	
No			1016	ConocoPhillips	GULF MOBIL	PARSONS L-43	300L436900133301	Delineation	Plug and abandoned	68.8774	-133.6989	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	10-Dec-75	9-Mar-92	3305.3	8-Mar-92	9-Mar-92	Not located in environmentally sensitive area	Not located in a protected area	SDL032	CONOCO CAN. (NORTH)	
No			889	ConocoPhillips	GULF MOBIL	PARSONS P-53	300P536900133300	Exploratory	Plug and abandoned	68.8804	-133.7159	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	22-Dec-73	9-Apr-74	3435.1	22-Dec-73	9-Apr-74	Not located in environmentally sensitive area	Not located in a protected area	SDL032	CONOCO CAN. (NORTH)	Drill sump intact, camp sump intact.
Yes			821	Shell	SHELL	KUGPIK O-13	300O136900135151	Exploratory	Plug and suspended	68.8806	-135.3042	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	26-Mar-73	30-Sep-73	3688.4	26-Mar-73	30-Sep-73	Not located in environmentally sensitive area	Not located in a protected area	SDL017	SHELL CANADA	Drill sump collapsed, camp sump minor subsidence.
No			584	ConocoPhillips	GULF MOBIL	ATIGI G-04	300G046900133450	Exploratory	Plug and abandoned	68.8878	-133.7676	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	7-Jan-71	27-Apr-71	3733.8	7-Jan-71	27-Apr-71	Not located in environmentally sensitive area	Not located in a protected area	SDL032	CONOCO CAN. (NORTH)	

Owner Confirmation of Well Ownership Received	Potential Orphan Based on Minor Interest Holder	Potential Orphan Based on Majority Interest Holder	WID	Current Well Owner (Preliminary)	CONSORTIUM (NEB)	WELL NAME	UWI	CLASS	STATUS	LATITUDE	LONGITUDE	NEB REGION Designation	Onshore or Offshore	ORIGINAL SPUD DATE	ORIGINAL RR DATE	DEPTH (m)	SPUD RE DATE	RIG RELEASE DATE	Environmental Sensitivity	Protected Areas Descriptive	Oil and Gas Dispositions #	Oil and Gas Dispositions - Name	Kokelj and Geonorth 2002 Assessment
Yes			976	Shell	SHELL	KUGPIK L-24	300L246900135150	Delineation	Plug and abandoned	68.8921	-135.3703	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	3-Feb-75	11-Apr-75	2871	3-Feb-75	11-Apr-75	Not located in environmentally sensitive area	Not located in a protected area	SDL017	SHELL CANADA	Drill sump collapsed, camp sump collapsed.
No			992	ConocoPhillips	GULF MOBIL	PARSONS A-44	300A446900133301	Delineation	Plug and abandoned	68.8847	-133.6767	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	9-Apr-75	8-Mar-92	3536	7-Mar-92	8-Mar-92	Not located in environmentally sensitive area	Not located in a protected area	SDL032	CONOCO CAN. (NORTH)	Drill sump collapsing, camp sump collapsed.
No			1942	Petro-Canada	PC DEVON	KUGPIK L-46	300L466900135150	Exploratory	Plug and suspended	68.9282	-135.4536	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	11-Mar-02	25-Apr-02	3014	11-Mar-02	25-Apr-02	Not located in environmentally sensitive area	Not located in a protected area	EL419	PETRO-CANADA	
No			1057	ConocoPhillips	GULF MOBIL	PARSONS L-37	300L376900133301	Delineation	Plug and abandoned	68.9452	-133.6652	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	26-Dec-76	28-Feb-92	3961	27-Feb-92	28-Feb-92	Not located in environmentally sensitive area	Not located in a protected area	SDL032	CONOCO CAN. (NORTH)	
No			1017	ConocoPhillips	GULF MOBIL	PARSONS N-17	300N176900133301	Delineation	Plug and abandoned	68.9481	-133.5664	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	18-Dec-75	27-Feb-92		24-Feb-92	27-Feb-92	Not located in environmentally sensitive area	Not located in a protected area	SDL032	CONOCO CAN. (NORTH)	
No			917	ConocoPhillips	GULF MOBIL	PARSONS O-27	300O27690013330 1	Delineation	Plug and abandoned	68.9481	-133.5989	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	23-Mar-74	30-Aug-74	3570.4	18-Mar-86	18-Mar-86	Not located in environmentally sensitive area	Not located in a protected area	SDL032	CONOCO CAN. (NORTH)	Drill sump subsidence, camp sump subsidence.
No			1018	ConocoPhillips	GULF-MOBIL	KAMIK D-48	300D486900133151	Delineation	Plug and abandoned	68.9535	-133.4583	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	23-Dec-75	4-Apr-76	3235.1	5-Mar-92	6-Mar-92	Not located in environmentally sensitive area	Not located in a protected area	SDL030	CONOCO CAN. (NORTH)	
No			960	ConocoPhillips	GULF-MOBIL	KAMIK D-58	300D586900133150	Delineation	Plug and abandoned	68.9537	-133.4976	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	26-Nov-74	14-Mar-75	3190.6	26-Nov-74	14-Mar-75	Not located in environmentally sensitive area	Not located in a protected area	SDL032	CONOCO CAN. (NORTH)	
No			1055	ConocoPhillips	GULF-MOBIL	KAMIK F-38	300F386900133150	Exploratory	Plug and abandoned	68.9564	-133.3985	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	13-Dec-76	13-Mar-77	3566.2	13-Dec-76	13-Mar-77	7 (1) (b)	Not located in a protected area	SDL030	CONOCO CAN. (NORTH)	
No			894	ConocoPhillips	GULF MOBIL	ATIGI O-48	300O48690013345 1	Exploratory	Plug and abandoned	68.9633	-133.9353	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	9-Jan-74	28-Feb-74	1981.2	10-Mar-92	11-Mar-92	Not located in environmentally sensitive area	Not located in a protected area	EL385	ENCANA WEST LTD.	
No			671	ConocoPhillips	GULF MOBIL	PARSONS F-09	300F096900133301	Exploratory	Plug and abandoned	68.9745	-133.5293	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	20-Dec-71	19-Apr-72	3547.3	4-Mar-92	5-Mar-92	Not located in environmentally sensitive area	Not located in a protected area	SDL032	CONOCO CAN. (NORTH)	
No			1029	ConocoPhillips	GULF IMP SHELL	TUNUNUK F-30	300F306900134300	Exploratory	Plug and abandoned	68.9894	-134.6119	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	5-Apr-76	6-Jul-76	3642.4	5-Apr-76	6-Jul-76	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No			991	ConocoPhillips	GULF-MOBIL	KAMIK L-60	300L606900133150	Exploratory	Plug and abandoned	68.9946	-133.4900	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	29-Mar-75	11-Jun-75	3207.1	29-Mar-75	11-Jun-75	Not located in environmentally sensitive area	Not located in a protected area	SDL062	IMPERIAL OIL RES.	Drill sump subsidence, camp sump collapsed.
No			405	Imperial	IOE BA SHELL	TUNUNUK K-10	300K106900134450	Exploratory	Plug and abandoned	68.9956	-134.7761	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	13-Aug-68	29-Jun-69	3757	13-Aug-68	29-Jun-69	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No			800	ConocoPhillips	GULF MOBIL	PARSONS N-10	300N106900133301	Delineation	Plug and abandoned	68.9968	-133.5306	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	24-Feb-73	2-Mar-92	3205	17-Feb-92	2-Mar-92	Not located in environmentally sensitive area	Not located in a protected area	SDL032	CONOCO CAN. (NORTH)	
No			1032	ConocoPhillips	GULF MOBIL	PARSONS D-20	300D206900133301	Delineation	Plug and abandoned	68.9859	-133.5736	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	21-Apr-76	23-Feb-92	4130	21-Feb-92	23-Feb-92	Not located in environmentally sensitive area	Not located in a protected area	SDL032	CONOCO CAN. (NORTH)	Drill sump collapsed, camp sump collapsed.
No			888	ConocoPhillips	GULF IMP SHELL	REINDEER A-41	300A416910134300	Delineation	Plug and abandoned	69.0033	-134.6719	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	22-Dec-73	7-Feb-74	1828.8	22-Dec-73	7-Feb-74	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No			1071	ConocoPhillips	GULF MOBIL	SIKU E-21	300E216910133301	Delineation	Plug and abandoned	69.0081	-133.6153	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	17-Apr-77	21-Jun-77	3427.5	1-Mar-92	1-Mar-92	Not located in environmentally sensitive area	Not located in a protected area	SDL032	CONOCO CAN. (NORTH)	

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No			1019	ConocoPhillips	GULF MOBIL	SIKU C-11	300C116910133301	Delineation	Plug and abandoned	69.0014	-133.5639	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	26-Dec-75	22-Mar-76	3294.9	29-Feb-92	29-Feb-92	Not located in environmentally sensitive area	Not located in a protected area	SDL032	CONOCO CAN. (NORTH)	Drill sump subsidence, camp sump subsidence.
No			1031	ConocoPhillips	GULF MOBIL	SIKU A-12	300A126910133301	Delineation	Plug and abandoned	69.0168	-133.5421	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	14-Apr-76	26-Jul-76	3287.9	3-Mar-92	3-Mar-92	Not located in environmentally sensitive area	Not located in a protected area	SDL032	CONOCO CAN. (NORTH)	Drill sump intact, camp sump intact.
No			982	ConocoPhillips	GULF MOBIL DOME	RED FOX P-21	300P216920133300	Exploratory	Plug and abandoned	69.1800	-133.5836	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	23-Feb-75	3-Jun-75	4178.8	23-Feb-75	3-Jun-75	7 (1) (b)	Not located in a protected area	99	Inuvialuit are surface owners	
Yes			1776	Shell	SHELL	UNIPKAT B-12	300B126920135151	Delineation	Plug and abandoned	69.1836	-135.3069	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	8-Jan-92	10-Feb-92	1186	27-Feb-96	12-Mar-96	Not located in environmentally sensitive area	Not located in a protected area	SDL100	SHELL CANADA	
No			833	Imperial	IMP	WAGNARK G-12	300G12692013315 0	Exploratory	Plug and abandoned	69.1892	-133.3039	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	18-Apr-73	5-Aug-73	3571.6	18-Apr-73	5-Aug-73	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
Yes			742	Shell	SHELL	UNIPKAT I-22	300I226920135151	Exploratory	Plug and abandoned	69.1937	-135.3409	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	8-Sep-72	6-Mar-73	4361.4	27-Feb-96	3-Mar-96	Not located in environmentally sensitive area	Not located in a protected area	SDL100	SHELL CANADA	Drill sump collapsed, camp sump collapsed.
No			891	Imperial	IMP	NUNA A-32	300A326910133150	Exploratory	Plug and abandoned	69.0206	-133.3761	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	28-Dec-73	18-Mar-74	3578.4	28-Dec-73	18-Mar-74	7 (1) (b)	Not located in a protected area	EL406	PETRO-CANADA	
Yes			1749	Shell	SHELL	UNIPKAT N-12	300N126920135151	Exploratory	Plug and abandoned	69.1986	-135.3188	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	6-Feb-90	4-Apr-90	1615	2-Mar-96	5-Mar-96	Not located in environmentally sensitive area	Not located in a protected area	SDL100	SHELL CANADA	
No			1030	Imperial	IMP DELTA 5	WAGNARK C-23	300C236920133150	Exploratory	Plug and abandoned	69.2003	-133.3625	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	7-Apr-76	5-Oct-76	4251	7-Apr-76	5-Oct-76	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No			1010	Chevron	SOBC CAN SUP ET AL	NORTH ELLICE J-23	300J236920135451	Exploratory	Plug and abandoned	69.2094	-135.8539	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	22-Oct-75	15-Mar-76	3505.2	15-Sep-95	16-Sep-95	Not located in environmentally sensitive area	Not located in a protected area	EL404	BP CAN. ENERGY CO.	Drill sump minor subsidence, camp sump collapsed.
No			760	ConocoPhillips	GULF MOBIL	YA-YA P-53	300P536920134301	Exploratory	Plug and abandoned	69.2127	-134.7138	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	8-Dec-72	20-Mar-73	3032.8	11-Mar-86	11-Mar-86	Not located in environmentally sensitive area	Not located in a protected area	SDL036	SHELL CANADA	
No			958	ConocoPhillips	GULF MOBIL	YA-YA M-33	300M33692013430 0	Delineation	Plug and abandoned	69.2158	-134.6622	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	22-Nov-74	13-Feb-75	2789	22-Nov-74	13-Feb-75	Not located in environmentally sensitive area	Not located in a protected area	EL394	BP CAN ENERGY CO	
No			923	ConocoPhillips	GULF MOBIL	TOAPOLOK H-24	300H246920134450	Delineation	Plug and abandoned	69.2217	-134.8403	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	21-Apr-74	15-Jun-74	2622.8	21-Apr-74	15-Jun-74	Not located in environmentally sensitive area	Not located in a protected area	EL394	BP CAN ENERGY CO	
No			882	ConocoPhillips	GULF MOBIL	TOAPOLOK O-54	300O54692013445 0	Exploratory	Plug and abandoned	69.2326	-134.9753	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	27-Nov-73	1-Apr-74	3048	27-Nov-73	1-Apr-74	Bird sanctuary	Kendall Island Bird Sanctuary	SDL031	SHELL CANADA	Drill sump collapsing, camp sump collapsed.
Yes			983	Shell	SHELL	KUMAK K-16	300K166920135001	Delineation	Plug and abandoned	69.2591	-135.0662	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	24-Feb-75	13-Jul-75	3709.4	16-Feb-96	26-Feb-96	Bird sanctuary	Kendall Island Bird Sanctuary	SDL018	SHELL CANADA	
Yes			879	Shell	SHELL	KUMAK J-06	300J066920135000	Delineation	Plug and abandoned	69.2600	-135.0161	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	24-Nov-73	16-May-74	3480.8	24-Nov-73	16-May-74	Bird sanctuary	Kendall Island Bird Sanctuary	SDL018	SHELL CANADA	Drill sump collapsed, camp sump collapsed.
No			1609	Imperial	ESSO HOME ET AL	WAGNARK L-36	300L366920133150	Exploratory	Plug and abandoned	69.2621	-133.4150	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	8-Mar-86	25-Apr-86	2609	8-Mar-86	25-Apr-86	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No			959	ConocoPhillips	GULF MOBIL	YA-YA I-17	300I176920134300	Delineation	Plug and abandoned	69.2764	-134.5469	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	22-Nov-74	11-Jan-75	2682.2	22-Nov-74	11-Jan-75	Not located in environmentally sensitive area	Not located in a protected area	SDL035	SHELL CANADA	

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No			1000	Imperial	IMP	IKATTOK J-17	300J176920136150	Exploratory	Plug and abandoned	69.2779	-136.3036	Beaufort Sea - Artificial Islands	Off-Shore	10-Jul-75	28-Feb-76	3810	10-Jul-75	28-Feb-76	Not located in environmentally sensitive area	Not located in a protected area	EL420	DEVON ARL CORP.	
No			463	Imperial	IOE	ESKIMO J-07	300J076920132300	Exploratory	Plug and abandoned	69.2786	-132.5164	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	10-May-69	31-May-69	905.6	10-May-69	31-May-69	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No			909	ConocoPhillips	GULF MOBIL	YA-YA A-28	300A286920134301	Delineation	Plug and abandoned	69.2864	-134.5908	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	28-Feb-74	6-Jul-74	3944.1	12-Mar-86	12-Mar-86	Not located in environmentally sensitive area	Not located in a protected area	SDL035	SHELL CANADA	Drill sump subsidence, camp sump collapsed.
No			1581	Imperial	ESSO PCI HOME ET AL	TUK G-48	300G48692013300 1	Delineation	Plug and abandoned	69.2898	-133.1839	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	14-Jan-86	5-Mar-86	1700	12-Feb-86	5-Mar-86	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
Yes			1064	Shell	SHELL	KUMAK E-58	300E586920135001	Delineation	Plug and abandoned	69.2915	-135.2487	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	28-Feb-77	8-Jun-77	1554.5	3-Feb-96	10-Feb-96	Bird sanctuary	Kendall Island Bird Sanctuary	SDL019	SHELL CANADA	Drill sump intact, camp sump sudsidence.
No			419	Imperial	IOE	TUK F-18	300F186920133000	Exploratory	Plug and abandoned	69.2914	-133.0669	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	29-Dec-68	27-Apr-69	3146.1	29-Dec-68	27-Apr-69	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
Yes			1933	Devon	DEVON PC	TUK M-18	300M18692013300 1	Delineation	Plug and suspended	69.2974	-133.0763	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	24-Dec-01	4-Feb-02	2966	24-Feb-02	30-Mar-02	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
Yes			838	Shell	SHELL	KUMAK C-58	300C586920135000	Exploratory	Plug and abandoned	69.2850	-135.2317	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	25-Apr-73	19-Oct-73	3530.2	25-Apr-73	19-Oct-73	Bird sanctuary	Kendall Island Bird Sanctuary	SDL019	SHELL CANADA	
Yes			1009	Shell	SHELL	NIGLINTGAK B-19	300B196920135151	Delineation	Plug and abandoned	69.3031	-135.3053	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	18-Oct-75	22-Feb-76	3144	13-Feb-96	15-Feb-96	Bird sanctuary	Kendall Island Bird Sanctuary	SDL019	SHELL CANADA	
No			1562	Imperial	ESSO PCI HOME ET AL	TUK G-39	300G39692013300 1	Delineation	Plug and suspended	69.3064	-133.1453	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	5-Dec-85	6-Jan-86	1797	5-Dec-85	6-Jan-86	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No			828	Imperial	IMP	LANGLEY E-29	300E296920135300	Exploratory	Plug and abandoned	69.3081	-135.6156	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	8-Apr-73	19-Jul-73	3809.7	8-Apr-73	19-Jul-73	Not located in environmentally sensitive area	Not located in a protected area	EL394	BP CAN ENERGY CO	
No			1474	Imperial	ESSO HOME PCI ET AL	TUK J-29	300J296920133000	Exploratory	Plug and abandoned	69.3115	-133.0973	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	10-Jan-85	20-Apr-85	3176	10-Jan-85	20-Apr-85	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No			1586	Chevron	CHEVRON TRILLIUM	NORTH ELLICE L-39	300L396920135450	Exploratory	Plug and abandoned	69.3120	-135.9166	Beaufort Sea - Artificial Islands	Off-Shore	25-Jan-86	20-Apr-86	2047	25-Jan-86	20-Apr-86	Not located in environmentally sensitive area	Not located in a protected area	EL404	BP CAN. ENERGY CO.	
No			1342	Imperial	ESSO PCI HOME ET AL	TUK L-09	300L096920133000	Exploratory	Plug and abandoned	69.3124	-133.0369	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	18-Nov-83	6-Mar-84	3030	18-Nov-83	6-Mar-84	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
Yes			933	Shell	SHELL	NIGLINTGAK M-19	300M19692013515 2	Delineation	Plug and abandoned	69.3136	-135.3239	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	1-Jun-74	20-Jan-75	4025.2	1-Feb-96	12-Feb-96	Bird sanctuary	Kendall Island Bird Sanctuary	SDL019	SHELL CANADA	
No			566	Imperial	IOE	TUKTU O-19	300O19692013245 0	Exploratory	Plug and abandoned	69.3153	-132.8047	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	7-Dec-70	6-Feb-71	2315.6	7-Dec-70	6-Feb-71	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	

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No			1563	Imperial	ESSO PCI HOME ET AL	TUK B-40	300B4069 20133001	Delineation	Plug and abandoned	69.3205	-133.1388	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	8-Dec-85	9-Jan-86	1800	25-Jan-86	11-Feb-86	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No			1763	Imperial	ESSO PCI HOME ET AL	TUK E-20	300E2069 20133000	Exploratory	Plug and abandoned	69.3219	-133.0833	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	25-Jan-91	8-Apr-91	3173	25-Jan-91	8-Apr-91	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No			1508	Imperial	ESSO PCI HOME ET AL	TUK H-30	300H3069 20133001	Delineation	Plug and abandoned	69.3224	-133.0872	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	21-Apr-85	6-May-85	1400	24-Nov-85	30-Dec-85	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
Yes			753	Shell	SHELL	NIGLINTGAK H-30	300H3069 20135151	Exploratory	Plug and abandoned	69.3226	-135.3431	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	24-Oct-72	7-Apr-73	2382.6	2-Feb-96	5-Feb-96	Bird sanctuary	Kendall Island Bird Sanctuary	SDL019	SHELL CANADA	
No			1985	Chevron	CHEVRON ET AL	LANGLEY K-30	300K3069 20135301	Exploratory	Plug and suspended	69.3251	-135.6109	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	19-Mar-03	12-Apr-03	1390	12-Apr-03	18-Apr-03	Not located in environmentally sensitive area	Not located in a protected area	EL394	BP CAN ENERGY CO	
No			1594	Imperial	ESSO PCI HOME ET AL	TUKTUK D-11	300D1169 30133001	Delineation	Plug and abandoned	69.3366	-133.0779	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	7-Feb-86	1-Apr-86	1810	11-Mar-86	1-Apr-86	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No			1274	Imperial	ESSO PEX HOME ET AL	PIKIOLIK G-21	300G216 930132300	Exploratory	Plug and abandoned	69.3398	-132.5954	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	16-Feb-83	24-Mar-83	1429.6	16-Feb-83	24-Mar-83	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No			770	Imperial	PACIFIC IMP ET AL	ROLAND BAY Y.T. L-41	300L4169 30138450	Exploratory	Plug and abandoned	69.3419	-138.9486	Yukon Onshore	On-Shore	22-Dec-72	20-Apr-73	2752.3	22-Dec-72	20-Apr-73	Not located in environmentally sensitive area	Ivvavik National Park	Proposed MPA	Proposed MPA	
No			797	Chevron	CHEVRON SOBC	UPLUK C-21	300C2169 30135150	Exploratory	Plug and abandoned	69.3350	-135.3569	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	16-Feb-73	19-May-73	1637.1	16-Feb-73	19-May-73	Bird sanctuary	Kendall Island Bird Sanctuary	SDL016	CHEVRON CANADA	
No			1561	Imperial	ESSO PCI HOME ET AL	TUKTUK A-12	300A1269 30133000	Delineation	Plug and abandoned	69.3504	-133.0496	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	2-Dec-85	12-Feb-86	1790	2-Dec-85	12-Feb-86	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
Yes			1941	Devon	DEVON PC	TUK B-02	300B0269 30133001	Exploratory	Plug and abandoned	69.3531	-133.0160	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	17-Feb-02	31-Mar-02	3187	1-Apr-02	16-Apr-02	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No			1059	Chevron	CCL	UPLUK A-42	300A4269 30135150	Exploratory	Plug and abandoned	69.3531	-135.4261	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	15-Jan-77	2-Apr-77	2794.4	15-Jan-77	2-Apr-77	Bird sanctuary	Kendall Island Bird Sanctuary	EL407	ANADARKO CANADA CORP	
No			1603	Imperial	ESSO HOME ET AL	MAYOGIAK G-12	300G126 930132450	Exploratory	Plug and abandoned	69.3548	-132.8108	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	18-Feb-86	28-Mar-86	2829	18-Feb-86	28-Mar-86	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No			1576	Imperial	ESSO PCI HOME ET AL	TUKTUK H-22	300H2269 30133001	Delineation	Plug and abandoned	69.3561	-133.0839	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	11-Jan-86	7-Apr-86	1802	3-Apr-86	7-Apr-86	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No			1500	Chevron	CHEVRON TRILLIUM	UPLUK L-42	300L4269 30135150	Exploratory	Plug and abandoned	69.3605	-135.4582	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	22-Mar-85	20-Jul-85	3350	22-Mar-85	20-Jul-85	Bird sanctuary	Kendall Island Bird Sanctuary	EL407	ANADARKO CANADA CORP	
No			727	Imperial	IOE	TAGLU C-42	300C4269 30134451	Delineation	Plug and abandoned	69.3514	-134.9472	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	30-Apr-72	18-Nov-72	4895.1	22-Mar-85	22-Mar-85	Bird sanctuary	Kendall Island Bird Sanctuary	SDL063	IMPERIAL OIL RES.	

Owner Confirmation of Well Ownership Received	Potential Orphan Based on Minor Interest Holder	Potential Orphan Based on Majority Interest Holder	WID	Current Well Owner (Preliminary)	CONSORTIUM (NEB)	WELL NAME	UWI	CLASS	STATUS	LATITUDE	LONGITUDE	NEB REGION Designation	Onshore or Offshore	ORIGINAL SPUD DATE	ORIGINAL RR DATE	DEPTH (m)	SPUD RE DATE	RIG RELEASE DATE	Environmental Sensitivity	Protected Areas Descriptive	Oil and Gas Dispositions #	Oil and Gas Dispositions - Name	Kokelj and Geonorth 2002 Assessment
No			819	Imperial	IOE	TAGLU D-43	300D436930134451	Delineation	Plug and abandoned	69.3705	-134.9501	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	23-Mar-73	11-Sep-73	4554.9	23-Mar-85	23-Mar-85	Bird sanctuary	Kendall Island Bird Sanctuary	SDL063	IMPERIAL OIL RES.	Drill sump collapsing, camp sump collapsed.
No			622	Imperial	ESSO	TAGLU G-33	300G33693013445 1	Exploratory	Plug and abandoned	69.3716	-134.8935	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	13-Apr-71	18-Aug-71	2994.1	1-Apr-85	1-Apr-85	Not located in environmentally sensitive area	Not located in a protected area	SDL063	IMPERIAL OIL RES.	
No			667	Imperial	ESSO	TAGLU WEST P-03	300P036930135001	Delineation	Plug and abandoned	69.3819	-135.0067	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	12-Dec-71	29-Mar-72	3310.1	25-Mar-85	25-Mar-85	Bird sanctuary	Kendall Island Bird Sanctuary	SDL063	IMPERIAL OIL RES.	
No			943	BP	ARCO	SMOKING HILLS A-23	300A236930126150	Exploratory	Plug and abandoned	69.3683	-126.3417	Northwest Territories - Mainland	On-Shore	4-Aug-74	22-Aug-74	596.5	4-Aug-74	22-Aug-74	7 (1) (b), Subject to environmental consideration	Cape Bathhurst-Husky Lakes Areas (1, 2 and 3)	No Data	No Data	
No			761	Imperial	ESSO CIGOL	AKKU F-14	300F146930132150	Exploratory	Plug and abandoned	69.3875	-132.3189	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	9-Dec-72	1-Jan-73	1523	9-Dec-72	1-Jan-73	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No			666	Imperial	IMP IOE	PIKIOLIK E-54	300E546930132300	Exploratory	Plug and abandoned	69.3875	-132.7431	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	11-Dec-71	15-Feb-72	3118.1	11-Dec-71	15-Feb-72	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No			1054	Imperial	IOE	TAGLU H-54	300H546930134452	Delineation	Plug and abandoned	69.3889	-134.9683	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	2-Dec-76	5-Apr-77	8079	25-Mar-85	26-Mar-85	Bird sanctuary	Kendall Island Bird Sanctuary	SDL063	IMPERIAL OIL RES.	
No			1547	Imperial	ESSO TRILLIUM ET AL	ADGO G-24	300G24693013545 0	Delineation	Plug and abandoned	69.3913	-135.8472	Beaufort Sea - Artificial Islands	Off-Shore	7-Oct-85	7-Jan-86	3087	7-Oct-85	7-Jan-86	Not located in environmentally sensitive area	Not located in a protected area	SDL050	IMPERIAL OIL RES.	
Yes			1006	Suncor	SUN SOBC BVX ET AL	GARRY P-04	300P046930135301	Exploratory	Plug and abandoned	69.3961	-135.5054	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	25-Aug-75	24-Mar-97	3352.8	24-Mar-97	24-Mar-97	Bird sanctuary	Kendall Island Bird Sanctuary	SDL026	Alberta	
No			1599	Imperial	ESSO HOME ET AL	MAYOGIAK N-34	300N346930132450	Exploratory	Plug and abandoned	69.3999	-132.9009	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	14-Feb-86	6-Mar-86	1722	14-Feb-86	6-Mar-86	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No			993	Imperial	IMP	ADGO C-15	300C156930135450	Delineation	Plug and abandoned	69.4036	-135.8175	Beaufort Sea - Artificial Islands	Off-Shore	21-Apr-75	25-Jul-75	3193.1	21-Apr-75	25-Jul-75	Not located in environmentally sensitive area	Not located in a protected area	SDL050	IMPERIAL OIL RES.	
No			715	Imperial	IOE	TAGLU D-55	300D556930134450	Exploratory	Plug and abandoned	69.4039	-134.9928	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	6-Apr-72	21-Aug-72	3706.1	6-Apr-72	21-Aug-72	Bird sanctuary	Kendall Island Bird Sanctuary	EL407	ANADARKO CANADA CORP	Drill sump collapsing, camp sump collapsed.
No			969	Imperial	IMP	ADGO P-25	300P256930135450	Delineation	Plug and abandoned	69.4158	-135.8417	Beaufort Sea - Artificial Islands	Off-Shore	2-Jan-75	28-Mar-75	2538.1	2-Jan-75	28-Mar-75	Not located in environmentally sensitive area	Not located in a protected area	SDL050	IMPERIAL OIL RES.	
No			1028	Imperial	IMP	SARPIK B-35	300B356930136150	Exploratory	Plug and abandoned	69.4019	-136.3861	Beaufort Sea - Artificial Islands	Off-Shore	2-Apr-76	4-Sep-76	3290.6	2-Apr-76	4-Sep-76	Not located in environmentally sensitive area	Not located in a protected area	EL420	DEVON ARL CORP.	
No			722	Imperial	ESSO	MALLIK A-06	300A066930134300	Exploratory	Plug and abandoned	69.4169	-134.5044	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	21-Apr-72	8-Oct-72	4136.7	21-Apr-72	8-Oct-72	Not located in environmentally sensitive area	Not located in a protected area	EL393	BP CAN ENERGY CO	
No			1501	Imperial	ESSO HOME ET AL	TAGLU WEST H-06	300H066930135000	Exploratory	Plug and abandoned	69.4235	-135.0082	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	26-Mar-85	5-Sep-85	4200	26-Mar-85	5-Sep-85	Bird sanctuary	Kendall Island Bird Sanctuary	EL407	ANADARKO CANADA CORP	
No			984	ConocoPhillips	GULF MOBIL	KILAGMIOTAK M-16	300M16693013400 0	Exploratory	Plug and abandoned	69.4311	-134.0750	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	25-Feb-75	1-Apr-75	3154.7	25-Feb-75	1-Apr-75	Not located in environmentally sensitive area	Not located in a protected area	EL384	ENCANA WEST LTD.	

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No			1152	Imperial	ESSO	MAYOGIAK M-16	300M166 93013245 0	Development	Plug and abandoned	69.4320	-132.8250	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	24-Jan-80	10-Apr-80	3093	24-Jan-80	10-Apr-80	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No			672	Imperial	IMP IOE	PIKIOLIK M-26	300M266 93013230 1	Exploratory	Plug and abandoned	69.4319	-132.6239	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	22-Dec-71	19-Mar-94	1984.2	19-Mar-94	19-Mar-94	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
Yes			1088	Suncor	SUN CCL BVX ET AL	GARRY G-07	300G076 93013530 1	Delineation	Plug and abandoned	69.4397	-135.5156	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	10-Feb-78	13-May-78	4021.2	26-Mar-97	29-Mar-97	Bird sanctuary	Kendall Island Bird Sanctuary	SDL025	Alberta	
No			1123	Imperial	ESSO	ADGO J-27	300J2769 30135450	Delineation	Plug and abandoned	69.4418	-135.8475	Beaufort Sea - Artificial Islands	Off-Shore	5-Apr-79	7-Aug-79	3108.1	5-Apr-79	7-Aug-79	Not located in environmentally sensitive area	Not located in a protected area	SDL050	IMPERIAL OIL RES.	
No			766	Imperial	IMP	UMIAK J-37	300J3769 30134150	Exploratory	Plug and abandoned	69.4433	-134.3856	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	17-Dec-72	1-Mar-73	3633.2	17-Dec-72	1-Mar-73	Not located in environmentally sensitive area	Not located in a protected area	EL384	ENCANA WEST LTD.	
No			1084	Imperial	IMP	MALLIK J-37	300J3769 30134300	Exploratory	Plug and abandoned	69.4439	-134.6397	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	22-Dec-77	11-Apr-78	3096.8	22-Dec-77	11-Apr-78	Not located in environmentally sensitive area	Not located in a protected area	EL393	BP CAN ENERGY CO	
No			631	Imperial	ESSO	MAYOGIAK J-17	300J1769 30132451	Exploratory	Plug and abandoned	69.4450	-132.8034	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	3-Apr-71	6-Aug-71	3685.9	3-Apr-85	3-Apr-85	7 (1) (a), Parks and park withdrawals	Not located in a protected area	SDL094	IMPERIAL OIL RES.	
No			892	Imperial	IMP	ADGO F-28	300F2869 30135450	Exploratory	Plug and abandoned	69.4546	-135.8544	Beaufort Sea - Artificial Islands	Off-Shore	28-Dec-73	19-Mar-74	3208.9	28-Dec-73	19-Mar-74	Not located in environmentally sensitive area	Not located in a protected area	SDL050	IMPERIAL OIL RES.	
No			693	ConocoPhillips	GULF MOBIL	KILAGMIOTAK F-48	300F4869 30134000	Exploratory	Plug and abandoned	69.4581	-134.1975	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	4-Feb-72	12-Oct-72	4771.9	4-Feb-72	12-Oct-72	Not located in environmentally sensitive area	Not located in a protected area	EL384	ENCANA WEST LTD.	
Yes			1919	Japex	JAPEX/JNOC/GSC	MALLIK 3L-38	303L3869 30134300	Other	Plug and abandoned	69.4606	-134.6616	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	25-Dec-01	8-Jan-02	1188	25-Dec-01	8-Jan-02	Not located in environmentally sensitive area	Not located in a protected area	SDL060	IMPERIAL OIL RES.	
Yes			1921	Japex	JAPEX/JNOC/GSC	MALLIK 5L-38	305L3869 30134300	Other	Plug and abandoned	69.4610	-134.6606	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	25-Jan-02	14-Mar-02	1166	25-Jan-02	14-Mar-02	Not located in environmentally sensitive area	Not located in a protected area	SDL060	IMPERIAL OIL RES.	
Yes			1827	Japex	JAPEX/JNOC/GSC	MALLIK 2L-38	302L3869 30134300	Development	Plug and abandoned	69.4613	-134.6584	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	16-Feb-98	28-Mar-98	1150	16-Feb-98	28-Mar-98	Not located in environmentally sensitive area	Not located in a protected area	SDL060	IMPERIAL OIL RES.	
Yes			1920	Japex	JAPEX/JNOC/GSC	MALLIK 4L-38	304L3869 30134300	Other	Plug and abandoned	69.4613	-134.6597	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	11-Jan-02	24-Jan-02	1188	11-Jan-02	24-Jan-02	Not located in environmentally sensitive area	Not located in a protected area	SDL060	IMPERIAL OIL RES.	
No			673	Imperial	ESSO	MALLIK L-38	300L3869 30134301	Exploratory	Plug and abandoned	69.4622	-134.6569	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	24-Dec-71	15-Sep-77	2535.5	15-Sep-77	15-Sep-77	Not located in environmentally sensitive area	Not located in a protected area	SDL060	IMPERIAL OIL RES.	
No			977	Chevron	CHEVRON SOBC	UPLUK M-38	300M386 93013515 0	Exploratory	Plug and abandoned	69.4656	-135.4150	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	6-Feb-75	4-Mar-75	3764.3	6-Feb-75	4-Mar-75	Bird sanctuary	Beluga Whale Management Zones 1a and 1b	None	None	
No			1445	Imperial	ESSO TRILLIUM	ADGO H-29	300H2969 30135450	Delineation	Plug and abandoned	69.4729	-135.8395	Beaufort Sea - Artificial Islands	Off-Shore	27-Sep-84	13-Jan-85	3314	27-Sep-84	13-Jan-85	Not located in environmentally sensitive area	Not located in a protected area	SDL050	IMPERIAL OIL RES.	
No			845	Husky	ELF ET AL	KILIGVAK I-29	300I2969 30131150	Exploratory	Plug and abandoned	69.4772	-131.3378	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	16-May-73	8-Aug-73	1965	16-May-73	8-Aug-73	7 (1) (b)	Cape Bathhurst-Husky Lakes Areas (1, 2 and 3)	No Data	No Data	

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No			919	Imperial	IMP	MAYOGIAK L-39	300L396930132450	Delineation	Plug and abandoned	69.4781	-132.9083	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	10-Apr-74	30-Aug-74	4446.7	10-Apr-74	30-Aug-74	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No			773	Imperial	IMP	MALLIK P-59	300P596930134300	Delineation	Plug and abandoned	69.4803	-134.7125	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	30-Dec-72	2-Mar-73	2633.3	30-Dec-72	2-Mar-73	Not located in environmentally sensitive area	Not located in a protected area	EL393	BP CAN ENERGY CO	
No			1070	Imperial	IMP. IOE	UMIAK N-10	300N106930134150	Exploratory	Plug and abandoned	69.4972	-134.2736	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	13-Apr-77	2-Oct-77	4814.3	13-Apr-77	2-Oct-77	Not located in environmentally sensitive area	Not located in a protected area	EL384	ENCANA WEST LTD.	Drill sumpp subsidence.
No			728	Imperial	IMP	ATERTAK E-41	300E416940132301	Exploratory	Plug and abandoned	69.5075	-132.7022	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	1-May-72	17-Mar-94	1984.2	17-Mar-94	17-Mar-94	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No			1615	Imperial	ESSO HOME ET AL	ATERTAK K-31	300K316940132300	Exploratory	Plug and abandoned	69.5096	-132.6521	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	8-Apr-86	12-May-86	3134	8-Apr-86	12-May-86	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No			767	Imperial	IMP	IVIK C-52	300C526940134150	Exploratory	Plug and abandoned	69.5194	-134.4811	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	19-Dec-72	13-Feb-73	3048	19-Dec-72	13-Feb-73	Not located in environmentally sensitive area	Not located in a protected area	EL384	ENCANA WEST LTD.	
No			1499	Imperial	ESSO PCI HOME ET AL	ITKRILEK B-52	300B526940131450	Exploratory	Plug and abandoned	69.5205	-131.9755	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	21-Mar-85	4-Apr-85	1284	21-Mar-85	4-Apr-85	7 (1) (b)	Cape Bathhurst-Husky Lakes Areas (1, 2 and 3)	No Data	No Data	
No			574	Imperial	IOE	MAGAK A-32	300A326940132000	Exploratory	Plug and abandoned	69.5192	-132.1256	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	20-Dec-70	22-Jan-71	1572.8	20-Dec-70	22-Jan-71	7 (1) (b)	Cape Bathhurst-Husky Lakes Areas (1, 2 and 3)	No Data	No Data	
No			950	Suncor	SUN BVX ET AL	UNARK L-24	300L246940134300	Exploratory	Plug and abandoned	69.5584	-134.6167	Beaufort Sea - Artificial Islands	Off-Shore	26-Sep-74	24-May-75	3813	26-Sep-74	24-May-75	Not located in environmentally sensitive area	Not located in a protected area	EL393	BP CAN ENERGY CO	
No			1051	Suncor	SUN BVX ET AL	UNARK 2L-24	302L246940134300	Exploratory	Plug and abandoned	69.5584	-134.6171	Beaufort Sea - Artificial Islands	Off-Shore	19-Oct-76	8-May-77	3935	19-Oct-76	8-May-77	Not located in environmentally sensitive area	Not located in a protected area	EL393	BP CAN ENERGY CO	
No			970	Imperial	IMP	NETSERK B-44	300B446940135450	Exploratory	Plug and abandoned	69.5508	-135.9327	Beaufort Sea - Artificial Islands	Off-Shore	6-Jan-75	8-Jun-75	3528.4	6-Jan-75	8-Jun-75	Not located in environmentally sensitive area	Not located in a protected area	EL407	ANADARKO CANADA CORP	
No			825	Imperial	IMP	IVIK K-54	300K546940134150	Exploratory	Plug and abandoned	69.5600	-134.4836	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	30-Mar-73	8-Jun-73	3151	30-Mar-73	8-Jun-73	Not located in environmentally sensitive area	Not located in a protected area	SDL027	Alberta	Drill sump minor subsidence, camp sump collapsed.
No			951	Suncor	SUN BVX ET AL	PELLY B-35	300B356940135150	Exploratory	Plug and abandoned	69.5697	-135.3909	Beaufort Sea - Artificial Islands	Off-Shore	5-Oct-74	14-Feb-75	3328.1	5-Oct-74	14-Feb-75	Not located in environmentally sensitive area	Not located in a protected area	SDL028	Alberta	
No			820	Husky	ELF ET AL IMPERIAL	AMAGUK H-16	300H166940131000	Exploratory	Plug and abandoned	69.5900	-131.0478	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	25-Mar-73	1-May-73	1257.9	25-Mar-73	1-May-73	7 (1) (b), Bird sanctuary	Cape Bathhurst-Husky Lakes Areas (1, 2 and 3)	No Data	No Data	
No			716	Imperial	ESSO	IVIK J-26	300J266940134151	Exploratory	Plug and abandoned	69.5950	-134.3439	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	8-Apr-72	22-Mar-94	3684.2	22-Mar-94	22-Mar-94	Not located in environmentally sensitive area	Not located in a protected area	SDL056	IMPERIAL OIL RES.	
No			475	Imperial	IOE	ELLICE O-14	300O14691013545 0	Exploratory	Plug and abandoned	69.0656	-135.8044	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	19-Nov-69	17-Feb-70	2905	19-Nov-69	17-Feb-70	Not located in environmentally sensitive area	Not located in a protected area	EL404	BP CAN. ENERGY CO.	

Owner Confirmation of Well Ownership Received	Potential Orphan Based on Minor Interest Holder	Potential Orphan Based on Majority Interest Holder	WID	Current Well Owner (Preliminary)	CONSORTIUM (NEB)	WELL NAME	UWI	CLASS	STATUS	LATITUDE	LONGITUDE	NEB REGION Designation	Onshore or Offshore	ORIGINAL SPUD DATE	ORIGINAL RR DATE	DEPTH (m)	SPUD RE DATE	RIG RELEASE DATE	Environmental Sensitivity	Protected Areas Descriptive	Oil and Gas Dispositions #	Oil and Gas Dispositions - Name	Kokelj and Geonorth 2002 Assessment
No			1597	Imperial	ESSO PCI HOME ET AL	HANSEN G-07	300G07694013400 1	Exploratory	Plug and abandoned	69.6057	-134.0200	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	10-Feb-86	11-Apr-86	3276	27-Apr-86	12-Jun-86	Not located in environmentally sensitive area	Not located in a protected area	SDL092	IMPERIAL OIL RES.	
No			779	Imperial	IMP	IVIK N-17	300N176940134150	Delineation	Plug and abandoned	69.6142	-134.3211	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	10-Jan-73	4-Mar-73	3049.2	10-Jan-73	4-Mar-73	Not located in environmentally sensitive area	Not located in a protected area	SDL056	IMPERIAL OIL RES.	
No			863	Imperial	IMP	IMMERK B-48	300B486940135000	Exploratory	Plug and abandoned	69.6190	-135.1808	Beaufort Sea - Artificial Islands	Off-Shore	17-Sep-73	22-Dec-73	2707.5	17-Sep-73	22-Dec-73	Not located in environmentally sensitive area	Not located in a protected area	EL420	DEVON ARL CORP.	
No			1047	Imperial	IMP	KUGMALLIT H-59	300H596940133150	Exploratory	Plug and abandoned	69.6393	-133.4636	Beaufort Sea - Artificial Islands	Off-Shore	30-Sep-76	10-Nov-76	2193	30-Sep-76	10-Nov-76	Not located in environmentally sensitive area	Not located in a protected area	EL420	DEVON ARL CORP.	
No			1533	BP	DOME ET AL	ADLARTOK P-09	300P096940137450	Exploratory	Plug and abandoned	69.6476	-137.7579	Beaufort Sea - Floating Units	Off-Shore	8-Aug-85	17-Oct-85	2647	8-Aug-85	17-Oct-85	Not located in environmentally sensitive area	Not located in a protected area	SDL089	BP CAN. ENERGY CO.	
No			670	Imperial	IMP IOE	KIMIK D-29	300D296940132150	Exploratory	Plug and abandoned	69.6347	-132.3694	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	17-Dec-71	16-Feb-72	2657.9	17-Dec-71	16-Feb-72	7 (1) (a), Parks and park withdrawals	Not located in a protected area	999	Inuvialuit are surface and subsurface owners	
No			1014	Imperial	ESSO	NETSERK F-40	300F406940135450	Exploratory	Plug and abandoned	69.6564	-135.9058	Beaufort Sea - Artificial Islands	Off-Shore	8-Nov-75	9-May-76	4370.2	8-Nov-75	9-May-76	Not located in environmentally sensitive area	Not located in a protected area	SDL061	IMPERIAL OIL RES.	
No			1731	Imperial	ESSO CHEVRON ET AL	NIPTERK P-32	300P326950135150	Exploratory	Plug and abandoned	69.6964	-135.3785	Beaufort Sea - Artificial Islands	Off-Shore	21-Feb-89	20-Apr-89	2136	21-Feb-89	20-Apr-89	Not located in environmentally sensitive area	Not located in a protected area	SDL116	IMPERIAL OIL RES.	
No			764	Imperial	IMP	NUKTAK C-22	300C226950134450	Exploratory	Plug and abandoned	69.6853	-134.8583	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	16-Dec-72	8-Mar-73	3856.6	16-Dec-72	8-Mar-73	Not located in environmentally sensitive area	Not located in a protected area	None	None	
No			520	Imperial	IOE	NATAGNAK K-23	300K236950131300	Exploratory	Plug and abandoned	69.7086	-131.6122	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	13-Mar-70	13-Apr-70	1517	13-Mar-70	13-Apr-70	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1560	Imperial	ESSO PCI HOME ET AL	MINUK I-53	300I536950136150	Exploratory	Plug and abandoned	69.7096	-136.4589	Beaufort Sea - Artificial Islands	Off-Shore	27-Nov-85	2-May-86	3367	27-Nov-85	2-May-86	Not located in environmentally sensitive area	Not located in a protected area	SDL115	IMPERIAL OIL RES.	
No			806	Imperial	IMP CIGOL	NATAGNAK K-53	300K536950131300	Exploratory	Plug and abandoned	69.7108	-131.7319	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	4-Mar-73	29-Mar-73	1751.7	4-Mar-73	29-Mar-73	7 (1) (b)	Not located in a protected area	No Data	No Data	
No			534	Imperial	IOE	ATKINSON M-33	300M336950131450	Exploratory	Plug and abandoned	69.7133	-131.9119	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	1-May-70	3-Jun-70	1928.5	1-May-70	3-Jun-70	7 (1) (b)	Not located in a protected area	No Data	No Data	
No			1740	BP	AMOCO ET AL	KINGARK J-54	300J546950137150	Exploratory	Plug and abandoned	69.7289	-137.4708	Beaufort Sea - Floating Units	Off-Shore	18-Jul-89	10-Oct-89	2247	18-Jul-89	10-Oct-89	Not located in environmentally sensitive area	Not located in a protected area	SDL114	BP CAN. ENERGY RES.	
No			730	ConocoPhillips	GULF MOBIL	SIKU C-55	300C556910133300	Exploratory	Plug and abandoned	69.0678	-133.7328	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	2-May-72	8-Nov-72	4506.5	2-May-72	8-Nov-72	7 (1) (b)	Not located in a protected area	99	Inuvialuit are surface owners	
No			478	Imperial	ESSO	ATKINSON H-25	300H256950131450	Exploratory	Plug and abandoned	69.7382	-131.8393	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	14-Dec-69	26-Feb-70	1810.8	14-Dec-69	26-Feb-70	7 (1) (b)	Not located in a protected area	No Data	No Data	
No			1738	ConocoPhillips	GULF ET AL	IMMIUGAK N-05	300N056950137000	Exploratory	Plug and abandoned	69.7482	-137.0224	Beaufort Sea - Floating Units	Off-Shore	1-Jun-89	10-Jun-89	397	1-Jun-89	10-Jun-89	Not located in environmentally sensitive area	Not located in a protected area	None	None	
No			887	Imperial	IMP CIGOL	ATKINSON A-55	300A556950131450	Delineation	Plug and abandoned	69.7358	-131.9650	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	15-Dec-73	23-Jan-74	2232.7	15-Dec-73	23-Jan-74	7 (1) (b)	Not located in a protected area	No Data	No Data	
No			1901	Petro-Canada	PC ANDERSON	KURK M-15	300M156910135152	Exploratory	Plug and abandoned	69.0809	-135.3233	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	10-Feb-01	16-Feb-02	3093	7-Jan-02	16-Feb-02	Not located in environmentally sensitive area	Not located in a protected area	EL419	PETRO-CANADA	

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No			1739	ConocoPhillips	GULF ET AL	IMMIUGAK A-06	300A066950137001	Exploratory	Plug and abandoned	69.7505	-137.0054	Beaufort Sea - Floating Units	Off-Shore	16-Jun-89	27-Jul-89	3800	3-Sep-89	22-Sep-89	Not located in environmentally sensitive area	Not located in a protected area	None	None	
No			1553	ConocoPhillips	GULF ET AL	AAGNERK E-56	300E566950136451	Exploratory	Plug and abandoned	69.7546	-136.9988	Beaufort Sea - Floating Units	Off-Shore	28-Oct-85	27-Jun-86	1100	17-Jun-86	27-Jun-86	Not located in environmentally sensitive area	Not located in a protected area	None	None	
No			1099	BP	DOME PACIFIC ET AL PEX	NATSEK E-56	300E566950139302	Exploratory	Plug and abandoned	69.7559	-139.7429	Beaufort Sea - Floating Units	Off-Shore	10-Jul-78	14-Oct-78	3520	1-Sep-79	8-Oct-79	Not located in environmentally sensitive area	Not located in a protected area	EL329	BP CAN. ENERGY RES.	
No			1619	Imperial	ESSO PCI HOME ET AL	ARNAK K-06	300K066950133450	Exploratory	Plug and abandoned	69.7612	-133.7724	Beaufort Sea - Artificial Islands	Off-Shore	27-Apr-86	12-Aug-86	4645	27-Apr-86	12-Aug-86	Not located in environmentally sensitive area	Not located in a protected area	SDL091	IMPERIAL OIL RES.	
No			1534	BP	DOME ET AL	EDLOK M-56	300M56695014000 0	Exploratory	Plug and abandoned	69.7641	-140.2398	Beaufort Sea - Floating Units	Off-Shore	10-Aug-85	18-Sep-85	2530	10-Aug-85	18-Sep-85	Not located in environmentally sensitive area	Not located in a protected area	EL329	BP CAN. ENERGY RES.	
Yes			995	Shell	SHELL GULF IMP	TITALIK O-15	300O15691013500 1	Delineation	Plug and abandoned	69.0828	-135.0533	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	27-Apr-75	16-Aug-75	3383.3	16-Feb-96	23-Feb-96	Not located in environmentally sensitive area	Not located in a protected area	SDL064	IMPERIAL OIL RES.	Drill sump collapsed, camp sump collapsed.
No			924	Imperial	IMP	PULLEN E-17	300E176950134150	Exploratory	Plug and abandoned	69.7711	-134.3281	Beaufort Sea - Artificial Islands	Off-Shore	21-Apr-74	11-Jul-74	3885	21-Apr-74	11-Jul-74	Not located in environmentally sensitive area	Not located in a protected area	None	None	
No			1210	Imperial	ESSO PEX	W. ATKINSON L-17	300L176950132000	Exploratory	Plug and abandoned	69.7761	-132.0757	Beaufort Sea - Artificial Islands	Off-Shore	1-May-82	25-Jun-82	2480	1-May-82	25-Jun-82	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1327	Imperial	ESSO HOME ET AL	KADLUK O-07	300O07695013600 0	Exploratory	Plug and abandoned	69.7801	-136.0213	Beaufort Sea - Caisson Retained Islands	Off-Shore	25-Sep-83	24-Apr-84	3896	25-Sep-83	24-Apr-84	Not located in environmentally sensitive area	Not located in a protected area	SDL058	IMPERIAL OIL RES.	
No			1509	Imperial	ESSO ET AL	NIPTERK L-19A	300L196950135150	Delineation	Plug and abandoned	69.8106	-135.2982	Beaufort Sea - Artificial Islands	Off-Shore	21-Apr-85	21-Jul-85	3520	21-Apr-85	21-Jul-85	Not located in environmentally sensitive area	Not located in a protected area	SDL095	IMPERIAL OIL RES.	
No			1447	Imperial	ESSO HOME PCI ET AL	NIPTERK L-19	300L196950135150	Exploratory	Plug and abandoned	69.8106	-135.3315	Beaufort Sea - Artificial Islands	Off-Shore	3-Oct-84	23-Mar-85	3879	3-Oct-84	23-Mar-85	Not located in environmentally sensitive area	Not located in a protected area	SDL095	IMPERIAL OIL RES.	
No			1254	Imperial	ESSO PEX HOME ET AL	NATAGNAK O-59	300O59695013130 0	Exploratory	Plug and abandoned	69.8157	-131.7223	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	17-Dec-82	28-Jan-83	2120	17-Dec-82	28-Jan-83	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			533	Imperial	IOE	NATAGNAK H-50	300H506950131300	Exploratory	Plug and abandoned	69.8242	-131.6697	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	30-Apr-70	1-Jun-70	1951.3	30-Apr-70	1-Jun-70	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1048	Imperial	IMP	ARNAK L-30	300L306950133450	Exploratory	Plug and abandoned	69.8290	-133.8725	Beaufort Sea - Artificial Islands	Off-Shore	5-Oct-76	16-Mar-77	4523.2	5-Oct-76	16-Mar-77	Not located in environmentally sensitive area	Not located in a protected area	EL420	DEVON ARL CORP.	
No			473	Husky	ELF	HORTON RIVER G-02	300G02700012715 0	Exploratory	Plug and abandoned	69.8563	-127.2656	Northwest Territories - Mainland	On-Shore	9-Nov-69	22-Jan-70	2478	9-Nov-69	22-Jan-70	7 (1) (b), Subject to environmental consideration	Cape Bathhurst-Husky Lakes Areas (1, 2 and 3)	No Data	No Data	
No			789	Imperial	IMP CIGOL	KANGUK F-42	300F427000131000	Exploratory	Plug and abandoned	69.8572	-131.1892	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	27-Jan-73	15-Feb-73	1545.3	27-Jan-73	15-Feb-73	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1219	ConocoPhillips	GULF ET AL	KIGGAVIK A-43	300A437000135450	Delineation	Plug and abandoned	69.8695	-135.9214	Beaufort Sea - Floating Units	Off-Shore	21-Jul-82	17-Oct-82	3511	21-Jul-82	17-Oct-82	Not located in environmentally sensitive area	Not located in a protected area	SDL084	CONOCOPHILLIPS RES.	
No			1628	Imperial	ESSO HOME ET AL	KAUBVIK I-43	300I437000135150	Exploratory	Plug and abandoned	69.8758	-135.4220	Beaufort Sea - Caisson Retained Islands	Off-Shore	22-Oct-86	10-Jan-87	3323	22-Oct-86	10-Jan-87	Not located in environmentally sensitive area	Not located in a protected area	None	None	

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No			1192	Imperial	ESSO PEX	ALERK P-23	300P237000132450	Exploratory	Plug and abandoned	69.8825	-132.8394	Beaufort Sea - Artificial Islands	Off-Shore	21-Sep-81	24-Dec-81	3223	21-Sep-81	24-Dec-81	Not located in environmentally sensitive area	Not located in a protected area	None	None	
No			751	ConocoPhillips	GULF IMP SHELL	TITALIK K-26	300K266910135000	Exploratory	Plug and abandoned	69.0917	-135.1042	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	17-Oct-72	20-Feb-73	3840.5	17-Oct-72	20-Feb-73	Not located in environmentally sensitive area	Not located in a protected area	SDL064	IMPERIAL OIL RES.	
No			603	Imperial	IOE	KANGUK I-24	300I247000131000	Exploratory	Plug and abandoned	69.8944	-131.0867	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	13-Feb-71	7-Mar-71	1601.4	13-Feb-71	7-Mar-71	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1201	ConocoPhillips	GULF ET AL	E. TARSIUT N-44	300N447000136000	Delineation	Plug and abandoned	69.8961	-136.1935	Beaufort Sea - Caisson Retained Islands	Off-Shore	10-Dec-81	7-Jun-82	4531	10-Dec-81	7-Jun-82	Not located in environmentally sensitive area	Not located in a protected area	SDL086	CONOCOPHILLIPS RES.	
No			1212	ConocoPhillips	GULF ET AL	E. TARSIUT N-44A	300N447000136001	Delineation	Plug and abandoned	69.8969	-136.1941	Beaufort Sea - Caisson Retained Islands	Off-Shore	8-Jun-82	19-Sep-82	2928	8-Jun-82	19-Sep-82	Not located in environmentally sensitive area	Not located in a protected area	SDL086	CONOCOPHILLIPS RES.	
No			920	Imperial	IMP CIGOL	AMAROK N-44	300N447000130450	Exploratory	Plug and abandoned	69.8997	-130.9378	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	11-Apr-74	26-May-74	2332.3	11-Apr-74	26-May-74	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1105	BP	DOME GULF	TARSIUT A-25	300A257000136153	Exploratory	Plug and abandoned	69.9030	-136.3390	Beaufort Sea - Floating Units	Off-Shore	18-Oct-78	29-Jul-80	4434	13-Jul-80	29-Jul-80	Not located in environmentally sensitive area	Not located in a protected area	SDL086	CONOCOPHILLIPS RES.	
No			1320	ConocoPhillips	GULF ET AL	PITSIULAK A-05	300A057000136451	Exploratory	Plug and abandoned	69.9039	-136.7595	Beaufort Sea - Floating Units	Off-Shore	21-Aug-83	25-Jul-84	2192	15-Jun-84	25-Jul-84	Not located in environmentally sensitive area	Not located in a protected area	SDL088	CONOCOPHILLIPS RES.	
No			980	Imperial	IMP DOME	LOUTH K-45	300K457000131150	Exploratory	Plug and abandoned	69.9089	-131.4464	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	19-Feb-75	12-Mar-75	2218.5	19-Feb-75	12-Mar-75	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1741	Imperial	ESSO CHEVRON ET AL	ISSERK I-15	300I157000134150	Exploratory	Plug and abandoned	69.9124	-134.2992	Beaufort Sea - Caisson Retained Islands	Off-Shore	11-Nov-89	8-Jan-90	2693	11-Nov-89	8-Jan-90	Not located in environmentally sensitive area	Not located in a protected area	SDL111	IMPERIAL OIL RES.	
No			1443	ConocoPhillips	GULF ET AL	W. TARSIUT P-45	300P457000136151	Delineation	Plug and abandoned	69.9154	-136.4180	Beaufort Sea - Caisson Retained Islands	Off-Shore	25-Sep-84	24-Dec-84	3042	15-Oct-91	15-Oct-91	Not located in environmentally sensitive area	Not located in a protected area	SDL086	CONOCOPHILLIPS RES.	
No			212	Chevron	TEXCAN C & E	NICHOLSON N-45	300N457000128450	Exploratory	Plug and abandoned	69.9164	-128.9386	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	30-Oct-62	7-Nov-62	863.5	30-Oct-62	7-Nov-62	7 (1) (b), Bird sanctuary	Cape Bathhurst-Husky Lakes Areas (1, 2 and 3)	No Data	No Data	
No			964	ConocoPhillips	GULF MOBIL	KIKORALOK N-46	300N466910134450	Exploratory	Plug and abandoned	69.0961	-134.9425	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	20-Dec-74	25-Jan-75	1885.2	20-Dec-74	25-Jan-75	7 (1) (a), Parks and park withdrawals	Not located in a protected area	EL419	PETRO-CANADA	
No			211	Chevron	TEXCAN C & E	NICHOLSON G-56	300G56700012845 0	Exploratory	Plug and abandoned	69.9247	-128.9761	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	4-Sep-62	19-Sep-62	863.5	4-Sep-62	19-Sep-62	7 (1) (b), Bird sanctuary	Cape Bathhurst-Husky Lakes Areas (1, 2 and 3)	No Data	No Data	
No			1083	Imperial	IMP IOE ET AL	ISSERK E-27	300E277000134150	Exploratory	Plug and abandoned	69.9389	-134.3697	Beaufort Sea - Artificial Islands	Off-Shore	4-Dec-77	29-Mar-78	4120.6	4-Dec-77	29-Mar-78	Not located in environmentally sensitive area	Not located in a protected area	SDL053	IMPERIAL OIL RES.	
No			1242	Imperial	ESSO PEX HOME ET AL	ITIYOK I-27	300I277000134000	Exploratory	Plug and abandoned	69.9444	-134.0887	Beaufort Sea - Artificial Islands	Off-Shore	5-Nov-82	2-May-83	3995	5-Nov-82	2-May-83	Not located in environmentally sensitive area	Not located in a protected area	SDL055	IMPERIAL OIL RES.	
No			968	Imperial	IMP CIGOL	KAPIK J-39	300J397000130000	Exploratory	Plug and abandoned	69.9756	-130.1361	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	1-Jan-75	30-Jan-75	1467.6	1-Jan-75	30-Jan-75	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			519	Imperial	IOE	NUVORAK O-09	300O09700013030 0	Exploratory	Plug and abandoned	69.9819	-130.5156	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	12-Mar-70	14-Apr-70	1156.7	12-Mar-70	14-Apr-70	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	

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No			1438	Imperial	ESSO HOME PCI ET AL	AMERK O-09	300O097 00013330 0	Exploratory	Plug and abandoned	69.9823	-133.5148	Beaufort Sea - Caisson Retained Islands	Off-Shore	22-Aug-84	3-Mar-85	5000	22-Aug-84	3-Mar-85	Not located in environmentally sensitive area	Not located in a protected area	SDL051	IMPERIAL OIL RES.	
No			814	ConocoPhillips	GULF IMP SHELL	REINDEER C-36	300C3669 10134301	Exploratory	Plug and abandoned	69.0861	-134.6542	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	13-Mar-73	3-Mar-86	1828.8	27-Feb-86	3-Mar-86	7 (1) (a), Parks and park withdrawals	Not located in a protected area	SDL033	SHELL CANADA	
No			275	Shell	B.A. SHELL IOE	REINDEER D-27	300D2769 10134300	Exploratory	Plug and abandoned	69.1014	-134.6150	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	8-Jul-65	5-Jan-66	3861.2	8-Jul-65	5-Jan-66	7 (1) (a), Parks and park withdrawals	Not located in a protected area	99	Inuvialuit are surface owners	
No			1969	Chevron	CHEVRON ET AL	ELLICE I-48	300I4869 10135450	Exploratory	Plug and suspended	69.1261	-135.9260	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	4-Feb-04	16-Apr-04	3806	4-Feb-04	16-Apr-04	Not located in environmentally sensitive area	Not located in a protected area	EL404	BP CAN. ENERGY CO.	
No			585	Imperial	IOE	SPRING RIVER YT N-58	300N5869 10138300	Exploratory	Plug and abandoned	69.1314	-138.7347	Yukon Onshore	On-Shore	7-Jan-71	18-Mar-71	2136.3	7-Jan-71	18-Mar-71	Not located in environmentally sensitive area	Ivvavik National Park	Proposed MPA	Proposed MPA	
Yes			965	BP	DOME IMP	IMNAK J-29	300J2969 10133000	Exploratory	Plug and abandoned	69.1447	-133.1014	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	22-Dec-74	12-Mar-75	3404.6	22-Dec-74	12-Mar-75	7 (1) (b)	Not located in a protected area	SDL093	IMPERIAL OIL RES.	
No			1056	Imperial	IMP DELTA 5	KURK M-39	300M396 91013515 0	Exploratory	Plug and abandoned	69.1486	-135.4150	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	16-Dec-76	9-Mar-77	3109	16-Dec-76	9-Mar-77	Not located in environmentally sensitive area	Not located in a protected area	EL419	PETRO-CANADA	
No			1350	Imperial	ESSO PCI HOME ET AL	NUNA A-10	300A1069 10133150	Exploratory	Plug and abandoned	69.1501	-133.2512	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	21-Dec-83	4-Feb-84	3250.5	21-Dec-83	4-Feb-84	7 (1) (b)	Not located in a protected area	EL406,99	PETRO-CANADA. Inuvialuit are surface owners	
No			1611	Imperial	ESSO HOME ET AL	NUNA E-40	300E4069 10133150	Exploratory	Plug and abandoned	69.1544	-133.4122	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	14-Mar-86	31-Mar-86	1625	14-Mar-86	31-Mar-86	7 (1) (a), Parks and park withdrawals	Not located in a protected area	EL406	PETRO-CANADA	
No			1977	Petro-Canada	PC DEVON	NUNA I-30	300I3069 10133150	Exploratory	Plug and suspended	69.1596	-133.3358	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	7-Feb-03	21-Apr-03	3250	7-Feb-03	21-Apr-03	7 (1) (a), Parks and park withdrawals	Not located in a protected area	EL406,99	PETRO-CANADA. Inuvialuit are surface owners	
Yes			1777	Shell	SHELL	SHAVILIG J-20	300J2069 10135150	Exploratory	Plug and abandoned	69.1607	-135.3033	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	18-Feb-92	16-Mar-92	1374	18-Feb-92	16-Mar-92	Not located in environmentally sensitive area	Not located in a protected area	EL419	PETRO-CANADA	
No			1178	Imperial	ESSO GULF ET AL	ISSUNGNAK 2O-61	302O617 01013400 0	Delineation	Plug and abandoned	70.0167	-134.3134	Beaufort Sea - Artificial Islands	Off-Shore	2-Oct-80	13-Aug-81	4460	2-Oct-80	13-Aug-81	Not located in environmentally sensitive area	Not located in a protected area	SDL083	CONOCOPHILLIPS RES.	
No			1157	Imperial	ESSO ET AL	ISSUNGNAK O-61	300O617 01013400 0	Exploratory	Plug and abandoned	70.0168	-134.3133	Beaufort Sea - Artificial Islands	Off-Shore	6-Feb-80	8-Jul-80	3583	6-Feb-80	8-Jul-80	Not located in environmentally sensitive area	Not located in a protected area	SDL083	CONOCOPHILLIPS RES.	
No			1041	BP	DOME GULF ET AL	TINGMIARK K-91	300K9170 20132301	Exploratory	Plug and abandoned	70.1767	-132.9823	Beaufort Sea - Floating Units	Off-Shore	11-Aug-76	17-Oct-76	3051	20-Jan-84	20-Jan-84	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1067	Imperial	IMP IOE	KANNERK G-42	300G427 01013100 0	Exploratory	Plug and abandoned	70.0233	-131.2156	Beaufort Sea - Artificial Islands	Off-Shore	30-Mar-77	14-May-77	2480.5	30-Mar-77	14-May-77	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1640	Suncor	TRILLIUM ESSO CHEVRON	ANGASAK L-03	300L0370 20129300	Exploratory	Plug and abandoned	70.2123	-129.5473	Beaufort Sea - Artificial Islands	Off-Shore	24-Feb-87	12-Apr-87	2334	24-Feb-87	12-Apr-87	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1450	ConocoPhillips	GULF ET AL	AKPAK P-35	300P3570 20134001	Exploratory	Plug and abandoned	70.2479	-134.1566	Beaufort Sea - Floating Units	Off-Shore	17-Oct-84	8-Nov-84	2169	10-Jun-85	8-Jul-85	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1525	ConocoPhillips	GULF ET AL	AKPAK 2P-35	302P3570 20134000	Exploratory	Plug and abandoned	70.2479	-134.1564	Beaufort Sea - Floating Units	Off-Shore	8-Jul-85	14-Aug-85	3673	8-Jul-85	14-Aug-85	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	

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No			1244	BP	DOME ET AL	UVILUK P-66	300P667020132000	Exploratory	Plug and abandoned	70.2634	-132.3133	Beaufort Sea - Caisson Retained Islands	Off-Shore	11-Nov-82	21-May-83	4756	11-Nov-82	21-May-83	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1314	BP	DOME ET AL	ARLUK E-90	300E907020135002	Exploratory	Plug and abandoned	70.3234	-135.4433	Beaufort Sea - Floating Units	Off-Shore	30-Jul-83	13-Oct-85	4300	23-Sep-85	13-Oct-85	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1308	BP	DOME ET AL	HAVIK B-41	300B417030132004	Exploratory	Plug and suspended	70.3364	-132.2182	Beaufort Sea - Floating Units	Off-Shore	17-Jul-83	24-Aug-86	4750	29-Jun-84	6-Oct-84	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1145	BP	DOME HUNT GULF	KOAKOAK O-22	300O22703013400 3	Exploratory	Plug and abandoned	70.3652	-134.1133	Beaufort Sea - Floating Units	Off-Shore	5-Nov-79	31-Oct-81	4365	15-Jul-85	15-Jul-85	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			906	Imperial	IMP CIGOL	RUSSELL H-23	300H237010130000	Exploratory	Plug and abandoned	70.0383	-130.1078	Northwest Territories - Mackenzie Delta - Onshore	On-Shore	17-Feb-74	1-Apr-74	1831.8	17-Feb-74	1-Apr-74	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1168	BP	DOME SUPERIOR	ORVILRUK O-03	300O03703013630 3	Exploratory	Plug and abandoned	70.3800	-136.5146	Beaufort Sea - Floating Units	Off-Shore	9-Jul-80	25-Oct-82	3912	15-Jul-85	15-Jul-85	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1046	BP	DOME GULF ET AL HUNT	KOPANOAR M-13	300M13703013500 4	Exploratory	Plug and abandoned	70.3820	-135.0928	Beaufort Sea - Floating Units	Off-Shore	27-Sep-76	5-Oct-76	4320.2	15-Jul-85	15-Jul-85	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1040	Bp	HUNT DOME	KOPANOAR D-14	300D147030135000	Exploratory	Plug and abandoned	70.3837	-135.0919	Beaufort Sea - Floating Units	Off-Shore	8-Aug-76	26-Sep-76	1146	8-Aug-76	26-Sep-76	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1720	Bp	HUNT DOME	KOPANOAR 2D-14	302D147030135000	Relief	Plug and abandoned	70.3839	-135.0919	Beaufort Sea - Floating Units	Off-Shore	20-Sep-76	26-Sep-76	559.3	20-Sep-76	26-Sep-76	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1143	BP	DOME GULF HUNT	KOPANOAR L-34	300L347030135000	Delineation	Plug and abandoned	70.3937	-135.1993	Beaufort Sea - Floating Units	Off-Shore	11-Oct-79	26-Nov-79	2015	11-Oct-79	26-Nov-79	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1146	BP	DOME GULF HUNT	KOPANOAR 2L-34	302L347030135000	Delineation	Plug and abandoned	70.3949	-135.1992	Beaufort Sea - Floating Units	Off-Shore	26-Nov-79	28-Nov-79	181	26-Nov-79	28-Nov-79	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1169	BP	DOME GULF HUNT	KOPANOAR I-44	300I447030135000	Delineation	Plug and abandoned	70.3954	-135.2007	Beaufort Sea - Floating Units	Off-Shore	10-Jul-80	1-Aug-80	649	10-Jul-80	1-Aug-80	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1171	BP	DOME GULF HUNT	KOPANOAR 2I-44	302I447030135001	Delineation	Plug and abandoned	70.3954	-135.2034	Beaufort Sea - Floating Units	Off-Shore	2-Aug-80	28-Oct-81	4015	18-Jul-81	28-Oct-81	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1311	BP	DOME ET AL	SIULIK I-05	300I057030134301	Exploratory	Plug and abandoned	70.4104	-134.5110	Beaufort Sea - Floating Units	Off-Shore	25-Jul-83	18-Oct-84	4824	30-Jul-84	18-Oct-84	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1233	BP	DOME ET AL	AIVERK I-45	300I457030133300	Exploratory	Plug and abandoned	70.4112	-133.7001	Beaufort Sea - Floating Units	Off-Shore	5-Oct-82	23-Oct-82	730	5-Oct-82	23-Oct-82	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1240	BP	DOME	AIVERK 2I-45	302I457030133302	Exploratory	Plug and abandoned	70.4123	-133.7054	Beaufort Sea - Floating Units	Off-Shore	3-Nov-82	11-Oct-84	5034	28-Jul-84	11-Oct-84	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1444	BP	DOME	NERLERK J-67	300J677030133001	Delineation	Plug and abandoned	70.4450	-133.3248	Beaufort Sea - Floating Units	Off-Shore	26-Sep-84	23-Oct-85	4904	15-Aug-85	23-Oct-85	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1079	BP	DOME	NERLERK M-98	300M98703013300 3	Exploratory	Plug and abandoned	70.4632	-133.4956	Beaufort Sea - Floating Units	Off-Shore	7-Oct-77	28-Oct-79	4940	15-Jul-85	15-Jul-85	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1042	BP	DOME HUNT	NEKTORALIK K-59	300K597030136001	Exploratory	Plug and abandoned	70.4763	-136.2808	Beaufort Sea - Floating Units	Off-Shore	23-Sep-76	17-Oct-77	2790.1	2-Aug-77	17-Oct-77	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	

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No			1674	ConocoPhillips	GULF ET AL	AMAULIGAK 2F-24	302F247010133300	Delineation	Plug and abandoned	70.0548	-133.6304	Beaufort Sea - Caisson Retained Islands	Off-Shore	22-Dec-87	29-Jan-88	4260	22-Dec-87	29-Jan-88	Not located in environmentally sensitive area	Not located in a protected area	PL02	ONOCOPHILLIPS RES.	
No			1678	ConocoPhillips	GULF ET AL	AMAULIGAK 2F-24A	302F247010133300	Delineation	Plug and abandoned	70.0548	-133.6304	Beaufort Sea - Caisson Retained Islands	Off-Shore	30-Jan-88	17-Feb-88	3760	30-Jan-88	17-Feb-88	Not located in environmentally sensitive area	Not located in a protected area	PL02	ONOCOPHILLIPS RES.	
No			1661	ConocoPhillips	GULF ET AL	AMAULIGAK F-24	300F247010133302	Delineation	Plug and abandoned	70.0548	-133.6303	Beaufort Sea - Caisson Retained Islands	Off-Shore	1-Oct-87	19-Dec-87	5260	10-Aug-88	12-Aug-88	Not located in environmentally sensitive area	Not located in a protected area	PL02	ONOCOPHILLIPS RES.	
No			1711	ConocoPhillips	GULF ET AL	AMAULIGAK 2F-24B	302F247010133302	Delineation	Plug and abandoned	70.0548	-133.6303	Beaufort Sea - Caisson Retained Islands	Off-Shore	15-Apr-88	27-Jun-88	4477	15-Apr-88	27-Jun-88	Not located in environmentally sensitive area	Not located in a protected area	PL02	ONOCOPHILLIPS RES.	
No			1717	ConocoPhillips	GULF ET AL	AMAULIGAK COREHOLE NO.1	303F247010133300	Other	Plug and abandoned	70.0549	-133.6291	Beaufort Sea - Caisson Retained Islands	Off-Shore	12-Aug-88	7-Sep-88	527.4	12-Aug-88	7-Sep-88	Not located in environmentally sensitive area	Not located in a protected area	PL02	ONOCOPHILLIPS RES.	
No			1340	ConocoPhillips	GULF ET AL	AMAULIGAK J-44	300J447010133301	Exploratory	Plug and abandoned	70.0588	-133.7127	Beaufort Sea - Floating Units	Off-Shore	16-Nov-83	23-Sep-84	4002	29-Jul-84	23-Sep-84	Not located in environmentally sensitive area	Not located in a protected area	PL02	ONOCOPHILLIPS RES.	
No			1330	ConocoPhillips	GULF ET AL	AMAULIGAK I-44	300I447010133300	Other	Plug and abandoned	70.0586	-133.7125	Beaufort Sea - Floating Units	Off-Shore	7-Oct-83	15-Nov-83	212	7-Oct-83	15-Nov-83	Not located in environmentally sensitive area	Not located in a protected area	PL02	ONOCOPHILLIPS RES.	
No			1108	BP	DOME	KAGLULIK M-64	300M647040130301	Other	Plug and suspended	70.5655	-130.8429	Beaufort Sea - Floating Units	Off-Shore	3-Nov-78	10-Jul-79	144.2	3-Nov-78	4-Nov-78	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1193	BP	DOME HUNT	IRKALUK B-35	300B357040134001	Exploratory	Plug and abandoned	70.5681	-134.1702	Beaufort Sea - Floating Units	Off-Shore	27-Sep-81	4-Oct-82	4860	10-Jul-82	4-Oct-82	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1077	BP	DOME	KAGLULIK A-75	300A757040130301	Exploratory	Plug and suspended	70.5686	-130.8561	Beaufort Sea - Floating Units	Off-Shore	19-Jul-77	20-Aug-78	644.7	19-Jul-77	28-Jul-77	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1307	BP	DOME ET AL	NATIAK O-44	300O447010137001	Exploratory	Plug and abandoned	70.0659	-137.2185	Beaufort Sea - Floating Units	Off-Shore	16-Jul-83	25-Sep-84	4650	30-Aug-84	25-Sep-84	Not located in environmentally sensitive area	Not located in a protected area	None	None	
No			1141	BP	DOME ET AL HUNT	KENALOOAK J-94	300J947050133303	Exploratory	Plug and abandoned	70.7289	-133.9744	Beaufort Sea - Floating Units	Off-Shore	20-Sep-79	1-Nov-82	4568	22-Jul-82	1-Nov-82	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1542	ConocoPhillips	GULF ET AL	AMAULIGAK I-65	300I657010133300	Delineation	Plug and abandoned	70.0777	-133.8046	Beaufort Sea - Caisson Retained Islands	Off-Shore	21-Sep-85	28-Jan-86	4126	21-Sep-85	28-Jan-86	Not located in environmentally sensitive area	Not located in a protected area	PL02	ONOCOPHILLIPS RES.	
No			1166	BP	DOME ET AL	KILANNAK A-77	300A777050129002	Exploratory	Plug and abandoned	70.7704	-129.3573	Beaufort Sea - Floating Units	Off-Shore	23-Jun-80	3-Sep-81	2996	22-Jul-81	3-Sep-81	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1191	ConocoPhillips	GULF ET AL	NORTH ISSUNGNAK L-86	300L867010134000	Exploratory	Plug and abandoned	70.0924	-134.4459	Beaufort Sea - Floating Units	Off-Shore	17-Jul-81	16-Oct-81	4771	17-Jul-81	16-Oct-81	Not located in environmentally sensitive area	Not located in a protected area	None	None	
No			1715	ConocoPhillips	GULF ET AL	AMAULIGAK O-86	300O867010133300	Exploratory	Plug and abandoned	70.0966	-133.9238	Beaufort Sea - Floating Units	Off-Shore	30-Jun-88	26-Aug-88	3910	30-Jun-88	26-Aug-88	Not located in environmentally sensitive area	Not located in a protected area	PL02	ONOCOPHILLIPS RES.	
No			1337	ConocoPhillips	GULF ET AL	KOGYUK N-67	300N677010133000	Exploratory	Plug and abandoned	70.1137	-133.3282	Beaufort Sea - Caisson Retained Islands	Off-Shore	28-Oct-83	30-Jan-84	4798	28-Oct-83	30-Jan-84	Not located in environmentally sensitive area	Not located in a protected area	None	None	
No			1100	BP	DOME GULF ET AL	UKALERK 2C-50	302C507010132302	Exploratory	Plug and abandoned	70.1515	-132.7298	Beaufort Sea - Floating Units	Off-Shore	10-Jul-78	11-Oct-78	4953	4-Jun-84	4-Jun-84	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1076	BP	DOME GULF ET AL	UKALERK C-50	300C507010132300	Exploratory	Plug and abandoned	70.1516	-132.7357	Beaufort Sea - Floating Units	Off-Shore	18-Jul-77	3-Oct-77	2304.6	18-Jul-77	3-Oct-77	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	

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No	No	Yes	775	Deminex	DEMINEX CGDC FOC AMOCO	ORKSUT I-44	300I447230122300	Exploratory	Plug and abandoned	72.3958	-122.7024	Northwest Territories - Arctic Islands - Onshore	On-Shore	1-Jan-73	28-Mar-73	3060.2	1-Jan-73	28-Mar-73	7 (1) (b), Bird sanctuary	Banks Island 1 Bird Sanctuary	No Data	No Data	
No			908	BP	COLUMBIA ET AL AMOCO	IKKARIKTOK M-64	300M64723012130	Exploratory	Plug and abandoned	72.3965	-121.8497	Northwest Territories - Arctic Islands - Onshore	On-Shore	26-Feb-74	16-Apr-74	1288.1	26-Feb-74	16-Apr-74	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
Yes			974	Murphy Oil Company Ltd.	MURPHY ET AL	VICTORIA ISLAND F-36	300F367250117000	Exploratory	Plug and abandoned	72.7550	-117.1869	Northwest Territories - Arctic Islands - Onshore	On-Shore	28-Jan-75	27-Apr-75	2457.3	28-Jan-75	27-Apr-75	Subject to environmental consideration	Not located in a protected area	No Data	No Data	
No			893	Husky	ELF TEXACO	TIRITCHIK M-48	300M48725012030	Exploratory	Plug and abandoned	72.7975	-120.7467	Northwest Territories - Arctic Islands - Onshore	On-Shore	31-Dec-73	6-Apr-74	2215.3	31-Dec-73	6-Apr-74	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			654	Husky	ELF ET AL	STORKERSON BAY A-15	300A157300124300	Exploratory	Plug and abandoned	72.9000	-124.5581	Northwest Territories - Arctic Islands - Onshore	On-Shore	23-Oct-71	10-Dec-71	2048	23-Oct-71	10-Dec-71	7 (1) (b), Bird sanctuary	Banks Island 1 Bird Sanctuary	No Data	No Data	
No			962	Husky	ELFEX ET AL	KUSRHAAK D-16	300D167330120000	Exploratory	Plug and abandoned	73.4178	-120.0883	Northwest Territories - Arctic Islands - Onshore	On-Shore	12-Jul-74	4-Apr-75	3810	12-Jul-74	4-Apr-75	Land reserved for natural park purposes	Aulavik National Park	No Data	No Data	
No			1113	Chevron	CHEVRON ET AL	PARKER RIVER J-72	300J727340115300	Exploratory	Plug and abandoned	73.5284	-115.8736	Northwest Territories - Arctic Islands - Onshore	On-Shore	13-Jan-79	1-Jun-79	3010	13-Jan-79	1-Jun-79	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			713	Husky	ELF	UMINMAK H-07	300H077340123000	Exploratory	Plug and abandoned	73.6081	-123.0083	Northwest Territories - Arctic Islands - Onshore	On-Shore	1-Apr-72	7-May-72	1698.7	1-Apr-72	7-May-72	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1197	Chevron	CHEVRON	MUSKOX D-87	300D877340117000	Exploratory	Plug and abandoned	73.6023	-117.4500	Northwest Territories - Arctic Islands - Onshore	On-Shore	30-Oct-81	27-Jan-82	3512	30-Oct-81	27-Jan-82	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			686	Husky	ELF	NANUK D-76	300D767310123000	Exploratory	Plug and abandoned	73.0869	-123.3958	Northwest Territories - Arctic Islands - Onshore	On-Shore	17-Jan-72	4-Mar-72	1377.1	17-Jan-72	4-Mar-72	7 (1) (b), Bird sanctuary	Banks Island 1 Bird Sanctuary	No Data	No Data	
No			1015	Petro-Canada	PANARCTIC ELF	BAR HARBOUR E-76	300E767420123300	Exploratory	Plug and abandoned	74.2575	-123.8972	Northwest Territories - Arctic Islands - Onshore	On-Shore	24-Nov-75	2-Jan-76	1835.5	24-Nov-75	2-Jan-76	Subject to environmental consideration	Not located in a protected area	No Data	No Data	
No			744	Petro-Canada	PANARCTIC DOME	DUNDAS C-80	300C807440113000	Exploratory	Plug and abandoned	74.6506	-113.3833	Northwest Territories - Arctic Islands - Onshore	On-Shore	14-Oct-72	19-Jan-73	3999.6	14-Oct-72	19-Jan-73	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1132	BP	DOME PANARCTIC	N. DUNDAS N-82	300N827450113000	Exploratory	Plug and abandoned	74.6966	-113.4281	Northwest Territories - Arctic Islands - Onshore	On-Shore	11-Jun-79	11-Sep-79	4100	11-Jun-79	11-Sep-79	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1107	BP	DOME PANARCTIC ET AL	HEARNE F-85	300F857450110300	Exploratory	Plug and abandoned	74.7378	-110.9328	Northwest Territories - Arctic Islands - Onshore	On-Shore	25-Oct-78	9-Jan-79	1676	25-Oct-78	9-Jan-79	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			201	BP	DOME ET AL	WINTER HARBOUR NO.1(A-09)	300A097450110300	Exploratory	Plug and abandoned	74.8017	-110.5103	Northwest Territories - Arctic Islands - Onshore	On-Shore	10-Sep-61	7-Apr-62	3823.1	10-Sep-61	7-Apr-62	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			975	Petro-Canada	PANARCTIC TENN ET AL	CASTEL BAY C-68	300C687410120300	Exploratory	Plug and abandoned	74.1197	-120.8331	Northwest Territories - Arctic Islands - Onshore	On-Shore	29-Jan-75	5-Apr-75	2904.7	29-Jan-75	5-Apr-75	Land reserved for natural park purposes	Aulavik National Park	No Data	No Data	
No			1011	Petro-Canada	PANARCTIC ET AL	SABINE BAY A-07	300A077530110000	Exploratory	Plug and abandoned	75.4350	-110.0139	Northwest Territories - Arctic Islands - Onshore	On-Shore	23-Oct-75	24-Feb-76	5192.9	23-Oct-75	24-Feb-76	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			843	Petro-Canada	PANARCTIC	APOLLO C-73	300C737540111300	Exploratory	Plug and abandoned	75.5333	-111.9828	Northwest Territories - Arctic Islands - Onshore	On-Shore	13-May-73	10-Aug-73	3665.2	13-May-73	10-Aug-73	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			955	Petro-Canada	PANARCTIC ET AL	PEDDER POINT D-49	300D497540118300	Exploratory	Plug and abandoned	75.6358	-118.8044	Northwest Territories - Arctic Islands - Onshore	On-Shore	12-Oct-74	10-Nov-74	1875.1	12-Oct-74	10-Nov-74	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	

Owner Confirmation of Well Ownership Received	Potential Orphan Based on Minor Interest Holder	Potential Orphan Based on Majority Interest Holder	WID	Current Well Owner (Preliminary)	CONSORTIUM (NEB)	WELL NAME	UWI	CLASS	STATUS	LATITUDE	LONGITUDE	NEB REGION Designation	Onshore or Offshore	ORIGINAL SPUD DATE	ORIGINAL RR DATE	DEPTH (m)	SPUD RE DATE	RIG RELEASE DATE	Environmental Sensitivity	Protected Areas Descriptive	Oil and Gas Dispositions #	Oil and Gas Dispositions - Name	Kokelj and Geonorth 2002 Assessment
No			841	Petro-Canada	PANARCTIC TENNECO ET AL	ZEUS F-11	300F117600113300	Exploratory	Plug and abandoned	75.8396	-113.6068	Northwest Territories - Arctic Islands - Onshore	On-Shore	2-May-73	27-May-73	949.1	2-May-73	27-May-73	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			934	Petro-Canada	PANARCTIC GULF	EGLINTON P-24	300P247600118000	Exploratory	Plug and abandoned	75.8981	-118.1275	Northwest Territories - Arctic Islands - Onshore	On-Shore	6-Jun-74	3-Jul-74	1837.9	6-Jun-74	3-Jul-74	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			561	Suncor	SUN KR PANARCTIC	KITSON R. C-71	300C717620112300	Exploratory	Plug and abandoned	76.1701	-112.9822	Northwest Territories - Arctic Islands - Onshore	On-Shore	14-Nov-70	6-Feb-71	2766.1	14-Nov-70	6-Feb-71	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1068	Petro-Canada	PANARCTIC	S.W. HECLA C-58	300C587620111000	Exploratory	Plug and abandoned	76.2846	-111.3480	Arctic Islands Offshore	Off-Shore	4-Apr-77	29-Apr-77	1219.2	4-Apr-77	29-Apr-77	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			799	Petro-Canada	PANARCTIC TENNECO ET AL	HECLA I-69	300I697620110001	Delineation	Plug and abandoned	76.3102	-110.3876	Northwest Territories - Arctic Islands - Onshore	On-Shore	22-Feb-73	11-Apr-73	1456.6	16-May-91	16-May-91	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			540	Petro-Canada	PANARCTIC HOMESTEAD	HECLA J-60	300J607620110000	Exploratory	Plug and abandoned	76.3272	-110.3303	Northwest Territories - Arctic Islands - Onshore	On-Shore	31-May-70	16-Sep-70	3616.5	31-May-70	16-Sep-70	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			470	Petro-Canada	PANARCTIC	MARIE BAY D-02	300D027630115300	Exploratory	Plug and abandoned	76.3503	-115.5587	Northwest Territories - Arctic Islands - Onshore	On-Shore	13-Aug-69	24-Sep-69	1272.5	13-Aug-69	24-Sep-69	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			754	Petro-Canada	PANARCTIC TENN ET AL POR	E. HECLA F-62	300F627630110002	Exploratory	Plug and abandoned	76.3544	-110.4107	Northwest Territories - Arctic Islands - Onshore	On-Shore	11-Nov-72	11-Dec-72	1219	1-Oct-95	5-Oct-95	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1020	Petro-Canada	PANARCTIC	W. HECLA P-62	300P627630110300	Delineation	Plug and abandoned	76.3642	-110.8764	Arctic Islands Offshore	Off-Shore	7-Jan-76	26-Feb-76	1127.8	7-Jan-76	26-Feb-76	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			913	Petro-Canada	PANARCTIC TENN ET AL CS	W. HECLA N-52	300N527630110300	Delineation	Plug and abandoned	76.3648	-110.8481	Arctic Islands Offshore	Off-Shore	5-Mar-74	15-Apr-74	938.8	5-Mar-74	15-Apr-74	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1013	Petro-Canada	PANARCTIC ET AL	E. HECLA C-32	300C327630110002	Delineation	Plug and abandoned	76.3526	-110.2295	Northwest Territories - Arctic Islands - Onshore	On-Shore	7-Nov-75	16-Dec-75	1341	1-Oct-95	4-Oct-95	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1073	Petro-Canada	PANARCTIC AIEG ET AL	DEPOT ISLAND C-44	300C447630114000	Exploratory	Plug and abandoned	76.3874	-114.2958	Northwest Territories - Arctic Islands - Onshore	On-Shore	19-Apr-77	10-Jun-77	2669.1	19-Apr-77	10-Jun-77	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1092	Petro-Canada	PANARCTIC NORCEN AIEG ET AL	GRASSY I-34	300I347630113000	Exploratory	Plug and abandoned	76.3954	-113.1896	Arctic Islands Offshore	Off-Shore	11-Mar-78	18-Apr-78	975.4	11-Mar-78	18-Apr-78	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1024	Petro-Canada	PANARCTIC TENN CS	N.W. HECLA M-25	300M25763011100 0	Delineation	Plug and abandoned	76.4151	-111.1870	Arctic Islands Offshore	Off-Shore	14-Mar-76	18-Apr-76	1207	14-Mar-76	18-Apr-76	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1033	Petro-Canada	PANARCTIC TENN ET AL	W. HECLA C-05	300C057630110300	Delineation	Plug and abandoned	76.4025	-110.5319	Northwest Territories - Arctic Islands - Onshore	On-Shore	28-Apr-76	16-May-76	1237.5	28-Apr-76	16-May-76	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			462	Petro-Canada	PANARCTIC	SANDY POINT L-46	300L467630115000	Exploratory	Plug and abandoned	76.4273	-115.3039	Northwest Territories - Arctic Islands - Onshore	On-Shore	9-May-69	2-Aug-69	2101.6	9-May-69	2-Aug-69	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			990	Husky	ELFEX ET AL	WILKIE POINT J-51	300J517640117000	Exploratory	Plug and abandoned	76.5086	-117.3300	Northwest Territories - Arctic Islands - Onshore	On-Shore	17-Mar-75	21-May-75	2347	17-Mar-75	21-May-75	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			620	Husky	ELF	JAMESON BAY C-31	300C317650116300	Exploratory	Plug and abandoned	76.6700	-116.7293	Northwest Territories - Arctic Islands - Onshore	On-Shore	11-Mar-71	16-May-71	2538.1	11-Mar-71	16-May-71	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			762	BP	BP ET AL PANARCTIC	EMERALD K-33	300K337650113300	Exploratory	Plug and abandoned	76.7119	-113.7225	Northwest Territories - Arctic Islands - Onshore	On-Shore	12-Dec-72	13-Apr-73	3660.6	12-Dec-72	13-Apr-73	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	

Owner Confirmation of Well Ownership Received	Potential Orphan Based on Minor Interest Holder	Potential Orphan Based on Majority Interest Holder	WID	Current Well Owner (Preliminary)	CONSORTIUM (NEB)	WELL NAME	UWI	CLASS	STATUS	LATITUDE	LONGITUDE	NEB REGION Designation	Onshore or Offshore	ORIGINAL SPUD DATE	ORIGINAL RR DATE	DEPTH (m)	SPUD RE DATE	RIG RELEASE DATE	Environmental Sensitivity	Protected Areas Descriptive	Oil and Gas Dispositions #	Oil and Gas Dispositions - Name	Kokelj and Geonorth 2002 Assessment
No			780	Husky	ELF	INTREPID INLET H-49	300H497700118300	Exploratory	Plug and abandoned	76.9741	-118.7510	Northwest Territories - Arctic Islands - Onshore	On-Shore	10-Jan-73	18-Mar-73	1766.6	10-Jan-73	18-Mar-73	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1012	Husky	ELF ET AL	DYER BAY L-49	300L497610121300	Exploratory	Plug and abandoned	76.1432	-121.8102	Northwest Territories - Arctic Islands - Onshore	On-Shore	1-Nov-75	20-Feb-76	3171.4	1-Nov-75	20-Feb-76	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			829	Husky	ELFEX	ANDREASEN L-32	300L327720118000	Exploratory	Plug and abandoned	77.1938	-118.2373	Northwest Territories - Arctic Islands - Onshore	On-Shore	9-Apr-73	30-May-73	2148.8	9-Apr-73	30-May-73	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			651	BP	BP ET AL PANARCTIC	SATELLITE F-68	300F687720116300	Exploratory	Plug and abandoned	77.2908	-116.9194	Northwest Territories - Arctic Islands - Onshore	On-Shore	17-Sep-71	2-May-72	3680.5	17-Sep-71	2-May-72	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			532	Husky	ELF	CAPE NOREM A-80	300A807730110000	Exploratory	Plug and abandoned	77.4869	-110.4514	Northwest Territories - Arctic Islands - Onshore	On-Shore	20-Apr-70	27-Aug-70	2970	20-Apr-70	27-Aug-70	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			1117	Apache	PHILLIPS AQUIT ET AL	HAZEN F-54	300F547710110000	Exploratory	Plug and abandoned	77.0546	-110.3539	Arctic Islands Offshore	Off-Shore	11-Feb-79	12-May-79	3064	11-Feb-79	12-May-79	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			657	Petro-Canada	PANARCTIC BP SKELLY TENNECO ET AL	BROCK C-50	300C507750114000	Exploratory	Plug and abandoned	77.8167	-114.2900	Northwest Territories - Arctic Islands - Onshore	On-Shore	12-Nov-71	22-Mar-72	3961.2	12-Nov-71	22-Mar-72	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			554	Husky	ELF	WILKINS E-60	300E607800111000	Exploratory	Plug and abandoned	77.9886	-111.3625	Northwest Territories - Arctic Islands - Onshore	On-Shore	11-Oct-70	20-Jan-71	3395.5	11-Oct-70	20-Jan-71	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	
No			719	Petro-Canada	PANARCTIC	BROCK I-20	300I207800114300	Exploratory	Plug and abandoned	77.9944	-114.5642	Northwest Territories - Arctic Islands - Onshore	On-Shore	14-Apr-72	28-Jun-72	3176.6	14-Apr-72	28-Jun-72	Not located in environmentally sensitive area	Not located in a protected area	No Data	No Data	

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WELL NAME	CONSORTIUM (NEB) / Suspected Current Well Owner / Owner Confirmation of Well Ownership Received			UWI	On or Off Shore	WID	LATITUDE / LONGITUDE	
HAZEN F-54	PHILLIPS AQUIT ET AL	Apache	No	300F547710110000	**Off**	1117	77.0546	-110.3539
SMOKING HILLS A-23	ARCO	BP	No	300A236930126150	On	943	69.3683	-126.3417
ADLARTOK P-09	DOME ET AL	BP	No	300P096940137450	**Off**	1533	69.6476	-137.7579
KINGARK J-54	AMOCO ET AL	BP	No	300J546950137150	**Off**	1740	69.7289	-137.4708
NATSEK E-56	DOME PACIFIC ET AL PEX	BP	No	300E566950139302	**Off**	1099	69.7559	-139.7429
EDLOK M-56	DOME ET AL	BP	No	300M566950140000	**Off**	1534	69.7641	-140.2398
TARSIUT A-25	DOME GULF	BP	No	300A257000136153	**Off**	1105	69.9030	-136.3390
IMNAK J-29	DOME IMP	BP	Yes	300J296910133000	On	965	69.1447	-133.1014
TINGMIARK K-91	DOME GULF ET AL	BP	No	300K917020132301	**Off**	1041	70.1767	-132.9823
UVILUK P-66	DOME ET AL	BP	No	300P667020132000	**Off**	1244	70.2634	-132.3133
ARLUK E-90	DOME ET AL	BP	No	300E907020135002	**Off**	1314	70.3234	-135.4433
HAVIK B-41	DOME ET AL	BP	No	300B417030132004	**Off**	1308	70.3364	-132.2182
KOAKOAK O-22	DOME HUNT GULF	BP	No	300O227030134003	**Off**	1145	70.3652	-134.1133
ORVILRUK O-03	DOME SUPERIOR	BP	No	300O037030136303	**Off**	1168	70.3800	-136.5146
KOPANOAR M-13	DOME GULF ET AL HUNT	BP	No	300M137030135004	**Off**	1046	70.3820	-135.0928
KOPANOAR D-14	HUNT DOME	Bp	No	300D147030135000	**Off**	1040	70.3837	-135.0919
KOPANOAR 2D-14	HUNT DOME	Bp	No	302D147030135000	**Off**	1720	70.3839	-135.0919
KOPANOAR L-34	DOME GULF HUNT	BP	No	300L347030135000	**Off**	1143	70.3937	-135.1993
KOPANOAR 2L-34	DOME GULF HUNT	BP	No	302L347030135000	**Off**	1146	70.3949	-135.1992
KOPANOAR I-44	DOME GULF HUNT	BP	No	300I447030135000	**Off**	1169	70.3954	-135.2007
KOPANOAR 2I-44	DOME GULF HUNT	BP	No	302I447030135001	**Off**	1171	70.3954	-135.2034
SIULIK I-05	DOME ET AL	BP	No	300I057030134301	**Off**	1311	70.4104	-134.5110
AIVERK I-45	DOME ET AL	BP	No	300I457030133300	**Off**	1233	70.4112	-133.7001
AIVERK 2I-45	DOME	BP	No	302I457030133302	**Off**	1240	70.4123	-133.7054
NERLERK J-67	DOME	BP	No	300J677030133001	**Off**	1444	70.4450	-133.3248
NERLERK M-98	DOME	BP	No	300M987030133003	**Off**	1079	70.4632	-133.4956
NEKTORALIK K-59	DOME HUNT	BP	No	300K597030136001	**Off**	1042	70.4763	-136.2808
KAGLULIK M-64	DOME	BP	No	300M647040130301	**Off**	1108	70.5655	-130.8429
IRKALUK B-35	DOME HUNT	BP	No	300B357040134001	**Off**	1193	70.5681	-134.1702
KAGLULIK A-75	DOME	BP	No	300A757040130301	**Off**	1077	70.5686	-130.8561
NATIAK O-44	DOME ET AL	BP	No	300O447010137001	**Off**	1307	70.0659	-137.2185
KENALOOAK J-94	DOME ET AL HUNT	BP	No	300J947050133303	**Off**	1141	70.7289	-133.9744
KILANNAK A-77	DOME ET AL	BP	No	300A777050129002	**Off**	1166	70.7704	-129.3573
UKALERK 2C-50	DOME GULF ET AL	BP	No	302C507010132302	**Off**	1100	70.1515	-132.7298

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UKALERK C-50	DOME GULF ET AL	BP	No	300C507010132300	**Off**	1076	70.1516	-132.7357
IKKARIKTOK M-64	COLUMBIA ET AL AMOCO	BP	No	300M647230121300	On	908	72.3965	-121.8497
N. DUNDAS N-82	DOME PANARCTIC	BP	No	300N827450113000	On	1132	74.6966	-113.4281
HEARNE F-85	DOME PANARCTIC ET AL	BP	No	300F857450110300	On	1107	74.7378	-110.9328
WINTER HARBOUR NO.1(A-	DOME ET AL	BP	No	300A097450110300	On	201	74.8017	-110.5103
EMERALD K-33	BP ET AL PANARCTIC	BP	No	300K337650113300	On	762	76.7119	-113.7225
SATELLITE F-68	BP ET AL PANARCTIC	BP	No	300F687720116300	On	651	77.2908	-116.9194
FISH RIVER B-60	CHEVRON CANADA PEX ET AL	Chevron	No	300B606840136000	On	1075	68.6508	-136.2275
NORTH ELLICE J-23	SOBC CAN SUP ET AL	Chevron	No	300J236920135451	On	1010	69.2094	-135.8539
NORTH ELLICE L-39	CHEVRON TRILLIUM	Chevron	No	300L396920135450	**Off**	1586	69.3120	-135.9166
LANGLEY K-30	CHEVRON ET AL	Chevron	No	300K306920135301	On	1985	69.3251	-135.6109
UPLUK C-21	CHEVRON SOBC	Chevron	No	300C216930135150	On	797	69.3350	-135.3569
UPLUK A-42	CCL	Chevron	No	300A426930135150	On	1059	69.3531	-135.4261
UPLUK L-42	CHEVRON TRILLIUM	Chevron	No	300L426930135150	On	1500	69.3605	-135.4582
UPLUK M-38	CHEVRON SOBC	Chevron	No	300M386930135150	On	977	69.4656	-135.4150
NICHOLSON N-45	TEXCAN C & E	Chevron	No	300N457000128450	On	212	69.9164	-128.9386
NICHOLSON G-56	TEXCAN C & E	Chevron	No	300G567000128450	On	211	69.9247	-128.9761
ELLICE I-48	CHEVRON ET AL	Chevron	No	300I486910135450	On	1969	69.1261	-135.9260
PARKER RIVER J-72	CHEVRON ET AL	Chevron	No	300J727340115300	On	1113	73.5284	-115.8736
MUSKOX D-87	CHEVRON	Chevron	No	300D877340117000	On	1197	73.6023	-117.4500
SHOLOKPAOQAK P-60	GULF	ConocoPhillips	No	300P606840133300	On	523	68.6625	-133.7167
SHAKGATLATACHIG D-50	GULF ET AL	ConocoPhillips	No	300D506840133450	On	1493	68.6520	-133.9523
IKHIL A-01	GULF MOBIL	ConocoPhillips	No	300A016850134000	On	639	68.6703	-134.0086
ONIGAT D-52	GULF ET AL	ConocoPhillips	No	300D526850133300	On	1483	68.6836	-133.7400
OGEOQEOQ J-06	GULF-MOBIL	ConocoPhillips	No	300J066850133450	On	981	68.7617	-133.7667
IKHIL I-37	GULF MOBIL	ConocoPhillips	No	300I376850134000	On	830	68.7761	-134.1306
ONIGAT C-38	GULF	ConocoPhillips	No	300C386850133300	On	536	68.7861	-133.6542
ONIGAT K-49	GULF ET AL	ConocoPhillips	No	300K496850133300	On	1592	68.8112	-133.6963
PARSONS P-41	GULF MOBIL	ConocoPhillips	No	300P416900133301	On	1058	68.8474	-133.6745
OGRUKNANG M-31	GULF MOBIL	ConocoPhillips	No	300M316900134150	On	1072	68.8478	-134.4140
SADENE D-02	MOBIL GULF	ConocoPhillips	No	300D026900126450	On	1066	68.8503	-126.7875
PARSONS E-02	GULF ET AL	ConocoPhillips	No	300E026900133300	On	1570	68.8544	-133.5362
PARSONS L-43	GULF MOBIL	ConocoPhillips	No	300L436900133301	On	1016	68.8774	-133.6989
PARSONS P-53	GULF MOBIL	ConocoPhillips	No	300P536900133300	On	889	68.8804	-133.7159

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ATIGI G-04	GULF MOBIL	ConocoPhillips	No	300G046900133450	On	584	68.8878	-133.7676
PARSONS A-44	GULF MOBIL	ConocoPhillips	No	300A446900133301	On	992	68.8847	-133.6767
PARSONS L-37	GULF MOBIL	ConocoPhillips	No	300L376900133301	On	1057	68.9452	-133.6652
PARSONS N-17	GULF MOBIL	ConocoPhillips	No	300N176900133301	On	1017	68.9481	-133.5664
PARSONS O-27	GULF MOBIL	ConocoPhillips	No	300O276900133301	On	917	68.9481	-133.5989
KAMIK D-48	GULF-MOBIL	ConocoPhillips	No	300D486900133151	On	1018	68.9535	-133.4583
KAMIK D-58	GULF-MOBIL	ConocoPhillips	No	300D586900133150	On	960	68.9537	-133.4976
KAMIK F-38	GULF-MOBIL	ConocoPhillips	No	300F386900133150	On	1055	68.9564	-133.3985
ATIGI O-48	GULF MOBIL	ConocoPhillips	No	300O486900133451	On	894	68.9633	-133.9353
PARSONS F-09	GULF MOBIL	ConocoPhillips	No	300F096900133301	On	671	68.9745	-133.5293
TUNUNUK F-30	GULF IMP SHELL	ConocoPhillips	No	300F306900134300	On	1029	68.9894	-134.6119
KAMIK L-60	GULF-MOBIL	ConocoPhillips	No	300L606900133150	On	991	68.9946	-133.4900
PARSONS N-10	GULF MOBIL	ConocoPhillips	No	300N106900133301	On	800	68.9968	-133.5306
PARSONS D-20	GULF MOBIL	ConocoPhillips	No	300D206900133301	On	1032	68.9859	-133.5736
REINDEER A-41	GULF IMP SHELL	ConocoPhillips	No	300A416910134300	On	888	69.0033	-134.6719
SIKU E-21	GULF MOBIL	ConocoPhillips	No	300E216910133301	On	1071	69.0081	-133.6153
SIKU C-11	GULF MOBIL	ConocoPhillips	No	300C116910133301	On	1019	69.0014	-133.5639
SIKU A-12	GULF MOBIL	ConocoPhillips	No	300A126910133301	On	1031	69.0168	-133.5421
RED FOX P-21	GULF MOBIL DOME	ConocoPhillips	No	300P216920133300	On	982	69.1800	-133.5836
YA-YA P-53	GULF MOBIL	ConocoPhillips	No	300P536920134301	On	760	69.2127	-134.7138
YA-YA M-33	GULF MOBIL	ConocoPhillips	No	300M336920134300	On	958	69.2158	-134.6622
TOAPOLOK H-24	GULF MOBIL	ConocoPhillips	No	300H246920134450	On	923	69.2217	-134.8403
TOAPOLOK O-54	GULF MOBIL	ConocoPhillips	No	300O546920134450	On	882	69.2326	-134.9753
YA-YA I-17	GULF MOBIL	ConocoPhillips	No	300I176920134300	On	959	69.2764	-134.5469
YA-YA A-28	GULF MOBIL	ConocoPhillips	No	300A286920134301	On	909	69.2864	-134.5908
KILAGMIOTAK M-16	GULF MOBIL	ConocoPhillips	No	300M166930134000	On	984	69.4311	-134.0750
KILAGMIOTAK F-48	GULF MOBIL	ConocoPhillips	No	300F486930134000	On	693	69.4581	-134.1975
SIKU C-55	GULF MOBIL	ConocoPhillips	No	300C556910133300	On	730	69.0678	-133.7328
IMMIUGAK N-05	GULF ET AL	ConocoPhillips	No	300N056950137000	**Off**	1738	69.7482	-137.0224
IMMIUGAK A-06	GULF ET AL	ConocoPhillips	No	300A066950137001	**Off**	1739	69.7505	-137.0054
AAGNERK E-56	GULF ET AL	ConocoPhillips	No	300E566950136451	**Off**	1553	69.7546	-136.9988
KIGGAVIK A-43	GULF ET AL	ConocoPhillips	No	300A437000135450	**Off**	1219	69.8695	-135.9214
TITALIK K-26	GULF IMP SHELL	ConocoPhillips	No	300K266910135000	On	751	69.0917	-135.1042
E. TARSIUT N-44	GULF ET AL	ConocoPhillips	No	300N447000136000	**Off**	1201	69.8961	-136.1935

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E. TARSIUT N-44A	GULF ET AL	ConocoPhillips	No	300N447000136001	**Off**	1212	69.8969	-136.1941
PITSIULAK A-05	GULF ET AL	ConocoPhillips	No	300A057000136451	**Off**	1320	69.9039	-136.7595
W. TARSIUT P-45	GULF ET AL	ConocoPhillips	No	300P457000136151	**Off**	1443	69.9154	-136.4180
KIKORALOK N-46	GULF MOBIL	ConocoPhillips	No	300N466910134450	On	964	69.0961	-134.9425
REINDEER C-36	GULF IMP SHELL	ConocoPhillips	No	300C366910134301	On	814	69.0861	-134.6542
AKPAK P-35	GULF ET AL	ConocoPhillips	No	300P357020134001	**Off**	1450	70.2479	-134.1566
AKPAK 2P-35	GULF ET AL	ConocoPhillips	No	302P357020134000	**Off**	1525	70.2479	-134.1564
AMAULIGAK 2F-24	GULF ET AL	ConocoPhillips	No	302F247010133300	**Off**	1674	70.0548	-133.6304
AMAULIGAK 2F-24A	GULF ET AL	ConocoPhillips	No	302F247010133300	**Off**	1678	70.0548	-133.6304
AMAULIGAK F-24	GULF ET AL	ConocoPhillips	No	300F247010133302	**Off**	1661	70.0548	-133.6303
AMAULIGAK 2F-24B	GULF ET AL	ConocoPhillips	No	302F247010133302	**Off**	1711	70.0548	-133.6303
AMAULIGAK COREHOLE	GULF ET AL	ConocoPhillips	No	303F247010133300	**Off**	1717	70.0549	-133.6291
AMAULIGAK J-44	GULF ET AL	ConocoPhillips	No	300J447010133301	**Off**	1340	70.0588	-133.7127
AMAULIGAK I-44	GULF ET AL	ConocoPhillips	No	300I447010133300	**Off**	1330	70.0586	-133.7125
AMAULIGAK I-65	GULF ET AL	ConocoPhillips	No	300I657010133300	**Off**	1542	70.0777	-133.8046
NORTH ISSUNGNAK L-86	GULF ET AL	ConocoPhillips	No	300L867010134000	**Off**	1191	70.0924	-134.4459
AMAULIGAK O-86	GULF ET AL	ConocoPhillips	No	300O867010133300	**Off**	1715	70.0966	-133.9238
KOGYUK N-67	GULF ET AL	ConocoPhillips	No	300N677010133000	**Off**	1337	70.1137	-133.3282
ORKSUT I-44	DEMINEX CGDC FOC AMOCO	Deminex	No	300I447230122300	On	775	72.3958	-122.7024
ITIGINKPAK F-29	DEVON ET AL	Devon	Yes	300F296830134300	On	1984	68.4718	-134.6088
TUK M-18	DEVON PC	Devon	Yes	300M186920133001	On	1933	69.2974	-133.0763
TUK B-02	DEVON PC	Devon	Yes	300B026930133001	On	1941	69.3531	-133.0160
CROSSLEY LK S K-60	CPOG	Encana	Yes	300K606830129150	On	407	68.4942	-129.4872
KUGALUK N-02	CPOG	Encana	Yes	300N026840131300	On	458	68.5319	-131.5219
KILIGVAK I-29	ELF ET AL	Husky	No	300I296930131150	On	845	69.4772	-131.3378
AMAGUK H-16	ELF ET AL IMPERIAL	Husky	No	300H166940131000	On	820	69.5900	-131.0478
HORTON RIVER G-02	ELF	Husky	No	300G027000127150	On	473	69.8563	-127.2656
TIRITCHIK M-48	ELF TEXACO	Husky	No	300M487250120300	On	893	72.7975	-120.7467
STORKERSON BAY A-15	ELF ET AL	Husky	No	300A157300124300	On	654	72.9000	-124.5581
KUSRHAAK D-16	ELFEX ET AL	Husky	No	300D167330120000	On	962	73.4178	-120.0883
UMINMAK H-07	ELF	Husky	No	300H077340123000	On	713	73.6081	-123.0083
NANUK D-76	ELF	Husky	No	300D767310123000	On	686	73.0869	-123.3958
WILKIE POINT J-51	ELFEX ET AL	Husky	No	300J517640117000	On	990	76.5086	-117.3300
JAMESON BAY C-31	ELF	Husky	No	300C317650116300	On	620	76.6700	-116.7293

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INTREPID INLET H-49	ELF	Husky	No	300H497700118300	On	780	76.9741	-118.7510
DYER BAY L-49	ELF ET AL	Husky	No	300L497610121300	On	1012	76.1432	-121.8102
ANDREASEN L-32	ELFEX	Husky	No	300L327720118000	On	829	77.1938	-118.2373
CAPE NOREM A-80	ELF	Husky	No	300A807730110000	On	532	77.4869	-110.4514
WILKINS E-60	ELF	Husky	No	300E607800111000	On	554	77.9886	-111.3625
NAPARTOK M-01	ESSO PEX	Imperial	No	300M016840134300	On	1116	68.5131	-134.5383
BLOW RIVER YT E-47	IOE	Imperial	No	300E476850137150	On	537	68.7722	-137.4536
TUNUNUK K-10	IOE BA SHELL	Imperial	No	300K106900134450	On	405	68.9956	-134.7761
WAGNARK G-12	IMP	Imperial	No	300G126920133150	On	833	69.1892	-133.3039
NUNA A-32	IMP	Imperial	No	300A326910133150	On	891	69.0206	-133.3761
WAGNARK C-23	IMP DELTA 5	Imperial	No	300C236920133150	On	1030	69.2003	-133.3625
WAGNARK L-36	ESSO HOME ET AL	Imperial	No	300L366920133150	On	1609	69.2621	-133.4150
IKATTOK J-17	IMP	Imperial	No	300J176920136150	**Off**	1000	69.2779	-136.3036
ESKIMO J-07	IOE	Imperial	No	300J076920132300	On	463	69.2786	-132.5164
TUK G-48	ESSO PCI HOME ET AL	Imperial	No	300G486920133001	On	1581	69.2898	-133.1839
TUK F-18	IOE	Imperial	No	300F186920133000	On	419	69.2914	-133.0669
TUK G-39	ESSO PCI HOME ET AL	Imperial	No	300G396920133001	On	1562	69.3064	-133.1453
LANGLEY E-29	IMP	Imperial	No	300E296920135300	On	828	69.3081	-135.6156
TUK J-29	ESSO HOME PCI ET AL	Imperial	No	300J296920133000	On	1474	69.3115	-133.0973
TUK L-09	ESSO PCI HOME ET AL	Imperial	No	300L096920133000	On	1342	69.3124	-133.0369
TUKTU O-19	IOE	Imperial	No	300O196920132450	On	566	69.3153	-132.8047
TUK B-40	ESSO PCI HOME ET AL	Imperial	No	300B406920133001	On	1563	69.3205	-133.1388
TUK E-20	ESSO PCI HOME ET AL	Imperial	No	300E206920133000	On	1763	69.3219	-133.0833
TUK H-30	ESSO PCI HOME ET AL	Imperial	No	300H306920133001	On	1508	69.3224	-133.0872
TUKTUK D-11	ESSO PCI HOME ET AL	Imperial	No	300D116930133001	On	1594	69.3366	-133.0779
PIKIOLIK G-21	ESSO PEX HOME ET AL	Imperial	No	300G216930132300	On	1274	69.3398	-132.5954
ROLAND BAY Y.T. L-41	PACIFIC IMP ET AL	Imperial	No	300L416930138450	On	770	69.3419	-138.9486
TUKTUK A-12	ESSO PCI HOME ET AL	Imperial	No	300A126930133000	On	1561	69.3504	-133.0496
MAYOGIAK G-12	ESSO HOME ET AL	Imperial	No	300G126930132450	On	1603	69.3548	-132.8108
TUKTUK H-22	ESSO PCI HOME ET AL	Imperial	No	300H226930133001	On	1576	69.3561	-133.0839
TAGLU C-42	IOE	Imperial	No	300C426930134451	On	727	69.3514	-134.9472
TAGLU D-43	IOE	Imperial	No	300D436930134451	On	819	69.3705	-134.9501
TAGLU G-33	ESSO	Imperial	No	300G336930134451	On	622	69.3716	-134.8935
TAGLU WEST P-03	ESSO	Imperial	No	300P036930135001	On	667	69.3819	-135.0067

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AKKU F-14	ESSO CIGOL	Imperial	No	300F146930132150	On	761	69.3875	-132.3189
PIKIOLIK E-54	IMP IOE	Imperial	No	300E546930132300	On	666	69.3875	-132.7431
TAGLU H-54	IOE	Imperial	No	300H546930134452	On	1054	69.3889	-134.9683
ADGO G-24	ESSO TRILLIUM ET AL	Imperial	No	300G246930135450	**Off**	1547	69.3913	-135.8472
MAYOGIAK N-34	ESSO HOME ET AL	Imperial	No	300N346930132450	On	1599	69.3999	-132.9009
ADGO C-15	IMP	Imperial	No	300C156930135450	**Off**	993	69.4036	-135.8175
TAGLU D-55	IOE	Imperial	No	300D556930134450	On	715	69.4039	-134.9928
ADGO P-25	IMP	Imperial	No	300P256930135450	**Off**	969	69.4158	-135.8417
SARPIK B-35	IMP	Imperial	No	300B356930136150	**Off**	1028	69.4019	-136.3861
MALLIK A-06	ESSO	Imperial	No	300A066930134300	On	722	69.4169	-134.5044
TAGLU WEST H-06	ESSO HOME ET AL	Imperial	No	300H066930135000	On	1501	69.4235	-135.0082
MAYOGIAK M-16	ESSO	Imperial	No	300M166930132450	On	1152	69.4320	-132.8250
PIKIOLIK M-26	IMP IOE	Imperial	No	300M266930132301	On	672	69.4319	-132.6239
ADGO J-27	ESSO	Imperial	No	300J276930135450	**Off**	1123	69.4418	-135.8475
UMIAK J-37	IMP	Imperial	No	300J376930134150	On	766	69.4433	-134.3856
MALLIK J-37	IMP	Imperial	No	300J376930134300	On	1084	69.4439	-134.6397
MAYOGIAK J-17	ESSO	Imperial	No	300J176930132451	On	631	69.4450	-132.8034
ADGO F-28	IMP	Imperial	No	300F286930135450	**Off**	892	69.4546	-135.8544
MALLIK L-38	ESSO	Imperial	No	300L386930134301	On	673	69.4622	-134.6569
ADGO H-29	ESSO TRILLIUM	Imperial	No	300H296930135450	**Off**	1445	69.4729	-135.8395
MAYOGIAK L-39	IMP	Imperial	No	300L396930132450	On	919	69.4781	-132.9083
MALLIK P-59	IMP	Imperial	No	300P596930134300	On	773	69.4803	-134.7125
UMIAK N-10	IMP. IOE	Imperial	No	300N106930134150	On	1070	69.4972	-134.2736
ATERTAK E-41	IMP	Imperial	No	300E416940132301	On	728	69.5075	-132.7022
ATERTAK K-31	ESSO HOME ET AL	Imperial	No	300K316940132300	On	1615	69.5096	-132.6521
IVIK C-52	IMP	Imperial	No	300C526940134150	On	767	69.5194	-134.4811
ITKRILEK B-52	ESSO PCI HOME ET AL	Imperial	No	300B526940131450	On	1499	69.5205	-131.9755
MAGAK A-32	IOE	Imperial	No	300A326940132000	On	574	69.5192	-132.1256
NETSERK B-44	IMP	Imperial	No	300B446940135450	**Off**	970	69.5508	-135.9327
IVIK K-54	IMP	Imperial	No	300K546940134150	On	825	69.5600	-134.4836
IVIK J-26	ESSO	Imperial	No	300J266940134151	On	716	69.5950	-134.3439
ELLICE O-14	IOE	Imperial	No	300O146910135450	On	475	69.0656	-135.8044
HANSEN G-07	ESSO PCI HOME ET AL	Imperial	No	300G076940134001	On	1597	69.6057	-134.0200
IVIK N-17	IMP	Imperial	No	300N176940134150	On	779	69.6142	-134.3211

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IMMERK B-48	IMP	Imperial	No	300B486940135000	**Off**	863	69.6190	-135.1808
KUGMALLIT H-59	IMP	Imperial	No	300H596940133150	**Off**	1047	69.6393	-133.4636
KIMIK D-29	IMP IOE	Imperial	No	300D296940132150	On	670	69.6347	-132.3694
NETSERK F-40	ESSO	Imperial	No	300F406940135450	**Off**	1014	69.6564	-135.9058
NIPTERK P-32	ESSO CHEVRON ET AL	Imperial	No	300P326950135150	**Off**	1731	69.6964	-135.3785
NUKTAK C-22	IMP	Imperial	No	300C226950134450	On	764	69.6853	-134.8583
NATAGNAK K-23	IOE	Imperial	No	300K236950131300	On	520	69.7086	-131.6122
MINUK I-53	ESSO PCI HOME ET AL	Imperial	No	300I536950136150	**Off**	1560	69.7096	-136.4589
NATAGNAK K-53	IMP CIGOL	Imperial	No	300K536950131300	On	806	69.7108	-131.7319
ATKINSON M-33	IOE	Imperial	No	300M336950131450	On	534	69.7133	-131.9119
ATKINSON H-25	ESSO	Imperial	No	300H256950131450	On	478	69.7382	-131.8393
ATKINSON A-55	IMP CIGOL	Imperial	No	300A556950131450	On	887	69.7358	-131.9650
ARNAK K-06	ESSO PCI HOME ET AL	Imperial	No	300K066950133450	**Off**	1619	69.7612	-133.7724
PULLEN E-17	IMP	Imperial	No	300E176950134150	**Off**	924	69.7711	-134.3281
W. ATKINSON L-17	ESSO PEX	Imperial	No	300L176950132000	**Off**	1210	69.7761	-132.0757
KADLUK O-07	ESSO HOME ET AL	Imperial	No	300O076950136000	**Off**	1327	69.7801	-136.0213
NIPTERK L-19A	ESSO ET AL	Imperial	No	300L196950135150	**Off**	1509	69.8106	-135.2982
NIPTERK L-19	ESSO HOME PCI ET AL	Imperial	No	300L196950135150	**Off**	1447	69.8106	-135.3315
NATAGNAK O-59	ESSO PEX HOME ET AL	Imperial	No	300O596950131300	On	1254	69.8157	-131.7223
NATAGNAK H-50	IOE	Imperial	No	300H506950131300	On	533	69.8242	-131.6697
ARNAK L-30	IMP	Imperial	No	300L306950133450	**Off**	1048	69.8290	-133.8725
KANGUK F-42	IMP CIGOL	Imperial	No	300F427000131000	On	789	69.8572	-131.1892
KAUBVIK I-43	ESSO HOME ET AL	Imperial	No	300I437000135150	**Off**	1628	69.8758	-135.4220
ALERK P-23	ESSO PEX	Imperial	No	300P237000132450	**Off**	1192	69.8825	-132.8394
KANGUK I-24	IOE	Imperial	No	300I247000131000	On	603	69.8944	-131.0867
AMAROK N-44	IMP CIGOL	Imperial	No	300N447000130450	On	920	69.8997	-130.9378
LOUTH K-45	IMP DOME	Imperial	No	300K457000131150	On	980	69.9089	-131.4464
ISSERK I-15	ESSO CHEVRON ET AL	Imperial	No	300I157000134150	**Off**	1741	69.9124	-134.2992
ISSERK E-27	IMP IOE ET AL	Imperial	No	300E277000134150	**Off**	1083	69.9389	-134.3697
ITIYOK I-27	ESSO PEX HOME ET AL	Imperial	No	300I277000134000	**Off**	1242	69.9444	-134.0887
KAPIK J-39	IMP CIGOL	Imperial	No	300J397000130000	On	968	69.9756	-130.1361
NUVORAK O-09	IOE	Imperial	No	300O097000130300	On	519	69.9819	-130.5156
AMERK O-09	ESSO HOME PCI ET AL	Imperial	No	300O097000133300	**Off**	1438	69.9823	-133.5148
SPRING RIVER YT N-58	IOE	Imperial	No	300N586910138300	On	585	69.1314	-138.7347

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KURK M-39	IMP DELTA 5	Imperial	No	300M396910135150	On	1056	69.1486	-135.4150
NUNA A-10	ESSO PCI HOME ET AL	Imperial	No	300A106910133150	On	1350	69.1501	-133.2512
NUNA E-40	ESSO HOME ET AL	Imperial	No	300E406910133150	On	1611	69.1544	-133.4122
ISSUNGNAK 2O-61	ESSO GULF ET AL	Imperial	No	302O617010134000	**Off**	1178	70.0167	-134.3134
ISSUNGNAK O-61	ESSO ET AL	Imperial	No	300O617010134000	**Off**	1157	70.0168	-134.3133
KANNERK G-42	IMP IOE	Imperial	No	300G427010131000	**Off**	1067	70.0233	-131.2156
RUSSELL H-23	IMP CIGOL	Imperial	No	300H237010130000	On	906	70.0383	-130.1078
IKHIL J-35	IPC	Inuvialuit Petroleum	No	300J356850134002	On	1839	68.7432	-134.1430
IKHIL K-35	IPC	Inuvialuit Petroleum	No	300K356850134002	On	1606	68.7455	-134.1545
IKHIL N-26	IPC	Inuvialuit Petroleum	No	300N266850134000	On	1840	68.7653	-134.1103
MALLIK 3L-38	JAPEX/JNOC/GSC	Japex	Yes	303L386930134300	On	1919	69.4606	-134.6616
MALLIK 5L-38	JAPEX/JNOC/GSC	Japex	Yes	305L386930134300	On	1921	69.4610	-134.6606
MALLIK 2L-38	JAPEX/JNOC/GSC	Japex	Yes	302L386930134300	On	1827	69.4613	-134.6584
MALLIK 4L-38	JAPEX/JNOC/GSC	Japex	Yes	304L386930134300	On	1920	69.4613	-134.6597
VICTORIA ISLAND F-36	MURPHY ET AL	Murphy Oil Company	Yes	300F367250117000	On	974	72.7550	-117.1869
WOLVERINE H-34	UNION	Northrock	No	300H346830130300	On	904	68.3886	-130.6333
KUGPIK L-46	PC DEVON	Petro-Canada	No	300L466900135150	On	1942	68.9282	-135.4536
KURK M-15	PC ANDERSON	Petro-Canada	No	300M156910135152	On	1901	69.0809	-135.3233
NUNA I-30	PC DEVON	Petro-Canada	No	300I306910133150	On	1977	69.1596	-133.3358
BAR HARBOUR E-76	PANARCTIC ELF	Petro-Canada	No	300E767420123300	On	1015	74.2575	-123.8972
DUNDAS C-80	PANARCTIC DOME	Petro-Canada	No	300C807440113000	On	744	74.6506	-113.3833
CASTEL BAY C-68	PANARCTIC TENN ET AL	Petro-Canada	No	300C687410120300	On	975	74.1197	-120.8331
SABINE BAY A-07	PANARCTIC ET AL	Petro-Canada	No	300A077530110000	On	1011	75.4350	-110.0139
APOLLO C-73	PANARCTIC	Petro-Canada	No	300C737540111300	On	843	75.5333	-111.9828
PEDDER POINT D-49	PANARCTIC ET AL	Petro-Canada	No	300D497540118300	On	955	75.6358	-118.8044
ZEUS F-11	PANARCTIC TENNECO ET AL	Petro-Canada	No	300F117600113300	On	841	75.8396	-113.6068
EGLINTON P-24	PANARCTIC GULF	Petro-Canada	No	300P247600118000	On	934	75.8981	-118.1275
S.W. HECLA C-58	PANARCTIC	Petro-Canada	No	300C587620111000	**Off**	1068	76.2846	-111.3480
HECLA I-69	PANARCTIC TENNECO ET AL	Petro-Canada	No	300I697620110001	On	799	76.3102	-110.3876
HECLA J-60	PANARCTIC HOMESTEAD	Petro-Canada	No	300J607620110000	On	540	76.3272	-110.3303
MARIE BAY D-02	PANARCTIC	Petro-Canada	No	300D027630115300	On	470	76.3503	-115.5587
E. HECLA F-62	PANARCTIC TENN ET AL POR	Petro-Canada	No	300F627630110002	On	754	76.3544	-110.4107
W. HECLA P-62	PANARCTIC	Petro-Canada	No	300P627630110300	**Off**	1020	76.3642	-110.8764
W. HECLA N-52	PANARCTIC TENN ET AL CS	Petro-Canada	No	300N527630110300	**Off**	913	76.3648	-110.8481

Environmental Studies Research Funds - Inuvialuit Settlement Region Regional Sump Study Project - Orphan Wells

WELL NAME	CONSORTIUM (NEB) / Suspected Current Well Owner / Owner Confirmation of Well Ownership Received			UWI	On or Off Shore	WID	LATITUDE / LONGITUDE	
E. HECLA C-32	PANARCTIC ET AL	Petro-Canada	No	300C327630110002	On	1013	76.3526	-110.2295
DEPOT ISLAND C-44	PANARCTIC AIEG ET AL	Petro-Canada	No	300C447630114000	On	1073	76.3874	-114.2958
GRASSY I-34	PANARCTIC NORCEN AIEG ET	Petro-Canada	No	300I347630113000	**Off**	1092	76.3954	-113.1896
N.W. HECLA M-25	PANARCTIC TENN CS	Petro-Canada	No	300M257630111000	**Off**	1024	76.4151	-111.1870
W. HECLA C-05	PANARCTIC TENN ET AL	Petro-Canada	No	300C057630110300	On	1033	76.4025	-110.5319
SANDY POINT L-46	PANARCTIC	Petro-Canada	No	300L467630115000	On	462	76.4273	-115.3039
BROCK C-50	PANARCTIC BP SKELLY	Petro-Canada	No	300C507750114000	On	657	77.8167	-114.2900
BROCK I-20	PANARCTIC	Petro-Canada	No	300I207800114300	On	719	77.9944	-114.5642
AKLAVIK A-37	SHELL	Shell	Yes	300A376820135000	On	546	68.2708	-135.1296
NAPOIAK F-31	SHELL	Shell	Yes	300F316830134450	On	921	68.3403	-134.8969
BEAVER HOUSE CREEK H-13	SHELL	Shell	Yes	300H136830135301	On	562	68.3712	-135.5508
UNAK B-11	SHELL	Shell	Yes	300B116850135150	On	876	68.6693	-135.3112
ULU A-35	SHELL	Shell	Yes	300A356850135452	On	1025	68.7339	-135.8825
UNAK L-28	SHELL ET AL	Shell	Yes	300L286850135150	On	1623	68.7940	-135.3684
KIPNIK O-20	SHELL	Shell	Yes	300O206850134450	On	939	68.8333	-134.8053
TULLUGAK K-31	SHELL	Shell	Yes	300K316900135000	On	1050	68.8417	-135.1560
KUGPIK O-13	SHELL	Shell	Yes	300O136900135151	On	821	68.8806	-135.3042
KUGPIK L-24	SHELL	Shell	Yes	300L246900135150	On	976	68.8921	-135.3703
UNIPKAT B-12	SHELL	Shell	Yes	300B126920135151	On	1776	69.1836	-135.3069
UNIPKAT I-22	SHELL	Shell	Yes	300I226920135151	On	742	69.1937	-135.3409
UNIPKAT N-12	SHELL	Shell	Yes	300N126920135151	On	1749	69.1986	-135.3188
KUMAK K-16	SHELL	Shell	Yes	300K166920135001	On	983	69.2591	-135.0662
KUMAK J-06	SHELL	Shell	Yes	300J066920135000	On	879	69.2600	-135.0161
KUMAK E-58	SHELL	Shell	Yes	300E586920135001	On	1064	69.2915	-135.2487
KUMAK C-58	SHELL	Shell	Yes	300C586920135000	On	838	69.2850	-135.2317
NIGLINTGAK B-19	SHELL	Shell	Yes	300B196920135151	On	1009	69.3031	-135.3053
NIGLINTGAK M-19	SHELL	Shell	Yes	300M196920135152	On	933	69.3136	-135.3239
NIGLINTGAK H-30	SHELL	Shell	Yes	300H306920135151	On	753	69.3226	-135.3431
TITALIK O-15	SHELL GULF IMP	Shell	Yes	300O156910135001	On	995	69.0828	-135.0533
REINDEER D-27	B.A. SHELL IOE	Shell	No	300D276910134300	On	275	69.1014	-134.6150
SHAVILIG J-20	SHELL	Shell	Yes	300J206910135150	On	1777	69.1607	-135.3033
GARRY P-04	SUN SOBC BVX ET AL	Suncor	Yes	300P046930135301	On	1006	69.3961	-135.5054
GARRY G-07	SUN CCL BVX ET AL	Suncor	Yes	300G076930135301	On	1088	69.4397	-135.5156
UNARK L-24	SUN BVX ET AL	Suncor	No	300L246940134300	**Off**	950	69.5584	-134.6167

Environmental Studies Research Funds - Inuvialuit Settlement Region Regional Sump Study Project - Orphan Wells

WELL NAME	CONSORTIUM (NEB) / Suspected Current Well Owner / Owner Confirmation of Well Ownership Received			UWI	On or Off Shore	WID	LATITUDE / LONGITUDE	
UNARK 2L-24	SUN BVX ET AL	Suncor	No	302L246940134300	**Off**	1051	69.5584	-134.6171
PELLY B-35	SUN BVX ET AL	Suncor	No	300B356940135150	**Off**	951	69.5697	-135.3909
ANGASAK L-03	TRILLIUM ESSO CHEVRON	Suncor	No	300L037020129300	**Off**	1640	70.2123	-129.5473
KITSON R. C-71	SUN KR PANARCTIC	Suncor	No	300C717620112300	On	561	76.1701	-112.9822

Appendix C

Sump Assessment Protocol

Protocol for the Assessment of Drilling-Mud Sumps

Objectives

To develop a field methodology to:

a) Describe the environmental conditions at abandoned camp and drilling mud-sumps in the Inuvialuit Settlement Region;

b) Establish a regional database;

c) Provide data to investigate factors which influence sump behaviour; and

d) Facilitate assessment of environmental risk associated with abandoned drilling-mud sumps.

The intent is that the data collected in this study will be archived in a database that can be used to develop appropriate management options for the respective sites.

Site Inventory

The following data should be collected prior to deployment for the field investigations as they will assist in sampling design. The information will also provide valuable context within which to interpret results.

Site Identification and Location

- Well number and current operator.
- Site coordinates (UTM and/or Latitude and Longitude).

Site History

- Type of mud system used and mud list (gel/water based, salt based, hydrocarbon based).
- Estimation of mud volume (based on well depth, diameter, drilling time).
- Date of sump construction (excavation).
- Date of sump capping.
- Total number of days open.
- Summer or winter operation.
- One or two season sump.
- Comments on operations and abandonment (see INAC inspection reports):
  - problems associated with closure and abandonment;
  - mitigation; and
  - date file was closed.

Supplementary Data (if available)

- Physiographic region (refer to Rampton 1988).
- Surficial deposits.
- Ground-ice conditions.
- Ground-temperatures (see Smith and Burgess 2000 – may indicate availability of site specific data, Open file report 3954, Mackay, 1974 for general).
- Past site assessments (White, 1999; Kokelj and GeoNorth, 2002; CAPP, 2003).

Site Visit

The contractor will develop a field form based on the protocol, with input from Technical Advisory Group (TAG), prior to the initiation of fieldwork. The data form (Excel spreadsheet) would include columns for data entry and for comments.

Visual Observations

Visual observations can provide important information on general site conditions and sump integrity. Careful documentation can assist in the determination of appropriate water quality, soil and vegetation sampling.

Infrastructure, Sump Morphology and Permafrost Conditions

a) Photographs:
   - ❑ Aerial photograph of drilling mud and camp sump:
     - a standardized methodology should be implemented for obtaining the photographic images (to be determined);
     - photographs may be annotated to indicate sampling points;
     - aerial photography or high quality remotely sensed imagery may be very useful to obtain and compare with visual inspections and may provide a valuable tool for future site assessments; and
     - some investigators may elect to obtain high quality remotely sensed imagery (optional).
   - ❑ Photographs of relevant features identified in site description.

b) Gravel pad:
   - ❑ Describe gravel pad, estimate thickness and size of pad.
   - ❑ Note any indication of ponding around pad or subsidence of pad:
     - for example a deep polygonal pattern across the pad can indicate thermal degradation beneath pad.

c) Pilings:

- ❑ Are pilings present?
- ❑ Indicate type of piling (material).
- ❑ Indicate if the pilings have heaved or if pilings are tilted.

d) Sump dimensions:

- ❑ Record dimensions of the sumps (drill and camp) including approximate thickness of cap above surrounding ground, if cap is present.
- ❑ Note the nature of cap materials – some sumps were recapped with gravel.
- ❑ Note the nature of vegetation on sump top:
  - Table with % cover – <10%, 10 -25%, 25-50, >50%; and
  - Vegetation type – mosses and lichens, grasses, vascular plants, woody shrubs (height).

e) Slumping and settlement:

- ❑ Note sloughing of cap material, cracking around sides of cap

f) Ponding:

- ❑ Note presence of standing water – standing water may indicate thermal degradation of frozen ground and surface subsidence.
- ❑ Indicate percentage of cap occupied by standing water (estimate should be supported by site measurement, photographs or remotely sensed imagery):
  - with respect to cap: no ponding (0%), minor ponding (0-20%), moderate ponding (20-50%), significant ponding (>50%) . Although ponding can be categorized in the above categories, actual percentages are to be provided;
  - if remotely sensed imagery is obtained, areas of ponding may be digitized to obtain more accurate estimates of the total area occupied by standing water; and
  - depth of ponded water should be estimated (<1.5 m or > 1.5 m).
- ❑ Indicate degree of ponding on lease and an evaluation in the field should be made as to whether the ponding is naturally occurring or associated with development - (estimate should be supported by site measurement, photographs or remotely sensed imagery).
- ❑ Attention should be paid to areas with pilings and around gravel pads:
  - with respect to entire lease: no ponding (0%), minor ponding (0-5%), moderate ponding (5-20%), major ponding (>15%);
  - although ponding can be categorized in the above categories, actual percentages are to be provided;
  - if remotely sensed imagery is obtained, areas of ponding may be digitized to obtain more accurate estimates of the total area occupied by standing water; and

- depth of ponded water should be estimated (<1.5 m or > 1.5 m).

❑ Note presence of live shrubs within pond (indication of active collapse after a period of stability)

g) Describe the location of lease with respect to local water bodies and drainage system.

❑ Note nature of the local drainage system (i.e., small lake basin, small stream, location relative to any hilltop or slope).

❑ Note any evidence of terrain degradation due to local drainage or adjacent water body.

Vegetation and Soils

a) Describe vegetation on the sump, lease and on surrounding tundra.

❑ Note if vegetation on the lease and directly downslope from the sump is different from surrounding landscape.

❑ For example: A) tussock tundra, ericaceous shrubs, sedges, lichen – adjacent to lease, B) Grasses – on sump cap, C) Willows – 1 to 2 m height, grasses understory - on lease.

b) Note salt efflorescences – thin white crust on surrounding soil surface and their relation to the sump cap and vegetation cover.

❑ Note proximity of site to the coast as the salt efflorescences may be natural.

c) Note iron staining of soils in or around sump cap.

Site Survey

- Abandoned site (well head) should be located using differential global positioning system (DGPS), and UTM and Latitude and Longitude coordinates should be supplied (NAD should be noted).
- The well-head, general sump dimensions, pond dimensions and other significant features identified in the visual assessment should be determined based on a ground survey (general) and indicated on an aerial map of site plan.
- A general site survey could be used to calibrate aerial photographs or remotely sensed imagery.
- Water, soil, active-layer and vegetation sampling should be referenced with respect to the aerial map/site plan (map or photograph).
- The date of the field survey must be indicated.

Active-layer Thickness

Active-layer thicknesses, determined by pushing a steel probe into the ground to the depth of refusal, should be obtained at the following locations:

a) 5 points across the drilling-sump cap (may not be possible if capped with gravel), 20 points around perimeter where cap meets adjacent terrain (5 on each side).

b) 15 points on lease.

c) 15 in undisturbed terrain:

- Measurements should be taken at 5 m intervals along transects on the sump top and along the perimeters of the sump (total of 5 - 20 m transects), on the lease (70 m transect) and in adjacent undisturbed terrain (70 m transect);
- 5 measurements should be obtained along the 4 sides of the sump (at 5 m intervals) at the interface between the cap and adjacent terrain; and
- Active-layer sampling should be supplemented by basic descriptions of terrain and vegetation at the respective sites/ transects and referenced to a site map.

Assessment of Water Quality and Pond Sediments

Water sampling should be conducted following measurement of electrical conductivity and salinity in ponded water on the lease and in adjacent undisturbed watercourses.

The following guidelines are provided for the water sampling program.

a) Obtain spot conductivity/salinity measurements of all major ponds on or around the drilling mud and camp sumps, on the lease, and in an adjacent undisturbed water body (upstream/upslope) (note the locations of sampling on a site map or aerial photograph).

- (Note: if site is in a potentially saline terrestrial environment the background sample should be taken from naturally ponded water adjacent to the lease rather than an adjacent freshwater body (e.g., Channel of the Mackenzie River).

b) Surface-water samples should be obtained from:

- Surface-water sample should be obtained from the nearest upstream water body in the surrounding terrain.
- (Note: if site is in a potentially saline environment the background sample should be taken from naturally ponded water adjacent to the lease rather than an adjacent freshwater body (e.g., Channel of the Mackenzie River).
- Any pond located on or adjacent to the sump cap. If several ponds are present, the sample should be obtained from the pond where the highest electrical conductivity was measured.
- An additional sample may be obtained from a pond on the lease, away from the sump cap if anomalously high conductivity/salinity values are measured or if a sheen on the water surface is observed (method for obtaining a sample for assessment of hydrocarbons should be prepared by the contractor).

Note: The location of sampling points should be indicated on a site map.

An appropriate amount of water should be obtained for analysis of samples at a certified laboratory. Water samples should be stored and preserved appropriately and returned to the laboratory as quickly as practical for geochemical analysis.

Routine water chemistry (conductivity pH, turbidity, colour, soluble anions and cations).

*** Only if necessary - Hydrocarbons (total petroleum hydrocarbons) extractables:

- ❑ BTEX
- ❑ Total Extractables

Assessment of Soils

Sampling of soils should be conducted if:

(1) Ponding is observed at the site, and pond water conductivity is elevated with respect to background levels;

(2) Salt efflorescences are observed; or

(3) Vegetation appears to be stressed;

(4) There is evidence of hydrocarbon contamination.

Soil investigations may not be deemed necessary if:

(1) The sump cap is completely intact;

(2) There is no ponding of water on or around the sump; and

(3) There are no salt efflorescences or disturbance to vegetation around the sumps.

However, it should be noted that collection of soil samples may also confirm effective containment.

The following guidelines are provided as a minimum requirement for the soil sampling program. The geochemical analysis will be on the pore water extracted from the samples.

The sample retained should be a composite of three mineral soil samples obtained from the near-surface, middle and base of the active layer. Soil sample sites should include:

a) a control sample at an undisturbed site adjacent to the lease in terrain judged to represent background soil conditions; and

b) a sample from the lease where salt efflorescences are observed or the vegetation is stressed or adjacent to ponding which shows elevated electrical conductivity.

Note:

- Describe the location of the sampling points with respect to the sump.
- Soil freezing in winter, or drying in summer can redistribute soluble materials within a soil profile, therefore it is recommended that three samples should be obtained from each profile (see above).

An appropriate amount of soil should be obtained for analysis at an accredited laboratory. Water samples should be stored in a cool dark place and returned to the laboratory as quickly as practical.

Routine (conductivity pH, turbidity, colour, soluble anions and cations)
Metals scan

**** Hydrocarbons (total petroleum hydrocarbons) extractables
- only if deemed necessary by field team

- ❑ BTEX
- ❑ Total Extractables

Electromagnetic Survey

Measurement of ground electrical conductivity by electromagnetic induction is an effective technique for rapidly determining if salts from salt-based drilling muds have escaped containment. The technique relies on the detection of the high conductivities associated with dissolved salts in areas where the soil pore water is otherwise low in total dissolved solids. However, it may not discriminate escaped leachates in areas of high natural soil salinity.

Both the EM 31 and EM 38 should be used to effectively evaluate the horizontal and vertical distribution of saline earth materials and drilling mud contents in the sump.

Additional Recommendations

1. Data collected using the following protocol should be entered into an appropriate data form developed prior to initiating fieldwork.
2. If data requested in the protocol was not obtained, the reason should be indicated on the data form (i.e., does not exist, not deemed necessary and why, logistical reasons, etc.)
3. Note: sample extraction methodology should be standardized.

Conclusions which may be drawn at the end of survey:

- Additional field investigations would be prudent.
- The site should be monitored.
- No intervention necessary.

Inuvialuit Land Administration
Right to Access Land

RIGHT NUMBER: ILA04IN052

TYPE OF RIGHT: Land Use Licence

Subject to the Inuvialuit Land Administration Rules and Procedures and the attached terms and conditions, this Right is hereby granted to ***AMEC Earth and Environmental*** *to proceed with the operation described in the application of* ***August 13th, 2004*** *to access Inuvialuit Lands situated at/near* ***Inuvik, NT on 7(1)(a) & (b) land*** *for the purpose of* ***Sump Assessments (Research).***

Commencement Date: ***August 16th, 2004*** **Expiry Date:** ***August 31st, 2004***

This Right may not be assigned, extended, discontinued, suspended or cancelled without notification and approval by the Inuvialuit Land Administration pursuant to the ILA Rules and Procedures.

Dated this day ***August 15th, 2004*** *at* ***Tuktoyaktuk, Northwest Territories*** *and signed by:*

James Thorbourne.

James Thorbourne
Chief Land Administrator
Inuvialuit Land Administration

Inuvialuit Land Administration

PO Box 290, Tuktoyaktuk, NT X0E 1C0
Tel: 867 977 7100 Fax: 867 977 7101

APPLICATION FORM FOR LAND USE LICENCE

1. ILA Permit No.: ILA04INC052 Date Aug 15, 2004

2. Name and Agency of Licensee:

   AMEC Earth & Environmental
   Mr. Chris Wenzel

3. Address of Licensee:
   221 – 18th Street SE
   Calgary, Alberta
   T2E 6J5

4. Phone: (403) 569-6593 or (403)248-4331 Fax: (403)248-2188

5. Name(s) of other individuals to be included under License:

   - Chris Wenzel
   - Dean Wall

6. General Nature of Activity:
   Assessment of drilling mud sumps for ESRF (Environmental Studies Research Funds), Government of Canada.

7. Details of activities that may be carried out by Licensee:

   - Assessment work includes observations and note taking, photography, limited soil and water sampling, active layer survey (measure depth to permafrost), EM survey (measure soil conductivity).
   - AMEC expects to spend about 3 hours on the ground at each location.

8. General Location(s):

- Sites on 7 (1) (a) or 7 (1) (b) Lands include:

1) OGRUKNANG M-31, 68.847, -134.414, 7 (1) (a), Parks and park withdrawals
2) TUNUNUK F-30, 68.989, -134.611, 7 (1) (a), Parks and park withdrawals
3) RED FOX P-21, 69.18, -133.58311111111, 7 (1) (b)
4) SIKU C-55, 69.067, -133.732, 7 (1) (b)
5) KIKORALOK N-46, 69.096, -134.942, 7 (1) (a), Parks and park withdrawals
6) REINDEER D-27, 69.101, -134.615, 7 (1) (a), Parks and park withdrawals

- List of all sites in the assessment:

1,ATIGI O-48, 68.9633300, -133.9352800
2,OGRUKNANG M-31, 68.8478000, -134.4140200
3,TUNUNUK F-30, 68 9868200, -134 6273000
4,SIKU C-55, 69.0687500, -133.7343700
5,KIKORALOK N-46, 69.0979200, -134.9427100
6,RED FOX P-21, 69.1812500, -133.5885400
7,TOAPOLOK H-24, 69.2229200, -134.8385400
8,KILAGMIOTAK M-16, 69.4311100, -134.0750000
9,KILAGMIOTAK F-48, 69.4580600, -134.1975000
10,KURK M-15,69.0809166666667, -135.32325
11,YA-YA P-53,69.2127222222222,-134.713833333333
12,YA-YA M-33,69.2158333333333,-134.662222222222
13,YA-YA I-17,69.2763888888889,-134.546944444444
14,YA-YA A-28,69.2863888888889,-134.590833333333
15, REINDEER D-27,69.1014,-134.6150

9. Equipment, vehicles, and facilities to be used:

Equipment:

- EM 38 ground conductivity meter
- GPS survey equipment
- Soil and water sample containers
- Water conductivity meter
- Various computers

- Vehicles: None – transportation to the sites is via helicopter (Trans North)

10. Fuels to be used (type, number of containers, capacity, etc.):
Location of campsites or fuel caches on Inuvialuit Lands:

Coordinates _____ N _____ W

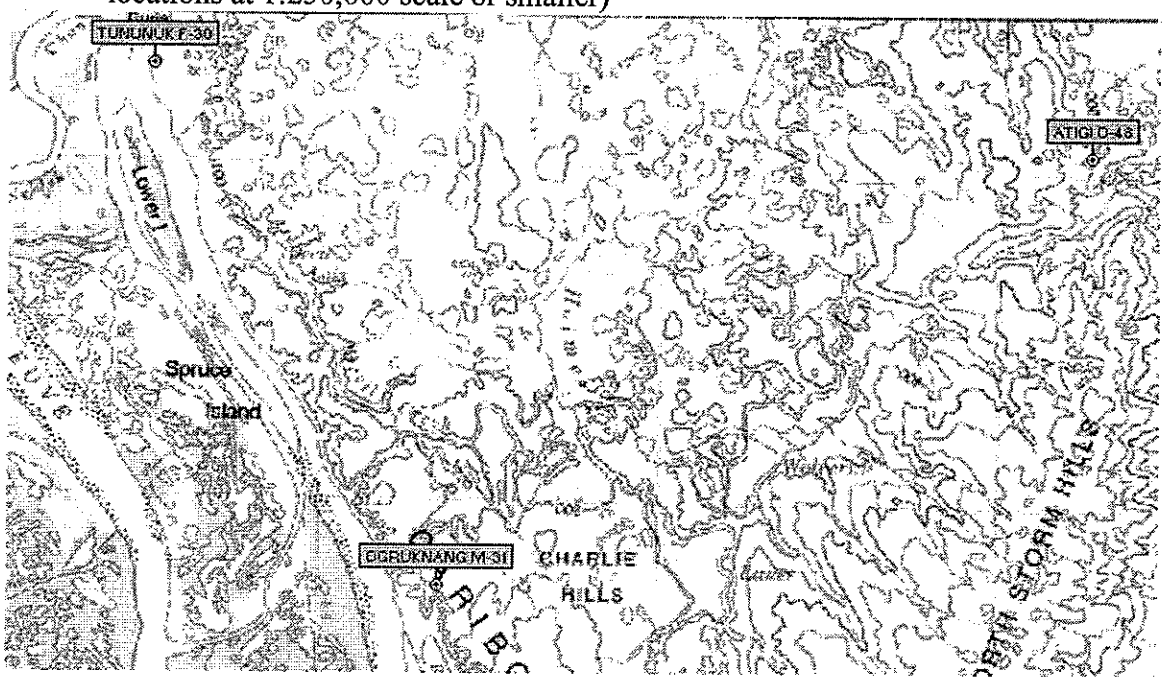
UTM _____ N _____ W

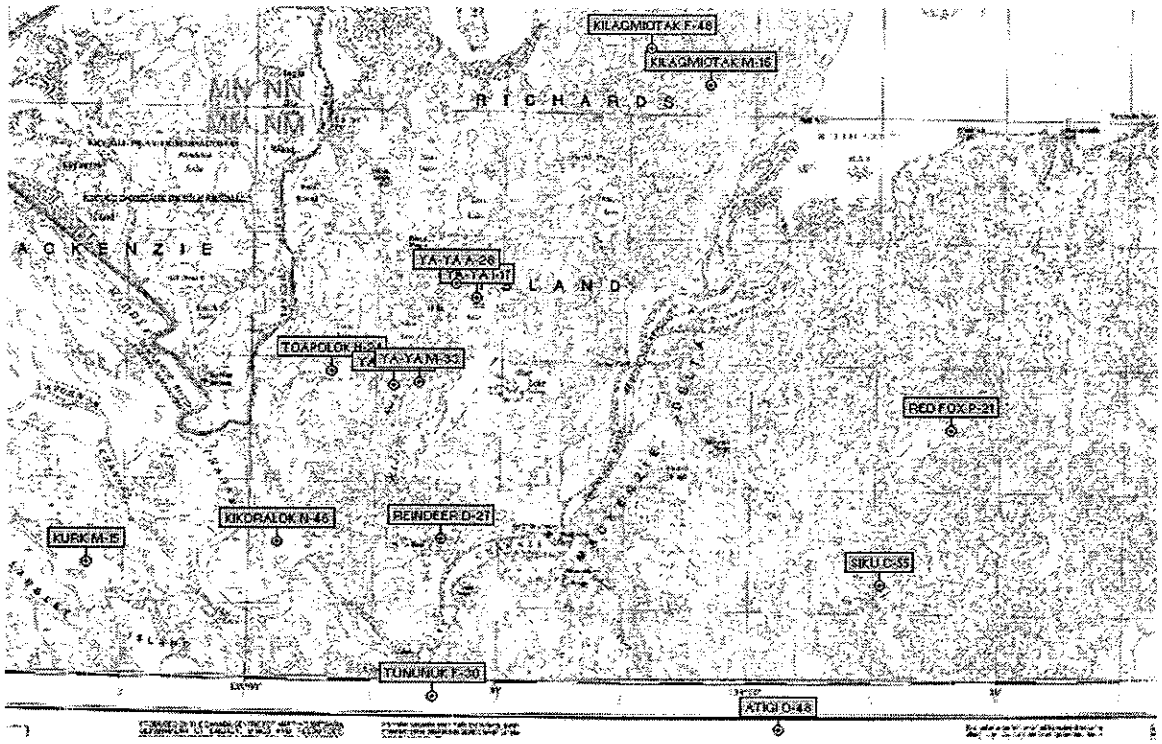
- All refueling will be done at the Inuvik airport (Trans North)
- There will be no campsites. AMEC will return to Inuvik each night and stay at the Eskimo Inn.

10. Location of other area(s) to be temporarily occupied by the Licensee on Inuvialuit Land:

- None, all site locations have been provided above.

(Please provide a map showing all areas to be used and all campsite and cache locations at 1:250,000 scale or smaller)





11. Waste disposal methods:

- All waste will be removed form the site.

13. Effective Date of License:

- August 16 to 31, 2004

14. Completion Date of the License:

- August 31, 2004
- Note: AMEC plans to have the work completed on August 22nd.

15. Please attach a detailed project description, expanding the information given on the above.

- AMEC will report all findings to the ESRF and INAC. We will be using GPS survey methods to collect data including the area of sump, the area of any ponding, the location of soil and water samples, the location of any stressed vegetaion, the location of all photographs. AMEC will be using a standard protocol which describes the methods for conducting this work.
- AMEC will be using the services of a local assistant (environmental monitor) for this work. The environmental monitor will accompany AMEC to all sites.

16. Fees paid: $_____ Invoice 04-072 255.23

- AMEC will issue payment of $238.53 plus GST via cheque.

17. This License shall be subject to the specific Terms and Conditions stipulated as follows:

a. The Licensee shall carry out the operation solely at his own risk and shall have no right of action against the Inuvialuit for alleged loss or damage therefrom.

b. The Licensee shall comply with the provisions of the "Inuvialuit Land Administration (ILA) Rules and Procedures", as the same may be amended from time to time, and with the Western Arctic (Inuvialuit) Claims Settlement Act, the Inuvialuit Final Agreement (IFA) and the laws of General Application.

c. The Licensee shall provide the Administrator with all reports generated by the project and any other information that may be required in accordance with the Rules.

d. The Licensee shall compensate the Inuvialuit for any damage to Inuvialuit Lands or for any diminution of the value of the Inuvialuit interest in such lands in accordance with the Rules.

e. The Licensee shall compensate Inuvialuit or any affected third persons for any damage or accidents as a result of the occupancy or operations carried out during the terms of the License.

f. The Licensee shall provide the following employment opportunities for Inuvialuit: Wildlife Monitor

g. The Licensee shall provide the following Inuvialuit Business opportunities: Helicopter support.

h. The provisions of subsection (f) and/or (g) are considered waived where the Assistant Administrator has signed below:
For (f) _____ for (g) _____

i. This License cannot be renewed or assigned.

j. The Licensee shall permit the ILA to inspect any aspect of the operations under this License and the Licensee shall pay such Inspection Fees as stipulated in the Rules.

18. This License includes the attached Terms and Conditions.

Signature of Licensee

Signature of Land Administrator

Date: August 13, 2004

Date: Aug 15 2004

Place: Tuktoyaktuk

Issuing Office:

Inuvialuit Land Administration
P.O. Box 290
Tuktoyaktuk, NT
X0E 1C0

Telephone: 867/ 977-7100
Fax: 867/ 977-7101

Note: Make Cheque Payable to: "Inuvialuit Regional Corporation c/o ILA"

AURORA COLLEGE
Aurora Research Institute

FILE# 12 406 035

30-Jul-04

Mr. Robert Jenkins
DIAND
PO Box 1500
Yellowknife, NT X1A 2R3

Dear Mr. Jenkins:

Enclosed you will find your 2004 Scientific Research Licence No. 13703 as prepared under the Northwest Territories Scientists Act and approved by the Science Advisor, Andrew Applejohn. Should you require support from the Aurora Research Institute's Research Centres, please contact the Research Centre Managers to discuss your research needs.

Upon completion of your 2004 field work in the Northwest Territories, please ensure that you provide a 200-word (maximum) non-technical summary of your research findings to our office by June of the following year, or with your new year's application, whichever is earlier. **According to the Scientists Act, researchers issued licences must provide a summary report for each year of their research. This summary must be received by our office no later than June 30th of the following year. In addition, we require a copy of your final report and copies of any papers that you publish that pertain to research conducted under this licence.**

Thank you for assisting in the promotion and development of a scientific research community and database within the Northwest Territories. The summary report and other information that you provide are utilized in our annual report compendium, which is distributed to communities and organizations in the N.W.T. as well as to researchers across Canada.

Best wishes for a successful study!

Sincerely,

M. Crossfield

Michelle Crossfield
Manager, Scientific Services, Aurora Research Institute

Box 1450
Inuvik NT X0E 0T0
Tel: (867) 777-3298
Fax (867) 777-4264

SCIENTIFIC RESEARCH LICENCE

Licence # 13703N

File # 12 406 035

ISSUED BY: **Aurora Research Institute - Aurora College**
Inuvik, Northwest Territories

ISSUED TO: Mr. Robert Jenkins
DIAND
PO Box 1500
Yellowknife, NT X1A 2R3
Tel: (867) 669-2574

ON: 30-Jul-04

TEAM MEMBERS: Steve Kokelj, Tim Taylor, Cynthia Pyc, John Lennie, Ron Quaife, Randy Hetman, Lin Callow, Al Cut, Chris Wenzel, AMEC Environmental, IEG/KOMEX

AFFILIATION: DIAND

FUNDING: Environmental Studies Research Funds (ESRF), internal industry funding

TITLE: Environmental Studies Research Funds Regional Sump Study Project

OBJECTIVES OF RESEARCH:
This study is being led by the Environmental Studies Research Funds Technical Advisory Group with members representing government, industry, and Inuvialuit. This research will help address growing concerns over the use of sumps as a disposal option for drilling waste in the ISR and is a first step in evaluating the environmental conditions at historic sump sites. The specific objectives of this research include: 1) conducting an inventory of all known specified drilling sump locations within the ISR (including location, last known operator, spud and sump closure date, identification of orphan locations, well description); 2) develop a protocol based on site assessment and risk ranking process; and 3) conduct site assessments using the protocol at a limited number of orphan sump sites, as well as company specific sites.

DATA COLLECTION IN THE NWT:
DATE(S): July to September, 2004
LOCATION: Shell, Imperial Oil, Conoco-Phillips and orphan sump sites in the Inuvialuit Settlement Region

Licence# 13703 expires on December 31, 2004.
Issued at the Town of Inuvik on Friday, July 30, 2004

Andrew Applejohn
Director, Aurora Research Institute

P.O. Box 1450 Inuvik NT X0E 0T0
Phone: 867-777-4029 Fax: 867-777-4264 E-mail: research_ari@gov.nt.ca

12 406 035
30-Jul-04

NOTIFICATION OF RESEARCH
Scientific Research Licence No. 13703N

I would like to inform you that Scientific Research Licence No. 13703 has been issued to:

Mr. Robert Jenkins
DIAND
PO Box 1500
Yellowknife, NT X1A 2R3
(867) 669-2574
Email: jenkinsre@inac-ainc.gc.ca

to conduct the following study:
"Environmental Studies Research Funds Regional Sump Study Project".

Please contact the researcher if you would like more information.

SUMMARY OF RESEARCH:
This study is being led by the Environmental Studies Research Funds Technical Advisory Group with members representing government, industry, and Inuvialuit. This research will help address growing concerns over the use of sumps as a disposal option for drilling waste in the ISR and is a first step in evaluating the environmental conditions at historic sump sites. The specific objectives of this research include: 1) conducting an inventory of all known specified drilling sump locations within the ISR (including location, last known operator, spud and sump closure date, identification of orphan locations, well description); 2) develop a protocol based on site assessment and risk ranking process; and 3) conduct site assessments using the protocol at a limited number of orphan sump sites, as well as company specific sites. An inventory of the sites will be conducted using public records and internal industry records. Field assessments consist of visual investigations, active-layer soil sampling (shallow), water sampling, and electromagnetic surveys. A detailed protocol for site assessments is available. All sites will be accessed by helicopter. An Inuvialuit environmental monitor will accompany the field teams. The results of these field investigations will be presented at a workshop in Inuvik in winter 2004/05. This work is being contracted to AMEC Environmental and IEG/KOMEX. Final sump site locations will be provided to ARI when available.

The study will be conducted at Shell, Imperial Oil, Conoco Phillips and orphan sump sites in the Inuvialuit Settlement Region from July to September, 2004.

Sincerely,
M. Crossfield
Michelle Crossfield
Manager, Scientific Services, Aurora Research Institute

P.O. Box 1450 Inuvik NT X0E 0T0
Phone: 867-777-4029 Fax: 867-777-4264 E-mail: research_ari@gov.nt.ca

12 406 035
30 Jul 04

NOTIFICATION OF RESEARCH
Scientific Research Licence No. 13703

DISTRIBUTION:
Land Administrator, Inuvialuit Land Administration, Box 290, Tuktoyaktuk, NT X0E 1C0
Secretary, Environmental Impact Screening Committee, Box 2120, Inuvik, NT X0E 0T0
Chair, Inuvik Hunters and Trappers Committee, Box 1720, Inuvik, NT X0E 0T0
President, Tukoyaktuk Hunters and Trappers Committee, Box 286, Tuktoyaktuk, NT X0E 1C0
President, Aklavik Hunters and Trappers Committee, Box 133, Aklavik, NT X0E 0A0
Mayor, Town of Inuvik, Box 1160, Inuvik, NT X0E 0T0
Mayor, Hamlet of Tuktoyaktuk, Box 120, Tuktoyaktuk, NT X0E 1C0
NWT Habitat Biologist, Canadian Wildlife Service, 301, 5204-50th Avenue, NT X1A 1E2
Mayor, Hamlet of Aklavik, Box 88, Aklavik, NT X0E 0A0
Resource Management Coordinator, Inuvialuit Game Council, Box 2120, Inuvik, NT X0E 0T0

Appendix D

Site Assessment Forms

Government of Canada

Environmental Studies Research Funds
ESRF-04-046 Regional Sump Study Project

AMEC Earth & Environmental
Site Assessment Form

REINDEER D-27

Table	Field	Data
Well Name	WELL NAME	**REINDEER D-27**
	WID	275
Current Ownership	Owner Confirmation of Well Ownership Received	No
	Potential Orphan Based on Minor Interest Holder	No
	Potential Orphan Based on Majority Interest Holder	No
	Current Well Owner (Preliminary)	Shell
Data Provided by the National Energy Board (July 2004)	Consortium Identified by NEB	B.A. SHELL IOE
	UWI	300D276910134300
	CLASS	Exploratory
	STATUS	Plug and abandoned
	LATITUDE	69.10138889
	LONGITUDE	-134.615
	NEB REGION Designation	Northwest Territories - Mackenzie Delta - Onshore
	Onshore or Offshore	On-Shore
	ORIGINAL SPUD DATE	08-Jul-65
	ORIGINAL RR DATE	05-Jan-66
	DEPTH (m)	3861.2
	SPUD RE DATE	08-Jul-65
	RIG RELEASE DATE	05-Jan-66
Site Information	Environmental Sensitivity	7 (1) (a), Parks and park withdrawals
	Protected Areas Descriptive	Not located in a protected area
	Oil and Gas Dispositions #	99
	Oil and Gas Dispositions - Name	Inuvialuit are surface owners
	Kokelj and Geonorth 2002 Assessment Finding	Not assessed
Visit	Well Site Visited by AMEC in Summer 2004 (Date)	21-Aug-04
Drill Sump Summary	Type of Mud System Used	GelChem
	Estimated Sump Volume (m3)	5019.56
	Estimated Date of Sump Construction	08-Jun-65
	Estimated Date of Sump Capping	04-Feb-66
	Estimated Number of Days Open	241

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form	REINDEER D-27

Table	Field	Data
	Season of Operation	Summer
	Number of Sump Seasons	Not Available
	INAC Inspection Report	Not Available
Drill Sump Data	Drill Sump Capped Area (m2)	Sump not capped; 184 m2 / 5 islands in the pond
	Drill Sump Cap Thickness and Height Above Ground (m)	Cap has subsided, 5 islands remain
	Drill Sump Cap Materials	Native soil
	Drill Sump Slope Position Location	Mid-slope
	Drill Sump Cap Vegetation Cover (%)	None- vegetation submerged. Islands of upland Grasses and Shrubs- >50% cover
	Drill Sump Cap Dominant Vegetation Type, Description and Vegetation Heights	0.1-1.0m- Grasses, Shrubs,-willow
	Description of and extent of Sloughing of Drill Sump Cap	Minor (0-20%), sloughing on east end
	Description of and extent of Drill Sump Cap Perimeter Cracking	Minor (0-20%), on east berm
	Description of and extent of subsidence on Drill Sump Cap	Significant (>50%)- sump covered by water and below berm level, possibly never capped
	Drill Sump Number of Ponds and Location	Large pond (1833 m2) on sump.
	Extent of Ponding	Significant (>50%)
	Depth of Ponded Water (m)	>1.5m
	Drill Sump Pond Dominant Vegetation Type / Description	Submerged Upland Species- Grasses, Shrubs- willows
Camp Sump Data	Camp Sump Area (m2)	Not investiagated
	Camp Sump Cap Thickness and Height Above Ground (m)	Not investiagated
	Camp Sump Cap Materials	Not investiagated
	Camp Sump Slope Position Location	Not investiagated
	Camp Sump Cap Vegetation Cover (%)	Not investiagated
	Camp Sump Cap Dominant Vegetation Type and Vegetation Heights	Not investiagated
	Description of and extent of Sloughing of Camp Sump Cap	Not investiagated
	Description of and extent of Camp Sump Cap Perimeter Cracking	Not investiagated
	Description of and extent of subsidence on Camp Sump Cap	Not investiagated
	Camp Sump Number of Ponds and Location	Not investiagated

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form	REINDEER D-27

Table	Field	Data
	Extent of Ponding (exact percentage to be provided after mapping)	Not investiagated
	Depth of Ponded Water	Not investiagated
	Camp Sump Pond Dominant Vegetation Type / Description	Not investiagated
Lease Data	Lease Area (m2)	Unable to determine lease boundary
	Lease Thickness and Height Above Adjacent Ground (m)	7-8m-varying due to gravel extraction
	Lease Materials	Gravel
	Lease Slope Position	Mid-slope
	Gravel Pad Thickness (m)	10
	Gravel Pad Area (m2)	Unknown, the entire area is a gravel pit.
	Gravel Pad Ponding Area (m2)	Numerous ponds in the gravel pit
	Gravel Pad Subsidence (m2) and Description	Recent gravel extraction has exposed the well casing.
	Piling Type (material) and Location	None
	Equipment Present?	NO
	Equipment Types and Location	N/A
	Lease Vegetation Cover (%)	25-50%
	Lease Dominant Vegetation Type, Description and Vegetation Heights	0.1-2.5m- Grasses, Shrubs-willow
	Extent and Description of Sloughing at Lease Perimeter	Unable to establish lease boundaries and features due to gravel extraction.
	Degree and Description of Lease Erosion	Embankment failing due to steep slope above wellhead.
	Lease Number of Ponds and Location	Numerous ponds in the gravel pit.
	Extent of Ponding (exact area to be provided after mapping)	Significant (>50%)
	Depth of Ponded Water (m)	<1.5 m
	Lease Pond Dominant Vegetation Type / Description	Submerged Upland Species- grasses
Surrounding Area Observations	Local Surface Expression	Terraced
	Physiographic Region	Tununuk Low Hills
	Dominant Adjacent Vegetation Type and Heights	0-1.0m- Lichen, Mosses, Forbs, Grasses, Shrubs
Receptors	Proximity to Nearest Natural Water Body (m)	400
	Nearest Natural Water Body Name	Small Lake

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form	REINDEER D-27

Table	Field	Data
	Does the Lease Drain to this Natural Water Body?	NO
	Surface Drainage Direction	S and N, sump drains South and lease drains North
	Description of Bird Activity in the Area	Raven, ducks, swans observed
	Description of Animal Activity in the Area	None
	Description of Human Activity in the Area	Gravel extraction
Visible Contaminants	Aerial Extent of Visible Salt Impacts (m2) and Description	None
	Aerial Extent of Visible Iron Staining (m2) and Description	None
	Aerial Extent of Drill Sump Related Visible Hydrocarbon Impacts(m2) and Description	None
	Description of EM Survey - Elevated ground conductivity	Localized EM anomalies on the west side of the pond are metal related. However, this area is barren and salt crystals were observed on the surface.
	Description of Solid Wastes Present on the Lease and Description	Buried metal, wood, concrete
Associated Data - Samples, Photos, Active Layer, EM Survey	Active Layer Thickness Survey Conducted?	YES, sump cap limited due to gravel (some measurements obtained by hand auger)
	No. of Water Samples Collected	2
	No. of Soil Samples Collected	1
	EM 38 Survey Conducted?	Yes
	EM 31 Survey Conducted?	No
	Site Features Survey Conducted?	YES
	Site Photographs Obtained?	YES

Government of Canada

Environmental Studies Research Funds
ESRF-04-046 Regional Sump Study Project

AMEC Earth & Environmental
Site Assessment Form

SIKU C-55

Table	Field	Data
Well Name	WELL NAME	**SIKU C-55**
	WID	730
Current Ownership	Owner Confirmation of Well Ownership Received	Yes
	Potential Orphan Based on Minor Interest Holder	No
	Potential Orphan Based on Majority Interest Holder	No
	Current Well Owner (Preliminary)	ConocoPhillips
Data Provided by the National Energy Board (July 2004)	Consortium Identified by NEB	GULF MOBIL
	UWI	300C556910133300
	CLASS	Exploratory
	STATUS	Plug and abandoned
	LATITUDE	69.06777778
	LONGITUDE	-133.73275
	NEB REGION Designation	Northwest Territories - Mackenzie Delta - Onshore
	Onshore or Offshore	On-Shore
	ORIGINAL SPUD DATE	02-May-72
	ORIGINAL RR DATE	08-Nov-72
	DEPTH (m)	4506.5
	SPUD RE DATE	02-May-72
	RIG RELEASE DATE	08-Nov-72
Site Information	Environmental Sensitivity	7 (1) (b)
	Protected Areas Descriptive	Not located in a protected area
	Oil and Gas Dispositions #	99
	Oil and Gas Dispositions - Name	Inuvialuit are surface owners
	Kokelj and Geonorth 2002 Assessment Finding	Not assessed
Visit	Well Site Visited by AMEC in Summer 2004 (Date)	19-Aug-04
Drill Sump Summary	Type of Mud System Used	GelChem, Diesel
	Estimated Sump Volume (m3)	5858.45
	Estimated Date of Sump Construction	02-Apr-72
	Estimated Date of Sump Capping	08-Dec-72
	Estimated Number of Days Open	250

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form	SIKU C-55

Table	Field	Data
	Season of Operation	Spring
	Number of Sump Seasons	Not Available
	INAC Inspection Report	Not Available
Drill Sump Data	Drill Sump Capped Area (m2)	2 mud sumps and 1 island = 2223
	Drill Sump Cap Thickness and Height Above Ground (m)	2
	Drill Sump Cap Materials	Silt, clay
	Drill Sump Slope Position Location	Level
	Drill Sump Cap Vegetation Cover (%)	>50%
	Drill Sump Cap Dominant Vegetation Type, Description and Vegetation Heights	0.25-2.0m- Grasses, Forbs, Shrubs
	Description of and extent of Sloughing of Drill Sump Cap	Minor (0-20%), sloughing is associated with cracking along about 10% of pond shores
	Description of and extent of Drill Sump Cap Perimeter Cracking	Minor (0-20%), sloughing is associated with cracking along about 10% of pond shores
	Description of and extent of subsidence on Drill Sump Cap	Significant (>50%)
	Drill Sump Number of Ponds and Location	1- large pond 4155 m2 (including island) with shallow connecting channel
	Extent of Ponding	Significant (>50%)
	Depth of Ponded Water (m)	>1.5m
	Drill Sump Pond Dominant Vegetation Type / Description	Submerged Upland Species- forbs, willows
Camp Sump Data	Camp Sump Area (m2)	Not investigated
	Camp Sump Cap Thickness and Height Above Ground (m)	Not investigated
	Camp Sump Cap Materials	Not investigated
	Camp Sump Slope Position Location	Not investigated
	Camp Sump Cap Vegetation Cover (%)	Not investigated
	Camp Sump Cap Dominant Vegetation Type and Vegetation Heights	Not investigated
	Description of and extent of Sloughing of Camp Sump Cap	Not investigated
	Description of and extent of Camp Sump Cap Perimeter Cracking	Not investigated
	Description of and extent of subsidence on Camp Sump Cap	Not investigated
	Camp Sump Number of Ponds and Location	Not investigated

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form		SIKU C-55
Table	**Field**	**Data**
	Extent of Ponding (exact percentage to be provided after mapping)	Not investigated
	Depth of Ponded Water	Not investigated
	Camp Sump Pond Dominant Vegetation Type / Description	Not investigated
Lease Data	Lease Area (m2)	28 342
	Lease Thickness and Height Above Adjacent Ground (m)	Very irregular, numerous mounds
	Lease Materials	Local materials-peat, silt
	Lease Slope Position	Level
	Gravel Pad Thickness (m)	None
	Gravel Pad Area (m2)	None
	Gravel Pad Ponding Area (m2)	None
	Gravel Pad Subsidence (m2) and Description	None
	Piling Type (material) and Location	About 60 log pilings about 1m above ground, south of wellhead
	Equipment Present?	NO
	Equipment Types and Location	None
	Lease Vegetation Cover (%)	>50%
	Lease Dominant Vegetation Type, Description and Vegetation Heights	0.1-2.5m-Shrubs, Grasses, Forbs
	Extent and Description of Sloughing at Lease Perimeter	None
	Degree and Description of Lease Erosion	None
	Lease Number of Ponds and Location	Standing water in patterned ground depressions around the wellhead.
	Extent of Ponding (exact area to be provided after mapping)	Moderate (20-50%)
	Depth of Ponded Water (m)	<1.5 m
	Lease Pond Dominant Vegetation Type / Description	Submerged Upland Species- grasses
Surrounding Area Observations	Local Surface Expression	Flat
	Physiographic Region	Kittigazuit Low Hills
	Dominant Adjacent Vegetation Type and Heights	0.1-0.5m- Grasses, Forbs, Shrubs
Receptors	Proximity to Nearest Natural Water Body (m)	75
	Nearest Natural Water Body Name	Lake

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form		SIKU C-55
Table	**Field**	**Data**
	Does the Lease Drain to this Natural Water Body?	Yes
	Surface Drainage Direction	W
	Description of Bird Activity in the Area	Lots of small birds observed, duck feathers found.
	Description of Animal Activity in the Area	Caribou antlers, bear scat, possible fish in lake.
	Description of Human Activity in the Area	None
Visible Contaminants	Aerial Extent of Visible Salt Impacts (m2) and Description	Approximately 50m2 at NE corner of sump pond.
	Aerial Extent of Visible Iron Staining (m2) and Description	None
	Aerial Extent of Drill Sump Related Visible Hydrocarbon Impacts(m2) and Description	None
	Description of EM Survey - Elevated ground conductivity	Localized elevated ground conductivity (3 x background (60)) in area between mud trough and pond.
	Description of Solid Wastes Present on the Lease and Description	Barrels/drums in pond and buried at south slope, cable mud trough, concrete, buried pipe
Associated Data - Samples, Photos, Active Layer, EM Survey	Active Layer Thickness Survey Conducted?	YES, limited due to gravel in some areas.
	No. of Water Samples Collected	2
	No. of Soil Samples Collected	2
	EM 38 Survey Conducted?	YES
	EM 31 Survey Conducted?	No
	Site Features Survey Conducted?	YES
	Site Photographs Obtained?	YES

Government of Canada

Environmental Studies Research Funds
ESRF-04-046 Regional Sump Study Project

AMEC Earth & Environmental
Site Assessment Form

YA-YA P-53

Table	Field	Data
Well Name	WELL NAME	**YA-YA P-53**
	WID	760
Current Ownership	Owner Confirmation of Well Ownership Received	Yes
	Potential Orphan Based on Minor Interest Holder	No
	Potential Orphan Based on Majority Interest Holder	No
	Current Well Owner (Preliminary)	ConocoPhillips
Data Provided by the National Energy Board (July 2004)	Consortium Identified by NEB	GULF MOBIL
	UWI	300P536920134301
	CLASS	Exploratory
	STATUS	Plug and abandoned
	LATITUDE	69.21272222
	LONGITUDE	-134.7138333
	NEB REGION Designation	Northwest Territories - Mackenzie Delta - Onshore
	Onshore or Offshore	On-Shore
	ORIGINAL SPUD DATE	08-Dec-72
	ORIGINAL RR DATE	20-Mar-73
	DEPTH (m)	3032.8
	SPUD RE DATE	11-Mar-86
	RIG RELEASE DATE	11-Mar-86
Site Information	Environmental Sensitivity	Not located in environmentally sensitive area
	Protected Areas Descriptive	Not located in a protected area
	Oil and Gas Dispositions #	SDL036
	Oil and Gas Dispositions - Name	SHELL CANADA
	Kokelj and Geonorth 2002 Assessment Finding	Not assessed
Visit	Well Site Visited by AMEC in Summer 2004 (Date)	22-Aug-04
Drill Sump Summary	Type of Mud System Used	Unknown
	Estimated Sump Volume (m3)	3942.64
	Estimated Date of Sump Construction	09-Feb-86
	Estimated Date of Sump Capping	10-Apr-86
	Estimated Number of Days Open	60

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form	YA-YA P-53

Table	Field	Data
	Season of Operation	Winter
	Number of Sump Seasons	Not Available
	INAC Inspection Report	Not Available
Drill Sump Data	Drill Sump Capped Area (m2)	Not capped
	Drill Sump Cap Thickness and Height Above Ground (m)	N/A
	Drill Sump Cap Materials	Silty clay, peat
	Drill Sump Slope Position Location	Level
	Drill Sump Cap Vegetation Cover (%)	None- vegetation submerged. Islands of upland Grasses- >50% cover
	Drill Sump Cap Dominant Vegetation Type, Description and Vegetation Heights	0.1-0.25m- Grasses
	Description of and extent of Sloughing of Drill Sump Cap	Minor (0-20%)- Sloughing into pond on South side
	Description of and extent of Drill Sump Cap Perimeter Cracking	Minor (0-20%)- cracking on South side
	Description of and extent of subsidence on Drill Sump Cap	Significant (>50%) - collapsed with extensive ponding.
	Drill Sump Number of Ponds and Location	Large pond over much of the sump - 3847 m2
	Extent of Ponding	Significant (>50%)
	Depth of Ponded Water (m)	>1.5m
	Drill Sump Pond Dominant Vegetation Type / Description	Submerged upland species - grasses.
Camp Sump Data	Camp Sump Area (m2)	Not investigated
	Camp Sump Cap Thickness and Height Above Ground (m)	Not investigated
	Camp Sump Cap Materials	Not investigated
	Camp Sump Slope Position Location	Not investigated
	Camp Sump Cap Vegetation Cover (%)	Not investigated
	Camp Sump Cap Dominant Vegetation Type and Vegetation Heights	Not investigated
	Description of and extent of Sloughing of Camp Sump Cap	Not investigated
	Description of and extent of Camp Sump Cap Perimeter Cracking	Not investigated
	Description of and extent of subsidence on Camp Sump Cap	Not investigated
	Camp Sump Number of Ponds and Location	Not investigated

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form		YA-YA P-53
Table	**Field**	**Data**
	Extent of Ponding (exact percentage to be provided after mapping)	Not investigated
	Depth of Ponded Water	Not investigated
	Camp Sump Pond Dominant Vegetation Type / Description	Not investigated
Lease Data	Lease Area (m2)	Lease boundary not clear
	Lease Thickness and Height Above Adjacent Ground (m)	Lease is level with surrounding ground.
	Lease Materials	Clay, Silt, Peat
	Lease Slope Position	Level
	Gravel Pad Thickness (m)	None
	Gravel Pad Area (m2)	None
	Gravel Pad Ponding Area (m2)	None
	Gravel Pad Subsidence (m2) and Description	None
	Piling Type (material) and Location	None
	Equipment Present?	NO
	Equipment Types and Location	N/A
	Lease Vegetation Cover (%)	>50%
	Lease Dominant Vegetation Type, Description and Vegetation Heights	0.1-0.5m- Grasses, Shrubs
	Extent and Description of Sloughing at Lease Perimeter	None
	Degree and Description of Lease Erosion	None
	Lease Number of Ponds and Location	Many small ponds
	Extent of Ponding (exact area to be provided after mapping)	Minor (0-20%)
	Depth of Ponded Water (m)	<1.5m
	Lease Pond Dominant Vegetation Type / Description	Aquatic species and submerged upland species - grasses, shrubs, sedges and willows .
Surrounding Area Observations	Local Surface Expression	Flat
	Physiographic Region	Tununuk Low Hills
	Dominant Adjacent Vegetation Type and Heights	0-0.5m- Grasses, Mosses, Lichens, Forbs, Shrubs
Receptors	Proximity to Nearest Natural Water Body (m)	400
	Nearest Natural Water Body Name	Seal Lake

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form		YA-YA P-53
Table	**Field**	**Data**
	Does the Lease Drain to this Natural Water Body?	No
	Surface Drainage Direction	E
	Description of Bird Activity in the Area	Ducks
	Description of Animal Activity in the Area	Moose, Caribou
	Description of Human Activity in the Area	No recent evidence
Visible Contaminants	Aerial Extent of Visible Salt Impacts (m2) and Description	Bare areas around north edge of large pond.
	Aerial Extent of Visible Iron Staining (m2) and Description	None
	Aerial Extent of Drill Sump Related Visible Hydrocarbon Impacts(m2) and Description	None
	Description of EM Survey - Elevated ground conductivity	Localized anomaly (twice background) on low barren area at north edge of pond.
	Description of Solid Wastes Present on the Lease and Description	None
Associated Data - Samples, Photos, Active Layer, EM Survey	Active Layer Thickness Survey Conducted?	YES, unable to probe cap due to pond water
	No. of Water Samples Collected	2
	No. of Soil Samples Collected	2
	EM 38 Survey Conducted?	YES
	EM 31 Survey Conducted?	NO
	Site Features Survey Conducted?	YES
	Site Photographs Obtained?	YES

Government of Canada

Environmental Studies Research Funds

ESRF-04-046 Regional Sump Study Project

AMEC Earth & Environmental

Site Assessment Form

ATIGI O-48

Table	Field	Data
Well Name	WELL NAME	**ATIGI O-48**
	WID	894
Current Ownership	Owner Confirmation of Well Ownership Received	Yes
	Potential Orphan Based on Minor Interest Holder	No
	Potential Orphan Based on Majority Interest Holder	No
	Current Well Owner (Preliminary)	ConocoPhillips
Data Provided by the National Energy Board (July 2004)	Consortium Identified by NEB	GULF MOBIL
	UWI	300O486900133451
	CLASS	Exploratory
	STATUS	Plug and abandoned
	LATITUDE	68.96333333
	LONGITUDE	-133.9352778
	NEB REGION Designation	Northwest Territories - Mackenzie Delta - Onshore
	Onshore or Offshore	On-Shore
	ORIGINAL SPUD DATE	09-Jan-74
	ORIGINAL RR DATE	28-Feb-74
	DEPTH (m)	1981.2
	SPUD RE DATE	10-Mar-92
	RIG RELEASE DATE	11-Mar-92
Site Information	Environmental Sensitivity	Not located in environmentally sensitive area
	Protected Areas Descriptive	Not located in a protected area
	Oil and Gas Dispositions #	EL385
	Oil and Gas Dispositions - Name	ENCANA WEST LTD.
	Kokelj and Geonorth 2002 Assessment Finding	Not assessed
Visit	Well Site Visited by AMEC in Summer 2004 (Date)	19-Aug-04
Drill Sump Summary	Type of Mud System Used	GelChem
	Estimated Sump Volume (m3)	2575.56
	Estimated Date of Sump Construction	09-Feb-92
	Estimated Date of Sump Capping	10-Apr-92
	Estimated Number of Days Open	61

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form		ATIGI O-48
Table	**Field**	**Data**
	Season of Operation	Winter
	Number of Sump Seasons	Not Available
	INAC Inspection Report	Not Available
Drill Sump Data	Drill Sump Capped Area (m2)	1925
	Drill Sump Cap Thickness and Height Above Ground (m)	5
	Drill Sump Cap Materials	Clay and sand
	Drill Sump Slope Position Location	Mid-slope
	Drill Sump Cap Vegetation Cover (%)	>50%
	Drill Sump Cap Dominant Vegetation Type, Description and Vegetation Heights	0.25-1.0m- Grasses, Forbs, Shrubs- fireweed and dwarf willow
	Description of and extent of Sloughing of Drill Sump Cap	Minor (0-20%)- Sloughing into adjacent pond
	Description of and extent of Drill Sump Cap Perimeter Cracking	Minor (0-20%)
	Description of and extent of subsidence on Drill Sump Cap	Minor (0-20%)
	Drill Sump Number of Ponds and Location	2 small ponds (37 m2, 17 m2), at NW edge of sump cap. Larger (760 m2) pond along SE edge of sump cap.
	Extent of Ponding	Moderate (20-50%)
	Depth of Ponded Water (m)	<1.5
	Drill Sump Pond Dominant Vegetation Type / Description	Submerged Upland Species- forbs, willows
Camp Sump Data	Camp Sump Area (m2)	Not investigated
	Camp Sump Cap Thickness and Height Above Ground (m)	Not investigated
	Camp Sump Cap Materials	Not investigated
	Camp Sump Slope Position Location	Not investigated
	Camp Sump Cap Vegetation Cover (%)	Not investigated
	Camp Sump Cap Dominant Vegetation Type and Vegetation Heights	Not investigated
	Description of and extent of Sloughing of Camp Sump Cap	Not investigated
	Description of and extent of Camp Sump Cap Perimeter Cracking	Not investigated
	Description of and extent of subsidence on Camp Sump Cap	Not investigated
	Camp Sump Number of Ponds and Location	Not investigated

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form		ATIGI O-48
Table	**Field**	**Data**
	Extent of Ponding (exact percentage to be provided after mapping)	Not investigated
	Depth of Ponded Water	Not investigated
	Camp Sump Pond Dominant Vegetation Type / Description	Not investigated
Lease Data	Lease Area (m2)	Lease boundary not clear
	Lease Thickness and Height Above Adjacent Ground (m)	0-1m
	Lease Materials	Gravel, Clay and Mud
	Lease Slope Position	Mid-slope
	Gravel Pad Thickness (m)	Gravel pad thickness not determined
	Gravel Pad Area (m2)	Gravel pad area not clear
	Gravel Pad Ponding Area (m2)	None
	Gravel Pad Subsidence (m2) and Description	None
	Piling Type (material) and Location	None
	Equipment Present?	NO
	Equipment Types and Location	N/A
	Lease Vegetation Cover (%)	10-25%
	Lease Dominant Vegetation Type, Description and Vegetation Heights	0.1-2.0 m - Shrubs, grasses, dwarf willow
	Extent and Description of Sloughing at Lease Perimeter	None
	Degree and Description of Lease Erosion	None
	Lease Number of Ponds and Location	No ponds observed
	Extent of Ponding (exact area to be provided after mapping)	None
	Depth of Ponded Water (m)	<1.5 m
	Lease Pond Dominant Vegetation Type / Description	Submerged Upland Species
Surrounding Area Observations	Local Surface Expression	Terraced
	Physiographic Region	North Caribou Hills
	Dominant Adjacent Vegetation Type and Heights	0.1-1.0m Grasses, Lichen, Shrubs- willow
Receptors	Proximity to Nearest Natural Water Body (m)	450
	Nearest Natural Water Body Name	Not named

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form		ATIGI O-48
Table	**Field**	**Data**
	Does the Lease Drain to this Natural Water Body?	NO
	Surface Drainage Direction	NE
	Description of Bird Activity in the Area	Small birds observed
	Description of Animal Activity in the Area	Bear prints and scat present
	Description of Human Activity in the Area	No recent evidence
Visible Contaminants	Aerial Extent of Visible Salt Impacts (m2) and Description	Vegetation stress and barren salt impacted soil at south end of large pond - 180 m2
	Aerial Extent of Visible Iron Staining (m2) and Description	None
	Aerial Extent of Drill Sump Related Visible Hydrocarbon Impacts(m2) and Description	None
	Description of EM Survey - Elevated ground conductivity	EM survey showed anomalies at the east and west side of the large pond. EM readings in these areas were twice background (40 to 60).
	Description of Solid Wastes Present on the Lease and Description	None
Associated Data - Samples, Photos, Active Layer, EM Survey	Active Layer Thickness Survey Conducted?	YES, partial conducted by hand auger, limited by gravel and clay suction.
	No. of Water Samples Collected	1
	No. of Soil Samples Collected	2
	EM 38 Survey Conducted?	Yes
	EM 31 Survey Conducted?	No
	Site Features Survey Conducted?	YES
	Site Photographs Obtained?	YES

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Environmental Studies Research Funds

ESRF-04-046 Regional Sump Study Project

AMEC Earth & Environmental

Site Assessment Form

TOAPOLOK H-24

Table	Field	Data
Well Name	WELL NAME	**TOAPOLOK H-24**
	WID	923
Current Ownership	Owner Confirmation of Well Ownership Received	Yes
	Potential Orphan Based on Minor Interest Holder	No
	Potential Orphan Based on Majority Interest Holder	No
	Current Well Owner (Preliminary)	ConocoPhillips
Data Provided by the National Energy Board (July 2004)	Consortium Identified by NEB	GULF MOBIL
	UWI	300H246920134450
	CLASS	Delineation
	STATUS	Plug and abandoned
	LATITUDE	69.22166667
	LONGITUDE	-134.8402778
	NEB REGION Designation	Northwest Territories - Mackenzie Delta - Onshore
	Onshore or Offshore	On-Shore
	ORIGINAL SPUD DATE	21-Apr-74
	ORIGINAL RR DATE	15-Jun-74
	DEPTH (m)	2622.8
	SPUD RE DATE	21-Apr-74
	RIG RELEASE DATE	15-Jun-74
Site Information	Environmental Sensitivity	Not located in environmentally sensitive area
	Protected Areas Descriptive	Not located in a protected area
	Oil and Gas Dispositions #	EL394
	Oil and Gas Dispositions - Name	BP CAN ENERGY CO
	Kokelj and Geonorth 2002 Assessment Finding	Not assessed
Visit	Well Site Visited by AMEC in Summer 2004 (Date)	28-Aug-04
Drill Sump Summary	Type of Mud System Used	GelChem, Diesel
	Estimated Sump Volume (m3)	3409.64
	Estimated Date of Sump Construction	22-Mar-74
	Estimated Date of Sump Capping	15-Jul-74
	Estimated Number of Days Open	115

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form	TOAPOLOK H-24

Table	Field	Data
	Season of Operation	Spring
	Number of Sump Seasons	Not Available
	INAC Inspection Report	Not Available
Drill Sump Data	Drill Sump Capped Area (m2)	3237
	Drill Sump Cap Thickness and Height Above Ground (m)	5
	Drill Sump Cap Materials	Local materials- silt, peat, sand
	Drill Sump Slope Position Location	Mid-slope
	Drill Sump Cap Vegetation Cover (%)	>50%
	Drill Sump Cap Dominant Vegetation Type, Description and Vegetation Heights	0.1-0.5m - Grasses, Forbs
	Description of and extent of Sloughing of Drill Sump Cap	None
	Description of and extent of Drill Sump Cap Perimeter Cracking	None
	Description of and extent of subsidence on Drill Sump Cap	None
	Drill Sump Number of Ponds and Location	Small ponds at east, northeast and southest edge of sump cap
	Extent of Ponding	Minor (0-20%)
	Depth of Ponded Water (m)	<1.5
	Drill Sump Pond Dominant Vegetation Type / Description	Submerged upland species - grasses.
Camp Sump Data	Camp Sump Area (m2)	Not investigated
	Camp Sump Cap Thickness and Height Above Ground (m)	Not investigated
	Camp Sump Cap Materials	Not investigated
	Camp Sump Slope Position Location	Not investigated
	Camp Sump Cap Vegetation Cover (%)	Not investigated
	Camp Sump Cap Dominant Vegetation Type and Vegetation Heights	Not investigated
	Description of and extent of Sloughing of Camp Sump Cap	Not investigated
	Description of and extent of Camp Sump Cap Perimeter Cracking	Not investigated
	Description of and extent of subsidence on Camp Sump Cap	Not investigated
	Camp Sump Number of Ponds and Location	Not investigated

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Environmental Studies Research Funds
ESRF-04-046 Regional Sump Study Project

AMEC Earth & Environmental
Site Assessment Form

TOAPOLOK H-24

Table	Field	Data
	Extent of Ponding (exact percentage to be provided after mapping)	Not investigated
	Depth of Ponded Water	Not investigated
	Camp Sump Pond Dominant Vegetation Type / Description	Not investigated
Lease Data	Lease Area (m2)	20000
	Lease Thickness and Height Above Adjacent Ground (m)	1.5
	Lease Materials	Gravel
	Lease Slope Position	Level
	Gravel Pad Thickness (m)	1.5
	Gravel Pad Area (m2)	14923
	Gravel Pad Ponding Area (m2)	None - Some standing water in patterned ground on gravel pad.
	Gravel Pad Subsidence (m2) and Description	Patterns emerging, gravel laid over peatland
	Piling Type (material) and Location	Several hundred log piles on the drilling pad.
	Equipment Present?	YES
	Equipment Types and Location	Thermisters installed on north and south side of the sump cap.
	Lease Vegetation Cover (%)	<10%
	Lease Dominant Vegetation Type, Description and Vegetation Heights	1-10cm- Grasses
	Extent and Description of Sloughing at Lease Perimeter	None
	Degree and Description of Lease Erosion	Gravel is taking on shape of patterned ground
	Lease Number of Ponds and Location	None - the entire lease area is covered with gravel
	Extent of Ponding (exact area to be provided after mapping)	Minor (0-20%)- most ponding is around the edge of the camp sump cap .
	Depth of Ponded Water (m)	<1.5 m
	Lease Pond Dominant Vegetation Type / Description	Submerged Upland Species- willows in pond at camp sump.
Surrounding Area Observations	Local Surface Expression	Inclined
	Physiographic Region	Tununuk Low Hills
	Dominant Adjacent Vegetation Type and Heights	0.1-2.0m- Grasses, Forbs, Shrubs in patterned ground depressions
Receptors	Proximity to Nearest Natural Water Body (m)	100
	Nearest Natural Water Body Name	Lake

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form		TOAPOLOK H-24
Table	**Field**	**Data**
	Does the Lease Drain to this Natural Water Body?	YES
	Surface Drainage Direction	N
	Description of Bird Activity in the Area	Eggs found at Lake
	Description of Animal Activity in the Area	Caribou antlers, moose tracks, various scat deposits
	Description of Human Activity in the Area	None
Visible Contaminants	Aerial Extent of Visible Salt Impacts (m2) and Description	None
	Aerial Extent of Visible Iron Staining (m2) and Description	None
	Aerial Extent of Drill Sump Related Visible Hydrocarbon Impacts(m2) and Description	None
	Description of EM Survey - Elevated ground conductivity	Localized anomaly (twice background (80 - 90)) in 3 separate areas at west edge of cap. Little effect on vegetation.
	Description of Solid Wastes Present on the Lease and Description	Minor metallic debris
Associated Data - Samples, Photos, Active Layer, EM Survey	Active Layer Thickness Survey Conducted?	YES
	No. of Water Samples Collected	2
	No. of Soil Samples Collected	3
	EM 38 Survey Conducted?	YES
	EM 31 Survey Conducted?	No
	Site Features Survey Conducted?	YES
	Site Photographs Obtained?	YES

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Environmental Studies Research Funds
ESRF-04-046 Regional Sump Study Project

AMEC Earth & Environmental
Site Assessment Form

YA-YA M-33

Table	Field	Data
Well Name	WELL NAME	YA-YA M-33
	WID	958
Current Ownership	Owner Confirmation of Well Ownership Received	Yes
	Potential Orphan Based on Minor Interest Holder	No
	Potential Orphan Based on Majority Interest Holder	No
	Current Well Owner (Preliminary)	ConocoPhillips
Data Provided by the National Energy Board (July 2004)	Consortium Identified by NEB	GULF MOBIL
	UWI	300M336920134300
	CLASS	Delineation
	STATUS	Plug and abandoned
	LATITUDE	69.21583333
	LONGITUDE	-134.6622222
	NEB REGION Designation	Northwest Territories - Mackenzie Delta - Onshore
	Onshore or Offshore	On-Shore
	ORIGINAL SPUD DATE	22-Nov-74
	ORIGINAL RR DATE	13-Feb-75
	DEPTH (m)	2789
	SPUD RE DATE	22-Nov-74
	RIG RELEASE DATE	13-Feb-75
Site Information	Environmental Sensitivity	Not located in environmentally sensitive area
	Protected Areas Descriptive	Not located in a protected area
	Oil and Gas Dispositions #	EL394
	Oil and Gas Dispositions - Name	BP CAN ENERGY CO
	Kokelj and Geonorth 2002 Assessment Finding	Not assessed
Visit	Well Site Visited by AMEC in Summer 2004 (Date)	22-Aug-04
Drill Sump Summary	Type of Mud System Used	Unknown
	Estimated Sump Volume (m3)	3625.7
	Estimated Date of Sump Construction	23-Oct-74
	Estimated Date of Sump Capping	15-Mar-75
	Estimated Number of Days Open	143

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form	YA-YA M-33

Table	Field	Data
	Season of Operation	Winter
	Number of Sump Seasons	Not Available
	INAC Inspection Report	Not Available
Drill Sump Data	Drill Sump Capped Area (m2)	4794
	Drill Sump Cap Thickness and Height Above Ground (m)	6
	Drill Sump Cap Materials	Clay, Silt
	Drill Sump Slope Position Location	Level
	Drill Sump Cap Vegetation Cover (%)	>50%
	Drill Sump Cap Dominant Vegetation Type, Description and Vegetation Heights	0.1-1.5m- Grasses, Forbs, Shrubs- fireweed, willow
	Description of and extent of Sloughing of Drill Sump Cap	None
	Description of and extent of Drill Sump Cap Perimeter Cracking	Minor (0-20%)- cracking noted on top of the sump, cracks are small- 20cm wide by 2m long
	Description of and extent of subsidence on Drill Sump Cap	None
	Drill Sump Number of Ponds and Location	Pond at NE corner is 417 m2, slough at NW corner is 26 m2.
	Extent of Ponding	Minor (0-20%)
	Depth of Ponded Water (m)	<1.5
	Drill Sump Pond Dominant Vegetation Type / Description	Submerged upland species - grasses.
Camp Sump Data	Camp Sump Area (m2)	Not investigated
	Camp Sump Cap Thickness and Height Above Ground (m)	Not investigated
	Camp Sump Cap Materials	Not investigated
	Camp Sump Slope Position Location	Not investigated
	Camp Sump Cap Vegetation Cover (%)	Not investigated
	Camp Sump Cap Dominant Vegetation Type and Vegetation Heights	Not investigated
	Description of and extent of Sloughing of Camp Sump Cap	Not investigated
	Description of and extent of Camp Sump Cap Perimeter Cracking	Not investigated
	Description of and extent of subsidence on Camp Sump Cap	Not investigated
	Camp Sump Number of Ponds and Location	Not investigated

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form		YA-YA M-33
Table	**Field**	**Data**
	Extent of Ponding (exact percentage to be provided after mapping)	Not investigated
	Depth of Ponded Water	Not investigated
	Camp Sump Pond Dominant Vegetation Type / Description	Not investigated
Lease Data	Lease Area (m2)	Lease boundary Is not clear
	Lease Thickness and Height Above Adjacent Ground (m)	Lease is level with surrounding ground.
	Lease Materials	Native soil
	Lease Slope Position	Level
	Gravel Pad Thickness (m)	None
	Gravel Pad Area (m2)	None
	Gravel Pad Ponding Area (m2)	None
	Gravel Pad Subsidence (m2) and Description	N/A
	Piling Type (material) and Location	None
	Equipment Present?	NO
	Equipment Types and Location	N/A
	Lease Vegetation Cover (%)	>50%
	Lease Dominant Vegetation Type, Description and Vegetation Heights	0.1-2m- Grasses, Forbs, Shrubs- willows, dogwood
	Extent and Description of Sloughing at Lease Perimeter	None
	Degree and Description of Lease Erosion	None
	Lease Number of Ponds and Location	1 small pond NE of the sump
	Extent of Ponding (exact area to be provided after mapping)	Minor (0-20%)- some ditching on lease
	Depth of Ponded Water (m)	<1.5m
	Lease Pond Dominant Vegetation Type / Description	Aquatic species - grasses, sedges.
Surrounding Area Observations	Local Surface Expression	Inclined
	Physiographic Region	Tununuk Low Hills
	Dominant Adjacent Vegetation Type and Heights	0.1-0.5m- Grasses, Forbs, Shrubs
Receptors	Proximity to Nearest Natural Water Body (m)	300
	Nearest Natural Water Body Name	Seal Lake

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form		YA-YA M-33
Table	**Field**	**Data**
	Does the Lease Drain to this Natural Water Body?	No
	Surface Drainage Direction	W
	Description of Bird Activity in the Area	None
	Description of Animal Activity in the Area	Fox seen during aerial recon.
	Description of Human Activity in the Area	None
Visible Contaminants	Aerial Extent of Visible Salt Impacts (m2) and Description	None
	Aerial Extent of Visible Iron Staining (m2) and Description	None
	Aerial Extent of Drill Sump Related Visible Hydrocarbon Impacts(m2) and Description	None
	Description of EM Survey - Elevated ground conductivity	Localized anomaly (twice background) on low area at northwest edge of cap. Little effect on vegetation.
	Description of Solid Wastes Present on the Lease and Description	None
Associated Data - Samples, Photos, Active Layer, EM Survey	Active Layer Thickness Survey Conducted?	YES, partial survey conducted by hand auger, limited by clay till
	No. of Water Samples Collected	1
	No. of Soil Samples Collected	3
	EM 38 Survey Conducted?	YES
	EM 31 Survey Conducted?	No
	Site Features Survey Conducted?	YES
	Site Photographs Obtained?	YES

Government of Canada

Environmental Studies Research Funds

ESRF-04-046 Regional Sump Study Project

AMEC Earth & Environmental

Site Assessment Form

KIKORALOK N-46

Table	Field	Data
Well Name	WELL NAME	**KIKORALOK N-46**
	WID	964
Current Ownership	Owner Confirmation of Well Ownership Received	Yes
	Potential Orphan Based on Minor Interest Holder	No
	Potential Orphan Based on Majority Interest Holder	No
	Current Well Owner (Preliminary)	ConocoPhillips
Data Provided by the National Energy Board (July 2004)	Consortium Identified by NEB	GULF MOBIL
	UWI	300N466910134450
	CLASS	Exploratory
	STATUS	Plug and abandoned
	LATITUDE	69.09611111
	LONGITUDE	-134.9425
	NEB REGION Designation	Northwest Territories - Mackenzie Delta - Onshore
	Onshore or Offshore	On-Shore
	ORIGINAL SPUD DATE	20-Dec-74
	ORIGINAL RR DATE	25-Jan-75
	DEPTH (m)	1885.2
	SPUD RE DATE	20-Dec-74
	RIG RELEASE DATE	25-Jan-75
Site Information	Environmental Sensitivity	7 (1) (a), Parks and park withdrawals
	Protected Areas Descriptive	Not located in a protected area
	Oil and Gas Dispositions #	EL419
	Oil and Gas Dispositions - Name	PETRO-CANADA
	Kokelj and Geonorth 2002 Assessment Finding	0
Visit	Well Site Visited by AMEC in Summer 2004 (Date)	No - aerial recon only, no place to land the chopper safely.
Drill Sump Summary	Type of Mud System Used	GelChem
	Estimated Sump Volume (m3)	2450.76
	Estimated Date of Sump Construction	20-Nov-74
	Estimated Date of Sump Capping	24-Feb-75
	Estimated Number of Days Open	96

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form	KIKORALOK N-46

Table	Field	Data
	Season of Operation	Winter
	Number of Sump Seasons	Not Available
	INAC Inspection Report	Not Available
Drill Sump Data	Drill Sump Capped Area (m2)	About 2000 m2
	Drill Sump Cap Thickness and Height Above Ground (m)	3
	Drill Sump Cap Materials	Native soil
	Drill Sump Slope Position Location	Level
	Drill Sump Cap Vegetation Cover (%)	>50%
	Drill Sump Cap Dominant Vegetation Type, Description and Vegetation Heights	0.1 - 2.0m, Shrubs, grasses, willows
	Description of and extent of Sloughing of Drill Sump Cap	None
	Description of and extent of Drill Sump Cap Perimeter Cracking	Cracking along about 25 m
	Description of and extent of subsidence on Drill Sump Cap	None
	Drill Sump Number of Ponds and Location	Large pond adjacent cap, includes wellhead area.
	Extent of Ponding	0
	Depth of Ponded Water (m)	<1.5
	Drill Sump Pond Dominant Vegetation Type / Description	Submerged Upland Species- Grasses, Shrubs- willows
Camp Sump Data	Camp Sump Area (m2)	0
	Camp Sump Cap Thickness and Height Above Ground (m)	0
	Camp Sump Cap Materials	0
	Camp Sump Slope Position Location	0
	Camp Sump Cap Vegetation Cover (%)	0
	Camp Sump Cap Dominant Vegetation Type and Vegetation Heights	0
	Description of and extent of Sloughing of Camp Sump Cap	0
	Description of and extent of Camp Sump Cap Perimeter Cracking	0
	Description of and extent of subsidence on Camp Sump Cap	0
	Camp Sump Number of Ponds and Location	0

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form		KIKORALOK N-46
Table	**Field**	**Data**
	Extent of Ponding (exact percentage to be provided after mapping)	0
	Depth of Ponded Water	0
	Camp Sump Pond Dominant Vegetation Type / Description	0
Lease Data	Lease Area (m2)	0
	Lease Thickness and Height Above Adjacent Ground (m)	Original surface
	Lease Materials	Native soil
	Lease Slope Position	Level
	Gravel Pad Thickness (m)	None
	Gravel Pad Area (m2)	None
	Gravel Pad Ponding Area (m2)	None
	Gravel Pad Subsidence (m2) and Description	None
	Piling Type (material) and Location	None
	Equipment Present?	NO
	Equipment Types and Location	N/A
	Lease Vegetation Cover (%)	>50%
	Lease Dominant Vegetation Type, Description and Vegetation Heights	Grasses, sedges, small shrubs
	Extent and Description of Sloughing at Lease Perimeter	None
	Degree and Description of Lease Erosion	None
	Lease Number of Ponds and Location	One large pond wraps around 2 edges of the sump cap.
	Extent of Ponding (exact area to be provided after mapping)	0
	Depth of Ponded Water (m)	<1.5
	Lease Pond Dominant Vegetation Type / Description	Submerged Upland Species- grasses, willows
Surrounding Area Observations	Local Surface Expression	Level
	Physiographic Region	Mackenzie Delta
	Dominant Adjacent Vegetation Type and Heights	Low willows, grasses in flooded areas.
Receptors	Proximity to Nearest Natural Water Body (m)	900
	Nearest Natural Water Body Name	Lake

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form	KIKORALOK N-46

Table	Field	Data
	Does the Lease Drain to this Natural Water Body?	No
	Surface Drainage Direction	All directions
	Description of Bird Activity in the Area	0
	Description of Animal Activity in the Area	0
	Description of Human Activity in the Area	0
Visible Contaminants	Aerial Extent of Visible Salt Impacts (m2) and Description	None noted from the air.
	Aerial Extent of Visible Iron Staining (m2) and Description	None noted from the air.
	Aerial Extent of Drill Sump Related Visible Hydrocarbon Impacts(m2) and Description	None noted from the air.
	Description of EM Survey - Elevated ground conductivity	0
	Description of Solid Wastes Present on the Lease and Description	None noted from the air.
Associated Data - Samples, Photos, Active Layer, EM Survey	Active Layer Thickness Survey Conducted?	NO
	No. of Water Samples Collected	None
	No. of Soil Samples Collected	None
	EM 38 Survey Conducted?	NO
	EM 31 Survey Conducted?	NO
	Site Features Survey Conducted?	NO
	Site Photographs Obtained?	YES

Government of Canada

Environmental Studies Research Funds
ESRF-04-046 Regional Sump Study Project

AMEC Earth & Environmental
Site Assessment Form

TUNUNUK F-30

Table	Field	Data
Well Name	WELL NAME	**TUNUNUK F-30**
	WID	1029
Current Ownership	Owner Confirmation of Well Ownership Received	Yes
	Potential Orphan Based on Minor Interest Holder	No
	Potential Orphan Based on Majority Interest Holder	No
	Current Well Owner (Preliminary)	ConocoPhillips
Data Provided by the National Energy Board (July 2004)	Consortium Identified by NEB	GULF IMP SHELL
	UWI	300F306900134300
	CLASS	Exploratory
	STATUS	Plug and abandoned
	LATITUDE	68.98944444
	LONGITUDE	-134.6119444
	NEB REGION Designation	Northwest Territories - Mackenzie Delta - Onshore
	Onshore or Offshore	On-Shore
	ORIGINAL SPUD DATE	05-Apr-76
	ORIGINAL RR DATE	06-Jul-76
	DEPTH (m)	3642.4
	SPUD RE DATE	05-Apr-76
	RIG RELEASE DATE	06-Jul-76
Site Information	Environmental Sensitivity	7 (1) (a), Parks and park withdrawals
	Protected Areas Descriptive	Not located in a protected area
	Oil and Gas Dispositions #	999
	Oil and Gas Dispositions - Name	Inuvialuit are surface and subsurface owners
	Kokelj and Geonorth 2002 Assessment Finding	Not assessed
Visit	Well Site Visited by AMEC in Summer 2004 (Date)	20-Aug-04
Drill Sump Summary	Type of Mud System Used	GelChem
	Estimated Sump Volume (m3)	4735.12
	Estimated Date of Sump Construction	06-Mar-76
	Estimated Date of Sump Capping	05-Aug-76
	Estimated Number of Days Open	152

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form	TUNUNUK F-30

Table	Field	Data
	Season of Operation	Spring
	Number of Sump Seasons	Not Available
	INAC Inspection Report	Not Available
Drill Sump Data	Drill Sump Capped Area (m2)	5945
	Drill Sump Cap Thickness and Height Above Ground (m)	6
	Drill Sump Cap Materials	Gravel, silt
	Drill Sump Slope Position Location	Level, sump elevated from lease area
	Drill Sump Cap Vegetation Cover (%)	>50%
	Drill Sump Cap Dominant Vegetation Type, Description and Vegetation Heights	0.1-2.5m- Shrubs, grasses, forbs, willows.
	Description of and extent of Sloughing of Drill Sump Cap	None
	Description of and extent of Drill Sump Cap Perimeter Cracking	None
	Description of and extent of subsidence on Drill Sump Cap	None
	Drill Sump Number of Ponds and Location	Small pond (232 m2 at south edge of sump cap. Pond is stagnant.
	Extent of Ponding	Minor (0-20%)
	Depth of Ponded Water (m)	<1.5m
	Drill Sump Pond Dominant Vegetation Type / Description	Pond is stagnant and plugged full of aquatic vegetation.
Camp Sump Data	Camp Sump Area (m2)	Not investigated
	Camp Sump Cap Thickness and Height Above Ground (m)	Not investigated
	Camp Sump Cap Materials	Not investigated
	Camp Sump Slope Position Location	Not investigated
	Camp Sump Cap Vegetation Cover (%)	Not investigated
	Camp Sump Cap Dominant Vegetation Type and Vegetation Heights	Not investigated
	Description of and extent of Sloughing of Camp Sump Cap	Not investigated
	Description of and extent of Camp Sump Cap Perimeter Cracking	Not investigated
	Description of and extent of subsidence on Camp Sump Cap	Not investigated
	Camp Sump Number of Ponds and Location	Not investigated

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form	TUNUNUK F-30

Table	Field	Data
	Extent of Ponding (exact percentage to be provided after mapping)	Not investigated
	Depth of Ponded Water	Not investigated
	Camp Sump Pond Dominant Vegetation Type / Description	Not investigated
Lease Data	Lease Area (m2)	Lease boundary not clear
	Lease Thickness and Height Above Adjacent Ground (m)	Lease is level with surrounding ground.
	Lease Materials	Native soils.
	Lease Slope Position	Level
	Gravel Pad Thickness (m)	None
	Gravel Pad Area (m2)	None
	Gravel Pad Ponding Area (m2)	None
	Gravel Pad Subsidence (m2) and Description	None
	Piling Type (material) and Location	Few (about 10) piles around the wellhead area.
	Equipment Present?	NO
	Equipment Types and Location	N/A
	Lease Vegetation Cover (%)	>50%
	Lease Dominant Vegetation Type, Description and Vegetation Heights	0.1-2.5m- Shrubs, grasses, forbs
	Extent and Description of Sloughing at Lease Perimeter	None
	Degree and Description of Lease Erosion	None
	Lease Number of Ponds and Location	2, NE area
	Extent of Ponding (exact area to be provided after mapping)	Minor (0-20%)- stagnant, ponds are in a ditch type structure
	Depth of Ponded Water (m)	<1.5 m
	Lease Pond Dominant Vegetation Type / Description	Aquatic species and submerged upland species - grasses, shrubs, sedges and willows .
Surrounding Area Observations	Local Surface Expression	Flat
	Physiographic Region	Mackenzie Delta
	Dominant Adjacent Vegetation Type and Heights	0-0.5m- Grasses, Shrubs, Lichen, Mosses
Receptors	Proximity to Nearest Natural Water Body (m)	400
	Nearest Natural Water Body Name	Unnamed lake east, Mackenzie River west

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form	TUNUNUK F-30

Table	Field	Data
	Does the Lease Drain to this Natural Water Body?	NO
	Surface Drainage Direction	W
	Description of Bird Activity in the Area	Small birds, geese overhead
	Description of Animal Activity in the Area	Moose and Caribou sign
	Description of Human Activity in the Area	No recent evidence
Visible Contaminants	Aerial Extent of Visible Salt Impacts (m2) and Description	None
	Aerial Extent of Visible Iron Staining (m2) and Description	None
	Aerial Extent of Drill Sump Related Visible Hydrocarbon Impacts(m2) and Description	None, sheen on south pond observed- suspected to be natural
	Description of EM Survey - Elevated ground conductivity	One small EM anomaly (twice background - 40) was found adjacent to the slough at the NW corner of the sump.
	Description of Solid Wastes Present on the Lease and Description	None
Associated Data - Samples, Photos, Active Layer, EM Survey	Active Layer Thickness Survey Conducted?	YES, impeded by gravel in places.
	No. of Water Samples Collected	None (water was very stagnant)
	No. of Soil Samples Collected	2
	EM 38 Survey Conducted?	Yes
	EM 31 Survey Conducted?	No
	Site Features Survey Conducted?	YES
	Site Photographs Obtained?	YES

Government of Canada

Environmental Studies Research Funds
ESRF-04-046 Regional Sump Study Project

AMEC Earth & Environmental
Site Assessment Form

OGRUKNANG M-31

Table	Field	Data
Well Name	WELL NAME	**OGRUKNANG M-31**
	WID	1072
Current Ownership	Owner Confirmation of Well Ownership Received	Yes
	Potential Orphan Based on Minor Interest Holder	No
	Potential Orphan Based on Majority Interest Holder	No
	Current Well Owner (Preliminary)	ConocoPhillips
Data Provided by the National Energy Board (July 2004)	Consortium Identified by NEB	GULF MOBIL
	UWI	300M316900134150
	CLASS	Exploratory
	STATUS	Plug and abandoned
	LATITUDE	68.84780556
	LONGITUDE	-134.4140278
	NEB REGION Designation	Northwest Territories - Mackenzie Delta - Onshore
	Onshore or Offshore	On-Shore
	ORIGINAL SPUD DATE	18-Apr-77
	ORIGINAL RR DATE	01-Aug-77
	DEPTH (m)	4429.4
	SPUD RE DATE	18-Apr-77
	RIG RELEASE DATE	01-Aug-77
Site Information	Environmental Sensitivity	7 (1) (a), Parks and park withdrawals
	Protected Areas Descriptive	Not located in a protected area
	Oil and Gas Dispositions #	999
	Oil and Gas Dispositions - Name	Inuvialuit are surface and subsurface owners
	Kokelj and Geonorth 2002 Assessment Finding	Not assessed
Visit	Well Site Visited by AMEC in Summer 2004 (Date)	18-Aug-04
Drill Sump Summary	Type of Mud System Used	GelChem
	Estimated Sump Volume (m3)	5758.22
	Estimated Date of Sump Construction	19-Mar-77
	Estimated Date of Sump Capping	31-Aug-77
	Estimated Number of Days Open	165

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form	OGRUKNANG M-31	
Table	**Field**	**Data**
	Season of Operation	Spring
	Number of Sump Seasons	Not Available
	INAC Inspection Report	Not Available
Drill Sump Data	Drill Sump Capped Area (m2)	7264
	Drill Sump Cap Thickness and Height Above Ground (m)	6
	Drill Sump Cap Materials	Gravel & sand
	Drill Sump Slope Position Location	Level
	Drill Sump Cap Vegetation Cover (%)	10-25%
	Drill Sump Cap Dominant Vegetation Type, Description and Vegetation Heights	0.1-0.5 m -Grasses, Forbs
	Description of and extent of Sloughing of Drill Sump Cap	None
	Description of and extent of Drill Sump Cap Perimeter Cracking	None
	Description of and extent of subsidence on Drill Sump Cap	Minor (0-20%), some subsidence but no ponding
	Drill Sump Number of Ponds and Location	Long narrow pond at north edge of sump cap.
	Extent of Ponding	Minor (0-20%)
	Depth of Ponded Water (m)	<1.5
	Drill Sump Pond Dominant Vegetation Type / Description	Submerged Upland Species- forbs, willows
Camp Sump Data	Camp Sump Area (m2)	Not investigated
	Camp Sump Cap Thickness and Height Above Ground (m)	Not investigated
	Camp Sump Cap Materials	Not investigated
	Camp Sump Slope Position Location	Not investigated
	Camp Sump Cap Vegetation Cover (%)	Not investigated
	Camp Sump Cap Dominant Vegetation Type and Vegetation Heights	Not investigated
	Description of and extent of Sloughing of Camp Sump Cap	Not investigated
	Description of and extent of Camp Sump Cap Perimeter Cracking	Not investigated
	Description of and extent of subsidence on Camp Sump Cap	Not investigated
	Camp Sump Number of Ponds and Location	Not investigated

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form	OGRUKNANG M-31

Table	Field	Data
	Extent of Ponding (exact percentage to be provided after mapping)	Not investigated
	Depth of Ponded Water	Not investigated
	Camp Sump Pond Dominant Vegetation Type / Description	Not investigated
Lease Data	Lease Area (m2)	21846
	Lease Thickness and Height Above Adjacent Ground (m)	1
	Lease Materials	Gravel and sand
	Lease Slope Position	Mid-slope
	Gravel Pad Thickness (m)	2
	Gravel Pad Area (m2)	26304
	Gravel Pad Ponding Area (m2)	None
	Gravel Pad Subsidence (m2) and Description	Patterned ground is emerging at the west end of the lease
	Piling Type (material) and Location	Few (about 10) piles around the wellhead area. These have heaved due to frost action.
	Equipment Present?	NO
	Equipment Types and Location	N/A
	Lease Vegetation Cover (%)	10-25%
	Lease Dominant Vegetation Type, Description and Vegetation Heights	0.2-2.0m- Small trees along sump cap perimeter, shrubs, grasses and forbs
	Extent and Description of Sloughing at Lease Perimeter	None
	Degree and Description of Lease Erosion	None
	Lease Number of Ponds and Location	Ponding in constructed ditches north and east of drill sump.
	Extent of Ponding (exact area to be provided after mapping)	Minor (0-20%)
	Depth of Ponded Water (m)	<1.5
	Lease Pond Dominant Vegetation Type / Description	Submerged upland species - trees, willows and dogwood.
Surrounding Area Observations	Local Surface Expression	Terraced, site on upland above Mackenzie River East Channel
	Physiographic Region	North Caribou Hills
	Dominant Adjacent Vegetation Type and Heights	0-0.5m-Lichen, mosses, small shrubs(blueberry, etc.)
Receptors	Proximity to Nearest Natural Water Body (m)	378
	Nearest Natural Water Body Name	Not named

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form		OGRUKNANG M-31
Table	**Field**	**Data**
	Does the Lease Drain to this Natural Water Body?	No
	Surface Drainage Direction	SW
	Description of Bird Activity in the Area	Ptarmigan, other small birds
	Description of Animal Activity in the Area	Caribou tracks
	Description of Human Activity in the Area	None
Visible Contaminants	Aerial Extent of Visible Salt Impacts (m2) and Description	None
	Aerial Extent of Visible Iron Staining (m2) and Description	None
	Aerial Extent of Drill Sump Related Visible Hydrocarbon Impacts(m2) and Description	None
	Description of EM Survey - Elevated ground conductivity	EM survey covered entire cap and perimeter. No anomalies were recorded.
	Description of Solid Wastes Present on the Lease and Description	None
Associated Data - Samples, Photos, Active Layer, EM Survey	Active Layer Thickness Survey Conducted?	YES, partialyl conducted by hand auger, limited by gravel .
	No. of Water Samples Collected	2
	No. of Soil Samples Collected	0
	EM 38 Survey Conducted?	Yes
	EM 31 Survey Conducted?	No
	Site Features Survey Conducted?	YES
	Site Photographs Obtained?	YES

Government of Canada

Environmental Studies Research Funds
ESRF-04-046 Regional Sump Study Project

AMEC Earth & Environmental
Site Assessment Form

KURK M-15

Table	Field	Data
Well Name	WELL NAME	**KURK M-15**
	WID	1901
Current Ownership	Owner Confirmation of Well Ownership Received	Yes
	Potential Orphan Based on Minor Interest Holder	No
	Potential Orphan Based on Majority Interest Holder	No
	Current Well Owner (Preliminary)	Petro-Canada
Data Provided by the National Energy Board (July 2004)	Consortium Identified by NEB	PC ANDERSON
	UWI	300M156910135152
	CLASS	Exploratory
	STATUS	Plug and abandoned
	LATITUDE	69.08091667
	LONGITUDE	-135.32325
	NEB REGION Designation	Northwest Territories - Mackenzie Delta - Onshore
	Onshore or Offshore	On-Shore
	ORIGINAL SPUD DATE	10-Feb-01
	ORIGINAL RR DATE	16-Feb-02
	DEPTH (m)	3093
	SPUD RE DATE	07-Jan-02
	RIG RELEASE DATE	16-Feb-02
Site Information	Environmental Sensitivity	Not located in environmentally sensitive area
	Protected Areas Descriptive	Not located in a protected area
	Oil and Gas Dispositions #	EL419
	Oil and Gas Dispositions - Name	PETRO-CANADA
	Kokelj and Geonorth 2002 Assessment Finding	Not assessed
Visit	Well Site Visited by AMEC in Summer 2004 (Date)	21-Aug-04
Drill Sump Summary	Type of Mud System Used	Unknown
	Estimated Sump Volume (m3)	4020.9
	Estimated Date of Sump Construction	08-Dec-01
	Estimated Date of Sump Capping	18-Mar-02
	Estimated Number of Days Open	100

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form	KURK M-15	
Table	**Field**	**Data**
	Season of Operation	Winter
	Number of Sump Seasons	Not Available
	INAC Inspection Report	Not Available
Drill Sump Data	Drill Sump Capped Area (m2)	1357
	Drill Sump Cap Thickness and Height Above Ground (m)	2.5
	Drill Sump Cap Materials	Silt and Peat
	Drill Sump Slope Position Location	Level- Delta
	Drill Sump Cap Vegetation Cover (%)	< 1%
	Drill Sump Cap Dominant Vegetation Type, Description and Vegetation Heights	2-10cm- Grasses
	Description of and extent of Sloughing of Drill Sump Cap	Seasonal flooding has resulted in some erosion along all edges of the sump cap.
	Description of and extent of Drill Sump Cap Perimeter Cracking	Minor (0-20%)- fine cracking around perimeter, none on top, could be a result of consolidation of loosely placed cap materials
	Description of and extent of subsidence on Drill Sump Cap	Minor (0-20%)- cap is not compact, very loose and soft materials. Top of the sump is flat with some shallow depressions
	Drill Sump Number of Ponds and Location	None
	Extent of Ponding	None
	Depth of Ponded Water (m)	None
	Drill Sump Pond Dominant Vegetation Type / Description	None
Camp Sump Data	Camp Sump Area (m2)	Not investigated
	Camp Sump Cap Thickness and Height Above Ground (m)	Not investigated
	Camp Sump Cap Materials	Not investigated
	Camp Sump Slope Position Location	Not investigated
	Camp Sump Cap Vegetation Cover (%)	Not investigated
	Camp Sump Cap Dominant Vegetation Type and Vegetation Heights	Not investigated
	Description of and extent of Sloughing of Camp Sump Cap	Not investigated
	Description of and extent of Camp Sump Cap Perimeter Cracking	Not investigated
	Description of and extent of subsidence on Camp Sump Cap	Not investigated
	Camp Sump Number of Ponds and Location	Not investigated

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form	KURK M-15

Table	Field	Data
	Extent of Ponding (exact percentage to be provided after mapping)	Not investigated
	Depth of Ponded Water	Not investigated
	Camp Sump Pond Dominant Vegetation Type / Description	Not investigated
Lease Data	Lease Area (m2)	Lease boundary not clear
	Lease Thickness and Height Above Adjacent Ground (m)	Original surface
	Lease Materials	Flooded - grass species
	Lease Slope Position	Level
	Gravel Pad Thickness (m)	None
	Gravel Pad Area (m2)	None
	Gravel Pad Ponding Area (m2)	None
	Gravel Pad Subsidence (m2) and Description	None
	Piling Type (material) and Location	None
	Equipment Present?	NO
	Equipment Types and Location	N/A
	Lease Vegetation Cover (%)	>50%
	Lease Dominant Vegetation Type, Description and Vegetation Heights	Aquatic Species
	Extent and Description of Sloughing at Lease Perimeter	None
	Degree and Description of Lease Erosion	None
	Lease Number of Ponds and Location	Large pond at north end of sump cap may be a result of overscraping the fill material area.
	Extent of Ponding (exact area to be provided after mapping)	Minor (0-20%)
	Depth of Ponded Water (m)	<1.5m
	Lease Pond Dominant Vegetation Type / Description	Aquatic Species- delta
Surrounding Area Observations	Local Surface Expression	Flat
	Physiographic Region	Mackenzie Delta
	Dominant Adjacent Vegetation Type and Heights	0.1-.25m- Aquatic species
Receptors	Proximity to Nearest Natural Water Body (m)	Adjacent
	Nearest Natural Water Body Name	Mackenzie Delta

Government of Canada Environmental Studies Research Funds ESRF-04-046 Regional Sump Study Project AMEC Earth & Environmental Site Assessment Form	KURK M-15

Table	Field	Data
	Does the Lease Drain to this Natural Water Body?	YES
	Surface Drainage Direction	All directions
	Description of Bird Activity in the Area	Numerous tracks, feathers and broken eggs
	Description of Animal Activity in the Area	Bear and moose tracks
	Description of Human Activity in the Area	None
Visible Contaminants	Aerial Extent of Visible Salt Impacts (m2) and Description	Salt is evident on dryed cap soil.
	Aerial Extent of Visible Iron Staining (m2) and Description	A small amount (5m2) on west side appears to be natural
	Aerial Extent of Drill Sump Related Visible Hydrocarbon Impacts(m2) and Description	None
	Description of EM Survey - Elevated ground conductivity	EM anomalies (3 x background (>80)) at SE corner and along the west edge of the sump cap.
	Description of Solid Wastes Present on the Lease and Description	Several plastic bags
Associated Data - Samples, Photos, Active Layer, EM Survey	Active Layer Thickness Survey Conducted?	YES
	No. of Water Samples Collected	2
	No. of Soil Samples Collected	4
	EM 38 Survey Conducted?	YES
	EM 31 Survey Conducted?	No
	Site Features Survey Conducted?	YES
	Site Photographs Obtained?	YES

Table : ESRF Sumps - Drilling Mud Additives

Sump Location	Mud Additives		
ATIGI O-48	Barites	92,253	kg
	Gel	76,499	kg
	Caustic	3,087	kg
	Soda Ash	1,634	kg
	Benex	103	kg
	Potash	69,371	kg
	Kelzan XC	3,337	kg
	Q Broxin	3,223	kg
	Bicarb	817	kg
	Sodium Nitrate	272	kg
KIKORALOK N-46	Gel	22,609	kg
	Barites	32,870	kg
	Benex	65	kg
	Q Broxin	1,430	kg
	Caustic	1,249	kg
	Kelzan	795	kg
	K.C.L.	21,610	kg
	Bicarb	363	kg
	Soda Ash	817	kg
	Sodium Nitrate	272	kg
KURK M-15	No Mud information available		
OGRUKNANG M-31	Barite	107,099	kg
	Gel	158,673	kg
	Caustic	4,222	kg
	Lime	272	kg
	Benex	533	kg
	Q-Broxin	114	kg
	Potash	65,580	kg
	Bicarb	499	kg
	Separan	45	kg
	Staflo	2,838	kg
	Potassium Iodide	129	kg
	Kwikseal	1,816	kg
REINDEER D-27	Aquagel	163,236	kg
	Baroid	491,319	kg
	Q-Broxin	2,020	kg
	Caustic	6,090	kg
	Carbonox	7,366	kg
	Cellex Hi Viscosity	91	kg
	Cellex Regular	443	kg
	Quick Gel	613	kg
	Bicarbonate of Sodium	953	kg
	Pep. Stretch	1	Gallons
	Detergent A	25	Gallons
	Lime	68	kg
	Aluminum Stearate	2	kg
SIKU C-55	Barite	12,041	Sacks
	Benex	37	Sacks
	Bicarb	18	Sacks
	Carbonex	9	Sacks
	Caustic	403	Sacks
	Cellophane	45	Sacks
	CMC	25	Sacks
	Diesel	18	Barrels
	Drispac Reg	1	Sacks
	Gel	2,913	Sacks
	KCL	861	Sacks

Table : ESRF Sumps - Drilling Mud Additives

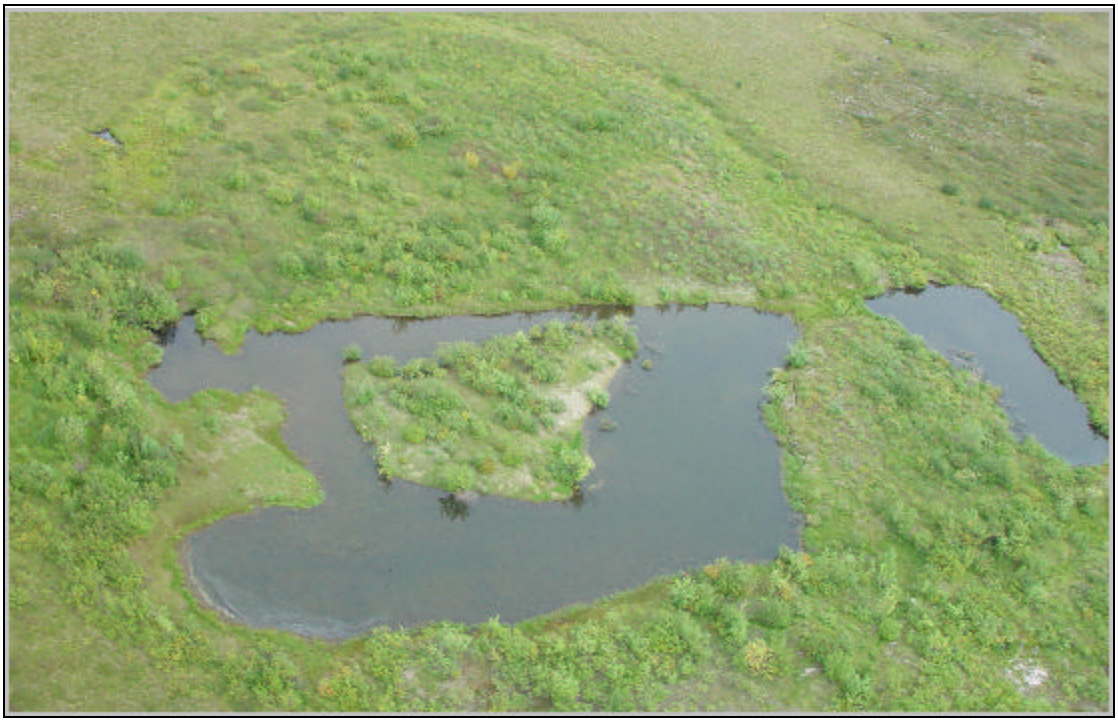
Sump Location	Mud Additives		
	Kelzan	17	Sacks
	Kwik Seal	40	Sacks
	Lime	2	Sacks
	Mil Gel	213	Sacks
	Peltex	29	Sacks
	Q-Broxin	183	Sacks
	Scot-free	2	Barrels
	Soda Ash	5	Sacks
	Super Cal	1,516	Sacks
	Unical	214	Sacks
	Surflo	5	Gallons
	Wt. Material	2,959	Sacks
	XC Polymer	169	Sacks
TOAPOLOK H-24	Gel	69,190	kg
	Barites	240,620	kg
	Benex	116	kg
	Q-Broxin	2,656	kg
	Caustic	2,020	kg
	Kelzan	817	kg
	K.C.L.	55,161	kg
	Bicarb	1,998	kg
	Soda Ash	2,406	kg
	Sodium Nitrate	34	kg
	Calcium Chloride	291	kg
	Kwikseal	1,362	kg
	Walnut	568	kg
	Cellex	363	kg
	Diesel Oil	4,625	Gallons
TUNUNUK F-30	Barite	162,941	kg
	Gel	79,995	kg
	Caustic	4,676	kg
	Benex	94	kg
	Q-Broxin	1,544	kg
	Soda Ash	499	kg
	Potash	36,365	kg
	Bicarb	1,044	kg
	CMC	1,816	kg
	Staflo	5,108	kg
	Potassium Iodide	52	kg
	Walnut	568	kg
YA-YA M-33	No Mud information available		
YA-YA M-53	No Mud information available		

Appendix E

Site Visit Photographs

1
ESRF - C-55 - 0408190036.JPG - Field Data Form, August 2004

2
ESRF - C-55 - 0408190040.JPG - Aerial, August 2004



3
ESRF - C-55 - 0408190042.JPG - Aerial, August 2004

4
ESRF - C-55 - 0408190045.JPG – Aerial of Solid Waste, August 2004

5
ESRF - C-55 - 0408190043.JPG – Aerial of Wellhead & Piles, August 2004

6
ESRF-C-55-0408190057.JPG - 69.067775921, -133.735547028 - Wellhead, August 2004

7

ESRF-C-55-0408190078.JPG - 69.068233255, -133.735533753 - Mud Sump, August 2004

8

ESRF - C-55 - 0408190004.JPG – Mud Sump/Submerged Willow, August 2004

9
ESRF - C-55 - 0408190005.JPG – Sump Pond, August 2004

10
ESRF-C-55-0408190070.JPG - 69.06870049, -133.736940283 - Cracking, August 2004

11
ESRF - C-55 - 0408190009.JPG - Salt Staining, August 2004

12
ESRF-C-55-0408190067.JPG - 69.068132573, -133.736695162 - Solid Waste, August 2004

13
ESRF-C-55-0408190065.JPG - 69.067775921, -133.735547028 - Piles, August 2004

14
ESRF-C-55-0408190049.JPG - 69.06929799, -133.735515162 - Active layer survey point, August 2004

15
ESRF - D-27 - 0408190034.JPG - Aerial, August 2004

16
ESRF - D-27 - 0408190036.JPG - Aerial, August 2004

17
ESRF - D-27 - 0408190038.JPG – Aerial, August 2004

18
ESRF-D-27-0408210031.JPG - 69.099904565, -134.619559895 - Wellhead/Sloughing, August 2004

19
ESRF - D-27 - 0408210025.JPG – Submerged vegetation at sump edge, August 2004

20
ESRF - D-27 - Wellhead.JPG – Wellhead - August 2004

21
ESRF - D-27 - 0408210026.JPG - Wellhead Sign, August 2004

22
ESRF-D-27-0408210021.JPG - 69.0995452, -134.6184926 - Vegetation on sump edge, August 2004

23
ESRF-D-27-0408210014.JPG - 69.09933753, -134.618716174 - Solid Waste, August 2004

24
ESRF-D-27-0408210003.JPG - 69.099530422, -134.617432486 - Solid Waste/ Piping, August 2004

25
ESRF - F-30 - 0408180034.JPG - Aerial, August 2004

26
ESRF - F-30 - 0408180042.JPG - Aerial, August 2004

27
ESRF - F-30 - 0408180046.JPG - Aerial, August 2004

28

ESRF - F-30 - 0408200007.JPG - 68.988500901, -134.613389422 - Ponding, August 2004

29
ESRF - F-30 - 0408200031.JPG - 68.989091082, -134.617393371 - Soil sample, August 2004

30
ESRF-F-30-0408200016.JPG - 68.989267471, -134.614833044 - Piles, August 2004

31
ESRF - F-30 - 0408200027.JP G - 68.989349605, -134.614570831 - Piles, August 2004

32
ESRF - F-30 - C0408200006.JPG – Aerial of road, August 2004

33
ESRF - H-24 - 0408210005.JPG - Aerial, August 2004

34
ESRF - H-24 - 0408210015.JPG - Aerial, August 2004

35
ESRF - H-24 - 0408210008.JPG – Aerial of Mud Sump, August 2004

36
ESRF - H-24 - 0408210013.JPG – Aerial of Camp Sump, August 2004

37
ESRF - H-24 - DSCF0049.JPG - 69.221590143, -134.840758665 - Ponding, August 2004

38
ESRF - H-24 - DSCF0046.JPG - 69.221610611, -134.842289559 - EM Survey, August 2004

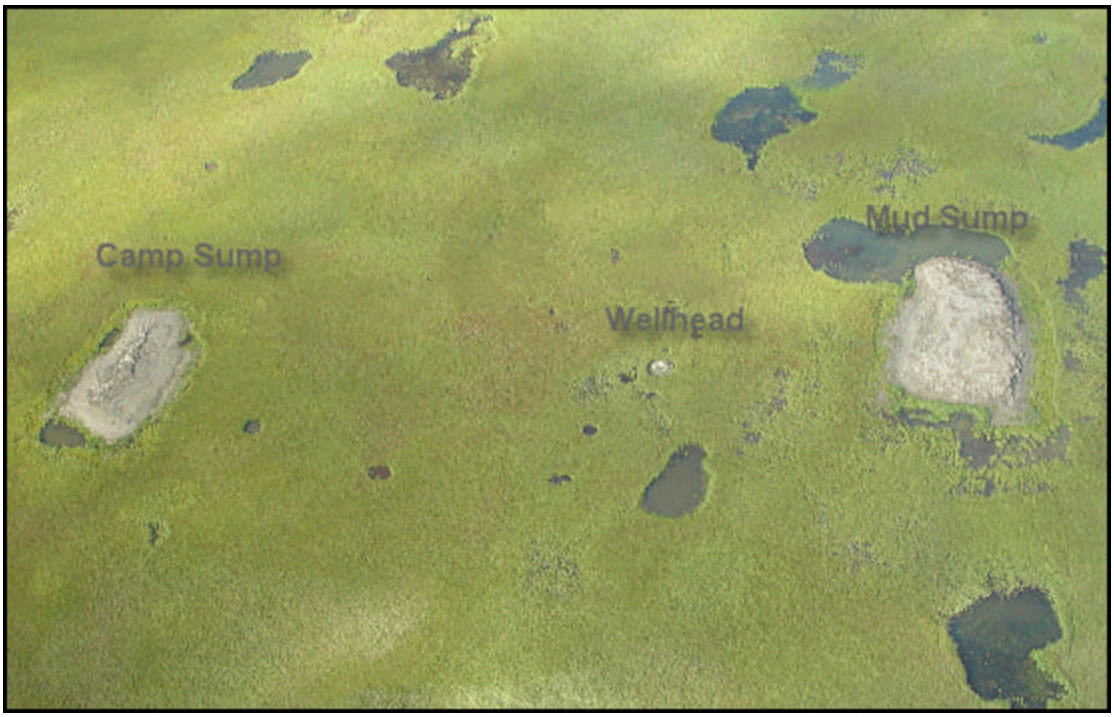
39
ESRF - H-24 - 0408210018.JPG - Instrumentation, August 2004

40
ESRF - H-24 - DSCF0051.JPG – Mud Sump Cap/Vegetation, August 2004

41
ESRF - H-24 - 0408210012.JPG – Aerial of Piles, August 2004

42
ESRF - H-24 - DSCF0043.JPG - 69.22222502, -134.842883898 – Gravel Lease/Vegetation, August 2004

43
ESRF - M-15 - 0408200053.JPG - Aerial, August 2004



44
ESRF-M-15-0408200052.JPG – Aerial, August 2004

45
ESRF - M-15 - 0408210039.JPG - 69.081130991, -135.324190867 – Mud Sump Cap, August 2004

46
ESRF - M-15 - 0408210043.JPG - 69.081130991, -135.324190867 - Ponding, August 2004

47
ESRF - M-15 - 0408210044.JPG - 69.081231597, -135.324237692 – Salt Staining, August 2004

48
ESRF - M-15 - 0408210045.JPG - 69.081329466, -135.324234594 - Cracking/Sloughing, August 2004

49
ESRF - M-15 - 0408210050.JPG - 69.080832505, -135.324646715 – Pipe Anchor, August 2004

50
ESRF - M-15 - bear1.JPG - Wildlife/Bear Print, August 2004

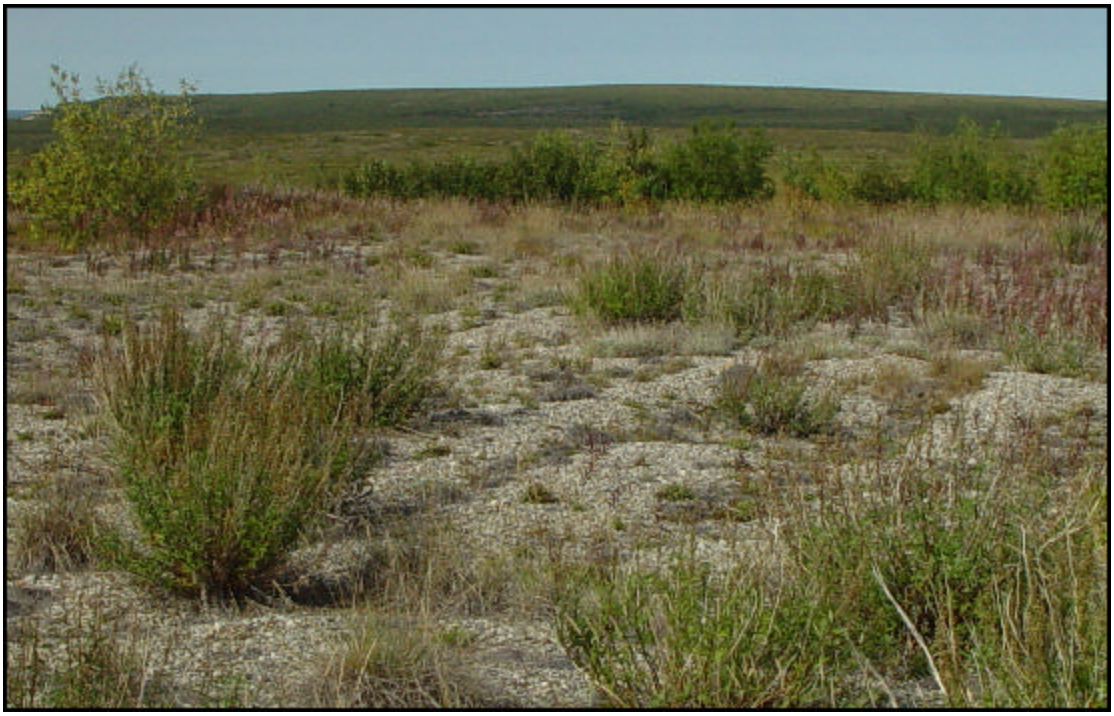
51
ESRF - M-31 - C0408180008.JPG - Aerial, August 2004

52

ESRF - M-31 - C0408180005.JPG – Aerial of Mud Sump, August 2004

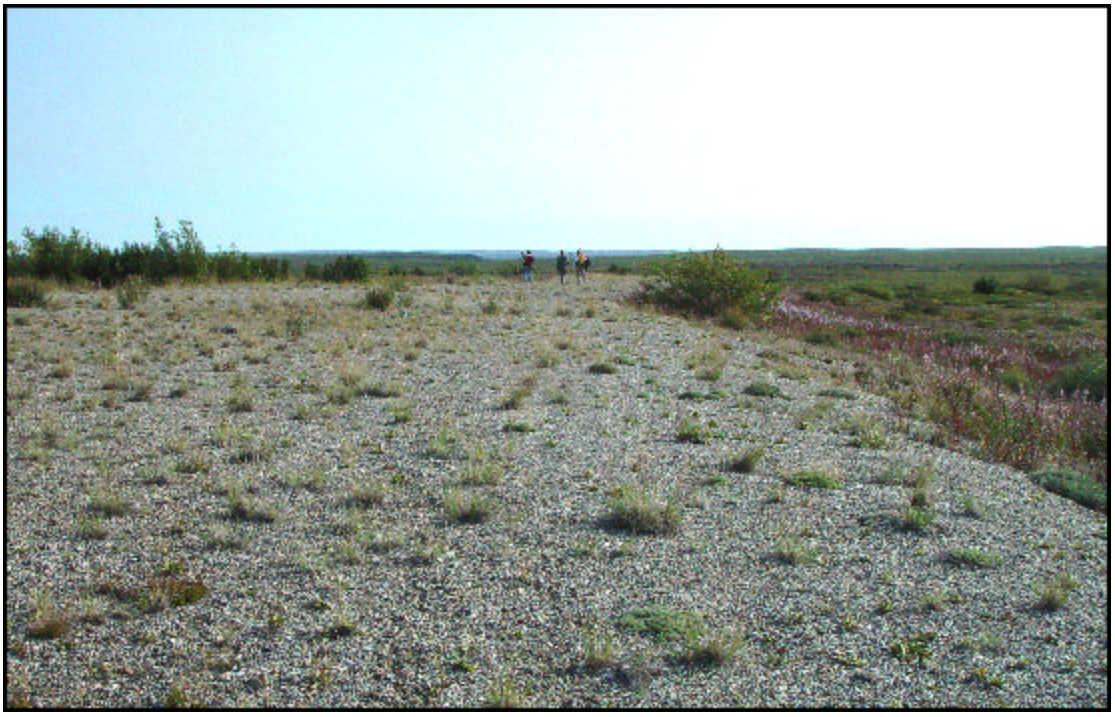
53
ESRF - M-31 - 0408180021.JPG – Mud Sump Cap/Vegetation, August 2004

54
ESRF - M-31 - 0408180030.JPG – Wellhead, August 2004



55
ESRF - M-31 - 0408180026.JPG – Subsidence on Mud Sump Cap, August 2004

56
ESRF - M-31 - 0408180018.JPG - Ponding/Vegetation, August 2004



57
ESRF - M-31 - 0408180011.JPG - 68.847415219, -134.418982303 - Gravel Lease, August 2004

58
ESRF - M-31 - 0408180029.JPG – Piles, August 2004

59
ESRF - M-33 - 0408210043.JPG - Aerial, August 2004

60
ESRF - M-33 - 0408210037.JPG – Aerial of Mud Sump, August 2004

61
ESRF - M-33 - 0408220014.JPG - 69.215570255, -134.665155723 – Wellhead Sign, August 2004

62
ESRF - M-33 - 0408220017.JPG – Sump/ Vegetation, August 2004

63
ESRF - M-33 - 0408220036.JPG - 69.215558482, -134.665084864 - Pond, August 2004

64
ESRF - M-33 - 0408220027.JPG - 69.215831857, -134.663230779 – Active Layer Survey, August 2004

65
ESRF - M-33 - 0408220005.JPG - 69.215325084, -134.664672924 - Active layer, August 2004

66
ESRF - M-33 - 0408220009.JPG - 69.21550024, -134.664080967 - Active Layer, August 2004

67
ESRF - N-46 - 0408200038.JPG - Aerial, August 2004

68
ESRF - N-46 - 0408200044.JPG - Aerial of Mud Sump, August 2004

69
ESRF - N-46 - 0408200046.JPG - Aerial of Mud Sump & Wellhead, August 2004

70
ESRF - N-46 - 0408200043.JPG - Aerial of Wellhead, August 2004

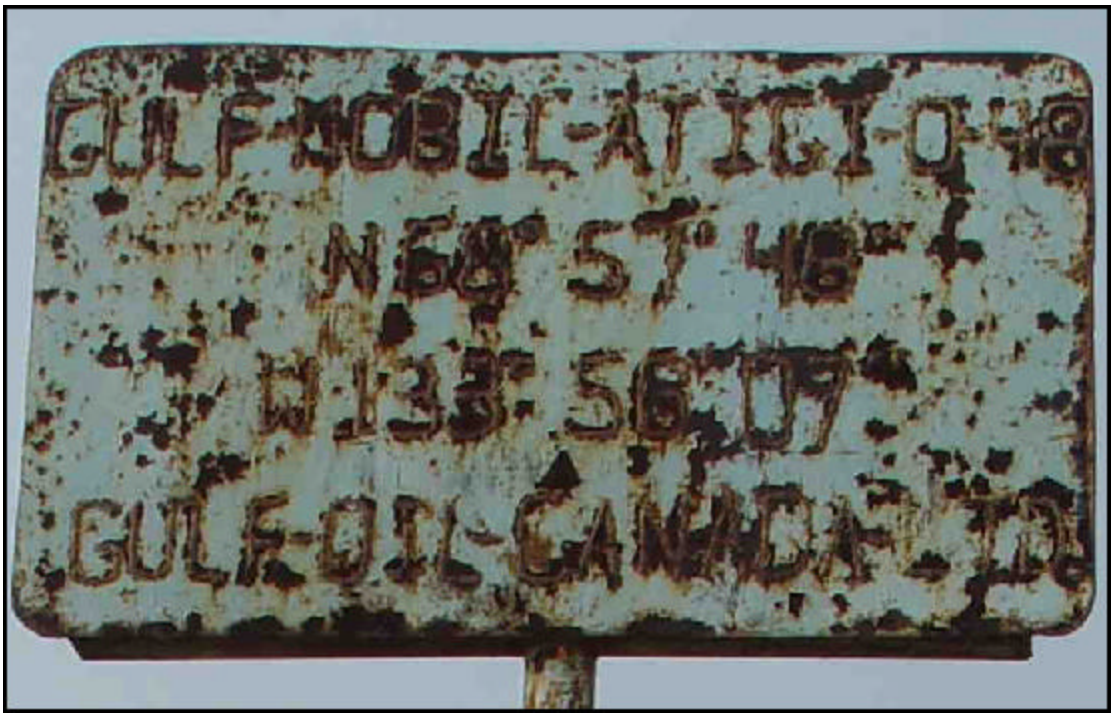
71
ESRF - O-48 - 0408180048.JPG - Aerial, August 2004

72
ESRF - O-48 - 0408180052.JPG - Aerial, August 2004

73
ESRF - O-48 - 0408180055.JPG – Aerial of Mud Sump, August 2004

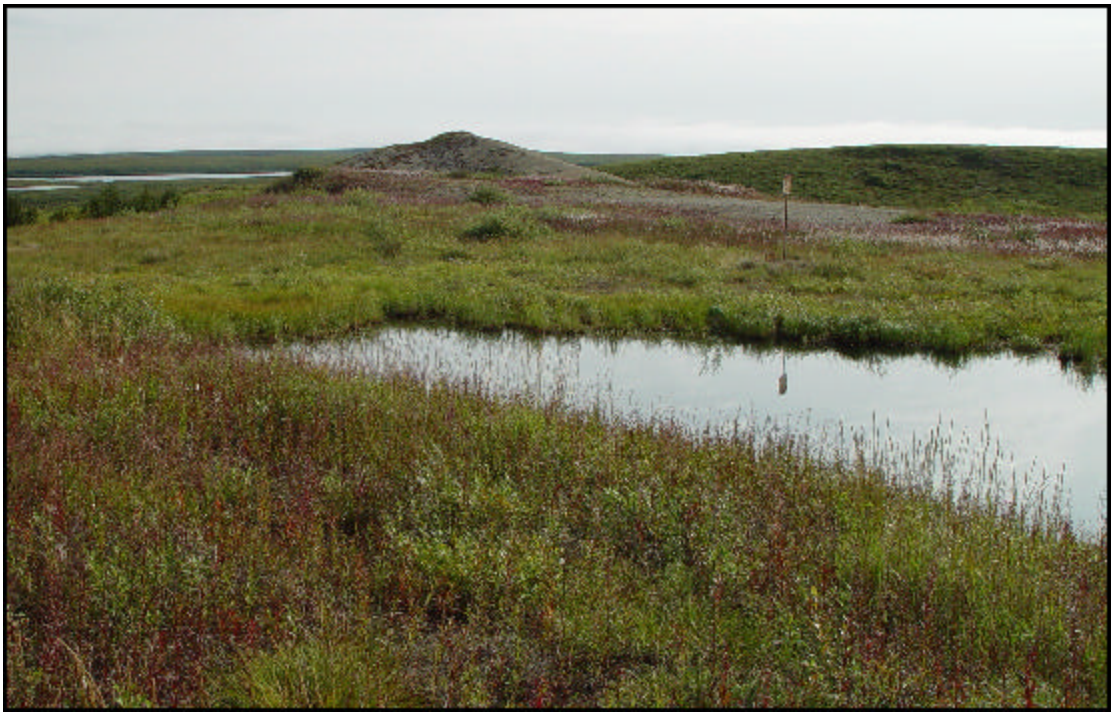
74
ESRF - O-48 - 0408180056.JPG – Aerial of Wellhead, August 2004

75
ESRF - O-48 - 0408190005.JPG - Wellhead, August 2004



76

ESRF - O-48 - 0408190005.JPG - Wellhead, August 2004



77
ESRF - O-48 - 0408190019.JPG – Mud Sump/Ponding, August 2004

78
ESRF - O-48 - 0408190021.JPG – Ponding/ Vegetation, August 2004

79
ESRF - O-48 - 0408190026.JPG – Soil Sample & Active Layer Tool, August 2004

80

ESRF - O-48 - 0408190008.JPG - 68.965427513, -133.942346478 - Pond, August 2004

81

ESRF - O-48 - 0408190013.JPG - 68.965175946, -133.941862776 - Lease vegetation, August 2004

82

ESRF - O-48 - 0408190016.JPG - 68.96563631, -133.942530032 – Salt staining, August 2004

83

ESRF - O-48 - 0408190015.JPG - 68.965790427, -133.942543399 - Cracking, August 2004

84

ESRF - O-48 - 0408190027.JPG - 68.965157302, -133.942206506 – Vegetation stress, August 2004

85
ESRF-P-53-0408210030.JPG - Aerial, August 2004

86
ESRF-P-53-0408210014.JPG - Wellhead, August 2004

87
ESRF-P-53-0408220043.JPG - 69.212587429, -134.716683343 - Wellhead Sign, August 2004

88
ESRF-P-53-0408210034.JPG - Sump sloughing/cracking around edge, August 2004

89
ESRF-P-53-0408220055.JPG - 69.212317346, -134.715738999 - Sloughing, August 2004

90
ESRF-P-53-0408220068.JPG - 69.212327092, -134.715862704 - EM survey, August 2004

91
ESRF-P-53-0408220067.JPG - 69.212770137, -134.717565935 - Active layer survey, August 2004

92
ESRF-P-53-0408220042.JPG - 69.212076009, -134.717017585 - Active layer survey, August 2004

93
ESRF-P-53-M33toP53Chris.JPG - Aerial, August 2004

94
ESRF-P-53-0408210031.JPG - Aerial, August 2004

Appendix F

Chain of Custody Records and Laboratory Reports

4810 - 93 Street
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Canada T6E 5M4
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ANALYTICAL REPORT

AMEC Earth & Environmental
221 - 18 Street SE
Calgary, AB T2E 6J5

Date Received: 2004/09/01
Date Sampled:
Report Date: 2004/09/17

Soil Analysis - ICP

Attention: Wenzel, Chris

Project No. CE02993 **File No.:** EC-47500

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	04-8037 O-48 Background	04-8038 F-30 Sump	04-8039 D-27 Sump	04-8040 C-55 Sump	04-8041 M-15 Background
DC	2004/09/13	Aluminum	µg/g (ppm)	EPA 3050/6010	5	1340	5670	2810	6600	10700
DC	2004/09/13	Arsenic	µg/g (ppm)	EPA 3050/6010	0.5	5.5	9.9	6.6	9.0	7.3
DC	2004/09/13	Barium	µg/g (ppm)	EPA 3050/6010	1	158	140	760	250	286
DC	2004/09/13	Cadmium	µg/g (ppm)	EPA 3050/6010	0.2	< 0.2	< 0.2	< 0.2	0.3	0.4
DC	2004/09/13	Calcium	µg/g (ppm)	EPA 3050/6010	5	165	12300	5740	8800	22300
DC	2004/09/13	Chromium	µg/g (ppm)	EPA 3050/6010	0.5	4.1	9.5	7.4	23.3	15.5
DC	2004/09/13	Cobalt	µg/g (ppm)	EPA 3050/6010	0.5	0.6	7.9	5.7	9.9	9.5
DC	2004/09/13	Copper	µg/g (ppm)	EPA 3050/6010	0.1	3.2	15.2	7.4	32.5	25.1
DC	2004/09/13	Iron	µg/g (ppm)	EPA 3050/6010	5	3200	30900	11800	26600	36300
DC	2004/09/13	Lead	µg/g (ppm)	EPA 3050/6010	0.5	6.3	7.5	40.5	97.1	10.7
DC	2004/09/13	Magnesium	µg/g (ppm)	EPA 3050/6010	1	113	3590	2340	3000	11800
DC	2004/09/13	Manganese	µg/g (ppm)	EPA 3050/6010	0.5	1.7	623	211	266	454
AD	2004/09/14	Mercury	µg/g (ppm)	EPA 7471A	0.02	0.03	0.03	0.09	0.10	0.06
DC	2004/09/13	Molybdenum	µg/g (ppm)	EPA 3050/6010	0.5	0.7	1.6	1.0	2.1	1.9
DC	2004/09/13	Nickel	µg/g (ppm)	EPA 3050/6010	0.5	1.1	18.1	13.6	23.0	25.6
DC	2004/09/13	Phosphorus	µg/g (ppm)	EPA 3050/6010	5	168	746	392	483	622
DC	2004/09/13	Potassium	µg/g (ppm)	EPA 3050/6010	5	108	1430	356	2670	972
DC	2004/09/13	Selenium	µg/g (ppm)	EPA 3050/6010	0.5	< 0.5	0.6	< 0.5	< 0.5	< 0.5
DC	2004/09/13	Sodium	µg/g (ppm)	EPA 3050/6010	1	10	430	692	399	716
DC	2004/09/13	Thallium	µg/g (ppm)	EPA 3050/6010	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
DC	2004/09/13	Vanadium	µg/g (ppm)	EPA 3050/6010	0.2	13.7	20.6	10.4	20.8	27.3
DC	2004/09/13	Zinc	µg/g (ppm)	EPA 3050/6010	0.5	4.0	66.6	61.6	112	107

All Analytical results pertain to samples analyzed as received
EPA: U S Environmental Protection Agency 1997 Test Methods of Evaluation of Solid Waste 3rd Ed through Update III Office Solid Waste Emergency Response U S Environmental Protection Agency, Washington D C
MDL - Method Detection Limit

Report reviewed by:

James A. LeBlanc, B.Sc., P Chem
QA/QC Manager
Laboratory Services

Brenda Chomin, P Chem
Manager
Laboratory Services

AMEC Earth & Environmental Limited has been certified by the Canadian Association for Environmental Analytical Laboratories (CAEAL) Inc for specific tests registered with the Association

** All samples will be disposed of after 30 days following analysis Please contact the lab if you require additional sample storage time (Samples deemed hazardous will be returned to the client at their own expense or disposal will be arranged) **

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ANALYTICAL REPORT

AMEC Earth & Environmental
221 - 18 Street SE
Calgary, AB T2E 6J5

Date Received: 2004/09/01
Date Sampled:
Report Date: 2004/09/17

Soil Analysis - ICP

Attention: Wenzel, Chris

Project No. CE02993 **File No.:** EC-47500

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	04-8042 C-55 Background	04-8043 O-48 Sump	04-8044 F-30 Background	04-8045 H-24 Background	04-8046 H-24 Sump
DC	2004/09/13	Aluminum	µg/g (ppm)	EPA 3050/6010	5	11800	7810	10600	6160	7150
DC	2004/09/13	Arsenic	µg/g (ppm)	EPA 3050/6010	0.5	9.6	10.9	8.4	5.7	9.1
DC	2004/09/13	Barium	µg/g (ppm)	EPA 3050/6010	1	232	285	240	203	199
DC	2004/09/13	Cadmium	µg/g (ppm)	EPA 3050/6010	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
DC	2004/09/13	Calcium	µg/g (ppm)	EPA 3050/6010	5	2380	4720	3330	8530	14900
DC	2004/09/13	Chromium	µg/g (ppm)	EPA 3050/6010	0.5	17.6	13.1	13.6	11.0	11.5
DC	2004/09/13	Cobalt	µg/g (ppm)	EPA 3050/6010	0.5	11.0	8.6	4.6	3.0	8.5
DC	2004/09/13	Copper	µg/g (ppm)	EPA 3050/6010	0.1	19.3	14.4	8.8	17.2	18.8
DC	2004/09/13	Iron	µg/g (ppm)	EPA 3050/6010	5	35700	31600	33800	11000	27600
DC	2004/09/13	Lead	µg/g (ppm)	EPA 3050/6010	0.5	10.8	8.9	40.9	8.1	8.1
DC	2004/09/13	Magnesium	µg/g (ppm)	EPA 3050/6010	1	2860	2770	2240	1600	6080
DC	2004/09/13	Manganese	µg/g (ppm)	EPA 3050/6010	0.5	278	302	159	34.4	351
AD	2004/09/14	Mercury	µg/g (ppm)	EPA 7471A	0.02	0.04	0.02	0.02	0.07	0.05
DC	2004/09/13	Molybdenum	µg/g (ppm)	EPA 3050/6010	0.5	2.1	2.1	1.5	2.5	1.8
DC	2004/09/13	Nickel	µg/g (ppm)	EPA 3050/6010	0.5	17.1	16.5	9.3	12.0	20.5
DC	2004/09/13	Phosphorus	µg/g (ppm)	EPA 3050/6010	5	507	422	325	379	580
DC	2004/09/13	Potassium	µg/g (ppm)	EPA 3050/6010	5	917	2160	533	623	877
DC	2004/09/13	Selenium	µg/g (ppm)	EPA 3050/6010	0.5	0.6	< 0.5	< 0.5	0.8	< 0.5
DC	2004/09/13	Sodium	µg/g (ppm)	EPA 3050/6010	1	67	553	80	276	647
DC	2004/09/13	Thallium	µg/g (ppm)	EPA 3050/6010	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
DC	2004/09/13	Vanadium	µg/g (ppm)	EPA 3050/6010	0.2	36.0	26.2	37.5	18.7	21.1
DC	2004/09/13	Zinc	µg/g (ppm)	EPA 3050/6010	0.5	75.1	56.2	56.4	31.7	77.4

All Analytical results pertain to samples analyzed as received
EPA: U S Environmental Protection Agency 1997 Test Methods of Evaluation of Solid Waste 3rd Ed through Update III Office Solid Waste Emergency Response, U S Environmental Protection Agency Washington D C
MDL - Method Detection Limit

Report reviewed by:

James A. LeBlanc, B Sc , P.Chem.
QA/QC Manager
Laboratory Services

Brenda Chomin, P Chem
Manager
Laboratory Services

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ANALYTICAL REPORT

AMEC Earth & Environmental
221 - 18 Street SE
Calgary, AB T2E 6J5

Date Received: 2004/09/01
Date Sampled:
Report Date: 2004/09/17

Soil Analysis - ICP

Attention: Wenzel, Chris

Project No. CE02993 **File No.:** EC-47500

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	04-8046-D H-24 Sump Duplicate	04-8047 M-15 SE	04-8048 P-53 Background	04-8049 M-15 W	04-8050 M-33 Sump 1
DC	2004/09/13	Aluminum	µg/g (ppm)	EPA 3050/6010	5	---	5940	8040	5090	9470
DC	2004/09/13	Arsenic	µg/g (ppm)	EPA 3050/6010	0.5	---	5.5	11.5	5.2	10.0
DC	2004/09/13	Barium	µg/g (ppm)	EPA 3050/6010	1	---	349	127	360	278
DC	2004/09/13	Cadmium	µg/g (ppm)	EPA 3050/6010	0.2	---	< 0.2	< 0.2	< 0.2	0.2
DC	2004/09/13	Calcium	µg/g (ppm)	EPA 3050/6010	5	---	57200	3980	62900	29400
DC	2004/09/13	Chromium	µg/g (ppm)	EPA 3050/6010	0.5	---	9.0	18.2	8.0	15.4
DC	2004/09/13	Cobalt	µg/g (ppm)	EPA 3050/6010	0.5	---	6.1	4.2	5.5	9.7
DC	2004/09/13	Copper	µg/g (ppm)	EPA 3050/6010	0.1	---	12.2	31.6	10.8	26.4
DC	2004/09/13	Iron	µg/g (ppm)	EPA 3050/6010	5	---	19100	32300	17300	36100
DC	2004/09/13	Lead	µg/g (ppm)	EPA 3050/6010	0.5	---	6.1	12.6	5.4	10.4
DC	2004/09/13	Magnesium	µg/g (ppm)	EPA 3050/6010	1	---	19800	2120	20500	5390
DC	2004/09/13	Manganese	µg/g (ppm)	EPA 3050/6010	0.5	---	245	61.0	228	544
AD	2004/09/14	Mercury	µg/g (ppm)	EPA 7471A	0.02	---	0.05	0.08	0.03	0.05
DC	2004/09/13	Molybdenum	µg/g (ppm)	EPA 3050/6010	0.5	---	1.0	4.0	0.9	3.1
DC	2004/09/13	Nickel	µg/g (ppm)	EPA 3050/6010	0.5	---	15.3	17.1	13.9	24.7
DC	2004/09/13	Phosphorus	µg/g (ppm)	EPA 3050/6010	5	---	692	509	714	678
DC	2004/09/13	Potassium	µg/g (ppm)	EPA 3050/6010	5	---	809	957	1390	1250
DC	2004/09/13	Selenium	µg/g (ppm)	EPA 3050/6010	0.5	---	< 0.5	1.0	< 0.5	0.7
DC	2004/09/13	Sodium	µg/g (ppm)	EPA 3050/6010	1	---	1460	101	1440	783
DC	2004/09/13	Thallium	µg/g (ppm)	EPA 3050/6010	0.5	---	< 0.5	< 0.5	< 0.5	< 0.5
DC	2004/09/13	Vanadium	µg/g (ppm)	EPA 3050/6010	0.2	---	17.5	28.3	15.4	28.8
DC	2004/09/13	Zinc	µg/g (ppm)	EPA 3050/6010	0.5	---	67.6	38.2	61.2	93.1

All Analytical results pertain to samples analyzed as received
EPA: U S Environmental Protection Agency 1997 Test Methods of Evaluation of Solid Waste 3rd Ed through Update III Office Solid Waste Emergency Response U S Environmental Protection Agency, Washington D C
MDL - Method Detection Limit

Report reviewed by:

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ANALYTICAL REPORT

AMEC Earth & Environmental
221 - 18 Street SE
Calgary, AB T2E 6J5

Date Received: 2004/09/01
Date Sampled:
Report Date: 2004/09/17

Soil Analysis - ICP

Attention: Wenzel, Chris

Project No. CE02993 **File No.:** EC-47500

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	04-8051 P-53 Sump	04-8052 M-33 Sump 2	04-8053 M-15 Top of Sump	04-8054 M-33 Background	04-8055 H-24 Sump Cap
DC	2004/09/13	Aluminum	µg/g (ppm)	EPA 3050/6010	5	7880	9540	6850	14000	7850
DC	2004/09/13	Arsenic	µg/g (ppm)	EPA 3050/6010	0.5	10.7	14.4	6.0	4.6	9.6
DC	2004/09/13	Barium	µg/g (ppm)	EPA 3050/6010	1	70	288	275	279	210
DC	2004/09/13	Cadmium	µg/g (ppm)	EPA 3050/6010	0.2	0.3	< 0.2	0.3	< 0.2	0.2
DC	2004/09/13	Calcium	µg/g (ppm)	EPA 3050/6010	5	13300	14200	51800	4690	12200
DC	2004/09/13	Chromium	µg/g (ppm)	EPA 3050/6010	0.5	16.8	15.7	10.0	18.4	12.7
DC	2004/09/13	Cobalt	µg/g (ppm)	EPA 3050/6010	0.5	7.5	11.1	6.4	3.1	8.9
DC	2004/09/13	Copper	µg/g (ppm)	EPA 3050/6010	0.1	28.1	27.4	15.6	18.2	21.6
DC	2004/09/13	Iron	µg/g (ppm)	EPA 3050/6010	5	29800	39500	24800	26500	31300
DC	2004/09/13	Lead	µg/g (ppm)	EPA 3050/6010	0.5	17.7	11.2	6.8	10.4	8.9
DC	2004/09/13	Magnesium	µg/g (ppm)	EPA 3050/6010	1	2340	6100	17900	2710	5850
DC	2004/09/13	Manganese	µg/g (ppm)	EPA 3050/6010	0.5	161	648	251	29.3	371
AD	2004/09/14	Mercury	µg/g (ppm)	EPA 7471A	0.02	0.10	0.08	0.04	0.10	0.05
DC	2004/09/13	Molybdenum	µg/g (ppm)	EPA 3050/6010	0.5	3.1	2.3	1.2	1.7	2.2
DC	2004/09/13	Nickel	µg/g (ppm)	EPA 3050/6010	0.5	24.3	26.8	17.0	11.9	21.7
DC	2004/09/13	Phosphorus	µg/g (ppm)	EPA 3050/6010	5	578	696	699	338	623
DC	2004/09/13	Potassium	µg/g (ppm)	EPA 3050/6010	5	1350	1460	768	554	874
DC	2004/09/13	Selenium	µg/g (ppm)	EPA 3050/6010	0.5	0.8	0.5	< 0.5	0.9	< 0.5
DC	2004/09/13	Sodium	µg/g (ppm)	EPA 3050/6010	1	1220	582	1070	115	522
DC	2004/09/13	Thallium	µg/g (ppm)	EPA 3050/6010	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
DC	2004/09/13	Vanadium	µg/g (ppm)	EPA 3050/6010	0.2	24.9	30.2	18.9	40.0	22.8
DC	2004/09/13	Zinc	µg/g (ppm)	EPA 3050/6010	0.5	98.0	98.1	75.6	39.8	82.4

All Analytical results pertain to samples analyzed as received
EPA: U S Environmental Protection Agency 1997 Test Methods of Evaluation of Solid Waste 3rd Ed through Update III Office Solid Waste Emergency Response U S Environmental Protection Agency, Washington D C
MDL - Method Detection Limit

Report reviewed by:

James A. LeBlanc B Sc., P Chem
QA/QC Manager
Laboratory Services

Brenda Chomin, P.Chem
Manager
Laboratory Services

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ANALYTICAL REPORT

AMEC Earth & Environmental
221 - 18 Street SE
Calgary, AB T2E 6J5

Date Received: 2004/09/01
Date Sampled:
Report Date: 2004/09/17

Soil Analysis

Attention: Wenzel, Chris

Project No. CE02993 **File No.:** EC-47500

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	04-8037 O-48 Background	04-8038 F-30 Sump	04-8039 D-27 Sump	04-8040 C-55 Sump	04-8041 M-15 Background
KL	2004/09/15	pH (Sat. Paste)	--	McKeague 4.13	0.01	6.63	6.98	8.26	7.99	7.32
KL	2004/09/15	Conductivity (Sat. Paste)	mS/cm	McKeague 4.13	0.001	0.134	5.15	3.64	2.33	1.99
DC	2004/09/14	Calcium	meq/L	McKeague 3.21	0.01	0.53	49.1	1.70	4.27	13.5
DC	2004/09/14	Magnesium	meq/L	McKeague 3.21	0.01	0.34	9.20	1.01	1.47	3.25
DC	2004/09/14	Potassium	meq/L	McKeague 3.21	0.01	0.09	6.40	0.59	5.86	0.08
DC	2004/09/14	Sodium	meq/L	McKeague 3.21	0.01	0.30	5.57	35.3	5.45	4.24
KL	2004/09/15	Bicarbonate	meq/L	McKeague 3.21	1.0	< 1.0	1.8	3.4	4.3	2.7
RM	2004/09/14	Chloride	meq/L	McKeague 3.21	0.01	0.37	19.8	1.55	5.19	12.7
RM	2004/09/14	Sulphate	meq/L	McKeague 3.21	0.01	0.42	39.4	32.8	11.2	2.56
KL	2004/09/16	Saturation	%	McKeague 3.21	0.1	27.8	89.3	33.6	56.8	86.9
KL	2004/09/15	Calcium	µg/g (ppm)	Calculation	0.10	2.93	879	11.5	48.6	236
KL	2004/09/15	Magnesium	µg/g (ppm)	Calculation	0.10	1.15	99.9	4.13	10.1	34.4
KL	2004/09/15	Potassium	µg/g (ppm)	Calculation	0.10	0.96	224	7.79	130	2.67
KL	2004/09/15	Sodium	µg/g (ppm)	Calculation	0.10	1.94	114	273	71.1	84.7
KL	2004/09/15	Chloride	µg/g (ppm)	Calculation	0.10	3.67	627	18.5	104	392
KL	2004/09/15	Sulphate	µg/g (ppm)	Calculation	0.10	5.55	1690	530	305	107
KL	2004/09/15	Bicarbonate	µg/g (ppm)	Calculation	0.1	8.7	97.2	70.1	148	144
KL	2004/09/15	Sodium Adsorption Ratio (SAR)		Calculation	0 10	0 46	1 03	30 4	3 22	1 46

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McKeague: Manual on Soil Sampling and Methods of Analyses Can Soc Soil Sci Ottawa
MDL - Method Detection Limit

Report reviewed by:

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ANALYTICAL REPORT

AMEC Earth & Environmental
221 - 18 Street SE
Calgary, AB T2E 6J5

Date Received: 2004/09/01
Date Sampled:
Report Date: 2004/09/17

Soil Analysis

Attention: Wenzel, Chris

Project No. CE02993 **File No.:** EC-47500

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	04-8042 C-55 Background	04-8043 O-48 Sump	04-8044 F-30 Background	04-8045 H-24 Background	04-8046 H-24 Sump
KL	2004/09/15	pH (Sat. Paste)	--	McKeague 4.13	0.01	6.77	6.40	6.17	6.01	7.18
KL	2004/09/15	Conductivity (Sat. Paste)	mS/cm	McKeague 4.13	0.001	0.191	16.9	0.261	0.405	7.38
DC	2004/09/14	Calcium	meq/L	McKeague 3.21	0.01	0.87	110	1.69	2.37	43.3
DC	2004/09/14	Magnesium	meq/L	McKeague 3.21	0.01	0.30	33.8	1.04	0.69	27.9
DC	2004/09/14	Potassium	meq/L	McKeague 3.21	0.01	0.08	9.65	0.05	0.07	0.79
DC	2004/09/14	Sodium	meq/L	McKeague 3.21	0.01	0.42	28.9	0.43	1.00	16.5
KL	2004/09/15	Bicarbonate	meq/L	McKeague 3.21	1.0	< 1.0	1.1	1.2	< 1.0	1.9
RM	2004/09/14	Chloride	meq/L	McKeague 3.21	0.01	0.92	156	0.60	1.03	47.2
RM	2004/09/14	Sulphate	meq/L	McKeague 3.21	0.01	0.18	18.8	0.31	1.83	38.0
KL	2004/09/16	Saturation	%	McKeague 3.21	0.1	43.2	48.6	66.3	229	56.3
KL	2004/09/15	Calcium	µg/g (ppm)	Calculation	0.10	7.50	1070	22.4	109	488
KL	2004/09/15	Magnesium	µg/g (ppm)	Calculation	0.10	1.55	199	8.37	19.3	191
KL	2004/09/15	Potassium	µg/g (ppm)	Calculation	0.10	1.38	183	1.29	6.37	17.4
KL	2004/09/15	Sodium	µg/g (ppm)	Calculation	0.10	4.20	323	6.61	52.5	213
KL	2004/09/15	Chloride	µg/g (ppm)	Calculation	0.10	14.1	2680	14.0	84.0	942
KL	2004/09/15	Sulphate	µg/g (ppm)	Calculation	0.10	3.63	439	9.96	201	1030
KL	2004/09/15	Bicarbonate	µg/g (ppm)	Calculation	0.1	17.1	32.4	49.8	98.9	65.2
KL	2004/09/15	Sodium Adsorption Ratio (SAR)		Calculation	0 10	0 55	3 41	0 37	0 81	2 76

All Analytical results pertain to samples analyzed as received
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ANALYTICAL REPORT

AMEC Earth & Environmental
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Calgary, AB T2E 6J5

Date Received: 2004/09/01
Date Sampled:
Report Date: 2004/09/17

Soil Analysis

Attention: Wenzel, Chris

Project No. CE02993 **File No.:** EC-47500

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	04-8046-D H-24 Sump Duplicate	04-8047 M-15 SE	04-8048 P-53 Background	04-8049 M-15 W	04-8050 M-33 Sump 1
KL	2004/09/15	pH (Sat. Paste)	–	McKeague 4.13	0.01	7.14	7.29	3.94	7.24	7.44
KL	2004/09/15	Conductivity (Sat. Paste)	mS/cm	McKeague 4.13	0.001	7.33	9.79	2.81	16.9	2.36
DC	2004/09/14	Calcium	meq/L	McKeague 3.21	0.01	59.6	66.5	32.8	90.0	23.1
DC	2004/09/14	Magnesium	meq/L	McKeague 3.21	0.01	27.8	20.4	3.11	30.0	3.91
DC	2004/09/14	Potassium	meq/L	McKeague 3.21	0.01	0.77	1.16	0.27	11.0	0.93
DC	2004/09/14	Sodium	meq/L	McKeague 3.21	0.01	16.3	25.9	1.06	25.3	3.14
KL	2004/09/15	Bicarbonate	meq/L	McKeague 3.21	1.0	1.7	2.0	< 1.0	1.8	3.1
RM	2004/09/14	Chloride	meq/L	McKeague 3.21	0.01	46.6	91.8	1.05	162	5.02
RM	2004/09/14	Sulphate	meq/L	McKeague 3.21	0.01	39.0	4.99	36.2	1.55	19.2
KL	2004/09/16	Saturation	%	McKeague 3.21	0.1	56.1	47.6	97.7	45.8	89.4
KL	2004/09/15	Calcium	µg/g (ppm)	Calculation	0.10	670	634	642	826	415
KL	2004/09/15	Magnesium	µg/g (ppm)	Calculation	0.10	189	118	37.0	167	42.6
KL	2004/09/15	Potassium	µg/g (ppm)	Calculation	0.10	16.8	21.6	10.1	197	32.5
KL	2004/09/15	Sodium	µg/g (ppm)	Calculation	0.10	210	283	23.8	267	64.5
KL	2004/09/15	Chloride	µg/g (ppm)	Calculation	0.10	928	1550	36.2	2630	159
KL	2004/09/15	Sulphate	µg/g (ppm)	Calculation	0.10	1050	114	1700	34.0	823
KL	2004/09/15	Bicarbonate	µg/g (ppm)	Calculation	0.1	59.6	57.9	< 0.1	50.4	168
KL	2004/09/15	Sodium Adsorption Ratio (SAR)		Calculation	0 10	2 46	3 93	0 25	3 27	0 85

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ANALYTICAL REPORT

AMEC Earth & Environmental
221 - 18 Street SE
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Date Received: 2004/09/01
Date Sampled:
Report Date: 2004/09/17

Soil Analysis

Attention: Wenzel, Chris

Project No. CE02993 **File No.:** EC-47500

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	04-8051 P-53 Sump	04-8052 M-33 Sump 2	04-8053 M-15 Top of Sump	04-8054 M-33 Background	04-8055 H-24 Sump Cap
KL	2004/09/15	pH (Sat. Paste)	--	McKeague 4.13	0.01	6.65	7.27	7.49	6.31	7.34
KL	2004/09/15	Conductivity (Sat. Paste)	mS/cm	McKeague 4.13	0.001	5.40	7.54	3.83	0.248	3.76
DC	2004/09/14	Calcium	meq/L	McKeague 3.21	0.01	38.9	63.0	30.6	1.46	38.2
DC	2004/09/14	Magnesium	meq/L	McKeague 3.21	0.01	5.95	13.6	11.2	0.66	14.0
DC	2004/09/14	Potassium	meq/L	McKeague 3.21	0.01	3.66	3.39	0.35	0.05	0.63
DC	2004/09/14	Sodium	meq/L	McKeague 3.21	0.01	19.6	12.0	7.19	0.45	9.98
KL	2004/09/15	Bicarbonate	meq/L	McKeague 3.21	1.0	8.1	1.2	2.2	< 1.0	1.9
RM	2004/09/14	Chloride	meq/L	McKeague 3.21	0.01	7.50	53.6	7.59	0.50	3.61
RM	2004/09/14	Sulphate	meq/L	McKeague 3.21	0.01	47.2	28.6	32.2	1.11	46.7
KL	2004/09/16	Saturation	%	McKeague 3.21	0.1	162	61.3	57.9	99.2	56.7
KL	2004/09/15	Calcium	µg/g (ppm)	Calculation	0.10	1270	775	354	29.0	434
KL	2004/09/15	Magnesium	µg/g (ppm)	Calculation	0.10	117	102	78.6	7.96	96.6
KL	2004/09/15	Potassium	µg/g (ppm)	Calculation	0.10	232	81.3	7.99	1.92	13.9
KL	2004/09/15	Sodium	µg/g (ppm)	Calculation	0.10	731	170	95.7	10.2	130
KL	2004/09/15	Chloride	µg/g (ppm)	Calculation	0.10	432	1160	156	17.7	72.5
KL	2004/09/15	Sulphate	µg/g (ppm)	Calculation	0.10	3680	843	895	52.9	1270
KL	2004/09/15	Bicarbonate	µg/g (ppm)	Calculation	0.1	801	44.2	76.7	40.3	66.7
KL	2004/09/15	Sodium Adsorption Ratio (SAR)		Calculation	0.10	4.13	1.94	1.57	0.43	1.95

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ANALYTICAL REPORT

AMEC Earth & Environmental
221 - 18 Street SE
Calgary, AB T2E 6J5

Date of Report: 2004/09/17

Quality Control Standard

Attention: Wenzel, Chris

Project No. CE02993

File No.: EC-47500

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	Analyzed Value	Advisory Range	Target Value	Reference No
DC	2004/09/13	Aluminum	µg/g (ppm)	EPA 3050/6010	5	8970	5408-10788	8,098 00	SS#8
DC	2004/09/13	Arsenic	µg/g (ppm)	EPA 3050/6010	0.5	13 4	10 1-14.7	12.40	SS#8
DC	2004/09/13	Barium	µg/g (ppm)	EPA 3050/6010	1	266	139-332	236 00	SS#8
DC	2004/09/13	Cadmium	µg/g (ppm)	EPA 3050/6010	0.1	116	101-149	125 00	ERA 540
DC	2004/09/13	Calcium	µg/g (ppm)	EPA 3050/6010	5	20700	15155-23039	19,097.00	SS#8
DC	2004/09/13	Chromium	µg/g (ppm)	EPA 3050/6010	0 5	21.8	16 3-33 0	24.70	SS#8
DC	2004/09/13	Cobalt	µg/g (ppm)	EPA 3050/6010	0 5	7.5	4 3-9 1	6 70	SS#8
DC	2004/09/13	Copper	µg/g (ppm)	EPA 3050/6010	0.1	107	91.4-125	108 00	SS#8
DC	2004/09/13	Iron	µg/g (ppm)	EPA 3050/6010	5	20300	13667-21894	17,781.00	SS#8
DC	2004/09/13	Lead	µg/g (ppm)	EPA 3050/6010	0.5	32.8	25.5-37.8	31 60	SS#8
DC	2004/09/13	Magnesium	µg/g (ppm)	EPA 3050/6010	1	4140	3145-4496	3,821.00	SS#8
DC	2004/09/13	Manganese	µg/g (ppm)	EPA 3050/6010	0.5	477	369-610	489.00	SS#8
AD	2004/09/14	Mercury	µg/g (ppm)	EPA 7471A	0.02	20	15 8-32 2	24 60	ERA 540
DC	2004/09/13	Molybdenum	µg/g (ppm)	EPA 3050/6010	0 5	53 8	47.6-78 1	62 90	ERA 540
DC	2004/09/13	Nickel	µg/g (ppm)	EPA 3050/6010	0.5	19.1	13.8-23.2	18 50	SS#8
DC	2004/09/13	Phosphorus	µg/g (ppm)	EPA 3050/6010	5	1100	1008-1375	1,192 00	SS#8
DC	2004/09/13	Potassium	µg/g (ppm)	EPA 3050/6010	5	1030	532-1567	1,050 00	SS#8
DC	2004/09/13	Selenium	µg/g (ppm)	EPA 3050/6010	0.5	95 5	69.6-124	97.00	ERA 540
DC	2004/09/13	Sodium	µg/g (ppm)	EPA 3050/6010	1	750	485-1244	865 00	SS#8
DC	2004/09/13	Thallium	µg/g (ppm)	EPA 3050/6010	0 5	66 0	58 4-100	79 10	ERA 540
DC	2004/09/13	Vanadium	µg/g (ppm)	EPA 3050/6010	0 2	19 8	12 6-23.1	17.90	SS#8
DC	2004/09/13	Zinc	µg/g (ppm)	EPA 3050/6010	0 5	143	110-156	133 00	SS#8

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MDL - Method Detection Limit

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Date of Report: 2004/09/17

Quality Control Standard

Attention: Wenzel, Chris

Project No. CE02993 **File No.:** EC-47500

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	Analyzed Value	Advisory Range	Target Value	Reference No
KL	2004/09/15	pH (Sat Paste)	---	Mckeague	0.01	7 87	7 66-8 18	7 92	SS#10
KL	2004/09/15	Conductivity (Sat Paste)	mS/cm	Mckeague 4 13	0 001	6 08	5 22-6 36	5 79	ss#10
DC	2004/09/14	Calcium	meq/L	McKeague 3 21	0 01	39 1	31 10-39 15	35 12	SS#10
DC	2004/09/14	Magnesium	meq/L	McKeague 3 21	0 01	13.8	11 75-14.38	13.07	SS#10
DC	2004/09/14	Potassium	meq/L	McKeague 3 21	0 01	1.51	1 04-1.68	1.36	SS#10
DC	2004/09/14	Sodium	meq/L	McKeague 3 21	0 01	23.5	20 73-25.02	22.88	SS#10
KL	2004/09/15	Bicarbonate	meq/L	Mckeague 3 21	1.0	3.7	2 88-4.70	3 79	SS#10
RM	2004/09/14	Chloride	mequ/L	Mckeague 3 21	0 01	22 6	20 53-27 69	24 11	SS#10
RM	2004/09/14	Sulphate	meq/L	McKeague 3 21	0.01	43 9	30 11-45 51	37 81	SS#10
KL	2004/09/16	Saturation	%	Mckeague 3 21	0 1	45 8	43 87-48 78	46 33	ss#10

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amec **EARTH & ENVIRONMENTAL** EC47500 18192 Dry

Chain of Custody Record/Analysis Request 14.3

ISSUING OFFICE: Calgary 3330

Project Name: ESRF Sumps | Job No.: CE02993

Project Manager: Chris Wenzel | Phone #: 248-4331

Sampler: II

Analysis Requested: (write preferred method in box)

QUOTED PRICE: ☐ YES ☐ NO — If Yes, Please attach a copy of quote.

Client Sample ID	AMEC E & E Lab Sample ID	Date Collected	Matrix (S=soil, W=water, A=air)	1L Bottle	250 mL Jar	40 mL Vial	1L Polyethylene	ICP Metals	Metals / Salinity	pH, EC	50% Rush (Please Notify Lab)	100% Rush (Please Notify Lab)
O-48 Background	8037	Aug/04	S									
F-30 Sump	38											
D-27 Sump	39											
C-55 Sump	40											
M-15 Background	41											
C-55 Background	42											
O-48 Sump	43											
F-30 Background	44											
H-24 Background	45											
H-24 Sump	46											
M-15 SE	47											
P-53 Background	48											
M-15 W	49											
M-33 Sump 1	50											
P-53 Sump	51											
M-33 Sump 2	52											
M-15 Top of Sump	53											
M-33 Background	54											
H-24 Sump Cap	55											

Receiver's Comments

RELINQUISHED BY SAMPLER	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:	COMMENTS:
Signature:	Signature:	Signature:	Signature:	
Printed Name: Chris Wenzel	Printed Name: RECEIVED	Printed Name:	Printed Name:	
Firm: AMEC	Firm: SEP - 1 2004	Firm:	Firm:	
Date/Time: Aug 31, 12:00	Date/Time: AMEC-EDMONTON	Date/Time:	Date/Time:	

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ANALYTICAL REPORT

AMEC Earth & Environmental
221 - 18 Street SE
Calgary, AB T2E 6J5

Date Received: 2004/09/01
Date Sampled:
Report Date: 2004/09/15

Water Analysis

Attention: Wenzel, Chris

Project No. CE02993 **File No.:** EC-47498

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	04-8022 C-5S Background	04-8023 C-5S Sump	04-8024 M-31 Sump	04-8025 M-31 Bacground	04-8026 0-48 Sump
RM	2004/09/09	Turbidity	NTU	APHA 2130-b	1	2	3	2	1	2
AD	2004/09/02	Calcium	mg/L (ppm)	APHA 3120	0.5	10.1	59.6	41.2	4.0	134
AD	2004/09/02	Magnesium	mg/L (ppm)	APHA 3120	0.5	3.4	28.1	10.5	1.4	54.2
AD	2004/09/02	Potassium	mg/L (ppm)	APHA 3120	0.5	0.6	5.7	4.7	< 0.5	43.8
AD	2004/09/02	Sodium	mg/L (ppm)	APHA 3120	0.5	4.1	50.4	6.4	0.6	69.5
RM	2004/09/05	Bicarbonate	mg/L (ppm)	APHA 2320	1	56	246	149	24	147
RM	2004/09/05	Chloride	mg/L (ppm)	APHA 4110	0.1	8.7	127	7.5	2.4	400
RM	2004/09/05	Nitrate - Nitrogen	mg/L (ppm)	APHA 4110	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
RM	2004/09/02	Sulphate	mg/L (ppm)	APHA 4110	0.5	2.5	32.3	44.8	< 0.5	31.0
RM	2004/09/05	Conductivity @ 25°C	mS/cm	APHA 2510	0.001	0.116	0.774	0.339	0.049	1.68
RM	2004/09/05	pH @ 25°C	--	APHA 4500H	0.01	7.82	8.13	7.94	7.39	8.01
RM	2004/09/09	Sodium Adsorption Ratio (SAR)		McKeague 3 21 (Calculation)	0 10	0 29	1 35	0 23	< 0 10	1 28

All Analytical results pertain to samples analyzed as received.
APHA: Standard Method for the Examination of Water and Wastewater 1998 20th Ed American Public Health Association
MDL - Method Detection Limit

Report reviewed by:

for James A. LeBlanc, B Sc., P Chem
QA/QC Manager
Laboratory Services

Brenda Chomin, P Chem
Manager
Laboratory Services

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Date Received: 2004/09/01
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Water Analysis

Attention: Wenzel, Chris

Project No. CE02993 **File No.:** EC-47498

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	04-8027 D-27 Background	04-8028 D-27 Sump	04-8029 M-15 Background	04-8030 P-53 Background	04-8031 M-15 Sump
RM	2004/09/09	Turbidity	NTU	APHA 2130-b	1	2	3	2	13	7
AD	2004/09/02	Calcium	mg/L (ppm)	APHA 3120	0.5	24.7	19.8	77.5	12.5	90.2
AD	2004/09/02	Magnesium	mg/L (ppm)	APHA 3120	0.5	8.6	6.3	21.0	4.2	22.9
AD	2004/09/02	Potassium	mg/L (ppm)	APHA 3120	0.5	0.7	4.3	3.5	1.9	2.0
AD	2004/09/02	Sodium	mg/L (ppm)	APHA 3120	0.5	6.2	22.3	91.4	6.0	107
RM	2004/09/05	Bicarbonate	mg/L (ppm)	APHA 2320	1	70	150	280	51	303
RM	2004/09/05	Chloride	mg/L (ppm)	APHA 4110	0.1	8.9	10.1	180	10.9	236
RM	2004/09/05	Nitrate - Nitrogen	mg/L (ppm)	APHA 4110	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
RM	2004/09/02	Sulphate	mg/L (ppm)	APHA 4110	0.5	52.0	1.4	2.3	18.6	1.0
RM	2004/09/05	Conductivity @ 25°C	mS/cm	APHA 2510	0.001	0.243	0.263	0.982	0.154	1.15
RM	2004/09/05	pH @ 25°C	--	APHA 4500H+	0.01	7.88	8.00	8.09	7.80	8.03
RM	2004/09/09	Sodium Adsorption Ratio (SAR)		McKeague 3.21 (Calculation)	0.10	0.27	1.12	2.38	0.37	2.61

All Analytical results pertain to samples analyzed as received
APHA: Standard Method for the Examination of Water and Wastewater 1998 20th Ed American Public Health Association
MDL - Method Detection Limit

Report reviewed by:

for

James A. LeBlanc, B.Sc., P.Chem.
QA/QC Manager
Laboratory Services

Brenda Chomin, P.Chem
Manager
Laboratory Services

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Date Received: 2004/09/01
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Water Analysis

Attention: Wenzel, Chris

Project No. CE02993 **File No.:** EC-47498

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	04-8032 P-53 Sump	04-8033 M-33 Sump	04-8034 H-24 Pond Adj Sump	04-8035 H-24 Background
RM	2004/09/09	Turbidity	NTU	APHA 2130-b	1	25	1	4	12
AD	2004/09/02	Calcium	mg/L (ppm)	APHA 3120	0.5	25.8	115	310	26.6
AD	2004/09/02	Magnesium	mg/L (ppm)	APHA 3120	0.5	7.1	17.9	139	11.8
AD	2004/09/02	Potassium	mg/L (ppm)	APHA 3120	0.5	14.8	18.7	6.5	1.6
AD	2004/09/02	Sodium	mg/L (ppm)	APHA 3120	0.5	22.0	30.5	131	16.3
RM	2004/09/05	Bicarbonate	mg/L (ppm)	APHA 2320	1	61	156	415	128
RM	2004/09/05	Chloride	mg/L (ppm)	APHA 4110	0.1	56.0	209	329	35.1
RM	2004/09/05	Nitrate - Nitrogen	mg/L (ppm)	APHA 4110	0.05	0.18	< 0.05	< 0.05	< 0.05
RM	2004/09/02	Sulphate	mg/L (ppm)	APHA 4110	0.5	31.7	50.1	755	7.0
RM	2004/09/05	Conductivity @ 25°C	mS/cm	APHA 2510	0.001	0.367	0.956	2.57	0.318
RM	2004/09/05	pH @ 25°C	--	APHA 4500H	0.01	7.40	7.76	7.99	8.04
RM	2004/09/09	Sodium Adsorption Ratio (SAR)		McKeague 3 21 (Calculation)	0 10	0 99	0 70	1 56	0 66

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Report reviewed by:

for James A. LeBlanc, B Sc , P Chem
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Brenda Chomin, P Chem
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Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	04-8022 C-5S Background	04-8023 C-5S Sump	04-8024 M-31 Sump	04-8025 M-31 Bacground	04-8026 0-48 Sump
DS	2004/09/03	EPH (C10-C60)	mg/L (ppm)	EPA 3510/CCME	0.030	---	---	---	---	---
GH	2004/09/03	Benzene	mg/L (ppm)	EPA 5030B/8260B	0.001	---	---	---	---	---
GH	2004/09/03	Toluene	mg/L (ppm)	EPA 5030B/8260B	0.001	---	---	---	---	---
GH	2004/09/03	Ethylbenzene	mg/L (ppm)	EPA 5030B/8260B	0.001	---	---	---	---	---
GH	2004/09/03	Total Xylenes	mg/L (ppm)	EPA 5030B/8260B	0.002	---	---	---	---	---
GH	2004/09/03	Surrogate Recovery	%	--	0.1	---	---	---	---	---

All Analytical results pertain to samples analyzed as received
CCME (EPH) - Canadian Council of Ministers of the Environment - Method for Canada Wide Standards for Petroleum Hydrocarbon in Soil, Tier 1 Method, Revision 5 0
EPA: U S Environmental Protection Agency 1997 Test Methods of Evaluation of Solid Waste 3rd Ed through Update III Office Solid Waste Emergency Response U S Environmental Protection Agency, Washington, D C
EPH: Extractable Petroleum Hydrocarbon - not corrected for PAH content
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Water Analysis

Attention: Wenzel, Chris

Project No. CE02993 **File No.:** EC-47498

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	04-8027 D-27 Background	04-8028 D-27 Sump	04-8029 M-15 Background	04-8030 P-53 Background	04-8031 M-15 Sump
DS	2004/09/03	EPH (C10-C60)	mg/L (ppm)	EPA 3510/CCME	0.030	---	---	---	---	---
GH	2004/09/03	Benzene	mg/L (ppm)	EPA 5030B/8260B	0.001	---	---	---	---	---
GH	2004/09/03	Toluene	mg/L (ppm)	EPA 5030B/8260B	0.001	---	---	---	---	---
GH	2004/09/03	Ethylbenzene	mg/L (ppm)	EPA 5030B/8260B	0.001	---	---	---	---	---
GH	2004/09/03	Total Xylenes	mg/L (ppm)	EPA 5030B/8260B	0.002	---	---	---	---	---
GH	2004/09/03	Surrogate Recovery	%	--	0.1	---	---	---	---	---

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Report reviewed by:

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QA/QC Manager
Laboratory Services

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Water Analysis

Attention: Wenzel, Chris

Project No. CE02993 **File No.:** EC-47498

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	04-8032 P-53 Sump	04-8033 M-33 Sump	04-8034 H-24 Pond Adj Sump	04-8035 H-24 Background
DS	2004/09/03	EPH (C10-C60)	mg/L (ppm)	EPA 3510/CCME	0.030	---	---	< 0.030	---
GH	2004/09/03	Benzene	mg/L (ppm)	EPA 5030B/8260B	0.001	---	---	< 0.001	---
GH	2004/09/03	Toluene	mg/L (ppm)	EPA 5030B/8260B	0.001	---	---	< 0.001	---
GH	2004/09/03	Ethylbenzene	mg/L (ppm)	EPA 5030B/8260B	0.001	---	---	< 0.001	---
GH	2004/09/03	Total Xylenes	mg/L (ppm)	EPA 5030B/8260B	0.002	---	---	< 0.002	---
GH	2004/09/03	Surrogate Recovery	%	--	0.1	---	---	114	---

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QA/QC Manager
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Brenda Chomin P.Chem
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Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	04-8022 C-5S Background	04-8023 C-5S Sump	04-8024 M-31 Sump	04-8025 M-31 Bacground	04-8026 0-48 Sump
JoL	2004/09/08	Colour (True)	Colour Units	APHA 2120-b	1	20	50	50	50	20

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Report reviewed by:

James A. LeBlanc, B.Sc , P Chem
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Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	04-8027 D-27 Background	04-8028 D-27 Sump	04-8029 M-15 Background	04-8030 P-53 Background	04-8031 M-15 Sump
JoL	2004/09/08	Colour (True)	Colour Units	APHA 2120-b	1	30	100	30	20	30

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Report reviewed by:

cc James A. LeBlanc, B Sc , P Chem.
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JoL	2004/09/08	Colour (True)	Colour Units	APHA 2120-b	1	500	125	85	30

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Date of Report: 2004/09/15

Quality Control Standard

Attention: Wenzel, Chris

Project No CE02993

File No.: EC-47498

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	Analyzed Value	Advisory Range	Target Value	Reference No
		Turbidity	NTU	APHA 2130-b	1	15	12.187-16 399	14 29	W-Turb-1042
AD	2004/09/02	Calcium	mg/L (ppm)	APHA 3120	0 2	27 4	22 9-29 7	26 30	P-CAT01042
AD	2004/09/02	Magnesium	mg/L (ppm)	APHA 3120	0 5	12 8	10 7-14 1	12 40	P-CAT01042
AD	2004/09/02	Potassium	mg/L (ppm)	APHA 3120	0 5	15 3	14 7-20 0	17 40	P-CAT01042
AD	2004/09/02	Sodium	mg/L (ppm)	APHA 3120	0 5	21 9	17 6-22 1	19 80	P-TM01042
		Chloride	mg/L (ppm)	APHA4110	0.1	46 9	40.1-49.0	44.52	MIN1112
		Nitrate - Nitrogen	mg/L (ppm)	APHA 4110	0.05	3.18	2.68-3.28	2.98	MIN1112
RM	2004/09/02	Sulphate	mg/L (ppm)	APHA 4110	0.5	83.5	76 6-93.6	85.12	MIN1112
RM	2004/09/05	Conductivity @ 25°C	mS/cm	APHA2510	0.001	0.568	0.513-0 627	0 57	MIN1112
RM	2004/09/05	pH @ 25°C	---	APHA 4500H	0 01	6 01	5 95-6 05	6 00	cc-ph-87

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Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	Analyzed Value	Advisory Range	Target Value	Reference No
GH	2004/09/03	Benzene	%	EPA5030B/8260B	0 100	107	80-120	100 00	Spike Recovery
GH	2004/09/03	Toluene	%	EPA5030B/8260B	0 001	100	80-120	100 00	Spike Recovery
GH	2004/09/03	Ethylbenzene	%	EPA5030B/8260B	0 001	96 3	80-120	100 00	Spike Recovery
GH	2004/09/03	Total Xylenes	%	EPA 5030B/8260B	0 100	107	80-120	100 00	Spike Recovery

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Report reviewed by:

B.a/ James A. LeBlanc, B.Sc , P.Chem
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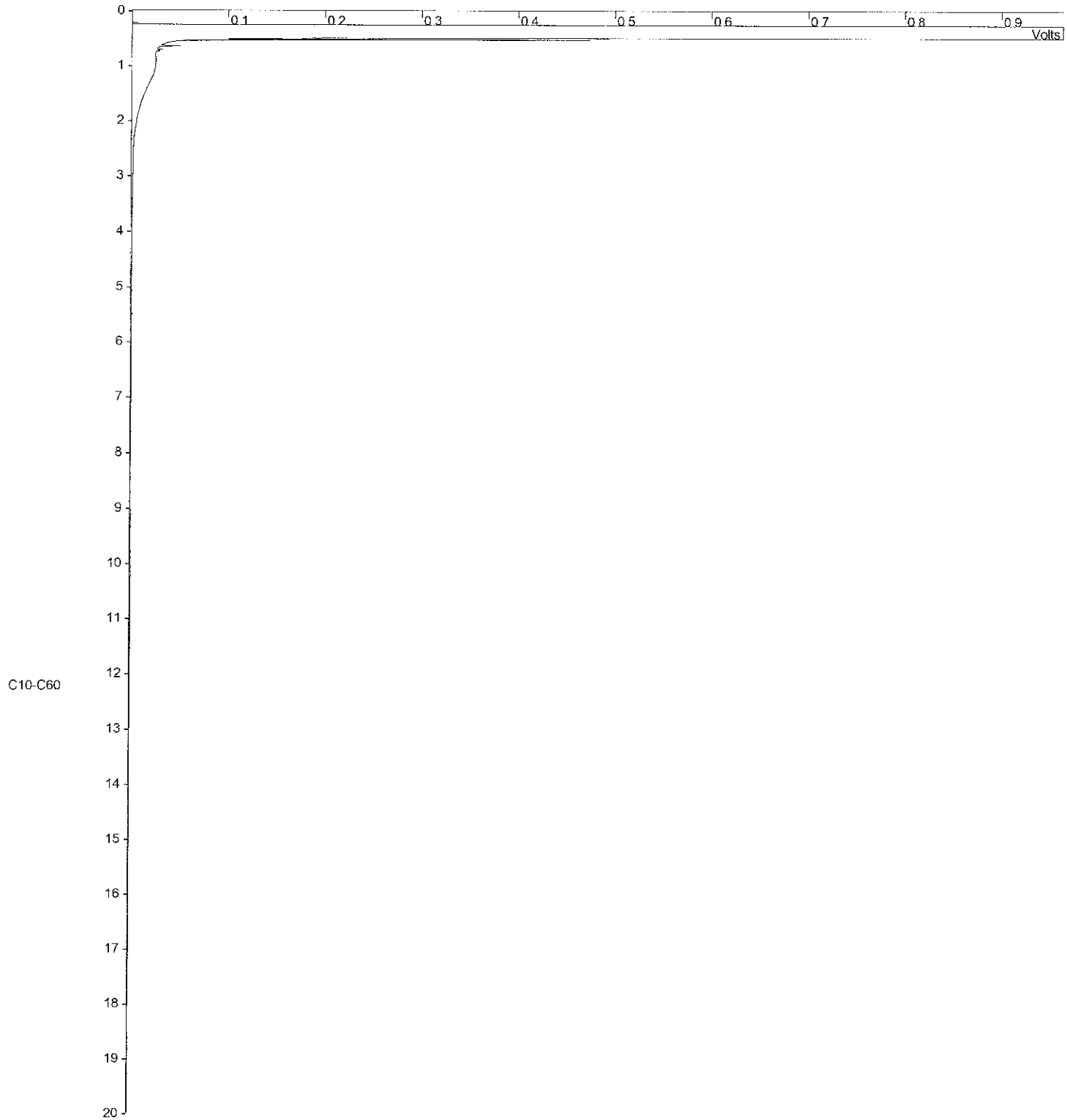
Title : EXTRACTABLE PETROLEUM HYDROCARBONS
Run File : C:\Star\data\eph-Sept-2004\2004-09-08-1;11;24 am--8034 water.run
Method File : c:\star\ccme-eph-c10-c60 jun04.mth
Sample ID : 8034 water

Injection Date: 2004/09/08 1:11 AM Calculation Date: 2004/09/08 12:01 PM

Operator : DS Detector Type: 3800 (1 Volt)
Workstation: GC3800EPH Bus Address : 44
Instrument : INS# 186 Sample Rate : 10.00 Hz
Channel : Front = FID Run Time : 23.147 min

** Star Chromatography Workstation Version 5 52 ** 00243-0E08-D91-22B9 **

Chart Speed = 0.99 cm/min Attenuation = 3949 Zero Offset = 0%
Start Time = 0.000 min End Time = 20.000 min Min / Tick = 1.00



EC47498

amec EARTH & ENVIRONMENTAL 18193

Chain of Custody Record/Analysis Request

14.3

ISSUING OFFICE: Calgary 3330 29

Project Name: ESRF Sumps | Job No.: CE02993

Project Manager: Chris Wenzel | Phone #: 248-4331

Sampler:

Client Sample ID	AMEC E & E Lab Sample ID	Date Collected	Matrix (S=soil, W=water, A=air)	1L Bottle	250 mL Jar	40 mL Vial	1L Polyethylene	pH, EC, Salinity	Anions/Cations	Turbidity/Colour	CCME PHCs 1-2 BTEX	50% Rush (Please Notify Lab)	100% Rush (Please Notify Lab)
C-55 Background	8022	Aug 04	W	✓			✓	✓	✓	✓			
C-55 Sump	23			✓				✓	✓	✓			
M-31 Sump	24			✓									
M-31 Background	25			✓									
O-48 Sump	26			✓									
O-27 Background	27			✓									
O-27 Sump	28			✓									
M-15 Background	29			✓									
P-53 Background	30			✓									
M-15 Sump	31			✓									
P-53 Sump	32			✓									
M-33 Sump	33			✓									
H-24 Pond Adj Sump	34			✓		✓	✓				✓		
H-24 Background	35			✓									

QUOTED PRICE

☐ YES ☐ NO

If Yes, Please attach a copy of quote.

Receiver's Comments

RELINQUISHED BY SAMPLER	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:	COMMENTS:
Signature: C Wenzel	Signature: RECEIVED	Signature:	Signature:	
Printed Name: Chris Wenzel	Printed Name: SEP - 1 2004	Printed Name:	Printed Name:	
Firm: AMEC	Firm: A E EDMONTON	Firm:	Firm:	
Date/Time: Aug 31, 12:00	Date/Time:	Date/Time:	Date/Time:	

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator; GOLDENROD - to lab in advance

Appendix G

Data CD

Appendix H

Limitations

LIMITATIONS

1. The work performed in this report was carried out in accordance with the Standard Terms of Conditions made part of our contract. The conclusions presented herein are based solely upon the scope of services and time and budgetary limitations described in our contract.

2. The report has been prepared in accordance with generally accepted environmental study and/or engineering practices. No other warranties, either expressed or implied, are made as to the professional services provided under the terms of our contract and included in this report.

3. The services performed and outlined in this report were based, in part, upon visual observations of the site and attendant structures. Our opinion cannot be extended to portions of the site which were unavailable for direct observation, reasonably beyond the control of AMEC Earth & Environmental.

4. The objective of this report was to assess environmental conditions at the site, within the context of our contract and existing environmental regulations within the applicable jurisdiction. Evaluating compliance of past or future owners with applicable local, provincial and federal government laws and regulations was not included in our contract for services.

5. Our observations relating to the condition of environmental media at the site are described in this report. It should be noted that compounds or materials other than those described could be present in the site environment.

6. The conclusions of this report are based in part, on the information provided by others. The possibility remains that unexpected environmental conditions may be encountered at the site in locations not specifically investigated. Should such an event occur, AMEC Earth & Environmental must be notified in order that we may determine if modifications to our conclusions are necessary.