

**CANADIAN BEAUFORT SEA
GEOTECHNICAL AND GEOPHYSICAL DATABASES**

0101-11085

FEBRUARY, 1993

**CANADIAN BEAUFORT SEA
GEOTECHNICAL AND GEOPHYSICAL DATABASES**

Prepared for:

SUPPLY AND SERVICES CANADA

and

INDIAN AND NORTHERN AFFAIRS CANADA

Prepared by:

EBA Engineering Consultants Ltd.

0101-11085

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SUMMARY

This report describes the work done in 1992/1993 to update the geotechnical and geophysical report catalogue and borehole databases compiled in 1988, 1989, and 1991 for the Canadian Beaufort Sea.

New boreholes were added to the borehole databases. Portions of the existing report catalogue database were checked and edited for consistency with the borehole databases. The report catalogue was also linked to databases of geophysical line data.

The report catalogue now contains 302 entries, and the borehole databases now contain a total of 2935 boreholes, coreholes, and surficial sediment samples.

The present assignment was carried out under a contract with Supply and Services Canada on behalf of Indian and Northern Affairs Canada. The project tasks, deliverables, participants, and report organization are described herein. Diskette copies of the modified databases have been provided under separate cover.

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1.0 INTRODUCTION

In 1988, EBA Engineering Consultants Ltd. (EBA) compiled a geotechnical report catalogue and a database of 1418 borehole logs completed in the Canadian Beaufort Sea between 1973 and 1987. To expand this database in 1989, 1032 surficial sediment corehole logs and borehole logs were added. In 1991, EBA expanded the geotechnical report catalogue and added 398 relatively deep boreholes or coreholes and surficial sediment samples to the borehole databases. In 1991, EBA also expanded the geophysical report catalogue prepared in 1988 by McElhanney Geosurveys Ltd. (McElhanney).

For the 1992/1993 work, Indian and Northern Affairs Canada (INAC) retained EBA through Supply and Services Canada (SSC) to compile some 87 borehole logs which were still missing from the Beaufort Sea database, to update the report catalogues, and link the report catalogues to listings of geophysical line data collected. This report provides a summary of the information collected and activities undertaken to complete the contract.

The project was conducted under SSC File No. 38ST.A134-2-037 and SSC Contract No. A-7134-2-036/01-ST, dated September 29, 1992, and authorized by Ms. Marianne Tang, Science Contracting Officer. The contract includes two other tasks which are addressed under separate cover. These tasks are as follows:

- o Work completed in the 1992/1993 work period on a similar report catalogue and granular source databases (1988, 1991, and 1992) for the Mackenzie Valley in the Northwest Territories. (Refer to EBA's report dated December 1992.)
- o Work with Earth and Oceans Research to develop new data handling routines to facilitate linking of ESEBase software with the existing mapping program INFOCUS using FOXPRO routines.

The terms of reference and deliverables are documented in EBA's letters of September 15, 1992 to the Science Contracting Officer and November 30, 1992, to Mr. R.J. Gowan, P.Geol., Geotechnical Advisor, of Indian and Northern Affairs Canada, and Appendix B of Mr. Peter Dixon's letter of August 20, 1992.

2.0 PROJECT DESCRIPTION

2.1 Objectives

The primary objective of the assignment was to continue compilation of a database of surficial sediment core and/or deep borehole data from the Canadian Beaufort Sea. The database, which is in a standardized (ESEBase Version 4.0) format, is intended for use in the evaluation of granular resources for construction materials. The database logs are intended to be accurate stratigraphic and textural interpretations of the originals; however, some detailed engineering data (for example: strength, consolidation, etc.) has been omitted. Existing geotechnical and geophysical report catalogues (compiled in 1988 by EBA and McElhanney, respectively) were to be combined into one catalogue and updated to reflect additions made to the data base in 1992/1993. The catalogue would then be linked to existing database listings of geophysical line data, in order to give an indication of which geophysical data is missing.

Some of the major tasks that were required to complete the databases were as follows:

- o Identify and obtain copies of geotechnical and geophysical reports including borehole/corehole/surficial sample data from Federal government departments and the major Beaufort Sea petroleum operators.
- o Interpret and standardize, in ESEBase Version 4.0 format, the stratigraphic, index test (moisture content, Atterberg Limits, gradation analyses) and permafrost data for each log.
- o Insert the study numbers into all (new and existing) of the borehole logs.
- o Combine and update the existing geotechnical and geophysical report catalogues.

-
- o Link the report catalogue to existing geophysical line database listings using the study numbers.
 - o Review and edit the final report catalogue entries and new logs as required.
 - o Prepare floppy disk and paper copies of the report catalogue entries and logs.
 - o Prepare this final report.

2.2 Deliverables

Final deliverables required under this contract are listed below:

- o Updated report catalogue database for geotechnical and geophysical/hydrographic reports for the Beaufort Sea in two copies of floppy disks.
- o Updated borehole/corehole/surficial sediment ESEBase Version 4.0 database for the Canadian Beaufort Sea in two copies on floppy disks and two bound paper copies. (Paper copies are presented only for the new logs compiled in 1992/1993.)
- o Updated geophysical line listing databases.
- o This final report (fifteen copies) describing the work undertaken and summarizing significant aspects of the database.

2.3 Project Participants

Personnel from EBA's Calgary and Edmonton offices were primarily involved in this project, compiling the logs and reporting.

Liaison with the Beaufort Sea operators, the Geological Survey of Canada, the Atlantic Geoscience Centre, and other holders of information was conducted by EBA Yellowknife and EBA Calgary staff. The following organizations and people should be acknowledged for their assistance:

- Amoco Canada Petroleum Company Ltd.
 - Mr. Kevin Hewitt (geotechnical)
 - Mr. Rocque Goh (geophysical)
- Imperial Oil Resources Ltd.
 - Mr. Jeff Weaver, Ph.D (geotechnical)
 - Mr. Don Hersak (geophysical)
- Geological Survey of Canada
 - Mr. Scott Dallimore
 - Mr. Bob Harmes (Atlantic GeoScience Centre)
 - Mr. Bernie Pelletier (Terrain Sciences Division)
- Lewis Geophysical Consulting
 - Mr. John Lewis

2.4 Activities

2.4.1 Data Search

EBA's efforts to find additional data to input to the INAC databases, were focused in three areas, as follows.

- o Listings of geotechnical and geophysical reports that were identified as being missing in previous phases of this project, as well as those reports containing borehole logs not yet compiled were distributed to the major Beaufort Sea operators (Amoco Canada Petroleum Company Ltd. (Amoco), Imperial Oil Resources Ltd. (IORL), and the Atlantic Geosciences Centre (AGC) to help identify additional data.

- o Laboratory test data for 50 coreholes done by the CSS Hudson in 1970 and 1971 were acquired from Geological Survey of Canada (GSC).
- o Several projects done by EBA in the late 1970's and early 1980's for Dome Petroleum Ltd. (DOME) and Canadian Marine Drilling Ltd. (CANMAR), which are now part of Amoco, and IORL's predecessor, ESSO Resources Canada Ltd. (ESSO) and Imperial Oil Ltd. (IOL), also had useful borehole information.

The possible new logs identified from geophysical reports done for Amoco did not result in any new data. About 20 additional logs available from IORL were not entered due to a minimum surficial clay thickness of 10 to 30 m in the boreholes. Furthermore, IORL was unsuccessful in finding numerous geophysical reports which could not be found in earlier phases of the project.

The AGC did locate several reports with geotechnical data. However, most of these logs appear to have already been input (from a data disk of borehole logs obtained from the GSC in a previous phase of this project), and the reports did not provide significant additional information on the existing logs. Those not already entered (part of 1984 Banksland survey), generally comprised clay materials, and were not input.

Of the 50 CSS Hudson corehole logs obtained from the GSC, 36 logs contained primarily clay, and were not input into the database.

2.4.2 Data Entry

Eighty-seven (87) new logs were compiled in ESEBase Version 4.0 and added to the borehole database. The boreholes were numbered according to the standard format established in previous phases of the project, as described in Appendix D. The data compiled comprises the following:

DOME : 15 borehole/corehole logs
CANMAR: 7 borehole/corehole logs
ESSO : 5 borehole/corehole logs
IOL : 17 borehole/corehole logs
GSC : 14 corehole logs
NTCL : 29 borehole logs

To satisfy the requirements for improvements to the database, the study numbers were also added to the "xref_1" field of the borehole index page of the new logs to provide a link to the report catalogue.

Table 1 summarizes the area abbreviations used for each exploration block in the database. For blocks included in previous work the same abbreviation was used where possible. Some new blocks have been added. Table 2 summarizes the testhole types and sample types.

2.4.3 Data Removal

Two sets of logs were removed from the database during the present update, as follows:

- o Based on new data acquired from AGC, 19 entries done in 1989 (from the GSC database), from the Nahidik 1986 cruise, were determined to be water samples rather than soil samples, and were removed from the database.
- o When the databases were merged, 21 duplicate entries (Nipterk West, EBA Project Numbers 0101-4912B and 0101-4912E) from the 1989 databases were removed.

2.4.4 Data Conversion

The borehole logs compiled in previous phases of this project were converted to ESEBase Version 4.0 as part of the 1992/1993 work. The database names were changed to reflect the year in which they were compiled, for easier future reference. As part of the changes made to the databases themselves, study numbers were added to the "xref_1" field of the borehole index page of the logs to provide a link to the report catalogue.

Some of the borehole numbers (for boreholes in databases compiled in 1989 and 1991) were renumbered to the standard format established in previous phases of the project, as described in Appendix D, and Tables 1 and 2. Some exceptions to the standard format still exist, as follows:

- o The 1418 boreholes compiled in 1988 do not yet have borehole names consistent with the standard format.
- o Sixty-eight (68) coreholes from the GSC database converted in 1989 (the Nahidik 1982, 1983, and 1985 boreholes) are still identified by the program name rather than a geographic region name as an identifying prefix.

2.4.5 Geophysical Line Database Modification

Earth and Oceans Research (EOR) in conjunction with EBA and Lewis Geophysical Consulting (LGC), produced reports in 1988 on the granular resources in the Isserk and Erksak regions. As a part of that work, dBase databases were compiled which listed any collected/found/copied geophysical data. For the present database updates, LGC provided several existing databases to EBA to help obtain information on possible missing data.

EBA used two of the databases provided by LGC, named **"GULFGREP"** and **"DOMEGREP"** to produce the modified databases. The file **"GULFGREP"** contained geophysical line data from Gulf Canada Resources Inc. (GULF), and the file **"DOMEGREP"** contained data from Dome Petroleum Ltd. (DOME), ESSO Resources Canada Ltd. (ESSO), and GSC.

As part of the 1992/1993 project, the following modifications were made:

- o A study number was added to each of the geophysical line records to create a link to the report catalogue.
- o The updated information was split into five databases, one for each sponsor with geophysical line data listed, and one containing the listings for all of the sponsors. The new databases are called **"DOME"**, **"ESSO"**, **"GSC"**, and **"GULF"**. The database **"GREPORTS"** contains all of the listings.
- o The geophysical line databases were indexed on the fields **"study_no"**, **"year"**, **"area"**, **"title1"**, and **"line"**. The database index files have the same name as their respective databases. This allows the database printing program to tabulate the geophysical line data according to the sponsor and specific project.
- o The dBase program **"GREPORTS.PRG"**, which tabulates and prints the database entries, was updated to include an additional check for each geophysical line.

With their link to the report catalogue, these databases now provide a complete list of missing data, at least for the Isserk/Erksak areas.

2.4.6 Report Catalogue Modification

The following changes have been made to the report catalogue database as part of the 1992/1993 update:

- o The geophysical report catalogue (compiled by McElhanney in 1988) and the geotechnical report catalogue (compiled by EBA in 1988) were combined into one database.
- o Study numbers were updated to be consistent with the standard format established in previous phases of the project, as described in Appendix D.
- o There is now an index field to easily identify the entries as either geotechnical or geophysical, so that the database can be sorted according to study number. (This was done to facilitate checking for duplicate study numbers.)
- o Another new field states if data has been noted as missing for a report entry, and where to look for details on the missing data. For example, if some geophysical line data for a DOME project has been noted missing, the field will contain the message: "Missing data, see DOME.DBF or GREPORTS.DBF".
- o Information for the additional boreholes was obtained from six reports. A report catalogue entry was created for each of these reports. The report catalogue entries are standardized according to the data dictionary presented in Appendix A. Including the new entries, the report catalogue now contains 302 entries.
- o The report catalogue entry relevant to the GSC CSS Hudson 1970 coreholes was updated.

- o Ten other reports or data sets which had been used previously for geophysical information were checked again specifically for geotechnical information. This did not yield significant additional data. In the case of the AGC reports, some of the original reports were not available, or comprised only an operations report. Report catalogue entries were not updated or created for these reports.

2.5 Data Presentation

The report catalogues originally compiled in 1988 for the Beaufort Sea have been updated and combined into one file. The new report catalogue is presented on a disk in a database called '**BEAU93IN**'. The geophysical reports are listed first, then the geotechnical reports. The report catalogue now contains 302 entries, which can be printed using the Relational Report Writer library "**BEAUCAT.RP1**" and file "**BEAUFORT**". A location map for the project is presented as Figure 1.

The report catalogue entries are standardized according to the data dictionary presented in Appendix A. The database structure and some sample entries are also presented in Appendix A. Appendix B contains a listing of the reports identified as containing Beaufort Sea borehole or corehole data. These have been organized by Proprietor/Year/Month and Consultant/Contractor who obtained the data. References from which logs were not included, or where only some logs were included, are uniquely identified.

In total, 87 new logs are included in this update of the ESEBase Version 4.0 borehole database, bringing the overall number of borehole logs to 2935. The new logs are stored on disk in one database called '**BEAU93**' and are presented under separate cover in a volume titled "Beaufort Sea Database, 1993: Corehole and Borehole Log Data". This volume also contains directory listings of the boreholes in '**BEAU93**', the new combined databases, and the renamed (converted to ESEBase Version 4.0) borehole databases, described as follows:

New combined databases:

- o **"BEAU1993"** contains all (2503) of the borehole logs compiled to date for the Beaufort Sea, excluding the Isserk and Erksak regions.
- o **"ISSERK93"** contains all (202) of the borehole logs compiled to date for the Isserk region.
- o **"ERKSAK93"** contains all (230) of the borehole logs compiled to date for the Erksak region.
- o **"BEAU93AL"** contains all (2935) of the borehole logs compiled to date for the Beaufort Sea including the Isserk and Erksak regions.

Renamed converted databases:

- o **"BEAU88"** contains (1226) all of the borehole logs compiled in 1988 for the Beaufort Sea, excluding the Isserk and Erksak regions. (This database was previously called "BEAUFORT".)
- o **"ISSERK88"** contains all (99) of the borehole logs compiled in 1988 for the Isserk region. (This database was previously called "ISSERK".)
- o **"ERKSAK88"** contains all (93) of the borehole logs compiled in 1988 for the Erksak region. (This database was previously called "ERKSAK".)
- o **"BEAU89"** contains all (792) of the borehole logs compiled in 1989 for the Beaufort Sea, excluding the Isserk and Erksak regions. (This database was previously called "BEAUF89".)
- o **"ISSERK89"** contains all (103) of the borehole logs compiled in 1989 for the Isserk region. (This database was previously called "ISSRKG2".)
- o **"ERKSAK89"** contains all (137) of the borehole logs compiled in 1989 for the Erksak region. (This database was previously called "ERKSG2".)
- o **"BEAU91"** contains all (398) of the borehole logs compiled in 1991 for the Beaufort Sea, excluding the Isserk and Erksak regions. (This database was previously called "BEAU1991".)

Figure 2 presents a typical borehole log as produced from ESEBase.

The updated geophysical line listing databases obtained from LGC are presented in five databases, one for each sponsor with data listed, and one containing all the data. The databases are called "DOME", "ESSO", "GSC", and "GULF". The database "GREPORTS" contains all of the listings. The database index files have the same name as their respective databases. The dBase program "GREPORTS.PRG" tabulates and prints the database entries. Appendix C contains a sample entry from the updated geophysical line databases.

3.0 RECOMMENDATIONS FOR FURTHER WORK

3.1 Borehole Numbering

Non-standard borehole numbers could be renumbered according to the standard format. The following logs should be changed:

- o The 1418 borehole logs compiled in 1988 presently have a large diversity in their numbering systems.
- o The 68 GSC corehole logs (from Nahidik 1982, 1983, and 1985) compiled in 1989 are standard except for having a program name rather than a geographic region name as an identifying prefix.

3.2 Area Names

Some of the area name abbreviations used to date do not strictly follow the mapped exploration block names. Any boreholes or reports (study numbers) so named could be located and renamed according to the actual block name. Examples include "Erksak", "Pullen Area III", "Western Beaufort Sea", and "M2 Ice Scour". An updated map of the exploration blocks will be needed for this operation.

In cases where the area studied is confined to one or two exploration blocks, renaming will be straightforward. However, there are a few cases where a study covers a very large area. For example, the Erksak Borrow Block extends over parts of 18 exploration blocks. In this case, renaming may not be possible or desirable, unless report catalogue entries are further broken down into sub-entries.

3.3 Additional Entries

If desired, the non-granular boreholes identified to date could be added to the borehole database.

3.4 Geophysical Line Listing Databases

The geophysical line listing databases have four sets of fields for which each set could be combined into a single field. The dBase printing program would be modified to accomodate the combined fields. If this not possible in dBase, it should be possible to write a Relational Report Writer program that will accomodate the new fields.

4.0 CLOSURE

Eighty-seven (87) new corehole, borehole, and surficial sediment logs, and 6 new reports were compiled for the 1992/1993 updates of the Beaufort Sea databases. The report catalogue now contains 302 entries, and the borehole databases now contain a total of 2935 boreholes, coreholes, and surficial sediment samples. These databases are intended to allow interpretation of the distribution of granular resources and restrictions on their development.

As noted previously, the database is as complete as possible with the exception of unreleased and unidentified data, and the omissions noted previously in this report. Inevitably, there may be some reports or logs that have been overlooked. It would be appreciated by the authors that anyone identifying missing data, bring it to our attention.

Regular maintenance of the database by updating annually with new borehole data will provide a reliable source of data on Beaufort Sea granular resources.

Respectfully submitted,
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TABLE 2 SAMPLE TYPES AND ABBREVIATIONS

TABLE 1
EXPLORATION BLOCK NAMES AND ABBREVIATIONS
(includes 1988 through 1993 work)

<u>BLOCK NAME</u>	<u>ABBREVIATION</u>
Aagnerk	AA
Adlartok	AD
Adgo	ADG
Amauligak	AE, AW, AF, AM
Amundsen Gulf	AG
Aiverk	AI
Akpak	AK, AKP
Alerk	AL
Angasak	AN
Aok	AOK
Arnak	AR
Amerk	AS
Atkinson	AT
Arluk	AU
Area III (Pullen)	A3
Beaufort Sea	BFT
Baillie Island	BI
Banks Island	BK
Nerlerk (Borrow)	BNR
Blow River	BR
Breaker's Shoal	BS
Tingmiark (Borrow)	BTN
Tarsiut (Borrow)	BTAR
Beaufort Sea Shipping Corridor	CORR
Drift Point	DP

TABLE 1
(Continued)

EXPLORATION BLOCK NAMES AND ABBREVIATIONS
(includes 1988 through 1993 work)

<u>BLOCK NAME</u>	<u>ABBREVIATION</u>
East Amauligak	EA
East Beaufort Sea	EBFT
Edlok	ED
Ellice Island	EI
Erksak Borrow	EK
Ernerk	ERK
Irkuluk (Foundation)	FIRK
Natiak (Foundation)	FNAT
Nerlerk (Foundation)	FNR
Garry Island	G, GI
Herschel Borrow	HB
Herschel Basin	HE
Herschel Island	HI
Herschel Island/Yukon Coast	HIYC
Hendrickson	HN
Hooper/Pelly Region	HP
Herschel Sill	HS
Isserk (Borrow)	IB
Isserk (I-15)	IR, ISRK
Issigak (Borrow)	IBS, IK, ISGK
Immerark	IE
Igaluk	IG
Igiloliroak	IGK
Amauligak I-06	IM
Immiugak	IMM

TABLE 1
(Continued)

EXPLORATION BLOCK NAMES AND ABBREVIATIONS
(includes 1988 through 1993 work)

<u>BLOCK NAME</u>	<u>ABBREVIATION</u>
Issungnak North	IN
Irkaluk	IRK
Issigak	IS, II
Issungnak South	IS
Issungnak	ISS
Itiyok	IT
Inukpak	IU
Kakoluk	KA
Kadok	KAD
Kaglulik Borrow	KAGB
Kannerk	KAN
Kogyuk	KB, KI, KY
Kadluk	KD
Kenalooak (J-94)	KE
Kugdjuk	KG
Kaubvik	KH
Kigut	KIG
Kaglulik	KK
Kilannak	KL
Kugmallit Bay	KM
Kaglulik South	KS
Kingark	KN
King Point	KO
Koakoak	KOA
Kopanoar	KP

TABLE 1
(Continued)

EXPLORATION BLOCK NAMES AND ABBREVIATIONS
(includes 1988 through 1993 work)

<u>BLOCK NAME</u>	<u>ABBREVIATION</u>
Kringalik	KR
Kaslutut	KT
Kugmallit Trough	KU
MacKenzie Bay	MB
McKinley Bay	MC
Mackenzie Delta	MD
Minuk (Borrow)	MI
Minuk	MK
Mackenzie River	MR
Miterk	MT
Mackenzie Trough West	MTW
Nayak	NA
Natsek	NAT
Nektoralik	NE
Nipterk	NP
Nipterk South (Borrow)	NS
Netserk	NTK
North Tingmiark	NTG
Nipterk West (borrow)	NW
North Ukalerk	NU
Oliver Island	OI
Omat (Borrow)	OBS
Orksok	OK
Puyok	PK
Pullen Island	PLN

TABLE 1
(Continued)

EXPLORATION BLOCK NAMES AND ABBREVIATIONS
(includes 1988 through 1993 work)

<u>BLOCK NAME</u>	<u>ABBREVIATION</u>
Sauvrak	PI, SK
Pelly Island	PY
Roland Bay	RB
Requisite Channel	RC
Russel Inlet	RI
Richards Island	RIS
South Adlartok	SA
South Beaufort Sea	SBFT
South Immerark	SI
Siulik	SIU
Silukoak	SLK
South Orksok	SO
Stokes Point	SP
Sartok	SR
South Tarsiut	ST
South Ukalerk	SU
South Kogyuk	SY
Thetis Bay	TB
Tuktoyaktuk Channel	TC
Tarsiut	TD, TW
Tiregluit	TG
Tuktoyaktuk Harbour	TH
Tent Island	TI
Tuktoyaktuk	TK

TABLE 1
(Continued)

EXPLORATION BLOCK NAMES AND ABBREVIATIONS
(includes 1988 through 1993 work)

<u>BLOCK NAME</u>	<u>ABBREVIATION</u>
Tuft Point	TP
Uviluk Borrow	UB
Unark	UK
Ukalerk	UKLR
Uqsuq	UQ
Uviluk	UV
Wise Bay	WB
Western Beaufort Sea	WBFT
West Tingmiark	WT

Following abbreviations used when block names not available:

Nahidik	NK
Tully	TU
M2 Ice Scour	M2
Production Site	PS
Location No. 1	L1

TABLE 2
SAMPLE TYPES AND ABBREVIATIONS
(Includes 1988 through 1993 work)

<u>SAMPLE TYPE</u>	<u>ABBREVIATION</u>
1) Grab Sample	Grab, G, GS, SH
2) Thin-Wall Tube	TWT, TT
3) Shelby Tube	T, TT
4) Heavy-Wall Tube	HWT, HT
5) Split-spoon	SS
6) Sampled borehole	S
7) Core	C
8) Gravity Core	GC
9) Liner	L
10) Piston Sample/Core	PIST, PC
11) Vibrocore	VIB
12) Drop Core	DC
13) No Recovery	NR

LIST OF FIGURES

FIGURE 1 AREA MAP OF THE BEAUFORT SEA

FIGURE 2 TYPICAL ESEBASE BOREHOLE LOG

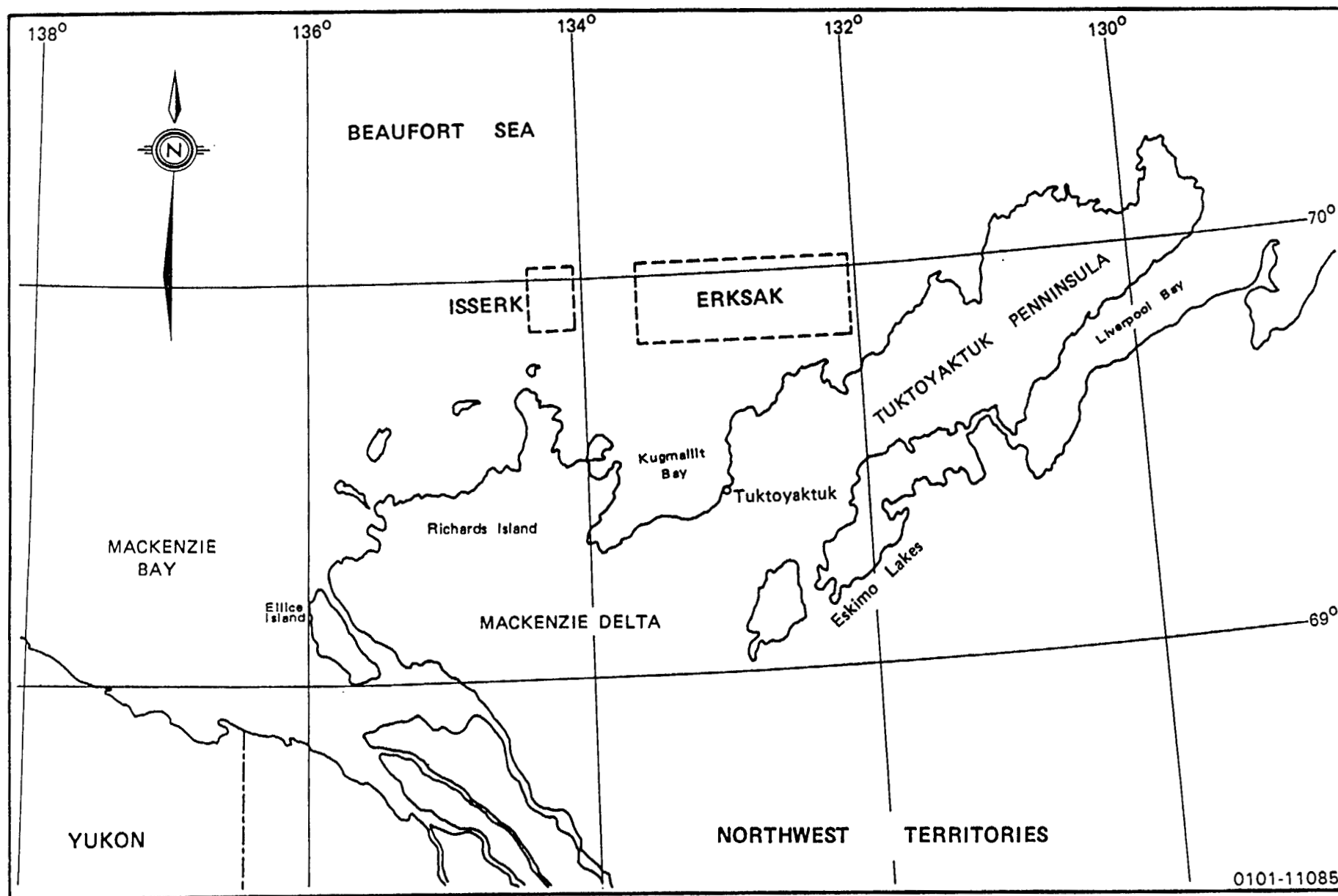


FIGURE 1 AREA MAP OF THE BEAUFORT SEA

MARINE SCIENCE ATLAS		DEPTHS ARE REFERENCED TO SEABED		BOREHOLE No: BFT70PC824	
GEOLOGICAL SURVEY OF CANADA		WATER DEPTH - 880m		Project No: GSC-MR-No.38	
ORIGINAL COREHOLE NO. 824, STATION 388		UTM ZONE: 8 N7860725.90 E452447.80		ELEVATION: -880.000 (m)	
SAMPLE TYPE <input checked="" type="checkbox"/> SHELBY TUBE <input type="checkbox"/> NO RECOVERY <input checked="" type="checkbox"/> SPLIT SPOON <input type="checkbox"/> CORE <input type="checkbox"/> GRAB SAMPLE <input type="checkbox"/> PISTON CORE					

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPTION	HYDRODYNAMIC ENERGY			CLAY (%)			USC	SOIL SYMBOL	ELEVATION (ft)		
				MEAN DIAMETER (um)			SILT (%)							
				PLASTIC M.C. LIQUID			SAND (%) GRAVEL (%)							
0.0			SILT AND CLAY	20	40	60	80	20	40	60	80			2887.1
			SILT - clayey, trace sand											
			SAND - silty, trace clay											
-1.0			CLAY AND SILT - trace to no sand, occ. pebble											2891.1
-2.0														2895.1
-3.0														2899.1
-4.0			- sandy layer for 0.25 m											2903.1
-5.0														2907.1
-6.0			END OF HOLE											2911.1
-7.0														2915.1
-8.0														2919.1
-9.0														2923.1
-10.0														2927.1
-11.0														2931.1
-12.0														2935.1
-13.0														
-14.0														

EBA Engineering Consultants Ltd. Calgary, Alberta		LOGGED BY: CSS HUDSON	COMPLETION DEPTH: 6.1 m
		REVIEWED BY: BRP	COMPLETE: 70/ /
		Fig. No: B-02	Page 1 of 1

APPENDIX A

REPORT CATALOGUE DATA DICTIONARY
AND SAMPLE ENTRIES

CATALOGUE OF GRANULAR RESOURCES - RELATED INFORMATION
DATA DICTIONARY - REPORT CATALOGUE

PART A: STUDY REFERENCE AND LOCATION

- AA1 - OLD STUDY NUMBER:** Same as study number, but obsolete.
- AA - STUDY NUMBER:** A unique study identifier number which serves as a link to other databases (e.g. Source Database, ESEBase Borehole Database).
- AB - YEAR:** The calendar year in which the majority of the field work on the study was complete. (e.g. 1983)
- ABI - MONTH:** The month in which the majority of the field work was completed (e.g. 07)
- AC - SPONSOR:** The name of the company, department, agency or organization sponsoring the study. (e.g. Indian and Northern Affairs Canada, Yukon Transportation Engineering, Public Works Canada)
- AC1 - SPONSOR JOB/FILE NUMBER:** The sponsor's file number.
- AD - SPONSOR CONTACT NAME:** The name of the person within the sponsoring organization who might be contacted to obtain additional information on the study and/or authorization for its use.
- AE - CONTRACTOR:** The name of the prime contractor, consultants or group contracted by the sponsor to undertake the study (e.g. EBA Engineering Consultants Ltd., Northern Engineering Services Company Ltd.)
- AE1 - CONTRACTOR JOB/FILE NUMBER:** The contractor's file number.

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- AE2 - **CONTRACTOR CONTACT NAME:** The name of the person within the contracting organization who might be contacted to obtain additional information on the study.
- AE3 - **REPORT TITLE:** The title of the original report.
- AF1 - **MINIMUM ZONE:** The UTM zone in which the southwestern corner of the enclosing block occurs. (e.g. 07)
- AF2 - **MINIMUM EASTING:** The UTM grid line of the western extremity of the enclosing block. (e.g. 381987)
- AF3 - **MINIMUM NORTHING:** The UTM grid line of the southern extremity of the enclosing block. (e.g. 7548335)
- AG1 - **MINIMUM LATITUDE:** The latitude in decimal degrees of the southern extremity of the enclosing block (e.g. 69.72345)
- AG2 - **MINIMUM LONGITUDE:** The longitude in decimal degrees of the eastern extremity of the enclosing block (e.g. 135.03926)
- AH1 - **CENTRE LATITUDE:** The latitude in decimal degrees of the centre of the enclosing block (e.g. 70.72345)
- AH2 - **CENTRE LONGITUDE:** The longitude in decimal degrees of the centre of the enclosing block (e.g. 135.53926)
- AI1 - **CENTRE ZONE:** The UTM zone of the centre of the enclosing block (e.g. 08)

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- AI2 - CENTRE EASTING: The UTM grid line of the centre of the enclosing block (e.g. 476321)
- AI3 - CENTRE NORTHING: The UTM grid line of the centre of the enclosing block (e.g. 7602500)
- AJ1 - MAXIMUM ZONE: The UTM zone in which the northeastern corner of the enclosing block occurs (e.g. 08)
- AJ2 - MAXIMUM EASTING: The UTM grid line of the western extremity of the enclosing block. (e.g. 567428)
- AJ3 - MAXIMUM NORTHING: The UTM grid line of the northern extremity of the enclosing block (e.g. 7661560)
- AK1 - MAXIMUM LATITUDE: The latitude in decimal degrees of the northern extremity of the enclosing block (e.g. 70.72345)
- AK2 - MAXIMUM LONGITUDE: The longitude in decimal degrees of the western extremity of the enclosing block (e.g. 136.03926)
- AL - GENERAL LOCATION - AREA NAME: The regional or local name in location map or plan.
- AM - LOCATION MAP NUMBER: The map or plan number of any small scale accompanying regional map or trackplot which indicates the location of the study area, or series of separate detailed study/borrow sites or regional survey lines.

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- AN - LOCATION MAP FORMAT: The format or type of data containing the location of the study area, or series of separate detailed study/borrow sites or regional survey lines (e.g. paper copy; mylar original, folded blue-line).
- AO - LOCATION MAP SCALE: The scale, expressed in terms of the representative fraction (e.g. 1:250,000) of any small scale accompanying regional map or trackplot which indicates the location of the study area, or series of separate detailed study/borrow sites or regional survey lines. The denominator only of the representative fraction is given since the numerator is consistently "1" (e.g. 250000)
- AP - LOCATION MAP DIGITIZER NUMBER: A unique five digit identifier number, to be assigned by INAC, which identifies a data set of points, lines, or polygons to be digitized from the location plan. This number links the report catalogue database to INAC's spatial database system.
- AQ - LOCATION MAP ARCHIVING: The general availability and where appropriate, specific location of storage of any map or plan number of any small scale accompanying regional map or trackplot which indicates the location of the study area, or series of separate detailed study/borrow sites or regional survey lines (e.g. sponsor/ contractor in-house, private/public repository, government agencies, etc.)
- AR - SITE PLAN/SITE NAME: Site or block name in site plans
- AS - SITE PLAN NUMBER: The map or plan number(s) of up to six larger scale accompanying local maps, site plans or trackplots which indicate the location of individual detailed study/borrow sites, boreholes/testpits/grab samples or detailed survey grids for separate study/borrow sites within the main study area.

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- AT - SITE PLAN FORMAT:** The format(s) or type(s) of up to six larger scale accompanying local maps, site plans or trackplots which indicate the location of individual detailed study/borrow sites, boreholes/testpits/grab samples or detailed survey grids for separate study/borrow site within the main study area (e.g. paper copy; mylar original, folded blueline).
- AU - SITE PLAN SCALE:** The scale(s), expressed in terms of the representative fraction(s) (e.g. 1:50,000, 1:10,000) of up to six larger scale accompanying local maps, site plans or trackplots which indicate the location of individual detailed study/borrow sites, boreholes/testpits/grab samples or detailed survey grids for separate study/borrow sites within the main study area. The denominator only of the representative fraction is given since the numerator is consistently "1" (e.g. 5000)
- AV - SITE PLAN DIGITIZER NUMBER:** A unique five digit identifier number or series of numbers, to be assigned by INAC, which identifies a data set of points, lines or polygons to be digitized from the site plans. This number links the report catalogue database to INAC's spatial database system.
- AW - SITE PLAN ARCHIVING:** The general availability and, where appropriate, specific location of storage of up to six larger scale accompanying local maps, site plans or trackplots which indicate the location of individual detailed study/borrow sites, boreholes/testpits/grab samples or detailed survey grids for separate study/borrow sites within the main study area (e.g. sponsor/contractor in-house, private/public repository, government agencies).
- AX - SOURCE NUMBERS:** A cross-reference field (to the source catalogue, when prepared) which lists the source numbers of the sources included in the report.

AY - SURVEY LINE NUMBERS/LOCATION DETAILS: Description of geophysical or hydrographic survey line numbers or locations, or further location details of geotechnical studies.

PART B: STUDY DETAILS

BB - STUDY TYPE: The type of data collected during the study or sub-study (e.g. hydrographic, geophysical, seabed sampling, geotechnical, dredging)

BB1 - STUDY TYPE INDEX: Same as study type, 2 character index field for sorting database.

BC - STUDY SCOPE: The areal scope of the study or sub-study (e.g. regional, site specific single site, many sites)

BD - STUDY SIZE: The extent of size of the study in terms of number of potential borrow sites identified, number of testpits or boreholes, or total number of line kilometres of geophysical data. (e.g. 21 sites; 55 BH's; 145 km)

BE - SURVEY LEVEL: The general purpose or level of detail of the study (e.g. airphoto interpretation, reconnaissance, exploration, delineation, production)

BF - SURVEY PATTERN: The pattern in which the individual borrow sites within the study area occur, or in which boreholes or survey lines within specific detailed study sites were laid out. (e.g. random, corridor, line, grid)

BG - SURVEY SPACING: The relative (e.g. random, wide) or actual (range and/or average) spacing of the survey data or study site. (e.g. 250 m E-W, 500 m N-S; 10 - 15 km)

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- BH - PROGRAM LENGTH/SURVEY LENGTH: The length of the field data collection or survey program, in days or showing specific dates.
- BI - SEASON: The season of the year in which the field data collection or survey program was conducted. (e.g. late summer, winter)
- BJ - EQUIPMENT TYPE: The type(s) of equipment used to collect data or obtain samples. (e.g. hand-excavated testpits; D8 cat; sonic drill; CME 750 Auger drill, etc.)
- BK - PENETRATION: The average penetration of drilling or soil sampling equipment, (e.g. 5, 7.5, 10), directly related to the equipment type.
- BL - RESOLUTION: The suitability of the data for distinguishing variations in subsurface stratigraphy, expressed in relative (e.g. poor, variable, unknown) or actual (e.g. range and/or average in tenths of metres) terms. (e.g. 0.5)
- BM - SAMPLING/RECORDING RATE: The relative (e.g. continuous, intermittent, slow) and/or actual rate of sampling or recording. (e.g. samples at 1 m intervals; chart speed)
- BN - SAMPLE/RECORDING QUALITY: A description of the relative overall quality or range in quality of the data, samples or records with regard to its use for determining subsurface stratigraphy and/or borrow quality. (e.g. poor-fair, good, disturbed, etc.)
- BO - SAMPLE/RECORDING TYPE(S): Additional details on the type(s) of samples (e.g. 75 mm diam. CRREL core, 1-2 kg grab samples, 100 mm sonic casing) or records obtained with the indicated types of equipment.

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- BP - SAMPLE/RECORDING SIZE: The total number(s) of samples obtained during the study, where appropriate, and related to the Sample/Recording type(s) (e.g. 75 grabs, 15 CRREL core)
- BQ - INTERPRETATION/TESTING LEVEL: The extent of laboratory testing of samples (e.g. routine classification testing only, concrete aggregate suitability testing); or the level of detail of the interpretation of geophysical records (e.g. field, preliminary, detailed) or geotechnical data (e.g. pit plans for 3 sources), as appropriate.
- BR - REPORT LEVEL: The type or level of detail of any report(s) resulting from the study. (e.g. annotated records, field logs/report only, summary/data compilation report, formal geophysical interpretation/geotechnical evaluation report)
- BS - REPORT DISTRIBUTION: The extent of distribution and/or general availability of any reports resulting from the study. (e.g. internal, sponsor/contractor only, specific government department/agencies/libraries, published)
- BS1 - REPORT ARCHIVING: The general availability and, where appropriate, specific location of storage of report. (e.g. sponsor/contractor in-house, private/public repository, government agencies).
- BT - DATA ARCHIVING: The general availability and, where appropriate, specific location of storage of raw data obtained during the study. (e.g. sponsor/contractor in-house, private/public repository, government agencies).
- BT1 - DATA MISSING: All or portions of collected geophysical line data has gone missing; user is referred to databases of line data for details.

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- BU - OTHER REPORTS: Related to present report or sources covered in present report.
- BY1 - COMPILER: Record compiled by (company/name).
- BY2 - COMPILE DATE: Date record compiled.
- BY3 - DATA COMPILATION PROJECT NUMBER:
- BZ1 - UPDATER: Record updated by (Company/Name).
- BZ2 - UPDATE DATE: Date record updated (most recent).
- BZ3 - DATA UPDATE PROJECT NUMBER:

Structure for database: b:beau92in.dbf

Number of data records: 295

Date of last update : 12/16/92

Field	Field Name	Type	Width	Dec
1	O_STUDY_NO	Character	10	
2	STUDY_NO	Character	10	
3	YEAR	Numeric	4	
4	MONTH	Numeric	2	
5	SPONSOR	Character	50	
6	SP_JOB_NO	Character	15	
7	SP_CONTACT	Character	20	
8	CONTRACTOR	Character	65	
9	CO_JOB_NO	Character	16	
10	CO_CONTACT	Character	24	
11	MN_ZONE	Numeric	2	
12	MN_EAST	Numeric	6	
13	MN_NORTH	Numeric	7	
14	MN_LAT_DEG	Numeric	8	5
15	MN_LON_DEG	Numeric	9	5
16	CN_LAT_DEG	Numeric	8	5
17	CN_LON_DEG	Numeric	9	5
18	CN_ZONE	Numeric	2	
19	CN_EAST	Numeric	6	
20	CN_NORTH	Numeric	7	
21	MX_ZONE	Numeric	2	
22	MX_EAST	Numeric	6	
23	MX_NORTH	Numeric	7	
24	MX_LAT_DEG	Numeric	8	5
25	MX_LON_DEG	Numeric	9	5
26	LOC_MAP_NO	Character	40	
27	LOC_MAP_FM	Character	40	
28	LOC_MAP_SC	Numeric	10	
29	LOC_MAP_DN	Character	10	
30	LOC_MAP_AR	Character	60	
31	AREA_NAME	Character	40	
32	SITE_NAME	Character	40	
33	SIT_PLN_NO	Character	80	
34	SIT_PLN_FM	Character	120	
35	SIT_PLN_SC	Character	45	
36	SIT_PLN_DN	Character	20	
37	SIT_PLN_AR	Character	120	
38	SOURCE NOS	Character	180	
39	LINE_NO	Character	180	
40	STINDEX	Character	2	
41	STUDY_TYPE	Character	60	
42	STUDY_SCOP	Character	60	
43	SURV_LEVEL	Character	80	
44	STUDY_SIZE	Character	40	
45	SURV_PATT	Character	40	
46	SURV_SPAC	Character	50	
47	PGM_LEN	Character	30	
48	SEASON	Character	25	
49	EQUIP_TYPE	Character	180	
50	PENETRATN	Character	120	
51	RESOLUTION	Character	15	
52	SAMPL_RATE	Character	60	
53	SAMPL_QUAL	Character	80	
54	SAMPL_TYPE	Character	100	
55	SAMPL_SIZE	Character	60	

56	INTRP_LEVL	Character	120
57	RPT_LEVL	Character	100
58	RPT_ARCHIV	Character	100
59	RPT_DIST	Character	120
60	DAT_ARCHIV	Character	120
61	DAT_MISSNG	Character	60
62	OTHER	Character	100
63	COMPILER	Character	120
64	COMP_DATE	Character	8
65	DC_PROJ_NO	Character	15
66	UPDATE_BY	Character	120
67	UPDT_DATE	Character	8
68	DU_PROJ_NO	Character	15
69	RPT_TITLE	Character	180
**	Total **		3486

BEAUFORT SEA
INDIAN AND NORTHERN AFFAIRS CANADA
CATALOGUE OF GRANULAR RESOURCE-RELATED INFORMATION

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STUDY NUMBER: CANM80TH MONTH: 4 YEAR: 1980

SPONSOR : CANADIAN MARINE DRILLING LTD.
JOB NO : N/A CONTACT: KEVIN HEWITT
CONTRACTOR : EBA ENGINEERING CONSULTANTS LTD.
JOB NO : 101-2806.2 CONTACT: NEIL MACLEOD
REPORT TITLE: TUKTOYAKTUK HARBOUR APPROACH STUDY - PHASE II, OCTOBER, 1980

COORDINATES :	MINIMUM	CENTRE	MAXIMUM
UTM: ZONE:	8	8	8
EASTING:	573135	576088	579029
NORTHING:	7705014	7709755	7714500
OR: LATITUDE:	69.44583	69.48750	69.52916
LONGITUDE:	133.13333	133.05400	132.97500

LOCATION:

	GENERAL LOCATION	SITE PLAN
NAME :	TUKTOYAKTUK	TUKTOYAKTUK HARBOUR APPROACH CHANNEL
NUMBER:	DWG NO. 1	
SCALE :	1:12000	DWG NO. 2 (LITHOLOGIC SECTION)
FORMAT:	PAPER COPY	1:31000
ARCHIV:	IN REPORT (EBA EDMONTON - 1453	PAPER COPY
DIG NO:	N/A	IN REPORT (EBA EDMONTON - 14535 - 1
SOURCE NUMBER(S):	N/A	N/A

SURVEY LINES / LOCATION DETAILS: N/A

DESCRIPTION OF STUDY AND SURVEY DETAILS:

TYPE : GEOTECHNICAL
SCOPE: SITE SPECIFIC
LEVEL: DELINEATION

SIZE :

6BH(1980);8BH,1CH(1979)
SURVEY PATTERN: LINE
SURVEY SPACING: 800M
SEASON: WINTER PROGRAM LENGTH: 2 DAYS(1980)

EQUIPMENT : SLEIGH-MOUNTED SONIC DRILL WITH 100MM OD CASING,20-9000HZ,60RPM

PENETRATION: 11.4-11.9-12.8M

RESOLUTION : GOOD

INFORMATION ON SAMPLES OR SURVEY RECORDS:

RATE : 1.5M
QUALITY: GOOD WHEN RECOVERED
TYPE : GRAB,TWT,SPT
SIZE : 64GRAB,8TWT,6SPT

LEVEL OF DETAIL: INTERPRETATION/ANALYSIS/REPORTING:

INTERP : CLASSIFICATION TESTING
REPORT : FORMAL GEOTECHNICAL REPORT
DISTRIB: SPONSOR/CONTRACTOR
OTHER : EBA 101-2622.3 (DOME79TC)

ARCHIVING OF INFORMATION:

REPORT : EBA EDMONTON (14535 - 118 AVENUE)
DATA : EBA EDMONTON (14535 - 118 AVENUE)

DATA COMPILATION AND UPDATING:

COMPILED BY: EBA ENGINEERING CONSULTANTS LTD.
DATE : 93/02/06 COMPILATION PROJECT NO.: 0101-11085
UPDATED BY :
DATE : UPDATE PROJECT NO.:

BEAUFORT SEA
INDIAN AND NORTHERN AFFAIRS CANADA
CATALOGUE OF GRANULAR RESOURCE-RELATED INFORMATION

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STUDY NUMBER: DOME80TH MONTH: 8 YEAR: 1980

SPONSOR : DOME PETROLEUM LTD.
JOB NO : N/A CONTACT: KEVIN HEWITT
CONTRACTOR : EBA ENGINEERING CONSULTANTS LTD.
JOB NO : 101-2995 CONTACT: NEIL MACLEOD
REPORT TITLE: GEOTECHNICAL EVALUATION, NEW DOCK STRUCTURE, TUK BASE, TUKTOYAKTUK, NWT, JANUARY 1981

COORDINATES :
UTM: ZONE: MINIMUM CENTRE MAXIMUM
 EASTING: 8 8 8
 NORTHING: 577500 577000 577500
OR: LATITUDE: 7706000 7706500 7707000
 LONGITUDE: 69.43333 69.45000 69.46666
 133.10000 133.05000 133.00000

LOCATION:

NAME :	GENERAL LOCATION	SITE PLAN
NUMBER:	TUKTOYAKTUK HARBOUR	TUKTOYAKTUK - NEW DOME SERVICE DOCK
SCALE : 1:	N/A	FIG 2 & 3
FORMAT: N/A		1:1333
ARCHIV: N/A		PAPER COPY
DIG NO: N/A		IN REPORT (EBA EDMONTON - 14535-118)
		N/A

SOURCE NUMBER(S): N/A

SURVEY LINES / LOCATION DETAILS: N/A

DESCRIPTION OF STUDY AND SURVEY DETAILS:

TYPE : GEOTECHNICAL
SCOPE: SITE SPECIFIC
LEVEL: DETAILED DELINEATION

SIZE :

5 NEW BH, 27 DYNAMIC CONE, (5 PREVIOUS BH)
SURVEY PATTERN: LINE AND GRID
SURVEY SPACING: 5-10M FOR DC, 20-40M FOR BH
SEASON: SUMMER/WINTER (APRIL) PROGRAM LENGTH: 2 DAYS/1 DAY/3DAYS

EQUIPMENT : RANGER WITH SOLID AUGERS, SONIC VIBRATORY DRILL

PENETRATION: 4.5-10.1-14.9 / 18.3 / 12.1-16.3-21.5

RESOLUTION : GOOD

INFORMATION ON SAMPLES OR SURVEY RECORDS:

RATE : 0.6-1.5M
QUALITY: GOOD
TYPE : GRAB, SPT, CORE
SIZE : 185 GRAB, 9 SPT, 2 CORE

LEVEL OF DETAIL: INTERPRETATION/ANALYSIS/REPORTING:

INTERP : CLASSIFICATION TESTING, DETAILED GEOTECHNICAL INTERPRETATION
REPORT : FORMAL GEOTECHNICAL REPORT
DISTRIB: SPONSOR/CONTRACTOR
OTHER : 101-2843.2, 101-2968 (DOME80??)

ARCHIVING OF INFORMATION:

REPORT : EBA EDMONTON - 14535 - 118 AVENUE
DATA : EBA EDMONTON - 14535 - 118 AVENUE

DATA COMPILATION AND UPDATING:

COMPILED BY: EBA ENGINEERING CONSULTANTS LTD.
DATE : 93/02/05 COMPILATION PROJECT NO.: 0101-11085
UPDATED BY :
DATE : UPDATE PROJECT NO.:

BEAUFORT SEA
INDIAN AND NORTHERN AFFAIRS CANADA
CATALOGUE OF GRANULAR RESOURCE-RELATED INFORMATION

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STUDY NUMBER: DOME81MC MONTH: 3 YEAR: 1981

SPONSOR : DOME PETROLEUM LTD.
JOB NO : N/A CONTACT: KEVIN HEWITT
CONTRACTOR : EBA ENGINEERING CONSULTANTS LTD.
JOB NO : 101-3156 CONTACT: NEIL MACLEOD
REPORT TITLE: GEOTECHNICAL EVALUATION OF PROPOSED CAMP FACILITIES AND MARINE WHARF AT NORTH
PROTECTION ISLAND, MCKINLEY BAY, NOVEMBER, 1981

COORDINATES :
UTM: ZONE: MINIMUM CENTRE MAXIMUM
 EASTING: 9 9 9
 NORTHING: 413920 414610 415300
OR: LATITUDE: 7761630 7761875 7762120
 LONGITUDE: 69.94928 69.95171 69.95413
 131.25000 131.23219 131.21441

LOCATION:

NAME : GENERAL LOCATION SITE PLAN
 NORTH PROTECTION ISLAND - MCKI NORTH PROTECTION ISLAND (ARTIFICIAL
NUMBER: IS)
 FIGURE 1
SCALE : 1:1128700 FIG A-1
FORMAT: PAPER COPY 1:4000
ARCHIV: IN REPORT (EBA EDMONTON 14535 PAPER COPY
DIG NO: N/A IN REPORT (EBA EDMONTON 14535 - 118
 N/A
SOURCE NUMBER(S):
 N/A

SURVEY LINES / LOCATION DETAILS: N/A

DESCRIPTION OF STUDY AND SURVEY DETAILS:

TYPE : GEOTECHNICAL
SCOPE: ONE SITE
LEVEL: DELINEATION, SUBSURFACE CONDITIONS

SIZE :

 10BH,2CH
SURVEY PATTERN: IRREGULAR GRID
SURVEY SPACING: IRREGULAR
SEASON: WINTER PROGRAM LENGTH: 14 DAYS (MAR 20 - APR 2)

EQUIPMENT : TRUCK MOUNTED CME-750 DRILL WITH CRREL (100MM ID) BARREL, WET ROTARY, 54-76MM SPLIT
SPOON, DUTCH CPT APPARATUS

PENETRATION: 8.85-12.63-17.7M

RESOLUTION :
 GOOD

INFORMATION ON SAMPLES OR SURVEY RECORDS:

RATE : 1.5M
QUALITY: GOOD
TYPE : GRAB, CORE, 54SPT, 76SPT
SIZE : 26 GRAB, 5 CORE, 42 54SPT, 16 76SPT

LEVEL OF DETAIL: INTERPRETATION/ANALYSIS/REPORTING:

INTERP : CLASSIFICATION TESTING, STRATIGRAPHY
REPORT : FORMAL GEOTECHNICAL REPORT
DISTRIB: SPONSOR/CONTRACTOR
OTHER : GEOTECHNICAL EVALUATION AT MCKINLEY BAY, EBA, 1980 (DOME80MC)

ARCHIVING OF INFORMATION:

REPORT : EBA EDMONTON (14535 - 118 AVENUE)
DATA : EBA EDMONTON (14535 - 118 AVENUE)

DATA COMPILATION AND UPDATING:

COMPILED BY: EBA ENGINEERING CONSULTANTS LTD.
DATE : 93/02/06 COMPILATION PROJECT NO.: 0101-11085
UPDATED BY :
DATE : UPDATE PROJECT NO.:

BEAUFORT SEA
INDIAN AND NORTHERN AFFAIRS CANADA
CATALOGUE OF GRANULAR RESOURCE-RELATED INFORMATION

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STUDY NUMBER: ESS076TH MONTH: 4 YEAR: 1976

SPONSOR : ESSO RESOURCE CANADA LTD. (IOL)
JOB NO : N/A CONTACT: JEFF WEAVER,PHD
CONTRACTOR : EBA ENGINEERING CONSULTANTS LTD.
JOB NO : 11-2169 CONTACT: NEIL MACLEOD
REPORT TITLE: DOCK FACILITY AT TUKTOYAKTUK HARBOUR, JULY 1978

<u>COORDINATES :</u>	<u>MINIMUM</u>	<u>CENTRE</u>	<u>MAXIMUM</u>
UTM: ZONE:	8	8	8
EASTING:	580080	580129	580177
NORTHING:	7702708	7702747	7702785
OR: LATITUDE:	69.42318	69.42351	69.42384
LONGITUDE:	132.95817	132.95689	132.95563

LOCATION:

	<u>GENERAL LOCATION</u>	<u>SITE PLAN</u>
NAME :	TUKTOYAKTUK HARBOUR	TUKTOYAKTUK IOL BASE CAMP DOCK
NUMBER:	SEE ESS081TH FIG 1	DWG NO 3
SCALE :	1:7700	1:363
FORMAT:	PAPER COPY	PAPER COPY
ARCHIV:	EBA EDMONTON (14535 - 118 AVENUE)	IN REPORT (EBA EDMONTON 14535-118 A
DIG NO:	N/A	N/A

SOURCE NUMBER(S): N/A

SURVEY LINES / LOCATION DETAILS: N/A

DESCRIPTION OF STUDY AND SURVEY DETAILS:

TYPE : GEOTECHNICAL
SCOPE: ONE SITE
LEVEL: DELINEATION,STRATIGRAPHY

SIZE : 9BH (FROM 1976 BEAUFORT SEA DRILLING PGM)
SURVEY PATTERN: GRID
SURVEY SPACING: 16M
SEASON: WINTER PROGRAM LENGTH: 3 DAYS

EQUIPMENT : IOL BECKER HAMMER DRILL

PENETRATION: 10.1-12.5M

RESOLUTION : POOR

INFORMATION ON SAMPLES OR SURVEY RECORDS:

RATE : 2.4M
QUALITY: POOR
TYPE : GRAB
SIZE : 22 GRAB

LEVEL OF DETAIL: INTERPRETATION/ANALYSIS/REPORTING:

INTERP : STRATIGRAPHY
REPORT : FORMAL GEOTECHNICAL REPORT
DISTRIB: SPONSOR/CONTRACTOR
OTHER : ESS081TH(FOR SITE LOCATION)

ARCHIVING OF INFORMATION:

REPORT : EBA EDMONTON (14535 - 118 AVENUE)
DATA : EBA EDMONTON (14535 - 118 AVENUE)

DATA COMPILATION AND UPDATING:

COMPILED BY: EBA ENGINEERING CONSULTANTS LTD.
DATE : 93/02/06 COMPILATION PROJECT NO.: 0101-11085
UPDATED BY :
DATE : UPDATE PROJECT NO.:

BEAUFORT SEA
INDIAN AND NORTHERN AFFAIRS CANADA
CATALOGUE OF GRANULAR RESOURCE-RELATED INFORMATION

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STUDY NUMBER: ESS081TH MONTH: 5 YEAR: 1981

SPONSOR : ESSO RESOURCES CANADA LTD.
JOB NO : N/A CONTACT: JEFF WEAVER, PHD
CONTRACTOR : EBA ENGINEERING CONSULTANTS LTD.
JOB NO : 101-3234 CONTACT: NEIL MACLEOD
REPORT TITLE: PRELIMINARY EVALUATION OF OFFSHORE BORROW RESOURCES, TUKTOYAKTUK HARBOUR, MAY 26, 1981

COORDINATES :
UTM: ZONE: MINIMUM CENTRE MAXIMUM
EASTING: 8 8 8
NORTHING: 579662 579893 580123
OR: LATITUDE: 7701693 7702347 7703000
LONGITUDE: 69.41420 69.42000 69.42578
132.96968 132.96324 132.95683

LOCATION:

NAME :	GENERAL LOCATION	SITE PLAN
NUMBER:	TUKTOYAKTUK HARBOUR	TUKTOYAKTUK HARBOUR
FIG 1		N/A
SCALE : 1:7700		1:
FORMAT: PAPER COPY		N/A
ARCHIV: IN REPORT (EBA EDMONTON - 1453		N/A
DIG NO: N/A		N/A

SOURCE NUMBER(S): N/A

SURVEY LINES / LOCATION DETAILS: N/A

DESCRIPTION OF STUDY AND SURVEY DETAILS:

TYPE : GEOTECHNICAL, BORROW STUDY
SCOPE: SITE SPECIFIC
LEVEL: DELINEATION

SIZE :

5CH(1981), 7BH(1973), 1CH(1978)

SURVEY PATTERN: RANDOM

SURVEY SPACING: 30-115-600M

SEASON: SUMMER(1981,78), WINTER(73 PROGRAM LENGTH: 3 DAYS(1981), 1 DAY(1973)

EQUIPMENT : SONIC DRILL (1981,1978), BECKER DRILL(1973)

PENETRATION: 14.94-18.15-24.38M (1981,1978)

RESOLUTION : GOOD

INFORMATION ON SAMPLES OR SURVEY RECORDS:

RATE : CONTINUOUS(1981,1978), 1.5M(1973)
QUALITY: GOOD(1981,1978), POOR(1973)
TYPE : CORE(1981,1973), GRAB(1973)
SIZE : 6CORE, 22GRAB

LEVEL OF DETAIL: INTERPRETATION/ANALYSIS/REPORTING:

INTERP : CLASSIFICATION TESTING
REPORT : PRELIMINARY BORROW ASSESSMENT
DISTRIB: SPONSOR/CONTRACTOR
OTHER : EBA E-604, 11-2169 (ESS076TH)

ARCHIVING OF INFORMATION:

REPORT : EBA EDMONTON (14535 - 118 AVENUE)
DATA : EBA EDMONTON (14535 - 118 AVENUE)

DATA COMPILATION AND UPDATING:

COMPILED BY: EBA ENGINEERING CONSULTANTS LTD.
DATE : 93/02/06 COMPILATION PROJECT NO.: 0101-11085
UPDATED BY :
DATE : UPDATE PROJECT NO.:

BEAUFORT SEA
INDIAN AND NORTHERN AFFAIRS CANADA
CATALOGUE OF GRANULAR RESOURCE-RELATED INFORMATION

=====

STUDY NUMBER: NTCL73TH MONTH: 7 YEAR: 1973

SPONSOR : NORTHERN TRANSPORTATION COMPANY LTD.
JOB NO : N/A CONTACT: MR. M.H. STOUT
CONTRACTOR : EBA ENGINEERING CONSULTANTS LTD.
JOB NO : E-659 CONTACT: NEIL MACLEOD
REPORT TITLE: GEOTECHNICAL EVALUATION, TERN BAY WHARF, TUKTOYAKTUK, NWT, SEPTEMBER 1973

COORDINATES : MINIMUM CENTRE MAXIMUM
UTM: ZONE: 8
 EASTING:
 NORTHING:
OR: LATITUDE:
 LONGITUDE:

LOCATION:

	<u>GENERAL LOCATION</u>	<u>SITE PLAN</u>
<u>NAME</u> :	TUKTOYAKTUK	TUKTOYAKTUK NTCL TERN BAY WHARF
<u>NUMBER:</u>	FIG A-1	N/A
<u>SCALE</u> :	1:2400	1:
<u>FORMAT:</u>	PAPER COPY	N/A
<u>ARCHIV:</u>	EBA EDMONTON (14535 - 118 AVENUE)	N/A
<u>DIG NO:</u>	N/A	N/A

SOURCE NUMBER(S): N/A

SURVEY LINES / LOCATION DETAILS: N/A

DESCRIPTION OF STUDY AND SURVEY DETAILS:

TYPE : GEOTECHNICAL
SCOPE: TWO SITES
LEVEL: DELINEATION

SIZE : 19 BH
SURVEY PATTERN: IRREGULAR
SURVEY SPACING: IRREGULAR
SEASON: SUMMER PROGRAM LENGTH: 4 DAYS (JULY 24 - 27)

EQUIPMENT : MOBILE AUGER (RANGER II) ON SMALL BARGE (M-BOAT) FOR OFFSHORE HOLES WITH AUGER (OFFSHORE) AND CORE BARREL (ONSHORE)

PENETRATION:
1.2-4.2-9.1M

RESOLUTION :
FAIR TO GOOD

INFORMATION ON SAMPLES OR SURVEY RECORDS:

RATE : 0.3-0.6M FOR GRAB, CONTINUOUS WITH 0.3-0.6M BREAKS FOR CORE?
QUALITY: FAIR TO GOOD
TYPE : GRAB, CORE
SIZE : 28 GRAB, 64 CORE

LEVEL OF DETAIL: INTERPRETATION/ANALYSIS/REPORTING:

INTERP : CLASSIFICATION TESTING
REPORT : FORMAL GEOTECHNICAL
DISTRIB: SPONSOR/CONTRACTOR
OTHER :

ARCHIVING OF INFORMATION:

REPORT : EBA EDMONTON (14535 - 118 AVENUE)
DATA : EBA EDMONTON (14535 - 118 AVENUE)

DATA COMPILATION AND UPDATING:

COMPILED BY: EBA ENGINEERING CONSULTANTS LTD.
DATE : 93/02/06 COMPILATION PROJECT NO.: 0101-11085
UPDATED BY :
DATE : UPDATE PROJECT NO.:

BEAUFORT SEA
INDIAN AND NORTHERN AFFAIRS CANADA
CATALOGUE OF GRANULAR RESOURCE-RELATED INFORMATION

=====

STUDY NUMBER: GSC84BFT MONTH: 0 YEAR: 1984

SPONSOR : GEOLOGICAL SURVEY OF CANADA
JOB NO : MISC RPT NO 38 CONTACT: MR. STEVE BLASCO
CONTRACTOR : GEOLOGICAL SURVEY OF CANADA
JOB NO : MISC RPT NO 38 CONTACT: MR. BERNIE PELLETIER
REPORT TITLE: MARINE SCIENCE ATLAS OF THE BEAUFORT SEA, SEDIMENT MISC REPORT NO. 38

COORDINATES :	MINIMUM	CENTRE	MAXIMUM
UTM: ZONE:	7	8	9
EASTING:	515204	519960	525228
NORTHING:	7674674	7811324	7948002
OR: LATITUDE:	69.18333	70.40833	71.63333
LONGITUDE:	140.61667	134.46667	128.31667

LOCATION:

	<u>GENERAL LOCATION</u>	<u>SITE PLAN</u>
NAME :	BEAUFORT SEA	BEAUFORT SEA
NUMBER:	PAGE 7 OF REPORT	VARIOUS
SCALE :	1:1000000	1:1000000
FORMAT:	PAPER	PAPER
ARCHIV:	IN REPORT (EBA CALGARY - 6111	IN REPORT (EBA CALGARY - 6111 - 36
DIG NO:	NA	NA

SOURCE NUMBER(S): N/A

SURVEY LINES / LOCATION DETAILS: N/A

DESCRIPTION OF STUDY AND SURVEY DETAILS:

TYPE : GEOLOGICAL
SCOPE: REGIONAL
LEVEL: DELINEATION

SIZE : 50 CORES (13 WITH SAND)
SURVEY PATTERN: IRREGULAR GRID
SURVEY SPACING: IRREGULAR
SEASON: SUMMER PROGRAM LENGTH: NA

EQUIPMENT : EWING PISTON CORE: 50MM DIAMETER, 700KG

PENETRATION: 0.1-4.84-12.19M

RESOLUTION : GOOD

INFORMATION ON SAMPLES OR SURVEY RECORDS:

RATE : CONTINUOUS: SUBSAMPLES 50MM THICK
QUALITY: GOOD
TYPE : PISTON CORE
SIZE : 50 COREHOLES

LEVEL OF DETAIL: INTERPRETATION/ANALYSIS/REPORTING:

INTERP : SOIL TYPE DISTRIBUTION, CHARACTERISTICS
REPORT : FORMAL OVERVIEW REPORT
DISTRIB: SPONSOR/CONTRACTOR
OTHER : FIELD DATA FOR REPORT

ARCHIVING OF INFORMATION:

REPORT : SPONSOR/CONTRACTOR
DATA : SC

DATA COMPILATION AND UPDATING:

COMPILED BY: EBA ENGINEERING CONSULTANTS LTD.
DATE : 91/03/11 COMPILATION PROJECT NO.: 0306-34693
UPDATED BY : EBA ENGINEERING CONSULTANTS LTD.
DATE : 93/02/06 UPDATE PROJECT NO.: 0101-11085

APPENDIX B

BOREHOLE LOG SOURCE REPORTS

BEAUFORT SEA PROJECTS FOR
ESSO RESOURCES CANADA LTD.

DATE (YR/MO)	REPORT TITLE/SITE	CONSULTANT NAME	CONSULTANT JOB NO.
83/	Geophysical Investigation, Arnak O-09 (4 cores)	Geoterrex	93-41 ^x
83/	Geophysical Investigation, Nipterk L-19 (3 cores)	Geoterrex	93-41 ^x
83/	Geophysical Investigation, Kadluk O-07 (4 cores)	Geoterrex	93-41 ^x
83/	Geophysical Investigation, Minuk I-53 (4 cores)	Geoterrex	93-41 ^x
83/	Geophysical Investigation, Kaubvik I-43 (1 core)	Geoterrex	93-41 ^x

X Logs contained clay to depth; not included in database.



**BEAUFORT SEA PROJECTS FOR
AMOCO/DOME/CANMAR**

DATE (YR/MO)	REPORT TITLE	CONSULTANT NAME	CONSULTANT JOB NO.
80/04	Tuktoyaktuk Harbour Approach Study - Phase II, October, 1980	EBA	101-2806.2*
80/08	Geotechnical Evaluation, New Dock Structure, Tuktoyaktuk Base, Tuktoyaktuk, NWT, January, 1981	EBA	101-2995
80/04	Base Camp and New Dock (no report, see 101-2995)	EBA	101-2843.2
81/04	Geotechnical Evaluation of Proposed Camp Facilities and Marine Wharf at North Projection Island, McKinley Bay, November, 1981	EBA	101-3156
73/78/81	Preliminary Evaluation of Offshore Borrow Resources, Tuktoyaktuk Harbour, May 26, 1981	EBA	101-3234
73/06	Geotechnical Evaluation, Tern Bay Wharf, Tuktoyaktuk, NWT, September, 1973	EBA	101-0659 (E-659)
82/01	Site Investigation for a Camp Facility at Tuktoyaktuk, June, 1982	EBA	101-3532

* Four of six logs included.

**BEAUFORT SEA PROJECTS FOR
GEOLOGICAL SURVEY OF CANADA / ATLANTIC GEOSCIENCE CENTRE**

DATE (YR/MO)	REPORT TITLE	CONSULTANT NAME	CONSULTANT JOB NO.
70/	Marine Science Atlas of the Beaufort Sea - Sediment, Miscellaneous Report No. 38 (40 cores/sites)	GSC	MR. 38 *
81/	Herschel Island to Baillie Island, Regional Wellsite Tielines (cores, grabs) **	AGC	-
82/	Nahidik 1982 - Grid Site 1 and 2, Pingo Search, Well Site Tielines (cores) **	AGC	- &
83/	Nahidik 1983 - Western Beaufort Sea (cores) **	Gov't	- &
84/	Multidisciplinary Geophysical and Hydrographic Survey off the Yukon Coast, October, 1984 (9 benthos cores)	Cansite/EOR	08SB.FP941-3 -3427#
86/09	CCGS Nahidik Operations Report for Shallow, High Resolution, Marine Geophysical Survey, Mackenzie Bay/Kugmallit Bay, Canadian Beaufort Sea, September, 1986 (grabs)	McGregor	86-50 &

* 13 of 40 logs included

Logs comprised clay; not included

& No new information available

** Report not available

APPENDIX C

GEOPHYSICAL LINE STUDY DATA - STRUCTURE AND SAMPLE SHEET

Structure for database: C:\greports.dbf

Number of data records: 819

Date of last update : 02/02/93

Field	Field Name	Type	Width	Dec
1	STUDY_NO	Character	12	
2	AREA	Character	30	
3	TITLE1	Character	30	
4	TITLE2	Character	30	
5	TITLE3	Character	30	
6	TITLE4	Character	30	
7	YEAR	Character	4	
8	CNTR1	Character	30	
9	CNTR2	Character	30	
10	SPNR1	Character	30	
11	SPNR2	Character	30	
12	LINE	Character	15	
13	MLTICH	Character	5	
14	NTRACE	Character	5	
15	PROFILE	Character	5	
16	ECHOS	Character	5	
17	SDSCAN	Character	5	
18	ARCH1	Character	30	
19	ARCH2	Character	30	
20	ARCH3	Character	30	
21	ARCH4	Character	30	
22	ARCH5	Character	30	
23	ARCH6	Character	30	
24	ARCH7	Character	30	
25	ARCH8	Character	30	
**	Total	**	567	

CATALOGUE OF GRANULAR RESOURCE RELATED FIELD ACTIVITIES
BEAUFORT SEA
STUDY DATA SHEET

PART A: STUDY REFERENCE AND LOCATION

YEAR: 1983 STUDY NUMBER: ESSO83NP1
BLOCK/REGION NAME: Nipterk L-19
TITLE OF REPORT : Marine Bottom and Subbottom Survey, Nipterk L-19

SPONSOR : ESSO Resources Canada Ltd.
CONTRACTOR : Geoterrex Ltd.

DATA ARCHIVING: ESSO Plaza 16 flr., working file room - reports.
Line data was obtained at M.J. O'Connors and Associates,
in the store room.

PART B: STUDY DETAILS

(listed= L, found= F, copied= C)

LINE #	MULTI-CHANNEL	NEAR TRACE	PROFILER	ECHO SOUNDER	SIDE SCAN
851088	L	L/F/C	L/F/C	L/F/C	L/F
851120	L		L/F/C	L/F/C	L/F
85118	L		L/F/C	L/F/C	L/F
85119	L		L/F/C	L/F/C	L/F
85121	L		L/F/C	L	L/F
85121A		L/F/C	L/F/C	L/F/C	L/F
85122	L/F	L/F/C	L/F/C	L/F/C	L/F
85123	L		L/F/C	L	L/F
85123A	L	L/F/C	L/F/C	L/F/C	L/F
85124	L	L/F/C	L/F/C	L/F/C	L/F
85125	L	L/F/C	L/F/C	L/F/C	L
85126	L/F	L/F/C	L/F/C	L/F/C	L/F
85127	L	L/F/C	L/F/C	L/F/C	L/F
85128	L	L/F/C	L/F/C	L/F/C	L/F
85129	L	L/F/C	L/F/C	L/F/C	L/F
85130	L	L/F/C	L/F/C	L/F/C	L/F
85131	L/F	L/F/C	L/F/C	L/F/C	L/F
85132	L	L/F/C	L/F/C	L/F/C	L/F
85133	L	L/F/C	L/F/C	L/F/C	L/F
85134	L	L/F/C	L/F/C	L/F/C	L/F
85136	L		L/F/C	L/F/C	L/F
regional line 1		L/F/C			

APPENDIX D

BACKGROUND INFORMATION ON DATABASES

APPENDIX D - TABLE OF CONTENTS

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USC DESCRIPTIONS

BACKGROUND INFORMATION ON DATABASES

1.0 REPORT CATALOGUE DATABASE DESCRIPTION

The report catalogue database summarizes general data for each report containing geophysical or geotechnical data in the Canadian Beaufort Sea. The database now contains information from 244 reports (154 geotechnical, 90 geophysical). Some reports cover large geographic areas; therefore, in order to facilitate searching for this data, the catalogue of field activities includes numerous entries with separate entries for 'sub-projects' from smaller geographic zones.

The report catalogue summarizes such items as the report title, the year and month of the field work, the sponsor and contractor of the work, the location coordinates and area name of the site, quality of the data obtained, numbers of samples obtained, and where the reports and raw data are archived.

A researcher can use the report catalogue to search for all the reports discussing a specified area or region (for example, Amerk) of the Beaufort Sea. As another example, the researcher could also search for all the reports done for a specified sponsor (for instance, GULF) between the years 1982 and 1988, with the data quality listed as "good". The researcher can then use the study number of each report (a unique identifier, to be discussed in a later section) to find the related boreholes in the ESEBase borehole database. Numerous operations can be done in ESEBase to provide an evaluation of the specified area of interest (to be discussed in a later section). Then, the researcher could obtain the original reports to obtain the detailed background information.

2.0 ESEBASE BOREHOLE DATABASE DESCRIPTION

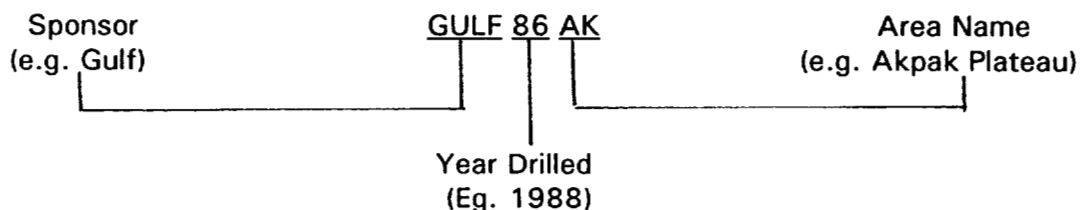
The Beaufort Sea Borehole Database now contains a total of 2935 boreholes. The database is now in ESEBase Version 4.0 format. This ESEBase database can be used as a research tool. For example, the researcher can use the borehole database to call up boreholes from a specified region, or boreholes with a specified gravel content. The researcher can then produce area plots showing the boreholes, stratigraphic cross-sections, plots of laboratory data versus depth, individual borehole plots, and so on. Improved mapping features will be available with the new INFOCUS/FOXPRO implementation of ESEBase, in future.

The original format, numbering system, datum, etc., are generally not consistent for the raw borehole data received. The following sub-sections describe some of the modifications required to standardize the logs to ESEBase format for inclusion in the present database.

Figure 2 presents a typical borehole log, as produced by the ESEBase program.

2.1 Study Number

The study number identifies the report from which borehole information is obtained, and is used as a link to other databases. This field is 12 characters long, with the first 4 characters identifying the sponsor, the following 2 characters the year of the field work, and up to 6 characters to identify the area or site name, as follows:



The study number appears in the "xref_1" field of the borehole index page, and also in the

2.2 Corehole/Borehole/Surficial Sediment Sample Number

To accommodate similar corehole or borehole numbers from logs acquired in different areas, some renaming and renumbering has been done. If boreholes have been renumbered, the original borehole number is shown on the "note_3" field of the borehole index page. Gravity cores, piston cores, and grab samples were also distinguished from boreholes where possible. ESEBase allows twelve characters for a borehole name. Some examples of revised identification format are presented, for instance:

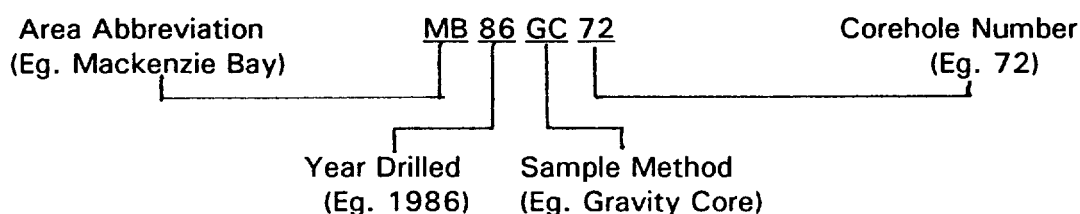


Table 1 summarizes the area abbreviations used for each block in the database. For blocks included in previous work the same abbreviation was used where possible. Some new blocks have been added. Table 2 lists the abbreviations for sample methods or types.

The original corehole or borehole numbers (from the original logs) are identified in the top centre block of the printout logs and in "note_3" or "xref_3" of the database index page, if these have been changed. The study number identifying the report source of the borehole is recorded in the "xref_1" field of the database index page. In future, a granular source number may be recorded in the "xref_2" field, if applicable.

2.3 Reference To Sea-Level

To facilitate searching capabilities with respect to sea level or seabed, all coreholes/boreholes/surficial sediment samples have been referenced to a seabed at zero metres elevation. To allow ESEBase to provide seabed profiles, a negative water depth was entered in the "top/hole" field of the database index page for each corehole log.

2.4 Borehole/Sample Method or Sample Type

Table 2 presents a list of borehole/sample method or sample types and corresponding abbreviations used for the database. For gravity cores having no recovery where the depth of penetration is unknown, the sample type is not described under sample data, but only under soil description.

2.5 Soil Description

The stratigraphic information on the logs includes the following components where available.

- principal component (e.g. Clay, Sand, Silt, etc.)
- Unified Soil Classification (USC)
- principal component modifier(s) (e.g. silty, some sand, etc.)
- particle shape
- structure
- moisture
- consistency
- plasticity
- colour
- ground ice description

It should be noted that many gravity core entries are the composite of several trials at the same depth (for instance A, B and C). Where a change in soil type does not occur at that depth, an average depth was calculated. However, the actual depth of a particular sample (generally the most descriptive sample was input) was plotted. For this reason, the range of a particular soil sample occasionally does not match exactly to the soil description. Many gravity core logs gave no indication of the depth of penetration. In these cases, an arbitrary value of 0.5 m was assigned.

2.6 Soil Classification Data

Available moisture content, Atterberg Limits, grain size analyses and Unified Soil Classification (USC) data have been included in the database. A description of the USC classifications is presented at the end of this text.

All moisture contents from original logs have been included, except where several moisture contents were performed on subsamples of a single sample. If the moisture contents were similar for the subsamples then only one moisture content value was recorded; however, moisture contents which varied significantly from one subsample to the next were included (for example, sand and clay layers within a sample).

Atterberg Limits and grain size analyses were used to check and provide Unified Soil Classification System (USC) classifications. Stratigraphy entered in the 'soil description' section of ESEBase have USC classifications in upper and lower case characters. Uppercase characters (e.g. CL) imply that there is soil test data to confirm the classification, while lower case USC classifications (e.g. cl) implies that there is only an estimate of the USC classification. On occasion there is soil test data which is insufficient to fully determine the classification, for example if a grain size analysis has been done but silt and clay contents have not been distinguished and no Atterberg Limits are available. Thus if a soil description is incomplete, for instance for a sand with a high fines content, it would be difficult to say whether the sand should be classed as "SM" or "SC". In these cases, lower case USC classifications are used, particularly if the logger made no attempt at classification. All USC classifications have been entered in upper case characters in the 'Basic Soil Characteristics Data' file where test data is available.

All available grain size data has been included in the database. 'D50' data was not always available for the logs and was not calculated. This data would be a valuable addition to the logs. Silt and clay contents are presented in separate fields in the 'Basic Soil Characteristics Data' file.

2.7 Ground Ice Description and Sample Temperature

The ground ice description standard used for this database follows the guidelines established by NRC. Where available and readily interpreted, ground ice information has been stored in the 'Ground Ice Description' field of the 'Scientific', 'Permafrost' and 'Rock Data' file. Soil sample temperature has been entered in the 'Temp' field of the 'Scientific', 'Permafrost' and 'Rock Data' file. This field is presented on the borehole log for logs where temperature data is available.

USC DESCRIPTIONS

UNIFIED SOIL CLASSIFICATION †

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES	CLASSIFICATION CRITERIA				
COARSE-GRAINED SOILS More than 50% retained on No. 200 sieve *	GRAVELS 50% or more of coarse fraction retained on No. 4 sieve	CLEAN GRAVELS	GW	Well-graded gravels and gravel-sand mixtures, little or no fines	Classification on basis of percentage of fines GW, GP, SW, SP GM, GC, SM, SC Borderline Classification requiring use of dual symbols Less than 5% Pass No. 200 sieve More than 12% Pass No. 200 sieve 5% to 12% Pass No. 200 sieve	$C_u = D_{60}/D_{10}$ Greater than 4 $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3			
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines		Not meeting both criteria for GW			
		GRAVELS WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures		Atterberg limits plot below "A" line or plasticity index less than 4	Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols		
			GC	Clayey gravels, gravel-sand-clay mixtures		Atterberg limits plot above "A" line and plasticity index greater than 7			
	SANDS More than 50% of coarse fraction passes No. 4 sieve	CLEAN SANDS	SW	Well-graded sands and gravelly sands, little or no fines		$C_u = D_{60}/D_{10}$ Greater than 6 $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3			
			SP	Poorly graded sands and gravelly sands, little or no fines		Not meeting both criteria for SW			
		SANDS WITH FINES	SM	Silty sands, sand-silt mixtures		Atterberg limits plot below "A" line or plasticity index less than 4	Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols		
			SC	Clayey sands, sand-clay mixtures		Atterberg limits plot above "A" line and plasticity index greater than 7			
			FINE-GRAINED SOILS 50% or more passes No. 200 sieve *	SILTS AND CLAYS Liquid limit 50% or less		ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands	<div>PLASTICITY CHART</div> <div>For classification of fine-grained soils and fine fraction of coarse-grained soils.</div> <div>Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols</div> <div>Equation of A-line: $P_I = 0.73 (LL - 20)$</div>	
						CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays		
OL	Organic silts and organic silty clays of low plasticity								
SILTS AND CLAYS Liquid limit greater than 50%	MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts							
	CH	Inorganic clays of high plasticity, fat clays							
	OH	Organic clays of medium to high plasticity							
HIGHLY ORGANIC SOILS				Pt	Peat, muck and other highly organic soils	* Based on the material passing the 3-in. (75-mm) sieve † ASTM Designation D 2487			

TERMS USED ON BOREHOLE LOGS

TERMS DESCRIBING CONSISTENCY OR CONDITION

COARSE GRAINED SOILS (major portion retained on 0.075mm sieve): includes (1) clean gravels and sands, and (2) silty or clayey gravels and sands. Condition is rated according to relative density, as inferred from laboratory or in situ tests.

DESCRIPTIVE TERM	RELATIVE DENSITY	N (blows per 0.3m)
Very Loose	0 to 20%	0 to 4
Loose	20 to 40%	4 to 10
Compact	40 to 75%	10 to 30
Dense	75 to 90%	30 to 50
Very Dense	90 to 100%	greater than 50

The number of blows, N, on a 51mm O.D. split spoon sampler of a 63.5kg weight falling 0.76m, required to drive the sampler a distance of 0.3m from 0.15m to 0.45m.

FINE GRAINED SOILS (major portion passing 0.075mm sieve): includes (1) inorganic and organic silts and clays, (2) gravelly, sandy, or silty clays, and (3) clayey silts. Consistency is rated according to shearing strength, as estimated from laboratory or in situ tests.

DESCRIPTIVE TERM	UNCONFINED COMPRESSIVE STRENGTH (kPa)
Very Soft	Less Than 25
Soft	25 to 50
Firm	50 to 100
Stiff	100 to 200
Very Stiff	200 to 400
Hard	Greater Than 400

NOTE: Slickensided and fissured clays may have lower unconfined compressive strengths than shown above, because of planes of weakness or cracks in the soil.

GENERAL DESCRIPTIVE TERMS

Slickensided	- having inclined planes of weakness that are slick and glossy in appearance.
Fissured	- containing shrinkage cracks, frequently filled with fine sand or silt; usually more or less vertical.
Laminated	- composed of thin layers of varying colour and texture.
Interbedded	- composed of alternate layers of different soil types.
Calcareous	- containing appreciable quantities of calcium carbonate.
Well Graded	- having wide range in grain sizes and substantial amounts of intermediate particle sizes.
Poorly graded	- predominantly of one grain size, or having a range of sizes with some intermediate size missing.

