CRUISE REPORT, C.S.S. DAWSON 91-018
INNER SCOTIAN SHELF
JUNE 4-21, 1991

BY

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CRUISE SUMMARY

Cruise Number:	91-018
Vessel:	C.S.S. Dawson
Cruise Dates:	June 4-June 21, 1991
Responsible Agency:	Atlantic Geoscience Centre, Geological Survey of Canada, Bedford Institute of Oceanography, Dartmouth, N. S., B2Y 4A2
Area:	Inner Scotian Shelf off Lunenburg, Halifax, Sheet Harbour and Country Harbour, and Halifax Harbour
Ship's Master:	Captain R. Heath
Senior Scientist:	Gordon B. J. Fader

Scientific Personnel:

Tony Atkinson	Technician
Michael Belliveau	Technician
Austin Boyce	Technician
Normand Chatelier	Student
Tom Duffett	Technician
Gordon Fader	Scientist
Michael Hughes	Technician
Larry Johnston	Technician
John MacDonald	Technician
Robert Miller	Technician
Shawn Pecore	Student
Mark Rudolph	Student
Ralph Stea	Scientist

INTRODUCTION

This cruise was part of a program to assess the non-fuel mineral and aggregate potential of the inner Scotian Shelf in an area extending from Lunenburg Bay to Country Harbour. It was largely sponsored by the Canada-Nova Scotia Cooperation Agreement on Mineral Development but also integrated research by Dalhousie University Centre for Marine Geology, Doctoral Thesis of R.R. Stea in a study of onshore-offshore Quaternary geological correlations; MA Sc. Thesis of Shawn Pecore from the Technical University of Nova Scotia on engineering aspects of hazards and geological constraints; and an EMR Research Grant through the University of Waterloo to assess the aggregate potential of the inner Scotian Shelf. The early part of the cruise tested a new AGC vibrocorer designed by the Geological Survey of Finland and modified and constructed by Brooke Ocean Technology Ltd. These vibrocorer trials were conducted in Halifax Harbour and the data collected will be integrated into a continuing study of the surficial geology and environmental assessment of contaminants in the Harbour sediments. Additionally, a survey of the gas-charged sediments of Halifax Harbour was conducted after the vibrocorer trials before leaving for the inner shelf study areas. The purpose of the experiment was an attempt to penetrate through the gassy sediments north of McNabs Island with the acoustic energy of the low frequency sleeve-gun system and to define the bedrock surface beneath. This cruise represented the first regional attempt to assess the mineral and aggregate potential of the inner Scotian Shelf.

Specifically, the cruise was designed as an acoustic and integrated sampling field study with the following objectives: 1) to evaluate the gold placer potential and aggregate resources, 2) to map the distribution of surficial sediments and bedrock as well as surface and subsurface features, 3) to establish seismostratigraphic and lithic criteria for the identification of till units in the nearshore, 4) to determine the offshore extent and timing of ice flow phases, previously identified on land, by dating the Quaternary sediments to establish a temporal framework for the regional glacial history, 5) to identify surficial sedimentary units using acoustic, biostratigraphic and textural properties for future engineering and resource studies, 6) to determine the amount of the late-Pleistocene-Holocene sea level lowering and the nature and history of the subsequent marine transgression across the inner shelf and its effect on previously deposited sediments, and 7) to assess geological hazards and constraints for engineering development in the nearshore. When analysed and interpreted, the data from the cruise will be synthesized to develop a placer genesis model for the inner Scotian Shelf.

EQUIPMENT

The seismic reflection systems deployed during the survey consisted of a Huntec Deep-Towed high resolution system (DTS), a Haliburton sleeve-gun system and an IKB Seistec Line-in-Cone system. The IKB Seistec system was only deployed in the quiet waters of Country Harbour. BIO designed 70 khz and Klein dual frequency 100 and 500 khz sidescan sonars provided sonograms of the seabed. Bathymetric data were collected with a hull mounted 3.5 khz profiler.

Cores in soft sediments were collected with a Benthos piston coring system, and in coarse sediments a new Finnish designed/Brooke Ocean fabricated vibrocore, with a 3 m penetration capability, was employed. Samples of the seabed were collected with a modified IKU grab sampler, a system which collects approximately 0.3 cubic metre samples and can penetrate through lag gravels and maintain an undisturbed stratigraphy in surficial sediment. Bottom photographs were collected with a frame-mounted Umel camera system.

DISCUSSION AND COMMENTS

For testing of the new vibrocorer, sites were chosen in Halifax Harbour where previous attempts to collect strategic piston cores were unsuccessful. A location was identified to the east of Georges Island, in the inner Harbour, where the Holocene mud thinned and subsurface sediments, interpreted as lacustrine deposits on the basis of previously collected seismic reflection data, became accessible. A vibrocore at this location penetrated through thin Holocene mud to a lag gravel and sand transgressive surface overlying the lacustrine sediment. Two additional cores were collected in the outer Harbour in silty sand. Minor adjustments and modifications were made to the vibrocorer system on the basis of these trials.

The inner shelf phase of the survey began off Lunenburg with the intention of surveying the first of four selected areas on a grid basis, progressing to the east (Figure 1). Each survey area was approximately 30 km by 50 km and extended from approximately 10 m water depth in the nearshore to over 160 m water depth at the northern margins of the large basins on the inner Scotian Shelf. The southernmost limit of the survey was intended to cross the inner shelf moraines, King et al. (1972), and King and Fader (1986), in an attempt to correlate the till of these moraines with that of the adjacent land.

LUNENBURG STUDY

The survey off Lunenburg revealed the presence of moraines in the northeastern area of the inner shelf. These features present a steep profile suggesting that they have not been transgressed. It is not clear if they are ridges or drumlins. Seaward of the moraines, outcropping bedrock is extensive on this area of the inner shelf. A large feature south of Cross Island off the mouth of Lunenburg Bay, previously identified as a moraine by Piper et al. (1985), was resurveyed and sampled. This large constructional feature appears

to occur over a deep, steeply-sided bedrock depression, likely a channel. This positive feature may represent a coarse grained morainal bank or outwash delta similar to deposits found in the near shore coastal area of Maine and on the northern Grand Banks of Newfoundland and is interpreted to have formed in a tide water glacial setting at the terminus of a marine based glacier. The subsurface bedrock channel may have previously existed as a subglacial tunnel valley which subsequently has been infilled. Similar morainal banks were not found in any of the other study areas.

Samples were collected close to land near Lunenburg where placer gold had previously been identified, and in a regional grid pattern to provide ground truthing for the acoustic data. An area previously interpreted, on the basis of sidescan sonograms, to consist of a series of possible mineral excavation pits at the seabed was also sampled in an attempt to obtain samples where industrial marine mining activity may have taken place.

HALIFAX STUDY

The survey off Halifax Harbour was intended to complement previous data collected by Forbes et al. (1991) on the inner shelf and to connect with data collected in outer Halifax Harbour (Miller et al. (1989); Fader et al. (1991). This would provide a regional transect across the entire inner shelf extending from Bedford Bay in the north, to the northern area of Emerald Basin on the central Scotian Shelf. East to west tie lines of the survey off Halifax had to be prematurely terminated because of the commencement of an unannounced NATO exercise involving a large number of vessels. However, an adequate acoustic grid coverage was completed in the short time available.

Bedrock outcrop is extensive off Halifax. A deltaic complex at a depth of 70 m, previously identified by Forbes and Boyd in 1989, was successfully vibrocored. A radiocarbon date on *Mytilus* shell hash indicates a low stand of sea level on the inner shelf at 11.6 ka. This is approximately 20 m deeper than the low stand suggested by Forbes and Boyd,(1989) and indicates that the large exposed bedrock platform which occurs seaward and deeper than their interpreted lowstand was likely denuded of glacial materials by the transgressing sea.

This area differs from the others in the study because of the presence of thick multiple till sequences in the nearshore, the presence of the ancestral Sackville River channel along the western side of the study area, deep northeast-southwest trending tributary valleys, and seaward of the till occurrences, at 60 m water depth, a transition to a broad area underlain by glaciomarine/glaciolacustrine sediment. Cores were collected through the glaciomarine/lacustrine sediments and large volume samples were collected from the tills on the inner shelf. The tills are overlain by generally thin deposits of lag gravel, the Sable Island Gravel Formation of King (1970). LaHave Clay and Sable Island Sand occur in the deep ancestral Sackville River Channel. In many areas of the Channel, gas-charging of the sediments is evident. In the deep part, beyond the headlands of Halifax Harbour, sand waves are present in an area accompanied by erosion of the underlying sediments, possibly estuarine mud, to a depth in excess of 10 m. The dynamic setting of the deep ancestral Sackville River Channel is also illustrated by evidence from outer Halifax Harbour where sand ribbons and megaripples are formed. The orientation of the bedforms suggests that the currents that formed them moved from the south to north, up Harbour.

SHEET HARBOUR STUDY

The survey off Sheet Harbour identified several new features on the inner shelf not previously known. A large zone, covering at least 500 sq km in water depths between 80 and 115 m, is characterized by the presence of steep-sided ridges with an internal acoustic character similar to till identified in many areas farther offshore (King and Fader, 1986). A closely spaced series of sidescan transects were conducted in several areas over the ridges to produce a sidescan sonar mosaic and assess the shape of the features. Individually, the ridges are up to 20 m in height and at least two populations of features appear to be

present. The surface of the ridges appear to be covered with gravel in the cobble to boulder size range (Sable Island Gravel) based on an interpretation of the sidescan sonar data. A study of large volume samples collected on the ridges shows they are composed of a diamicton with striated clasts and a muddy-sandy matrix, likely a till. These features are very significant to an understanding of the glacial/sea level history of the inner shelf. The steepness of the features and their location in water depths well above the previously interpreted low sea level stand of 110 m King, (1970) and Fader (1989), suggest that they have not been transgressed. They either represent a late glacial advance across the inner shelf sometime after the migration of the transgressing sea or they were protected from erosion by a remnant ice cover. King and Fader (1988) interpreted the presence and advance of local Younger Dryas ice on the emergent banks of the Scotian Shelf between 11 000 and 10 000 years ago. These moraines may also attest to the presence and advance of ice across the inner shelf at the same time.

A series of buried channels and valleys have been identified across this area of the inner shelf. They occur in present water depths of 80 m and extend to 70 m in depth. They are filled with a complex series of acoustic units interpreted as till, lacustrine, estuarine, and glaciomarine sediments and the sequence is truncated near the top, and overlain with transgressive sand and gravel of the Sable Island Sand and Gravel Formation. Similar channels occur in all of the other study areas surveyed during this cruise.

An initial interpretation of the seismic profiles, from a transect across the inner shelf in the Sheet Harbour area, revealed zones of distinct surface morphology and seismic sequences. These include landward: 1) Eastern Shore Moraine, 2) Basin Fill-Emerald Silt and LaHave Clay, 3) Truncated Emerald Silt, 4) Minor Till-Tongue Moraine, 5) Inter Moraine Basin, 6) Symmetrical and Asymmetrically Moraines, 7) Valleys and 8) Bedrock.

Zones 4-6 contain distinct ridges varying from 2-30 m in height and several hundred metres to several kilometres in length. These ridges internally consist of acoustically incoherent reflections interpreted as till. Indeed, grab samples taken from these ridges consisted of a stony diamicton with striated clasts. The ridges display several differing morphologies which can be grouped into zones of similar shaped features. Their distribution appears to be related to water depth. In regions extending from 150-120 m water depth, the ridges interfinger with conformable glaciomarine Emerald Silt. These are the till-tongue moraines of King and Fader, (1986). From 120-80 m water depth the ridges are symmetrical and do not interfinger with surrounding glaciomarine deposits (Emerald Silt). In depths shallower than 80 m, the ridges have a marked asymmetry with a steep landward side. The orientation of these ridges changes landward from northeast-southwest at the southern Eastern Shore Moraine, to northwest-southeast at the shallowest features. These ridges are interpreted as ice marginal moraines. In several respects they are similar to the lift-off moraines, King and Fader, (1986) found in the adjacent basins of the shelf generally buried beneath the glaciomarine Emerald Silt Formation.

We interpret the seismic sequences and morainal zones in the Sheet Harbour area to represent ice marginal deposition from a landward-retreating ice mass, punctuated by stillstands or slight readvances. At the same time on the adjacent land, ice centres were changing from an ice-divide which straddled the axis of Nova Scotia flowing southeastward (Scotian Ice Divide), to southwestward-flowing remnant ice caps largely confined to northern Nova Scotia. The valley fill zone (ca 70 m) marks the lowest sea level position in the region. Above this zone is a region generally denuded of Quaternary cover but containing areas with bedded sediment that are truncated by an erosional surface at the sea floor.

COUNTRY HARBOUR STUDY

This survey was conducted within Country Harbour and on the contiguous inner Scotian Shelf. Long known as an area of potential gold placers, the survey concentrated on morphological features such as "The Dome", an area at the mouth of Country Harbour where previous industry surveys have suggested a potential for placer gold. Within Country Harbour, the seismic survey utilized the IKB Seistec Line-in-Cone

system to provide higher stratigraphic resolution. However, much of the inner area of Country Harbour is underlain by gas-charged sediments preventing the penetration of the acoustic energy from the seismic reflection systems. In the outer area of the western side of Country Harbour, a large field of pockmarks were identified at the seabed, suggesting the venting of biogenic methane. Aquaculture sites are located within the area of the pockmarks and it is not known if there is a relationship between the two. Beyond the mouth of Country Harbour, seaward of "The Dome" the Holocene mud gives way to coarser sand and gravel overlying very thick deposits of acoustically stratified sediment interpreted as glaciomarine material over 200 m in thickness.

All of the surveys conducted in the detailed study areas were extended seaward to include the inner Scotian Shelf moraines previously identified by King et al. (1972) and King and Fader, (1986). Samples were collected on the upper surfaces of the moraines to compare the lithology of the tills sampled landward and on the adjacent land.

PRELIMINARY INTERPRETATION

The large volume IKU grab samples portray a different distribution and detailed stratigraphy of the surficial sediments than that gained from the smaller Van Veen grab samples previously collected. The earlier samples consisted mostly of well-rounded gravel clasts. In contrast, the IKU sampler cut through the lag gravel and recovered a relatively intact sample of the underlying sediment, mostly till. This indicates that the lag deposits are thin, only several clasts thick, resulting from a modification of the till surface during the marine transgression. The absence of thick deposits of sand and gravel may result from the vast exposure of bedrock on the inner shelf which generally occurs as a series of regionally, coast parallel, bedrock ridges. These ridges are in effect riffles which likely prevented effective erosion of thick till deposits and the transport of gravels and sands. The bedrock ridges additionally protected the till deposits during the marine transgression. An absence of beach ridges is also characteristic of the inner shelf and we suggest that even though such features were likely developed during the Holocene transgression, subsequent conditions of high energy and wave-base erosion in the sublittoral zone of the transgressing sea may have dispersed such features. The lag gravels are however, widespread.

The presence of the thin lag gravel surfaces overlying till has potential limiting implications for placer mining in the nearshore. Mining through thin gravel lag surfaces to obtain heavy minerals would likely expose fine-grained sediments within the till with the concomitant release of this material to the water column and possible environmental consequences for the benthic community. Further analyses will provide an assessment of the concentrating mechanisms for placer gold and stratigraphic variations through the surficial sediments.

Sand-sized sediments were relatively rare on the inner shelf in all of the areas studied. Most of the sand bodies were concentrated near the present shoreline, especially along drumlin strewn coasts. Sand was also present over many of the buried channels.

Shape analysis of the gravel fraction will assist in an understanding of the low sea level stand and the possible late advance of glaciers across the inner Scotian Shelf.

ACKNOWLEDGMENTS

We thank Captain Robin Heath, the officers and the crew of C.S.S., Dawson for their support during the cruise. This was the first cruise of the Atlantic Geoscience Centre in 1991, conducted under severe overtime restrictions, and as such, was a difficult and trying event for all staff and ship's complement. The technicians of the Program Support Subdivision of the Atlantic Geoscience Centre are particularly thanked for the extra effort they put forth in operating and repairing the new prototype vibrocore. The technicians and engineers of Brooke Ocean Technology are also thanked for the supreme effort in preparing the

vibrocore system for the cruise within tight time constraints. The Huntec technicians from Seastar Ltd. provided excellent support to the tired system and responded quickly to failures, resulting in minimal down time. Norman Chatelier from McGill University worked long hours in assisting the data technicians log the information and we sincerely thank him. We appreciate the support and discussions with John Fowler of the Nova Scotia Department of Natural Resources on the cruise plans and his continuing encouragement throughout the project. We also thank the Canada-Nova Scotia Cooperation Agreement on Mineral Development for providing the funding for most of the research and the excellent support we received from their program office.

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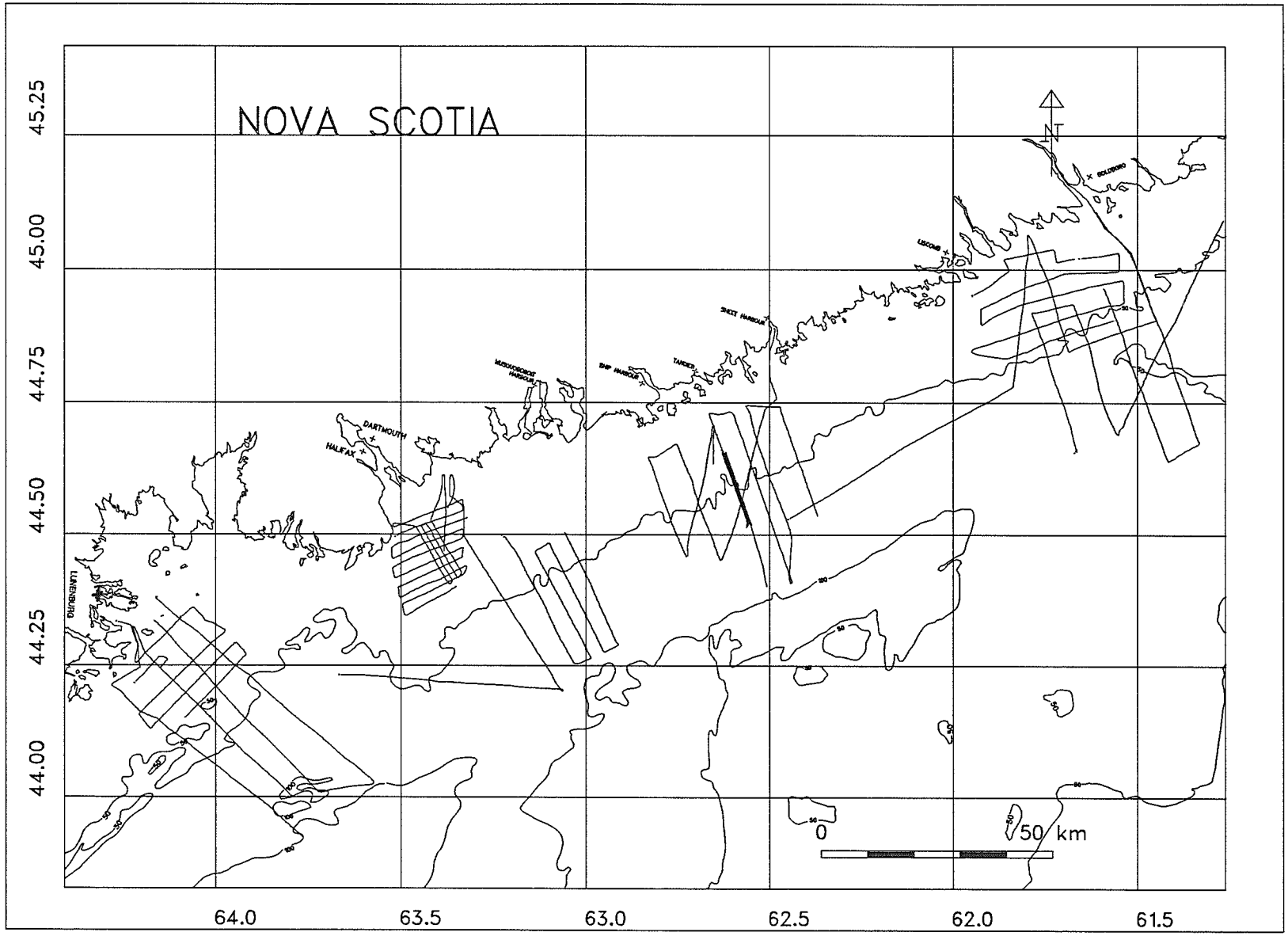

Figure 1. Tracks - Cruise 91-018

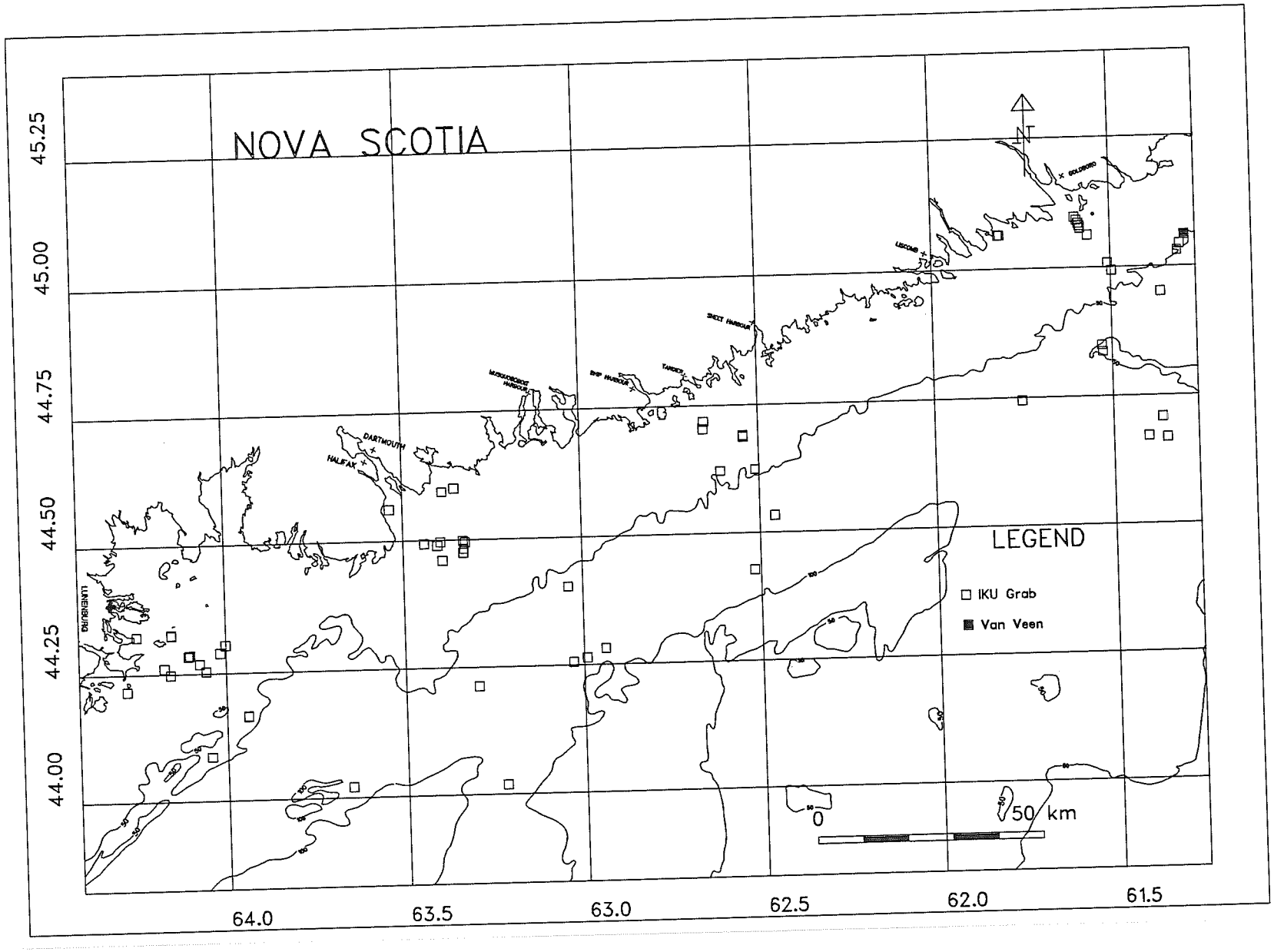

Figure 2. Grab sample locations - Cruise 91-018

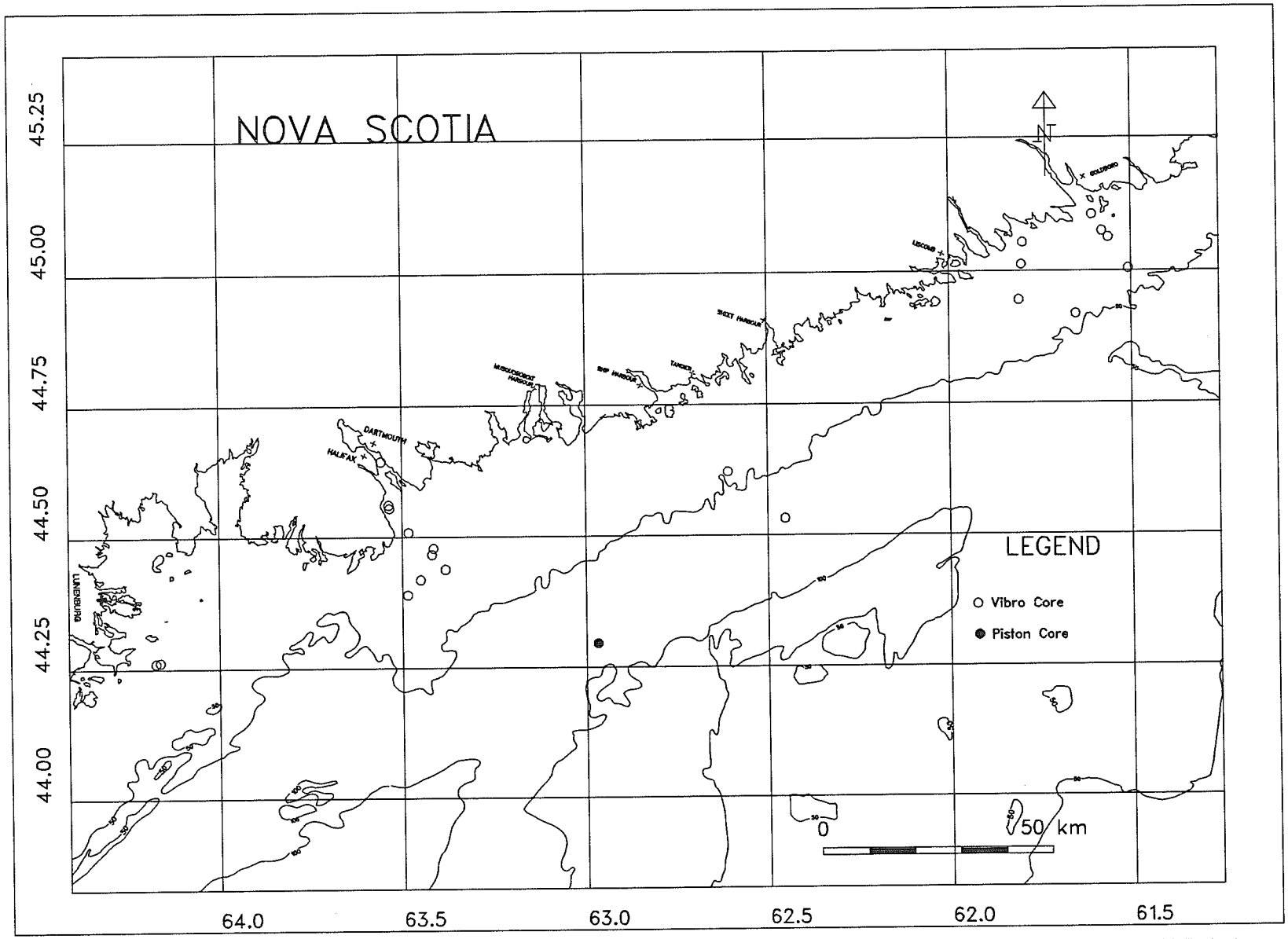

Figure 3. Core sample locations - Cruise 91-018

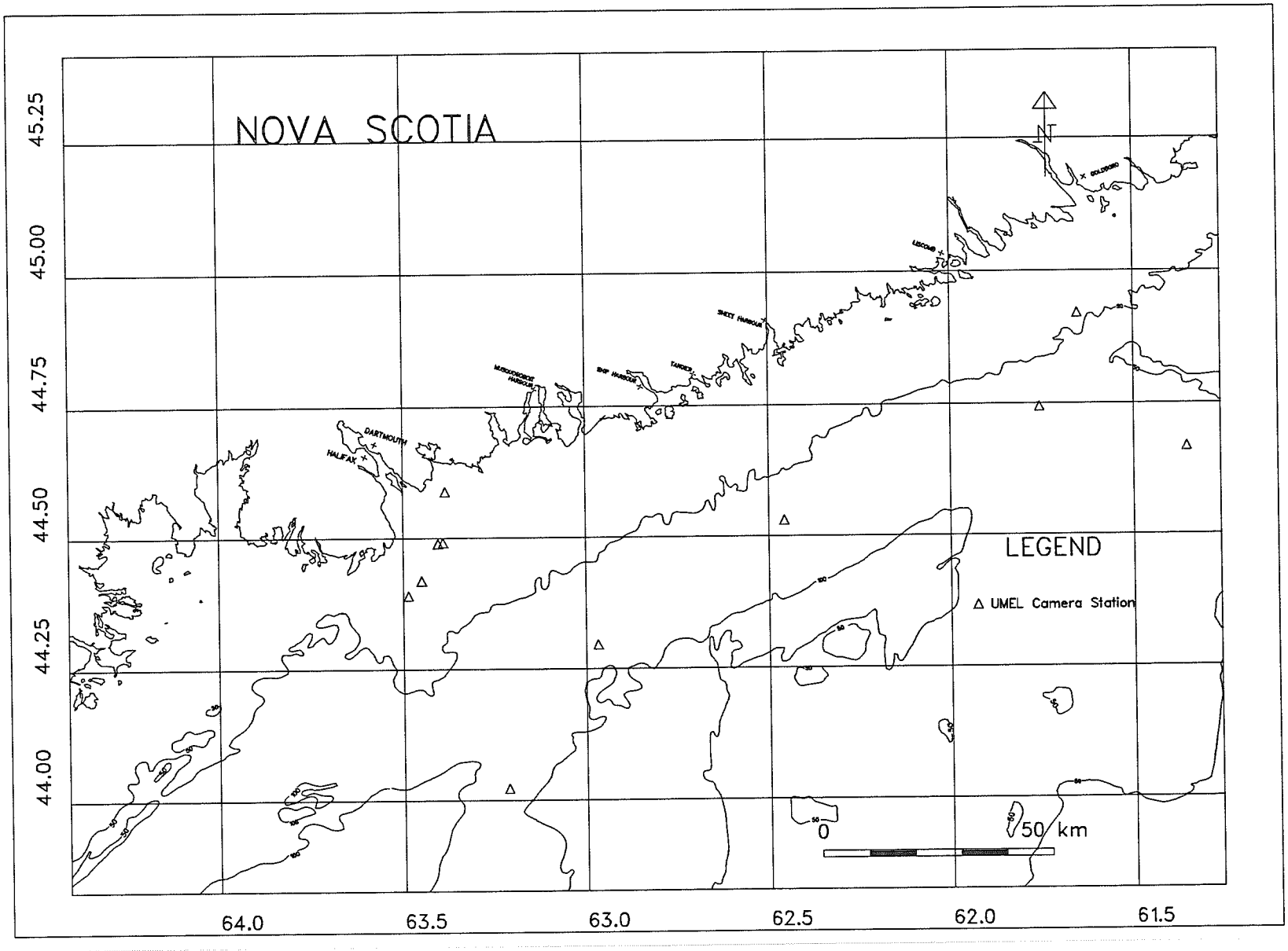

Figure 4. Camera stations - Cruise 91-018

TABLE 1
TOTAL SAMPLE INVENTORY

SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DAY/TIME	SEISMIC DAY/TIME	LATITUDE	LONGITUDE	DEPTH (M)	GEOGRAPHIC LOCATION
001	CORE	1551913	1551903	44 38.65N	63 33.36W	21.9	HALIFAX HARBOUR
002	IKU	1561448		44 33.62N	63 32.17W	31.0	HALIFAX HARBOUR
003	CORE	1561615		44 33.62N	63 32.17W	31.0	HALIFAX HARBOUR
004	CORE	1561722		44 33.25N	63 32.07W	24.0	HALIFAX HARBOUR
005	IKU	1581231		44 19.50N	64 09.17W	20.00	LUNENBURG HARBOUR
006	IKU	1581247	1581200	44 19.46N	64 09.14W	22.00	LUNENBURG HARBOUR, NORTH CROSS ISLAND
007	IKU	1581326	1581100	44 17.08N	64 06.09W	62.0	LUNENBURG
008	IKU	1581334	1581100	44 17.08N	64 06.21W	62.0	LUNENBURG
009	IKU	1581345	1581120	44 16.95N	64 06.34W	62.0	LUNENBURG
010	IKU	1581409	1581100	44 16.12N	64 04.46W	65.0	LUNENBURG
011	IKU	1581441	1581045	44 15.23N	64 03.41W	67.0	LUNENBURG
012	IKU	1581608	1580910	44 09.89N	63 56.40W	106.0	LUNENBURG
013	IKU	1581618	1580910	44 09.89N	63 56.40W	106.0	LUNENBURG
014	IKU	1581624	1580910	44 09.90N	63 56.43W	106.0	LUNENBURG
015	IKU	1581825	1580520	44 01.22N	63 39.23W	165.0	PENNANT PT.
016	IKU	1591236	1591135	43 55.27N	63 45.41W		LUNENBURG
017	IKU	1591424	1590740	44 05.16N	64 02.71W	82.3	LUNENBURG
018	CORE	1591637	1590200	44 15.60N	64 10.43W	56.0	SOUTH CROSS ISLAND
019	IKU	1591746	1590200	44 15.60N	64 10.43W	56.0	SOUTH CROSS ISLAND
020	IKU	1591838	1590150	44 14.85N	64 09.40W	53.0	SOUTH CROSS ISLAND
021	IKU	1591928	1590440	44 12.96N	64 16.75W	40.0	LUNENBURG
022	CORE	1601438	1601242	44 15.74N	64 09.69W	65.0	
023	IKU	1601650		44 19.33N	64 15.01W	20.0	DIRECTLY OFF OVENS PARK
024	IKU	1601850	1600145	44 18.19N	64 00.06W	70.0	LUNENBURG
025	IKU	1601915	1600200	44 17.33N	64 00.96W	71.0	LUNENBURG
026	IKU	1611148	1611010	44 35.95N	63 21.36W	18.0	SOUTH OF LAWRENCETOWN
027	IKU	1611240	1610800	44 29.68N	63 19.65W	62.0	SOUTH OF THREE FATHOM HARBOUR
028	IKU	1611432	1610120	44 12.75N	63 17.83W	164.0	HALIFAX MORAINE
029	IKU	1611640		44 01.13N	63 13.50W	81.0	HALIFAX HARBOUR
030	CAMERA	1611745	1610120	44 01.39N	63 13.03W	163.0	OFF HALIFAX HARBOUR
031	IKU	1621415	1620916	44 29.85N	63 19.98W	64.0	OLD SACKVILLE RIVER VALLEY
032	IKU	1621440	1620444	44 28.41N	63 19.97W	82.0	EAST OF OLD SACKVILLE RIVER VALLEY
033	IKU	1621650	1620535	44 27.52N	63 23.49W	64.0	SOUTH OF DARTMOUTH
034	CORE	1621710	1620331	44 25.09N	63 27.01W	82.3	EAST SAMBRO LEDGES
035	CAMERA	1621737	1620331	44 25.09N	63 27.01W	82.3	EAST SAMBRO LEDGES
036	CORE	1621920	1620235	44 23.36N	63 29.13W	80.5	OLD SACKVILLE RIVER VALLEY
037	CAMERA	1621922	1620235	44 23.37N	63 29.15W	80.5	OLD SACKVILLE RIVER VALLEY
038	CORE	1631200	1630355	44 28.65N	63 24.86W	73.0	DELTA ON FLANK OLD SACKVILLE RIVER
039	CORE	1631330	1630147	44 47.95N	63 25.17W	64.0	NORTH EAST OF SAMPLE 038
040	CORE	1631429	1630315	44 26.24N	63 22.98W	80.0	SACKVILLE RIVER SOUTHERN TRIBUTARY
041	CORE	1631620	1622045	44 30.48N	63 28.95W	60.0	DUNCANS COVE
042	IKU	1631709	1630915	44 35.59N	63 23.39W	27.4	SOUTH CONRODS HEAD
043	CAMERA	1631723	1630915	44 35.27N	63 23.10W	24.0	SOUTH CONRODS HEAD
044	IKU	1631825	1630725	44 29.73N	63 23.73W	55.0	TILL SHEET, SOUTH CONRODS HEAD
045	CAMERA	1631829	1630725	44 29.44N	63 23.44W	55.0	TILL SHEET, SOUTH OF HALIFAX
046	CAMERA	1631851	1630510	44 29.30N	63 24.31W	54.0	OUTWASH, SOUTH OF HALIFAX
047	IKU	1631904	1630510	44 29.30N	63 24.31W	54.0	INNER SHELF, SOUTH OF HALIFAX
048	IKU	1631940	1630125	44 29.53N	63 26.46W	53.0	INNER SHELF, SOUTH OF HALIFAX
049	IKU	1641211	1640558	44 24.18N	63 02.50W	128.0	EASTERN SHORE MORAINE
050	IKU	1641320	1640105	44 15.35N	63 01.88W	164.0	NORTH OF EASTERN SHORE MORAINE
051	IKU	1641415	1640127	44 15.79N	62 59.54W	165.0	
052	IKU	1641500	1640800	44 16.85N	62 56.41W	171.0	HALIFAX MORAINE
053	CORE	1641630	1640730	44 17.72N	62 58.12W	168.0	HALIFAX MORAINE
054	CAMERA	1641732	1640730	44 17.72N	62 58.12W	168.0	HALIFAX MORAINE
055	IKU	1651428	1650435	44 28.90N	63 19.88W	128.0	EASTERN SHORE MORAINE
056	IKU	1651630	1642015	44 25.61N	62 31.08W	128.0	EASTERN SHORE MORAINE
057	IKU	1651749	1650655	44 31.93N	62 27.43W	142.0	NORTH OF EASTERN SHORE MORAINE
058	CAMERA	1651828	1650655	44 31.75N	62 27.44W	139.0	NORTH OF EASTERN SHORE MORAINE
059	IKU	1651930	1650815	44 37.37N	62 30.59W	91.0	DRUMLIN FIELDS
060	IKU	1671150	1650015	44 42.25N	62 39.28W	37.0	SOUTH OF TANGIER ISLAND
061	IKU	1671215	1650034	44 43.11N	62 39.17W	38.0	SOUTH OF TANGIER ISLAND
062	IKU	1671320	1650910	44 41.40N	62 32.56W	79.0	SOUTH OF MUSHABOOM
063	IKU	1671337	1650910	44 41.23N	62 32.59W	80.0	SOUTH OF MUSHABOOM

064	IKU	1671428	1642305	44 37.28N	62 36.48W	64.0	SOUTH OF MUSHABOOM
065	LAND	1671200		44 52.30N	62 29.10W	0.00	SHEET HARBOUR (LAND SAMPLE)
066	CORE	1671630	1650910	44 37.28N	62 36.48W	64.0	SOUTH OF MUSHABOOM
067	CORE	1671900	1650655	44 31.88N	62 27.13W	137.0	SOUTH OF SHEET HARBOUR
068	IKU	1681127	1681050	45 05.78N	61 35.92W	27.0	MOUTH OF COUNTRY HARBOUR
069	IKU	1681147	1681045	45 05.46N	61 35.54W	31.0	MOUTH OF COUNTRY HARBOUR
070	IKU	1681202	1681040	45 05.11N	61 35.22W	27.0	MOUTH OF COUNTRY HARBOUR
071	IKU	1681226	1681040	45 05.12N	61 35.29W	29.0	MOUTH OF COUNTRY HARBOUR
072	IKU	1681236	1681035	45 04.81N	61 35.16W	33.0	MOUTH OF COUNTRY HARBOUR
073	IKU	1681242	1681035	45 04.80N	61 35.13W	31.0	MOUTH OF COUNTRY HARBOUR
074	IKU	1681329	1681030	45 04.52N	61 34.98W	35.0	MOUTH OF COUNTRY HARBOUR
075	IKU	1681349	1681015	45 03.70N	61 33.74W	35.0	SOUTH OF COUNTRY HARBOUR (DOME)
076	IKU	1681437	1680915	45 00.43N	61 30.46W	73.0	SOUTH OF COUNTRY HARBOUR (DOME)
077	IKU	1681630	1680903	44 59.61N	61 29.85W	40.0	SOUTH OF COUNTRY HARBOUR (DOME)
078	CORE	1681654	1680912	45 00.28N	61 30.38W	80.0	SOUTH OF COUNTRY HARBOUR
079	CORE	1681755	1681012	45 03.78N	61 33.66W	45.0	SOUTH OF DOME, COUNTRY HARBOUR
080	CORE	1681836	1681038	45 04.50N	61 34.73W	36.0	SOUTH OF DOME, COUNTRY HARBOUR
081	CORE	1681925	1681050	45 06.36N	61 36.36W	27.4	NORTH OF DOME, COUNTRY HARBOUR
082	IKU	1691250	1691020	44 50.95N	61 31.71W	82.0	SOUTH OF COUNTRY HARBOUR
083	IKU	1691320	1691010	44 50.18N	61 31.55W	82.0	SOUTH OF COUNTRY HARBOUR
084	IKU	1691409	1690415	44 40.25N	61 24.11W	82.0	SOUTH OF COUNTRY HARBOUR (MORAINE)
085	IKU	1691615	1690548	44 42.46N	61 21.71W	109.0	SOUTH OF COUNTRY HARBOUR (MORAINE)
086	IKU	1691650	1690630	44 40.08N	61 20.95W	107.0	COUNTRY HARBOUR
087	CAMERA	1691706	1690630	44 40.05N	61 21.22W	109.0	COUNTRY HARBOUR
088	CAMERA	1691856	1691055	44 44.62N	61 45.35W	106.0	EAST OF COUNTRY HARBOUR MORAINE
089	IKU	1691920	1691055	44 44.62N	61 45.35W	106.0	COUNTRY HARBOUR MORAINE
090	GRAB	1701218	1701030	45 03.61N	61 17.46W	98.0	SOUTH OF TOR BAY
091	IKU	1701248	1701010	45 02.53N	61 18.24W	73.0	SOUTH OF TOR BAY
092	IKU	1701340	1701002	45 01.77N	61 18.71W	93.0	SOUTH OF TOR BAY
093	IKU	1701414	1700855	44 57.07N	61 21.64W	112.0	SOUTH OF NEW HARBOUR RIVER
094	IKU	1701633	169	45 03.86N	61 48.87W	11.00	WINE HEAD
095	IKU	1701648		45 03.85N	61 48.60W	18.00	WINE HEAD
096	CORE	1701726	1690205	45 03.25N	61 47.79W	25.00	SOUTH OF INDIAN HARBOUR
097	CORE	1701820	1680135	45 00.76N	61 48.03W	25.60	SOUTH OF INDIAN HARBOUR
098	CORE	1701908	1690045	44 56.73N	61 48.46W	47.00	SOUTH OF INDIAN HARBOUR
099	CORE	1711840	1710100	44 55.12N	61 39.13W	89.00	SOUTH OF LISCOMB TILL
100	CAMERA	1711852	1711105	44 55.22N	61 39.08W	90.00	SOUTH OF LISCOMB TILL

TABLE 2
GRAB SAMPLES

SAMPLE NUMBER	TYPE OF SAMPLER	DAY/TIME (GMT)	LATITUDE LONGITUDE	DEPTH (M)	NO.OF TRIES	NO. OF SUBSAMPLES	GEOGRAPHIC LOCATION	GRAB SAMPLE NOTES
090	VAN VEEN	1701218	45 03.61N 61 17.46W	98.0	1	1	SOUTH OF TOR BAY	SAMPLING A SAND FILLED BEDROCK DEPRESSION OF SABLE ISLAND SAND AND GRAVEL- SEE SIDESCAN AND HUNTEC. IKU SAMPLING WAS ABORTED ON THIS SITE AFTER SEVERAL ATTEMPTS. A VERY MUDDY OLIVE-GREY SEDIMENT WITH GRAVEL CLASTS. 1 (1 GAL) PAIL FOR SAMPLE AND 1 (1 GAL) PAIL FOR GRAIN SIZE.

TABLE 3
CORE SAMPLES

SAMP. #	SAMPLE TYPE	DAY/TIME (GMT)	LATITUDE LONGITUDE	DEPTH (MTRS)	CORER LENGTH (CM)	APP. PENN (CM)	CORE LENGTH (CM)	NO OF SECT	GEOGRAPHIC LOCATION	NOTES
001	VIBRO	1551913	44 38.65N 63 33.36W	21.9	304	200	152	1	HALIFAX HARBOUR	CATCHER SAMPLE IN A BUCKET. (125 ML) ANN MILLER HAS TAKEN THIS SAMPLE TO WASH FOR FORAMS. NO CUTTER SAMPLE. SEISMIC TIME FROM NAVICULA 89009 DATA.
003	VIBRO	1561615	44 33.62N 63 32.17W	31.0	304	0	182	2	HALIFAX HARBOUR	1 BUCKET WITH CUTTER SAMPLE. ANN MILLER HAS THE SAMPLE. THIS IS THE 'BOT' VIBROCORE, NOT THE 'AGC' VIBROCORE.
004	VIBRO	1561722	44 33.25N 63 32.07W	24.0	304	0	132	1	HALIFAX HARBOUR	STOPPED VIBROCORING WITH 30CM TO GO BECAUSE OF THE LACK OF PENETRATION THROUGH SEDIMENTS OVER A FEW MINUTES. FINE SAND, VERY DRY, GREEN-BLACK, WELL SORTED, FEW SHELL FRAGMENTS.
018	VIBRO	1591637	44 15.60N 64 10.43W	56.0	304	0	0	0	SOUTH CROSS ISLAND	LATE TILL. PIPERS YOUNG MORAINE SOUTH OF CROSS ISLAND TILL MOUND. LINER JAMMED IN THE BARRELL BUT THERE ONLY WAS A CATCHER SAMPLE. FINE GRAVEL AND A COBBLE IN THE CATCHER.
022	VIBRO	1601438	44 15.74N 64 09.69W	65.0	304	0	220	2		GOUGES IN THE CORE BARRELL, BOULDERS ? SILTY SAND GRAY, SULPHIDE- H2S SMELL IN CORE BOTTOM. GRAVELLY SAND (COARSE) WITH FEW PEBBLES IN CORE CATCHER. CORE CATCHER SAMPLE STORED IN A 1 GAL BUCKET. SAMPLE CUT INTO 2 SECTIONS. A-B = 152CM, B-C = 66CM. SECTION A-B SLUMPED(COMPRESSED) 20CM WHEN HELD UPRIGHT. MAIN SECTION COARSE SAND, GRANULE, GREY (SLATE FRAGMENTS). NOT WELL SORTED. ANGULAR ROCKS. CORE ON DISTAL (LATE TILL) MOUND. TOTAL RECOVERY 2.2M INCLUDING CATCHER.
034	VIBRO	1621710	44 25.09N 63 27.01W	82.3	304	200	135	1	EAST SAMBRO LEDGES	OLIVE GREY STONY DIAMICTON ANGULAR SLATE FRAGMENTS. SILTY, CLAYEY MATRIX WITH GREY MOTTLING. SEISMIC UNIT (C) SURFACE TOP. CRUDELY LAMINATED. MASSIVE ACOUSTIC UNIT. TILL- GLACIAL MARINE PROXIMAL ?? CORE CATCHER IMPLODED. CUTTER DAMAGED BY BOULDER. CORE CUTTER SAMPLE BAGGED IN A BUCKET.
036	VIBRO	1621920	44 23.36N 63 29.13W	80.5	304	200	186	2	OLD SACKVILLE RIVER VALLEY	OLIVE GREY SILTY CLAY DIAMICTON. FEW STONES. COBBLING ON SURFACE. SHELL FRAGMENTS. MUCH MORE CLAY THEN 034. SOME SAND HORIZONS-INCLUSIONS, SHELL FRAGMENTS ON SURFACE. SEISMIC UNIT (C) OUTCROPS ON SURFACE. APPARENT LAMINATION. CORE CUTTER SAMPLE BAGGED IN BUCKET.

038	VIBRO	1631200	44 28.65N 63 24.86W	73.0	304	0	172	1	DELTA ON FLANK OLD SACKVILLE RIVER	KEPT CORE AS 1 PIECE BECAUSE OF COARSE NATURE OF THE SAMPLE. SAMPLE WOULD BE DAMAGED BY CUTTING. NO CATCHER OR CUTTER SAMPLES. POSSIBLE DELTA ? MOUND WITH REFLECTORS DIPPING DOWN SLOPE TERMINATING ON FLAT HORIZONTAL REFLECTORS AT BASE. TOP 92CM OLIVE GREY COARSE SAND, GRANULES, COBBLES ON TOP, SHELL FRAGMENT THROUGHOUT. SHARP CONTACT WITH LOWER 80CM OF OLIVE GREY SILTY FINE SAND WITH A FEW PEBBLES-MASSIVE. NO SHELLS.
039	VIBRO	1631330	44 47.95N 63 25.17W	64.0	304	250	15	1	NORTH EAST OF SAMPLE 038	CATCHER SAMPLE + 15CM SAMPLE BAGGED IN A BUCKET. UNDER UNIT (C) OR (B) OUTCROPS ON BEDROCK. CHANNEL FLANK UNIT (C)INCISED IN CHANNEL AND FILLED BY YOUNGER SEDIMENTS (HOLOCENE)? TOP 15CM SANDY, GREY GREEN, COBBLES, SHELL FRAGMENTS. CORE CATCHER GREY DIAMICTON WITH REDDISH TINGE. SILTY, METAGRAYWACKE CLASTS (ANGULAR-SUBROUNDED), ABUNDANT SHELL FRAGMENTS. CORE DID NOT SAMPLE UPPER UNIT BUT SAMPLED LOWER UNIT (C).PENETRATED 2 METRES WITHOUT SAMPLING UNIT.
040	VIBRO	1631429	44 26.24N 63 22.98W	80.0	304	200	144	1	SACKVILLE RIVER SOUTHERN TRIBUTARY	OLIVE GREY SILTY SAND (SOME CLAY). DIAMICTON COBBLEY SURFACE, NO VISIBLE SHELLS-TILL OR GLACIAL MARINE. METAGREYWACKE CLASTS (SUBANGULAR-SUBROUNDED). 1 GRANITE CLAST.
041	VIBRO	1631620	44 30.48N 63 28.95W	60.0	304	200	0	0	DUNCANS COVE	NO RECOVERY.
053	BENTHOS PISTON	1641630	44 17.72N 62 58.12W	168.0	912	936	820	6	HALIFAX MORAINE	LAHAVE CLAY APPROX 6M THICK. TOP 22 FT.OLIVE-GREY SILTY-CLAY. BOTTOM 5 FT. GREY-BLACK, REDUCED MUD, H2S ODOUR.CUTTER SLIGHTLY DAMAGED. ATTEMPT TO CORE COARSE UNIT AT BASE OF LAHAVE CLAY. STRATIGRAPHY-LAHAVE CLAY OVER FACIES A, THIS COULD BE THE YOUNGER DRYAS EVENT (FACIES A) BENEATH LAHAVE CLAY. NO TRIGGER WEIGHT-BARREL TOO LONG TO CLEAR THE RAIL.
066	VIBRO	1671630	44 37.28N 62 36.48W	64.0	304	0	35	0	SOUTH OF MUSHABOOM	OLIVE GREY GREEN SILTY SAND WITH COBBLE LAG. BRITTLE STAR ON SURFACE. GREY SILT AND CLAY, NO STONES AT 20CM. DEPTH 3 (1 GAL) PAILS. 1= TOP 10CM, 2= BOTTOM20CM, 1= CORE CUTTER.
067	VIBRO	1671900	44 31.88N 62 27.13W	137.0	304	200	128	1	SOUTH OF SHEET HARBOUR	STRATIGRAPHY OF CORE. UNIT-2 OLIVE-GREY SANDY MATRIX, UNIT-1 GREEN AND BROWN SILTY MUD, FEW GRANULES (METAWACKE).
078	VIBRO	1681654	45 00.28N 61 30.38W	80.0	304	100	24	0	SOUTH OF COUNTRY HARBOUR	SEISMIC OUTCROP OR OLDER UNIT (C)? OLIVE-GREY SAND (20CM OVERLYING BLACK ORGANIC CLAY (4CM). CORE EXTRUDED INTO 2 (1 GAL)

										BUCKETS. 1 IS LABELLED 78TOP 20CM AND THE OTHER IS LABELLED 78 BOTTOM 4CM. CORE MOTOR HOUSING FRAME BROKEN WHILE HITTING THE SIDE OF THESHIP. ONLY A FEW WELDS LEFT. ONLY BOLTS HOLDING THE FRAME ON THE VIBROCORE.
079	VIBRO	1681755	45 03.78N 61 33.66W	45.0	304	170	148	1	SOUTH OF DOME, COUNTRY HARBOUR	CUTTER CONTAINED OLDER UNIT (C). VENEERED BY SABLE ISLAND SAND. UNIT 3=COBBLE-PEBBLE LAG METAGRAYWACKE QUARTZ VEIN GRANITE. UNIT 2= OLIVE-GREY COARSE TO MEDIUM SAND. UNIT 1= GREY-BLACK ORGANIC CLAY. SLOWED DOWN THE DESCENT OF THE VIBROCORE TO THE BOTTOM AND GOT BETTER RECOVERY/APP. PENETRATION RATIO AS A RESULT.
080	VIBRO	1681836	45 04.50N 61 34.73W	36.0	304	200	78	1	SOUTH OF DOME, COUNTRY HARBOUR	ONLAP OF THICK SABLE ISLAND SAND? WEDGE ONTO DOME STRUCTURE. OLIVE-GREY SAND WITH BLACK SANDY BANDS. APP. PENETRATION OF 2.1 METRES (RECORDER) BUT ONLY 78CM RECOVERY. MUCH OF THE SAMPLE MAY HAVE WASHED THROUGH THE CATCHER.
081	VIBRO	1681925	45 06.36N 61 36.36W	27.4	304	0	0	0	NORTH OF DOME, COUNTRY HARBOUR	SEISMIC WEDGE OF SAND NORTH OF DOME. OLIVE-GREY SAND. CORE SOCK DID NOT HOLD SAMPLE. EXTRUDED FROM THE BOTTOM ONLY. 40CM RETAINED. BAGGED IN A BUCKET.
096	VIBRO	1701726	45 03.25N 61 47.79W	25.00	304	200	167	1	SOUTH OF INDIAN HARBOUR	OLIVE-GREY SAND LITHOTHAMNION ENCRUSTED COBBLE ON TOP. BOTTOM IN COBBLY SAND. SEISMIC- BEDROCK CHANNEL FILLED WITH LAMINATE ON TOP FILL. SOCK IN CORE CATCHER PREVENTED SOME LOSS. 1 GAL BUCKET WITH CORE CATCHER MATERIAL.
097	VIBRO	1701820	45 00.76N 61 48.03W	25.60	304	200	152	1	SOUTH OF INDIAN HARBOUR	SEISMIC-CHANNELS IN BEDROCK FILLED WITH TRANSGRESSIVE ON TOP FACIES WITH UNIT (E). MYSTERY IN BASE OF CHANNELS. OLIVE-GREY SILTY SAND, COBBLE PINK COVERED CLASTS ON SURFACE (LITHOTHAMNION). LAG, WELL SORTED, BLACK REDUCED ZONES. MOTTLING (SULPHIDE). FEW GRANULES. 2 SUBSAMPLES (CUTTER-CATCHER).
098	VIBRO	1701908	44 56.73N 61 48.46W	47.00	304	0215	0146	1	SOUTH OF INDIAN HARBOUR	CORING BASIN CHANNEL FILL UNITS (30CM),MAY GET INTO UNIT 2? UNIT 3 IS SABLE ISLAND SAND. UNIT 2- ESTUARINE. UNIT 1- TILL-UNIT (C). UNIT 2- OLIVE-GREY SILTY SAND WELL SORTED, COBBLE-PEBBLE LAG. UNIT 1- GREY-BLACK SILTY CLAY REDUCED-ORGANIC- SULPHIDE MOTTLING. FRAME AROUND THE MOTOR WAS DESTROYED.
099	VIBRO	1711840	44 55.12N 61 39.13W	89.00	304	150	030	1	SOUTH OF LISCOMB TILL	CORE HIT STONE IN UPPER UNIT(3) AND CONTINUED TO PENETRATE WITHOUT FURTHER RETENTION. THE RESULTANT CORE WAS AN OLIVE-GREY SAND (UNIT 3), THE TOP AN APPARENT TRANSGRESSIVE SAND. THE OUTSIDE OF THE BARREL WAS COVERED WITH A

GREY-GREEN SILTY DIAMICTON WITH SHELL FRAGMENTS (UNIT 1). THIS UNIT MAY NOT HAVE BEEN SAMPLED. 3 SEISMIC UNITS: 1= TRANSGRESSIVE SAND, 2= ESTUARINE MUD, 3= MYSTERY UNIT -TILL ? CATCHER MATERIAL BAGGED IN A BUCKET. THE STONE IN THE CATCHER (METAGRAYWACKE).

TABLE 4
CAMERA STATIONS

SAMPLE NUMBER	TYPE OF CAMERA	DAY/TIME (GMT)	LATITUDE LONGITUDE	DEPTH (MTRS)	FRAMES SHOT	DIST OFF. BOTT	STEREO	COLOR1 COLOR2	ASA1 ASA2	FSTOP1 FSTOP2	FOCUS1 FOCUS2	FILM1 FILM2	GEOGRAPHIC LOCATION
030	UMEL	1611745	44 01.39N	163.0	20	185	N	COLOR	200	F5.6	135	EKTACHROME	OFF HALIFAX HARBOUR
			63 13.03W					B-W	400	F8.0	135	TMAX400	
035													
037	UMEL	1621922	44 23.37N	80.5	15	135	N	COLOR	200	F5.6	135	EKTACHROME	OLD SACKVILLE RIVER VALLEY
			63 29.15W					B-W	400	F8.0	135	TMAX400	
043	UMEL	1631723	44 35.27N	24.0	15	135	N	COLOR	200	F5.6	135	EKTACHROME	SOUTH CONROD HEAD
			63 23.10W					B-W	400	F8.0	135	TMAX400	
045	UMEL	1631829	44 29.44N	55.0	15	135	N	COLOR	200	F5.6	135	EKTACHROME	TILL SHEET, SOUTH OF HALIFAX
			63 23.44W					B-W	400	F8.0	135	TMAX400	
046	UMEL	1631851	44 29.30N	54.0	15	135	N	COLOR	200	F5.6	135	EKTACHROME	OUTWASH, SOUTH OF HALIFAX
			63 24.31W					B-W	400	F8.0	135	TMAX400	
054	UMEL	1641732	44 17.72N	168.0	15	135	N	COLOR	200	F5.6	135	EKTACHROME	HALIFAX MORAINE
			62 58.12W					B-W	400	F8.0	135	TMAX400	
058	UMEL	1651828	44 31.75N	139.0	15	135	N	COLOR	200	F5.6	135	EKTACHROME	NORTH OF EASTERN SHORE MORAINE
			62 27.44W					B-W	400	F8.0	135	TMAX400	
087	UMEL	1691706	44 40.05N	109.0	15	135	N	COLOR	200	F5.6	135	EKTACHROME	COUNTRY HARBOUR
			61 21.22W					B-W	400	F8.0	135	TMAX400	
088	UMEL	1691856	44 44.62N	106.0	15	135	N	COLOR	200	F5.6	135	EKTACHROME	EAST OF COUNTRY HARBOUR MORAINE
			61 45.35W					B-W	400	F8.0	135	TMAX400	
100	UMEL	1711852	44 55.22N	90.00	50	135	N	COLOR	200	F5.6	135	EKTACHROME	SOUTH OF LISCOMB TILL
			61 39.08W					B-W	400	F8.0	135	TMAX400	

TABLE 5
IKU SAMPLES

SAMPLE NUMBER	TYPE OF IKU	JULIAN DAY/TIME	LATITUDE LONGITUDE	DEPTH (MTRS)	NO OF ATMTS	NO OF SUBS	NO OF CORES	PHOTOS TAKEN	GEOGRAPHIC LOCATION	NOTES
002	IKU	1561448	44 33.62N 63 32.17W	31.0	1	0	0	N	HALIFAX HARBOUR	GREENISH GREY COMPACTED MUDDY SEDIMENT WITH QUOHOG SHELLS IN SEDIMENT. HIGHLY DISTURBED, SO NO PUSH CORE TAKEN. SAMPLE STORED IN 1 (5 GAL) BUCKET. SMALL SAMPLE.
005	IKU	1581231	44 19.50N 64 09.17W	20.00	1	0	0	N	LUNENBURG HARBOUR	POCKED BEDROCK SURFACE ON SIDE SCAN. HALIFAX SLATE COBBLES.
006	IKU	1581247	44 19.46N 64 09.14W	22.00	3	0	0	Y	LUNENBURG HARBOUR, NORTH CROSS ISLAND	BEDROCK SURFACE, POSSIBLY HALIFAX SLATE. 3 (5 GAL) BUCKETS. TAKEN IN AREA OF BEDROCK ON THE SIDESCAN, WITH UNUSUAL PITS AT SEABED, POSSIBLY OLD MINING PITS BY 'SEAGOLD'.
007	IKU	1581326	44 17.08N 64 06.09W	62.0	1	0	0	N	LUNENBURG	1ST ATTEMPT, JAWS OPEN. BROUGHT BACK ROCKS IN THE JAWS.
008	IKU	1581334	44 17.08N 64 06.21W	62.0	1	0	0	N	LUNENBURG	NO RECOVERY.
009	IKU	1581345	44 16.95N 64 06.34W	62.0	1	1	0	Y	LUNENBURG	MUDDY SANDY GRAVEL, MOSTLY SLATE. SAMPLE STORED IN 5 (5 GAL) BUCKETS. PANNED SAMPLE. HEAVIES MAGNETITE, GARNET, ILMENITE. NO GOLD. SUBSAMPLES - GRAVEL, FINES.
010	IKU	1581409	44 16.12N 64 04.46W	65.0	1	0	0	Y	LUNENBURG	SAMPLE STORED IN 4 (5 GAL) BUCKETS. 2 PHOTOS TAKEN.
011	IKU	1581441	44 15.23N 64 03.41W	67.0	1	0	0	N	LUNENBURG	SAMPLE ROCKS/MACROFAUNA. SAMPLE STORED IN 1 (5 GAL) BUCKET.
012	IKU	1581608	44 09.89N 63 56.40W	106.0	1	0	0	N	LUNENBURG	NO RECOVERY.
013	IKU	1581618	44 09.89N 63 56.40W	106.0	1	0	0	N	LUNENBURG	NO RECOVERY.
014	IKU	1581624	44 09.90N 63 56.43W	106.0	1	1	0	N	LUNENBURG	SAMPLER JAMMED OPEN WITH LARGE BOULDER. 1/3 FULL. PANNED SUBSAMPLE. NO GOLD. BOULDERS, COBBLES, SAND, SILT AND MUD.STARFISH (BRITTLE). GREENISH BROWN COLOR. AREA OF EXPOSED BEDROCK WITH SAND AND GRAVEL IN 'RIPPLES' BETWEEN RIDGES.
015	IKU	1581825	44 01.22N 63 39.23W	165.0	1	0	3	Y	PENNANT PT.	3 PUSH CORES (AREA E). 40CM EACH. GREY MUD, NO STONES (LAHAVE CLAY), FEW SHELLS. MORAINE TOP SAMPLE (PENNANT PT.). MAY HAVE MISSED TOPOGRAPHIC HIGH. MISSED TILL. GOT LAHAVE CLAY. ALL MUD, NO STONES. SAMPLE STORED IN 3 (5 GAL BUCKETS). LABELLED - SURFACE LAG, JUST BENEATH SURFACE, BOTTOM.
016	IKU	1591236	43 55.27N 63 45.41W		1	2	1	Y	LUNENBURG	ICEBERG FURROWS ON SEABED. GOOD TILL-S O U T H S H O R E M O R A I N E. SLATE-FACETTED-STRIATED. SOME GRANITE CLASTS. GREY BROWN MUDDY MATRIX. TOP

									SAMPLE PANNED- 2 SUBSAMPLES 1= PEBBLE 2=GRANULE. SAMPLE STORED IN 5 (5 GAL BUCKETS). 1 TOP, 2 MIDDLE, 2 BOTTOM. PUSH CORE WAS STARTED IN THE MIDDLE OF GRAB, AVOIDED SURFACE LAG. PUSH CORE LABELLED AS 91-18-015, SUBSAMPLES LABELLED AS IKU-16 PEBBLE, IKU-16 GRANULE.
017	IKU 1591424	44 05.16N 64 02.71W	82.3	1	2	0	Y	LUNENBURG	(SEISMIC) SABLE ISL. SAND ON REWORKED TILL,CLASTS, ANGULAR AND ROUNDED. SLATE, GRANITE 5-10 %, SANDY MATRIX, COARSE GRANULES. GREY QTZ VEIN IN FLOAT. 2 SUBSAMPLES, IKU-17 GRAVEL GRANULE, IKU-17 GRANULE. SAMPLE STORED IN 2 (5 GAL) BUCKETS. 1 BUCKET RETAINED FOR PANNING.
019	IKU 1591746	44 15.60N 64 10.43W	56.0	4	0	0	Y	SOUTH CROSS ISLAND	JUST RECOVERED ROUNDED BOULDERS OF METAGRAYWACKE. 1-2 FT. IN DIAMETER. 10-12 BOULDERS IN 4 TRIES.
020	IKU 1591838	44 14.85N 64 09.40W	53.0	3	0	0	N	SOUTH CROSS ISLAND	(SEISMIC) BOULDERY SURFACE INTERMIXED WITH GRAVEL TILL OR BEDROCK COVER. MAYBE LATE TILL? 1 BOULDER RETAINED. BOULDER IN FIRST 2 ATTEMPTS, WATER IN THIRD.
021	IKU 1591928	44 12.96N 64 16.75W	40.0	2	0	0		LUNENBURG	GRAVEL RIPPLES IN BEDROCK. FIRST ATTEMPT WAS WATER. SECOND ATTEMPT BOULDERS AND SOME GRAVEL. SAMPLE STORED IN 1 (5 GAL) BUCKET.
023	IKU 1601650	44 19.33N 64 15.01W	20.0	8	3	0		DIRECTLY OFF OVENS PARK	8 ATTEMPTS- ONLY ONE HAS SMALL SAMPLE. MUDDY GRAVEL- OTHERS HAVE BOULDERS IN JAWS. UNUSUAL BOULDERS OF BRIDGEWATER CONGLOMERATE IN ONE ATTEMPT. MUDDY GRAVEL WASHED DOWN. 3 BAGED SUBSAMPLES FROM PANNING. 1= GRAVEL SAMPLE, 2=GRANULE SAMPLE, 3= HEAVIES SAMPLE. 1 BUCKET SAMPLE OF BRIDGEWATER CONGLOMERATE.
024	IKU 1601850	44 18.19N 64 00.06W	70.0	1	1	0	Y	LUNENBURG	MATRIX-SILTY-SAND, SOME CLAY. GRAVEL-PEBBLES GREY BROWN. LARGE CLASTS, SOME STRIATED, HALIFAX SLATE. TOP OF INTERPRETED DRUMLIN (SEE SIDESCAN). DRUMLIN EXPOSURE. 3 (5 GAL) BUCKETS OF LARGE CLASTS. 1 BAG OF MATRIX.
025	IKU 1601915	44 17.33N 64 00.96W	71.0	1	0	0	Y	LUNENBURG	DRUMLIN EXPOSURE- TOP OF DRUMLIN. 1 (5 GAL) BUCKET SAMPLE GOOD TILL, LOTS OF MATRIX. GREY-BROWN, SILTY-SAND MATRIX.
026	IKU 1611148	44 35.95N 63 21.36W	18.0	1	0	0	N	SOUTH OF LAWRENCETOWN	SAMPLING BOULDER ARMOR SOUTH OF LAWRENCETOWN BEACH. 2 (5 GAL) BUCKETS OF GRAVEL, ROCKS.
027	IKU 1611240	44 29.68N 63 19.65W	62.0	1	1	0	Y	SOUTH OF THREE FATHOM HARBOUR	HUMMOCKY TILL SURFACE. BOULDERY ROUNDED AND ANGULAR CLASTS.S A N D Y MATRIX. 3 (5 GAL) BUCKETS + 1 BAG OF MATRIX STORED IN A (1 GAL) BUCKET.
028	IKU 1611432	44 12.75N 63 17.83W	164.0	1	1	1	Y	HALIFAX MORAINE	BROWN-GREY SILTY TILL, STRIATED CLASTS. SURFACE LAG BOULDERY, SOME EDGE ROUNDING INCLUSIONS OF UNOXIDIZED GREY-BLACK SILTY TILL(DRY) WITHIN BASE OF GRAB. THIS WAS SAVED AS

									A BAG SAMPLE. HALIFAX MORAINE CONTINUATION. MOUND OF TILL (SEISMIC). 1 PUSH CORE LABELLED 91-18-028 AND 4 (5 GAL) BUCKETS. PUSH CORE WAS BENEATH SURFACE LAG. BUCKETS LABELLED AS 1= TOP, 1= MIDDLE AND 2=BOTTOM.
029	IKU	1611640	44 01.13N 63 13.50W	81.0	1	0	1	Y	HALIFAX HARBOUR	NORTH SAMBRO BANK- TILL MOUND OR MORAINE SAMPLE GREY-BROWN STONY TILL. SILTY-CLAY-SAND MATRIX. CLASTS: METAWACKE, PINK GRANITE. INCLUSIONS OF RED SEDIMENT. FEW SHELLS. EDGE ROUNDING. SAMPLE STORED IN 5 (5 GAL) BUCKETS. 1 TOP, 2 MIDDLE AND 2 BOTTOM. 1 PUSH CORE LABELLED 91-18-029. REFER TO 3.5KHZ RECORD AT 161/1640.
031	IKU	1621415	44 29.85N 63 19.98W	64.0	1	0	0	Y	OLD SACKVILLE RIVER VALLEY	SURFACE TILL? SHEET TRANSGRESSED-SANDY MATRIX SLATE-METAWACKE CLASTS. EDGE ROUNDED, LOOKS LIKE BEAVER RIVER TILL. LOCAL LITHOLOGY. LARGE BOULDERS, COBBLES. 2 (5 GAL) BUCKETS. LARGEBOULDERS, PEBBLES, SOME MATRIX RECOVERED, PUT IN BUCKET.
032	IKU	1621440	44 28.41N 63 19.97W	82.0	1	0	0	Y	EAST OF OLD SACKVILLE RIVER VALLEY	SURFACE TILL SHEET OR OUTWASH MOUNDS ? GRAVEL SURFACE (SIDESCAN), GREY-BROWN SANDY MATRIX. METAWACKE CLASTS ROUNDED TO SUBANGULAR. BEAVERRIVER TILL ? LARGE BOULDERS. SAME AS PREVIOUS TILL! 3 (5 GAL) BUCKETS. 2 BOULDERS- PEBBLE LAGS. 1 BUCKET OF MATRIX-TILL.
033	IKU	1621650	44 27.52N 63 23.49W	64.0	1	1	0		SOUTH OF DARTMOUTH	TILL-SHEET HUMMOCKY SURFACE. (SIDESCAN) GRAVEL-BOULDERS. GREY SANDY MATRIX (SILT < 20%) UNWASHED. CLASTS SUBROUNDED TO SUBANGULAR METAGRAYWACKE > 90%. GRANITE < 5%. SHELL FRAGMENTS-PELECYPOD BEAVER RIVER TILL. 3 (5 GAL) BUCKETS. 2 FOR TOP LAG AND 1 FOR BOTTOM TILL. 1 SUBSAMPLE OF MATRIX TILL FOR GRAIN SIZE LABELLED AS 91-18-33.
042	IKU	1631709	44 35.59N 63 23.39W	27.4	1	0	0	Y	SOUTH CONRODS HEAD	SAMPLE STORED IN 5 (5 GAL) BUCKETS. TILL SURFACE-BOULDERY-HUMMOCKY-REWORKED SURFACE. WELL ROUNDED AND DISCOIDAL COBBLES, PEBBLES, GRAVEL AND SAND, GREY BROWN, BLACK ORGANIC ZONE. INNER MIXED (ESTUARINE?). LITHOLOGIES - METAGRAYWACKE GRANITE, RED SANDSTONE (WIDE VARIETY).
044	IKU	1631825	44 29.73N 63 23.73W	55.0	1	0	0	Y	TILL SHEET, SOUTH CONRODS HEAD	COBBLES- FEW BOULDERS. SEISMIC-SIDESCAN. COBBLE LAG-SUBROUNDED TO SUBANGULAR METAGRAYWACKE CLASTS; < 2% GRANITOID (SOUTH MTN). MATRIX-COARSE SAND, OLIVEGREY, SOME MATRIX RETAINED IN GRAB. (BEAVER RIVER TILL ?). SAMPLE STORED IN 2 (5 GAL) BUCKETS.
047	IKU	1631904	44 29.30N 63 24.31W	54.0	1	0	0	Y	INNER SHELF, SOUTH OF HALIFAX	SAMPLE STORED IN 2 (5 GAL) BUCKETS LABELLED MATRIX AND LAG. BLACK SIDESCAN. COBBLE SURFACE, A FEW BOULDERS. DIAMICTON-TILL, COBBLE-BOULDER LAG: OLIVE GREY SILTY

									SAND TILL UNDERNEATH: LAG SURFACE PROTECTS AN UNDERLYING TILL MATRIX WHICH IS NOT WASHED. > 90% METAGRAYWACKE CLASTS, SANDY MATRIX.
048	IKU	1631940	44 29.53N 63 26.46W	53.0	1	0	0	Y	INNER SHELF, SOUTH OF HALIFAX	SAMPLE STORED IN 2 (5 GAL) BUCKETS LABELLED MATRIX AND LAG. TILL-SECTION (SEISMIC INTERP) OLIVE- GREY SANDY MATRIX, UNWASHED- SUBROUNDED-SUBANGULAR CLASTS; LAG SURFACE OF METAGRAYWACKE. 1 LARGE METASOMATIZED ? GRANITE BOULDER.
049	IKU	1641211	44 24.18N 63 02.50W	128.0	1	0	0	Y	EASTERN SHORE MORAINE	SAMPLE STORED IN 4 (5 GAL) BUCKETS LABELLED AS 1=TOP, 1=MIDDLE, 1=BOTTOM AND 1 LABELLED RED LAYER. TILL MOUND ADJACENT TO POSSIBLE LIFTOFF? MORAINE. OLIVE GREY SANDY SILTY DIAMICTON-TILL. STRIATED FACETTED METAGRAY-WACKE CLASTS AND GRANITE CLASTS. ANOMALOUS RED GREY LAYER IN TILL (SAMPLE).
050	IKU	1641320	44 15.35N 63 01.88W	164.0	1	1	1	Y	NORTH OF EASTERN SHORE	TILL MOUND SURROUNDED BY GLACIO MARINE. EMERALD SILT. OLIVE GREY SILTY TILL. MORAINE GREY SAND AND RED CLAY INCLUSIONS. SHELL FRAGMENTS, METAGRAYWACKE CLASTS, SUBROUNDED TO SUBANGULAR; SURFACE COBBLE LAG-TILL DOMINATED BY PEBBLE-SIZED CLASTS. 1 PUSH CORE FROM AREA (E). SAMPLE STORED IN 4 (5 GAL) BUCKETS LABELLED 1=TOP, 3=BOTTOM.
051	IKU	1641415	44 15.79N 62 59.54W	165.0	1	1	1	Y		SURFACE LAG SILTY-SANDY DIAMICTON-TILL? WITH SUBROUNDED TO SUBANGULAR CLASTS-METAGRAY-WACKE (>90 %). RED SILTSTONE,VOLCANIC, METAMORPHIS CLASTS <5%,GRADES INTO MASSIVE GREYISH CLAY-SILTY-CLAY. FEW STONES. 1 PUSH CORE OF BOTTOM SILTY-CLAY SEDIMENTS. POSSIBLE EMERALD SILT (A) (SEE SEISMIC). GRAB WELL STRATIFIED, NOT MIXED INSITU. 1SUBSAMPLE OF LITHOLOGY. SAMPLE STORED IN 5 (5 GAL) BUCKETS. 1 FROM TOP, 2 FROM MIDDLE AND 2 FROM THE BOTTOM.
052	IKU	1641500	44 16.85N 62 56.41W	171.0	1	1	0	Y	HALIFAX MORAINE	OLIVE GREY SANDY-SILTY DIAMICTON (TILL)SAND INCLUSIONS, COBBLE-BOULDER LAG SURFACE METAGRAYWACKE CLASTS >90 %.SUBROUNDED TO SUBANGULAR, 1 PINK GRANITOID CLAST ON SURFACE (SYENITE). SAMPLE STORED IN 4 (5 GAL) BUCKETS. LABELLED 1=TOP, 1=MIDDLE AND 2 FROM BOTTOM. 1 SUBSAMPLE OF ERRATIC GRANITE IN A BAG.
055	IKU	1651428	44 28.90N 63 19.88W	128.0	1	0	0	Y	EASTERN SHORE MORAINE	TOP OF MORAINE-ICEBERG FURROWS? OLIVE-GREY SILTY SANDY MATRIX (DIAMICTON). METAGRAY-WACKE >90 %. GRANITE, MUD CLASTS (CARB ?) (<5 %)- SANDY INCLUSIONS.BURROWS INSIDE SAND. 2 BUCKETS FROM THE TOP AND 2 FROM THE BOTTOM. BASE OF CLASTS-METAGRAYWACKE, GRANITE, MUD CLASTS ! GREY GREEN MUDSTONE.
056	IKU	1651630	44 25.61N 62 31.08W	128.0	1	0	0	Y	EASTERN SHORE MORAINE	TOP OF EASTERN SHORE MORAINE. SURFACE LAG-BOULDER-COBBLE LAYER.

										METAGRAYWACKE ANGULAR TO SUBROUNDED, CLASTS (> 90%).S O M E FACETTED AND STRIATED, BECOMING CLAYISH AND LESS STONY BENEATH THE SURFACE, MATRIX OLIVE-GREY SILTY-CLAY SAND; RED-BROWN CLAYEY LAYERS-INCLUSIONS. 1 GRANITE CLAST. SOME CLASTS VERY ANGULAR AND SOME WITH EDGE ROUNDING. SAMPLE STORED IN 5 (5 GAL) BUCKETS. 2 FROM TOP, 2 FROM BOTTOM AND 1 OF CLASTS.
057	IKU	1651749	44 31.93N 62 27.43W	142.0	1	1	0	Y	NORTH OF EASTERN SHORE MORAINE	EMERALD SILT (ERODED). COBBLE-BOULDER SURFACE LAG. METAGRAY-WACKE >90% SILTY-CLAY SAND MATRIX BELOW OLIVE-GREY SILTY DIAMICTON COBBLE-PEBBLE SIZED CLASTS. BOULDERS ENCRUSTED WITH POLYPS- LARGE WORM RECOVERED. 1 BAG OF PURPLE SLIME OF UNKNOWN ORIGIN. SAMPLE STORED IN 3 (5 GAL) BUCKETS. 1 FROM THE TOP AND 2 FROM THE BOTTOM.
059	IKU	1651930	44 37.37N 62 30.59W	91.0	1	0	0	Y	DRUMLIN FIELDS	HUMMOCKY MOUNDS OF TILL. BOULDERY LAG IN IKU. METAGRAYWACKE GRANITE, SOME MATRIX, (OLIVE GREY SAND), VERY BOULDERY. SAMPLE STORED IN 2 (5 GAL) BUCKETS, 1 OF LAG BOULDERS AND 1 OF MATRIX.
060	IKU	1671150	44 42.25N 62 39.28W	37.0	1	0	0	Y	SOUTH OF TANGIER ISLAND	SAND BEDFORMS OVERLYING ARMOUR UNCONFORMING ESTUARINE/GLACIOMARINE SEDIMENTS (SEISMIC). ARMOUR OF COBBLES, BOULDERS, DISCOIDAL CLASTS (SHINGLE) OVERLYING OLIVE-GREY-BLACK SILTY SAND MATRIX, TILL? (DIAMICTON). SAMPLE STORED IN 3 (5 GAL) BUCKETS, 1 LABELLED LAG, 1 LABELLED MIXED AND 1 LABELLED MATRIX.
061	IKU	1671215	44 43.11N 62 39.17W	38.0	1	0	0	N	SOUTH OF TANGIER ISLAND	SAND BODY (WHITE ON SIDESCAN). COBBLE LAG-DISCOID CLASTS (SHINGLE SHAPE) METAGRAYWACKE, GRANITE, LITHOTHAMNION ENCRUSTATION ON CLASTS, MATRIX, SAND. 2 (5 GAL) BUCKETS.
062	IKU	1671320	44 41.40N 62 32.56W	79.0	1	0	0	Y	SOUTH OF MUSHABOOM	BEACH GRAVEL (SEISMIC). DISCOID CLASTS METAWACKE-GRANITE. SAND MATRIX WAS WELL SORTED GREY-GREEN IN COLOR. (BEACH). MISSED ON 1ST ATTEMPT, OVERSHOT. 2(5 GAL) BUCKETS.
063	IKU	1671337	44 41.23N 62 32.59W	80.0	1	0	0	Y	SOUTH OF MUSHABOOM	UNIT-C OUTCROPS ON SURFACE BETWEEN 2 DEEP VALLEYS FILLED WITH BEACH (UNIT-B) AND ESTUARINE SEDIMENT (UNIT-G) (SEISMIC) OLIVE-GREY STONEY SANDY DIAMICTON (TILL) METAGRAYWACKE CLASTS, 1 GRANITE CLAST. 3 (5 GAL) BUCKETS OF MIXED SAMPLE (LAG + SUBSURFACE) (SMALL VOLUMN IN GRAB).
064	IKU	1671428	44 37.28N 62 36.48W	64.0	1	0	0	Y	SOUTH OF MUSHABOOM	TILL MOUNDS (SEISMIC). OLIVE-GREY STONEY DIAMICTON (TILL). SUBANGULAR TO SUBROUNDED CLASTS, MOSTLY SUBROUNDED. SANDY MATRIX, METAGRAYWACKE CLASTS >90%. SAMPLE WELL WASHED DURING RECOVERY. 4 (5 GAL) BUCKETS. 1= TOP, 3= MATRIX.

068	IKU	1681127	45 05.78N 61 35.92W	27.0	1	0	0	Y	MOUTH OF COUNTRY HARBOUR	OLIVE-GREY MEDIUM GRAINED SAND WITH ABUNDANT SAND SIZED SHELL FRAGMENTS. SAMPLE ALSO CONTAINS ABUNDANT SAND DOLLARS. 4 (5 GAL) BUCKETS.
069	IKU	1681147	45 05.46N 61 35.54W	31.0	1	0	0	Y	MOUTH OF COUNTRY HARBOUR	DESCRIPTION- OLIVE-GREY MEDIUM SAND WITH SAND SIZED SHELL FRAGMENTS. NICE SMELL TO THE SAMPLE!!!!! PROBABLY A HIGH CONCENTRATION OF HEAVIES IN SAMPLE. SAND DOLLARS AND QUOHOG SHELL. 4 (5 GAL) BUCKETS.
070	IKU	1681202	45 05.11N 61 35.22W	27.0	1	0	0	Y	MOUTH OF COUNTRY HARBOUR	ON THE DOME. GRAVEL LAG OVER MATRIX MUDDY SAND. LITHOTHAMNION ON ALL ROCKS. 2 (5 GAL) BUCKETS OF MATRIX ONLY. 4 (5 GAL) BUCKETS OF FULL SAMPLE. THIS IS A SPECIAL SAMPLE FOR ASSAY. SAMPLE ACCUMULATED IN 4 GRABS AT THIS SITE.
071	IKU	1681226	45 05.12N 61 35.29W	29.0	4	0	0	N	MOUTH OF COUNTRY	MUDDY GRAVEL. CLASTS ARE COVERED WITH LITHOTHAMNION. SLATE-METAGRAYWACKE >90%. 1 (5 GAL) BUCKET. PANNED SAMPLE, NO VISIBLE GOLD. LOTS OF HEAVIES (GARNET).
072	IKU	1681236	45 04.81N 61 35.16W	33.0	1	0	0	N	MOUTH OF COUNTRY HARBOUR	OLIVE-GREY MEDIUM SAND WITH GRAVEL CLASTS. SLATE METAGRAYWACKE >90%-GRANITE-QUARTZ VEIN (NO VG). 1 (5 GAL) BUCKET. PANNED SAMPLE, NO VISIBLE GOLD BUT LOTS OF HEAVIES.
073	IKU	1681242	45 04.80N 61 35.13W	31.0	1	0	0	N	MOUTH OF COUNTRY HARBOUR	OLIVE-GREY MEDIUM SAND (NO GRAVEL). SAND DOLLARS. 2 (5 GAL) BUCKETS.
074	IKU	1681329	45 04.52N 61 34.98W	35.0	1	1	0	Y	MOUTH OF COUNTRY HARBOUR	OLIVE-GREY MEDIUM SAND. FEW COBBLES. SAND DOLLARS (SAND WEDGE SEISMIC). PANNED SAMPLE - ABUNDANT GARNET, A FEW COBBLES SILT-SIZED. 3 (5 GAL) BUCKETS. SAMPLER WAS 1/4 FULL.
075	IKU	1681349	45 03.70N 61 33.74W	35.0	1	0	0	Y	SOUTH OF COUNTRY HARBOUR	GRAVEL AND COBBLES. SANDY MATRIX, OLIVE GREY. DISCOID CLASTS, SLATE-(DOME) METAGRAYWACKE > 90%. SOME GRANITE, REWORKED TILL (SEISMIC) SABLE ISLAND SAND-GRAVEL. 2 (5 GAL) BUCKETS. SAMPLER WAS 1/8 FULL.
076	IKU	1681437	45 00.43N 61 30.46W	73.0	1	0	0		SOUTH OF COUNTRY HARBOUR	(SEISMIC) SABLE ISLAND SAND-GRAVEL. BROAD CHANNEL. COBBLE LAG METAGRAYWACKE (DOME) SUBANGULAR TO SUBROUNDED MOSTLY SUBROUNDED, MATRIX OLIVE-GREY (<5%) SAND MEDIUM, NOT AS MUCH ROUNDING AS PREVIOUS SAMPLE. SAMPLE THOROUGHLY WASHED ON RETRIEVAL. 1 (5 GAL) BUCKET. SAMPLER WAS 1/4 FULL.
077	IKU	1681630	44 59.61N 61 29.85W	40.0	1	0	0	N	SOUTH OF COUNTRY HARBOUR	SEISMIC RIPPLE ZONE BETWEEN 2 ROCK KNOBS OLIVE-GREY STONY DIAMICTON-METAGRAYWACKE (DOME) CLASTS > 90% SUBANGULAR TO SUBROUNDED (WIDE RANGE) SILTY-CLAY-SAND MATRIX. SOME BLACK ORGANIC CLAY IN MATRIX. 3 (5 GAL) BUCKETS OF MATRIX SAMPLE. LAG LEFT

										BEHIND. SAMPLER WAS 1/2 FULL.
082	IKU	1691250	44 50.95N 61 31.71W	82.0	1	0	0	Y	SOUTH OF COUNTRY HARBOUR	ON TOP OF BRASS NUT MOUND, TRANSGRESSED COUNTRY HBR MORAINE, LAG GRAVEL OVER TILL, LAG-COBBLE-BOULDER SUBROUNDED; TILL; OLIVE-GREY SANDY DIAMICTON, SUBROUNDED TO ANGULAR CLASTS. METAGRAYWACKE > 95%. 2 (5 GAL) BUCKETS. SAMPLER WAS 1/4 FULL.
083	IKU	1691320	44 50.18N 61 31.55W	82.0	1	0	0	Y	SOUTH OF COUNTRY HARBOUR	ONSIDE OF MOUND (BRASS NUT). COBBLE-BOULDER LAG SUBANGULAR TO UNIT-3, SUBROUNDED, METAGRAYWACKE AND QUARTZ VEIN OVERLYING GREY-BROWN SANDY DIAMICTON, 20CM. UNIT-2 OVERLYING GREY CLAY WITH SHELLS, FEW STONES UNIT-1 (EMERALD SILT). 3 (5 GAL) BUCKETS, 1=TOP, 1=MIDDLE AND 1= BOTTOM. SAMPLER WAS 3/4 FULL
084	IKU	1691409	44 40.25N 61 24.11W	82.0	1	0	0	Y	SOUTH OF COUNTRY HARBOUR	MORAINE MOUND (TRANSGRESSED). COBBLE-BOULDER LAG. QUARTZ VEIN IN BOULDER. (MORAINE) METAGRAYWACKE >95%, TILL UNDERNEATH OLIVE-GREY SANDY DIAMICTON. METAGRAYWACKE SUBROUNDED TO SUBANGULAR, METAGRAYWACKE >95%. 1 (5 GAL) BUCKET OF LAG DEPOSIT AND 1 (5 GAL) BUCKET OF TILL BENEATH (BOTTOM). SAMPLER WAS 1/2 FULL.
085	IKU	1691615	44 42.46N 61 21.71W	109.0	1	0	0	Y	SOUTH OF COUNTRY HARBOUR	SEISMIC MOUND MORAINE OVERLAIN BY VENEER OF EMERALD SILT. SAMPLE 3 UNITS: TOP (MORAINE) TOP UNIT-COBBLE-BOULDER LAG METAGRAYWACKE; MIDDLE UNIT- (10-40CM)OLIVE-GREY-SANDY DIAMICTON. UNIT 3-(+ 40CM) GREY-BROWN (REDDISH TINGE) CLAY WITH FEW STONES. 3 (5 GAL) BUCKETS. 1= TOP LAG, 1= MIDDLE SAMPLE, 1= BOTTOM. SAMPLER WAS 3/4 FULL.
086	IKU	1691650	44 40.08N 61 20.95W	107.0	1	0	0	Y	COUNTRY HARBOUR	SURFACE OUTCROPPING TILL TONGUE OVERLAIN BY EMERALD SILT, THEN TRUNCATED BY MARINE EROSION ? COBBLE-BOULDER LAG, METAGRAYWACKE SUBROUNDED TO SUBANGULAR OVERLYING OLIVE-GREEN-GREY SANDY DIAMICTON. > 95% METAGRAYWACKE CLASTS. A THIN CLAY LAYER NOTED AT BASE. PROBABLY OVERLIES EMERALD SILT. PANNED SAMPLE-CLASTS MOSTLY SUBANGULAR QUARTZ VEIN. NO VG (VISIBLE GOLD) ILMANITE, GARNET. 2 (5 GAL) BUCKETS, 1= LAG (SURFACE), 1= BOTTOM, SAMPLER WAS 1/2 FULL.
089	IKU	1691920	44 44.62N 61 45.35W	106.0	1	0	1	Y	COUNTRY HARBOUR MORAINE	BOTTOM- UNIT-1 GREY-SANDY CLAY-SILTY CLAY MASSIVE, SHELL BEARING, HEAVY > 6CM MIDDLE- UNIT 2 OLIVE-GREY SILTY SANDY DIAMICTON 2-6CM. TOP- UNIT 3 BOULDER COBBLE LAG, SUBANGULAR TO SUBROUNDED METAGRAYWACKE > 95%. PUSH CORE WAS TAKEN UNDERNEATH THE SURFACE LAG. SAMPLE STORED IN 3 BUCKETS. 1 (2 1/2 GAL) BUCKET LABELLED TOP. 1 (2 1/2 GAL) BUCKET LABELLED MIDDLE. 1 (5 GAL) BUCKET LABELLED

									BOTTOM. APPROX 70CM FROM TOP TO BOTTOM. SAMPLER WAS FULL TO BRIMMING.
091	IKU	1701248	45 02.53N 61 18.24W	73.0	1	1	0	Y	SOUTH OF TOR BAY	BEDROCK RIDGE LAG DEPOSITS (SEISMIC) COBBLE-BOULDER LAG- WELL ROUNDED COBBLES -BOULDERS MIXED WITH SUBANGULAR COBBLES- PEBBLES, OVERLYING GREY DIAMICTON, METAGRAYWACKE >95%. SOME RED INCLUSIONS IN MATRIX DERIVED LAWRENCETOWN TILL. 1 (2.5 GAL) BUCKET LABELLED BOTTOM CONTAINS UNDERLYING TILL MATRIX AND 2 (1 GAL) BUCKETS LABELLED TOP. CONTAINING TRANSGRESSIVE LAG. + 1 BAG OF MATRIX FOR GRAIN SIZE. SAMPLER WAS 1/2 FULL.
092	IKU	1701340	45 01.77N 61 18.71W	93.0	2	1	0	Y	SOUTH OF TOR BAY	ERODED UNIT (C)? TILL ? IN BEDROCK CHANNEL (SEISMIC). COBBLE-BOULDER LAG SLATE-ANGULAR (>80%), ROUNDED GRANITE (CANSO PLUTON?). UNDERLYING GREY-MD-BROWN SILTY CLAY. DIAMICTON, FEW STONES. NOTE REDDISH TINGE. TRIP ARM WAS BENT, NEEDED 2 ATTEMPTS. 2 (1 GAL) BUCKETS LABELLED TOP LAG AND 1 (2 1/2 GAL) BUCKET OF UNDERLYING TILL LABELLED BOTTOM. + 1 BAG OF GRANITE (CLAST LITHOLOGY).
093	IKU	1701414	44 57.07N 61 21.64W	112.0	1	0	2	Y	SOUTH OF NEW HARBOUR RIVER	ERODED EMERALD SILT (A) AT LOW SEA LEVEL POSITION (SEE HUNTEC, SIDESCAN). PEBBLE-LAG (5CM) BROWNISH-GREY DIAMICTON METAGRAYWACKE >90% (UNIT-3) OVERLYING GREYISH-GREEN SANDY SILT DIAMICTON (UNIT-2) OVERLYING (15-40CM) CLAY WITH REDDISH INCLUSIONS (SHELL FRAGMENTS) (UNIT-1). 4 (1 GAL) BUCKETS, 2= TOP,1=MIDDLE AND 1= BOTTOM. PUSH CORES (BLOW BY) 4-10CM OF SEDIMENT (COMPRESS). SAMPLER WAS FULL.
094	IKU	1701633	45 03.86N 61 48.87W	11.00	2	3	0	Y	WINE HEAD	WINE HEAD SAND SAMPLE. FIRST ATTEMPT HAD KELP AND MUSSELS. WASHED AND REWORKED GRAVEL AND COBBLES WITH ORGANIC SILTY SAND (SECOND KELP). 1 (5 GAL)BUCKET + 3 BAGS. SAMPLER WAS 1/2 FULL.
095	IKU	1701648	45 03.85N 61 48.60W	18.00	1	0	0	Y	WINE HEAD	BROWN COBBLY-SAND OXIDIZED OVER BLACK ORGANIC SILTY-SAND WITH PEBBLES. (ESTUARINE). 3 BAGS LABELLED TOP, BOTTOM AND SURFACE GRAVEL. SAMPLER WAS 1/2 FULL.

TABLE 6
SEISMIC RECORDS

ROLL NUMBERS	START DAY/TIME	STOP DAY/TIME	HYDROPHONE	LINE NUMBERS	RECORD TYPE	GEOGRAPHIC LOCATION	RECORDER	SYSTEM/ SOUND SOURCE
01B	1571500	1581157	NSRF 25 FT		SINGLE		EPC 4603	AGC SEISMICS SLEEVE GUN 40 CU IN
01A	1592113	1601100	NSRF 25 FT		SINGLE		EPC 4603	AGC SEISMICS SLEEVE GUN 40 CU IN
002	1601155	1601321	NSRF 25 FT		SINGLE		EPC 4603	AGC SEISMICS SLEEVE GUN 40 CU IN
003	1602112	1611100	NSRF 25 FT		SINGLE		EPC 4603	AGC SEISMICS SLEEVE GUN 40 CU IN
004	1612020	1621330	NSRF 25 FT		SINGLE		EPC 4603	AGC SEISMICS SLEEVE GUN 40 CU IN
005	1622037	1631100	NSRF 25 FT		SINGLE		EPC 4603	AGC SEISMICS SLEEVE GUN 40 CU IN
006	1632110	1640616	NSRF 25 FT		SINGLE		EPC 4603	AGC SEISMICS SLEEVE GUN 40 CU IN

007	1640619	1651337	NSRF 25 FT		SINGLE	EPC 4603	AGC SEISMICS SLEEVE GUN 40 CU IN
009	1652050	1661127	NSRF 25 FT		SINGLE	EPC 4603	AGC SEISMICS SLEEVE GUN 40 CU IN
010	1661905	1662120	NSRF 25 FT		SINGLE	EPC 4603	AGC SEISMICS SLEEVE GUN 40 CU IN
011	1662125	1671059	NSRF 25 FT		SINGLE	EPC 4603	AGC SEISMICS SLEEVE GUN 40 CU IN
013	1672224	1681100	NSRF 25 FT		SINGLE	EPC 4603	AGC SEISMICS SLEEVE GUN 40 CU IN
014	1682105	1691153	NSRF 25 FT		SINGLE	EPC 4603	AGC SEISMICS SLEEVE GUN 40 CU IN
015	1692040	1701100	NSRF 25 FT		SINGLE	EPC 4603	AGC SEISMICS SLEEVE GUN 40 CU IN
016	1702035	1711700	NSRF 25 FT		SINGLE	EPC 4603	AGC SEISMICS SLEEVE GUN 40 CU IN

TABLE 7
HUNTEC RECORDS

ROLL NUMBERS	START DAY/TIME	STOP DAY/TIME	HYDROPHONE	LINE NUMBERS	RECORD TYPE	GEOGRAPHIC LOCATION	RECORDER	HUNTEC SYSTEM
001	1571412	1591040	EXTERNAL		COMBINED		EPC 4800	HUNTEC DTS (AGC 3)
001	1551315	1551800	EXTERNAL		SINGLE		EPC 4100	HUNTEC DTS (AGC 3)
002	1591955	1592230	EXTERNAL		COMBINED		EPC 4800	HUNTEC DTS (AGC 3)
002	1572120	1580020	EXTERNAL		SINGLE		EPC 4100	HUNTEC DTS (AGC 3)
003	1592337	1602250	EXTERNAL		COMBINED		EPC 4800	HUNTEC DTS (AGC 3)
003	1580035	1581145	EXTERNAL		SINGLE		EPC 4100	HUNTEC DTS (AGC 3)
004	1602303	1612200	EXTERNAL		COMBINED		EPC 4800	HUNTEC DTS (AGC 3)
004	1582100	1590732	EXTERNAL		SINGLE		EPC 4100	HUNTEC DTS (AGC 3)
005	1612201	1621303	EXTERNAL		COMBINED		EPC 4800	HUNTEC DTS (AGC 3)
005	1590735	1591155	EXTERNAL		SINGLE		EPC 4100	HUNTEC DTS (AGC 3)
006	1622055	1630200	EXTERNAL		COMBINED		EPC 4800	HUNTEC DTS (AGC 3)
006	1592115	1601100	EXTERNAL		SINGLE		EPC 4100	HUNTEC DTS (AGC 3)
007	1630300	1631100	EXTERNAL		COMBINED		EPC 4800	HUNTEC DTS (AGC 3)
007	1601200	1601322	EXTERNAL		SINGLE		EPC 4100	HUNTEC DTS (AGC 3)
008	1632140	1641102	EXTERNAL		COMBINED		EPC 4800	HUNTEC DTS (AGC 3)
008	1602110	1610555	EXTERNAL		SINGLE		EPC 4100	HUNTEC DTS (AGC 3)
009	1642000	1650500	EXTERNAL		COMBINED		EPC 4800	HUNTEC DTS (AGC 3)
009	1610635	1610850	EXTERNAL		SINGLE		EPC 4100	HUNTEC DTS (AGC 3)
010	1650540	1651350	EXTERNAL		COMBINED		EPC 4800	HUNTEC DTS (AGC 3)
010	1612030	1621327	EXTERNAL		SINGLE		EPC 4100	HUNTEC DTS (AGC 3)
011	1652100	1661130	EXTERNAL		COMBINED		EPC 4800	HUNTEC DTS (AGC 3)
011	1621100	1621325	EXTERNAL		SINGLE		EPC 4100	HUNTEC DTS (AGC 3)
012	1661810	1670500	EXTERNAL		COMBINED		EPC 4800	HUNTEC DTS (AGC 3)
012	1630129	1631102	EXTERNAL		SINGLE		EPC 4100	HUNTEC DTS (AGC 3)
013	1672230	1680230	EXTERNAL		COMBINED		EPC 4800	HUNTEC DTS (AGC 3)
013	1630133	1630750	EXTERNAL		SINGLE		EPC 4100	HUNTEC DTS (AGC 3)
014	1680235	1681033	EXTERNAL		COMBINED		EPC 4800	HUNTEC DTS (AGC 3)
014	1632113	1640647	EXTERNAL		SINGLE		EPC 4100	HUNTEC DTS (AGC 3)
015	1682100	1690300	EXTERNAL		COMBINED		EPC 4800	HUNTEC DTS (AGC 3)
015	1640648	1641125	EXTERNAL		SINGLE		EPC 4100	HUNTEC DTS (AGC 3)
016	1690300	1691102	EXTERNAL		COMBINED		EPC 4800	HUNTEC DTS (AGC 3)
016	1641955	1651030	EXTERNAL		SINGLE		EPC 4100	HUNTEC DTS (AGC 3)
017	1692046	1701100	EXTERNAL		COMBINED		EPC 4800	HUNTEC DTS (AGC 3)
017	1652051	1661126	EXTERNAL		SINGLE		EPC 4100	HUNTEC DTS (AGC 3)
018	1702030	1710510	EXTERNAL		COMBINED		EPC 4800	HUNTEC DTS (AGC 3)
018	1661856	1662249	EXTERNAL		SINGLE		EPC 4100	HUNTEC DTS (AGC 3)
019	1710525	1711700	EXTERNAL		COMBINED		EPC 4800	HUNTEC DTS (AGC 3)
019	1662251	1671059	EXTERNAL		SINGLE		EPC 4100	HUNTEC DTS (AGC 3)
020	1672220	1680620	EXTERNAL		SINGLE		EPC 4100	HUNTEC DTS (AGC 3)
021	1680643	1681100	EXTERNAL		SINGLE		EPC 4100	HUNTEC DTS (AGC 3)
022	1682103	1691153	EXTERNAL		SINGLE		EPC 4100	HUNTEC DTS (AGC 3)
023	1692040	1701100	EXTERNAL		SINGLE		EPC 4100	HUNTEC DTS (AGC 3)
024	1702033	1710512	EXTERNAL		SINGLE		EPC 4100	HUNTEC DTS (AGC 3)
025	1710515	1711700	EXTERNAL		SINGLE		EPC 4100	HUNTEC DTS (AGC 3)
001	1572130	1580830	INTERNAL		SINGLE		EPC 4603	HUNTEC DTS (AGC 3)
002	1580840	1581205	INTERNAL		SINGLE		EPC 4603	HUNTEC DTS (AGC 3)
003	1582040	1591159	INTERNAL		SINGLE		EPC 4603	HUNTEC DTS (AGC 3)
004	1592100	1592317	INTERNAL		SINGLE		EPC 4603	HUNTEC DTS (AGC 3)
005	1592317	1601100	INTERNAL		SINGLE		EPC 4603	HUNTEC DTS (AGC 3)
006	1601155	1601316	INTERNAL		SINGLE		EPC 4603	HUNTEC DTS (AGC 3)
007	1602110	1610454	INTERNAL		SINGLE		EPC 4603	HUNTEC DTS (AGC 3)
008	1610455	1610847	INTERNAL		SINGLE		EPC 4603	HUNTEC DTS (AGC 3)
009	1612030	1621132	INTERNAL		SINGLE		EPC 4603	HUNTEC DTS (AGC 3)

010	1622038	1631027	INTERNAL	SINGLE	EPC 4603	HUNTEC DTS (AGC 3)
011	1631027	1631105	INTERNAL	SINGLE	EPC 4603	HUNTEC DTS (AGC 3)
012	1632113	1632357	INTERNAL	SINGLE	EPC 4603	HUNTEC DTS (AGC 3)
013	1632354	1641017	INTERNAL	SINGLE	EPC 4603	HUNTEC DTS (AGC 3)
014	1641018	1641118	INTERNAL	SINGLE	EPC 4603	HUNTEC DTS (AGC 3)
015	1641955	1650217	INTERNAL	SINGLE	EPC 4603	HUNTEC DTS (AGC 3)
016	1650220	1651004	INTERNAL	SINGLE	EPC 4603	HUNTEC DTS (AGC 3)
017	1651004	1651337	INTERNAL	SINGLE	EPC 4603	HUNTEC DTS (AGC 3)
018	1652050	1660405	INTERNAL	SINGLE	EPC 4603	HUNTEC DTS (AGC 3)
019	1660419	1661125	INTERNAL	SINGLE	EPC 4603	HUNTEC DTS (AGC 3)
020	1661857	1670607	INTERNAL	SINGLE	EPC 4603	HUNTEC DTS (AGC 3)
021	1670610	1671059	INTERNAL	SINGLE	EPC 4603	HUNTEC DTS (AGC 3)
022	1672229	1681107	INTERNAL	SINGLE	EPC 4603	HUNTEC DTS (AGC 3)
023	1682103	1691153	INTERNAL	SINGLE	EPC 4603	HUNTEC DTS (AGC 3)
024	1692040	1700332	INTERNAL	SINGLE	EPC 4603	HUNTEC DTS (AGC 3)
025	1700758	1701100	INTERNAL	SINGLE	EPC 4603	HUNTEC DTS (AGC 3)
026	1702033	1710500	INTERNAL	SINGLE	EPC 4603	HUNTEC DTS (AGC 3)
027	1710503	1711658	INTERNAL	SINGLE	EPC 4603	HUNTEC DTS (AGC 3)

TABLE 8
SIDESCAN RECORDS

ROLL NUMBERS	START DAY/TIME	STOP DAY/TIME	LINE NUMBERS	RECORD TYPE	GEOGRAPHIC LOCATION	RECORDER	SIDESCAN SYSTEM
001	1571412	1591040		COMBINED		EPC 4800	BIO SIDESCAN (70 KHZ
001	1572120	1580555		SINGLE		KLEIN 521	BIO SIDESCAN (70 KHZ
002	1580716	1581210		SINGLE		KLEIN 521	BIO SIDESCAN (70 KHZ
003	1582040	1590505		SINGLE		KLEIN 521	BIO SIDESCAN (70 KHZ
004	1590515	1590755		SINGLE		KLEIN 521	BIO SIDESCAN (70 KHZ
005	1590800	1591034		SINGLE		KLEIN 521	BIO SIDESCAN (70 KHZ
002	1591955	1592230		COMBINED		EPC 4800	BIO SIDESCAN (70 KHZ
006	1592035	1600045		SINGLE		KLEIN 521	BIO SIDESCAN (70 KHZ
003	1592337	1602250		COMBINED		EPC 4800	BIO SIDESCAN (70 KHZ
007	1600050	1600820		SINGLE		KLEIN 521	BIO SIDESCAN (70 KHZ
008	1600830	1601105		SINGLE		KLEIN 521	BIO SIDESCAN (70 KHZ
009	1602100	1610854		SINGLE		KLEIN 521	BIO SIDESCAN (70 KHZ
004	1602303	1612200		COMBINED		EPC 4800	BIO SIDESCAN (70 KHZ
010	1612025	1620527		SINGLE		KLEIN 521	BIO SIDESCAN (70 KHZ
005	1612201	1621303		COMBINED		EPC 4800	BIO SIDESCAN (70 KHZ
011	1620525	1621333		SINGLE		KLEIN 521	BIO SIDESCAN (70 KHZ
012	1621045	1630120		SINGLE		KLEIN 521	BIO SIDESCAN (70 KHZ
006	1622055	1630200		COMBINED		EPC 4800	BIO SIDESCAN (70 KHZ
013	1630125	1630853		SINGLE		KLEIN 521	BIO SIDESCAN (70 KHZ
007	1630300	1631100		COMBINED		EPC 4800	BIO SIDESCAN (70 KHZ
014	1632113	1640815		SINGLE		KLEIN 521	BIO SIDESCAN (70 KHZ
008	1632140	1641102		COMBINED		EPC 4800	BIO SIDESCAN (70 KHZ
015	1640820	1641130		SINGLE		KLEIN 521	BIO SIDESCAN (70 KHZ
016	1641949	1651007		SINGLE		KLEIN 521	BIO SIDESCAN (70 KHZ
009	1642000	1650500		COMBINED		EPC 4800	BIO SIDESCAN (70 KHZ
010	1650540	1651350		COMBINED		EPC 4800	BIO SIDESCAN (70 KHZ
017	1651008	1651246		SINGLE		KLEIN 521	BIO SIDESCAN (70 KHZ
018	1651250	1651350		SINGLE		KLEIN 521	BIO SIDESCAN (70 KHZ
019	1652050	1661130		SINGLE		KLEIN 521	BIO SIDESCAN (70 KHZ
011	1652100	1661130		COMBINED		EPC 4800	BIO SIDESCAN (70 KHZ
012	1661810	1670500		COMBINED		EPC 4800	BIO SIDESCAN (70 KHZ
020	1662050	1671055		SINGLE		KLEIN 521	BIO SIDESCAN (70 KHZ
021	1672215	1680318		SINGLE		KLEIN 521	BIO SIDESCAN (70 KHZ
013	1672230	1680230		COMBINED		EPC 4800	BIO SIDESCAN (70 KHZ
014	1680235	1681033		COMBINED		EPC 4800	BIO SIDESCAN (70 KHZ
022	1680320	1681055		SINGLE		KLEIN 521	BIO SIDESCAN (70 KHZ
015	1682100	1690300		COMBINED		EPC 4800	BIO SIDESCAN (70 KHZ
023	1682300	1691200		SINGLE		KLEIN 521	BIO SIDESCAN (70 KHZ
016	1690300	1691102		COMBINED		EPC 4800	BIO SIDESCAN (70 KHZ
024	1692030	1700440		SINGLE		KLEIN 521	BIO SIDESCAN (70 KHZ
017	1692046	1701100		COMBINED		EPC 4800	BIO SIDESCAN (70 KHZ

025	1700440	1701100	SINGLE		KLEIN 521	BIO SIDESCAN (70 KHZ
018	1702030	1710510	COMBINED		EPC 4800	BIO SIDESCAN (70 KHZ
019	1710525	1711700	COMBINED		EPC 4800	BIO SIDESCAN (70 KHZ
001	1572100	1572235	SINGLE	HALIFAX HBR	KLEIN 595	KLEIN 100KHX-500KHX
002	1572245	1580605	SINGLE	HALIFAX HBR	KLEIN 595	KLEIN 100KHX-500KHX
003	1580615	1581210	SINGLE	HALIFAX HBR	KLEIN 595	KLEIN 100KHX-500KHX
004	1582039	1590125	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
005	1590130	1590445	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
06A	1590445	1590945	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
06B	1590945	1592359	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
06C	1600000	1600350	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
007	1600354	1600705	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
008	1600706	1601105	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
009	1601154	1602230	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
010	1602232	1610646	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
011	1610645	1611102	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
012	1612011	1612205	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
013	1612207	1620420	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
014	1620420	1621020	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
015	1621024	1621332	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
016	1622034	1630130	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
017	1630133	1630750	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
018	1630750	1631105	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
019	1632109	1641140	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
020	1642143	1650246	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
021	1650251	1651002	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
022	1651004	1651309	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
023	1651317	1660050	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
024	1660050	1660638	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
025	1660640	1661130	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
026	1661735	1662156	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
027	1662200	1670300	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
028	1670300	1670700	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
029	1670708	1672310	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
030	1672310	1680302	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
031	1680302	1680640	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
032	1680640	1681100	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
033	1682100	1690045	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
034	1690045	1690516	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
035	1690522	1691156	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
036	1692135	1700150	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
037	1700155	1700640	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
038	1700640	1701105	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
039	1702031	1702215	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
040	1702220	1710240	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
041	1710240	1710645	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
042	1710648	1711245	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
043	1711245	1711636	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX
044	1711640	1711700	SINGLE		KLEIN 595	KLEIN 100KHX-500KHX

TABLE 9
3.5 KHZ RECORDS

ROLL NUMBERS	START DAY/TIME	STOP DAY/TIME	LINE NUMBERS	GEOGRAPHIC LOCATION	RECORDER	SYSTEM / SOUND SOURCE
001	1551715	1552014			LSR 1811	HULL MOUNTED
002	156	156			LSR 1811	HULL MOUNTED
003	1571420	1580555			LSR 1811	HULL MOUNTED
004	1580610	1581850			LSR 1811	HULL MOUNTED
005	1581930	1590700			LSR 1811	HULL MOUNTED
006	1590710	1591200			LSR 1811	HULL MOUNTED
007	1591225	1601215			LSR 1811	HULL MOUNTED
008	1601225	1610850			LSR 1811	HULL MOUNTED
009	1610850	1612058			LSR 1811	HULL MOUNTED
010	1612110	1621600			LSR 1811	HULL MOUNTED
011	1621615	1631425			LSR 1811	HULL MOUNTED

012	1631425	1640600	LSR 1811	HULL MOUNTED
013	1640610	1642246	LSR 1811	HULL MOUNTED
014	1642300	1660300	LSR 1811	HULL MOUNTED
015	1660300	1662306	LSR 1811	HULL MOUNTED
016	1662315	1671315	LSR 1811	HULL MOUNTED
017	1671315	1672239	LSR 1811	HULL MOUNTED
018	1672240	1681225	LSR 1811	HULL MOUNTED
019	1681225	1682046	LSR 1811	HULL MOUNTED
020	1682055	1691510	LSR 1811	HULL MOUNTED
021	1691510	1701108	LSR 1811	HULL MOUNTED
022	1701110	1702320	LSR 1811	HULL MOUNTED
023	1702353	1710445	LSR 1811	HULL MOUNTED
024	1710510	1711700	LSR 1811	HULL MOUNTED