Report of
C.S.S Dawson Cruise 87-023
in the Gulf of St. Lawrence

by

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General Information:

Cruise:	87-023
Vessel:	C.S.S. Dawson
Master:	M. McConnell
Chief Scientist:	J.P.M. Syvitski
Duration:	June 18 - June 29, 1987
Area:	St. Lawrence Estuary - Sept Isles - Baie des Chaleurs

Personnel:

<u>June 18-27</u>	
Ken Asprey	(AGC, EMG)
Daryl Beaver	(AGC, PSS)
John Burns	(AGC, student)
Randy Currie	(AGC, PSS)
Frances Hein	(Dalhousie U.)
Bill LeBlanc	(AGC, EMG)
Don Locke	(AGC, PSS)
Ann Miller	(Dalhousie U.)
Dan Praeg	(AGC, EMG)
Andy Sherin	(AGC, PSS)
Graham Standen	(AGC, Huntec)
<u>June 18-20</u>	
Bernard Long	(INRS)
<u>June 20-27</u>	
Gordon Cameron	(Dalhousie U.)

Objectives:

(1) To collect Huntec DTS high resolution and air gun medium resolution seismic reflection profiles in order to detail the Quaternary history of basin infilling processes in the St. Lawrence estuary, Sept Isles area, and Baie des Chaleurs.

(2) To collect suitable piston cores to ground-truth the seismic profiles and create a realistic stratigraphic model.

(3) To collect grab samples from nearshore heavy mineral locales for the development of an actualistic placer model.

(4) To test the new design of the AGC Floc Camera, and collect information on the water column throughout the study area.

Results:

(1) A total of 1270 km of seismic reflection lines (Table 1) were collected in the three areas of interest (Figure 1). The resulting database of air gun, Huntec, sidescan and echosounder records are listed in Tables 2-8.

In the St. Lawrence estuary and Sept Isles areas the seismic lines were positioned primarily to provide information on the paleo-extent of offshore depositional styles associated with north shore deltas. The records show that bedrock units are overlain by Quaternary sediments up to 350 m thick, which include glacial deposits, deltaic sediments, and recent estuarine mud. The glacial deposits suggest probable grounded glacial ice, and subsequent estuarine deposition in quiet water conditions. Deltaic sediments dominated by mass-flow deposits are found in lobes within the glacial sediments, overlying them, and as part of the modern nearshore deltaic environment. Their areal distributions document a history of glacial to deglacial expansion of the north shore deltas (especially the Manicouagan), followed by shoreward retreat to their present positions, where the depositional styles observed seaward continue to operate. The recent estuarine mud forms the seabed in most areas, and is characterized on high resolution records by point source reflectors interpreted as boulders transported by sea ice.

In the Baie des Chaleurs seismic lines were positioned to provide high resolution Huntec information along the air gun lines collected in 1986, and to extend the seismic coverage available. The Huntec records provided detailed resolution of the relatively thin Quaternary stratigraphic elements previously recognized from the air gun records, including features such as: constructional accumulations within glacial sediments that may be moraines; stratified glacial sediments indicative of several styles of deposition; erosional channels on the surface of the glacial sediments; deltaic channels and channel deposits of the inner bay; acoustic masking by gas and associated gas escape marks; and prograding reflectors within the recent muds.

(2) 17 piston core stations totalling 60 m of sediment were occcupied in the St. Lawrence estuary and Sept Isles areas (Figures 2-4, Table 10). Core locations were chosen from the seismic data where an interesting sequence was present, or where older sediments were observed near the seabed (Figure 5). Preliminary examination of the cores while on the ship (Appendix 1) indicated several lithologically and geotechnically distinct zones which may be correlative with units recognized on seismic records. Grab samples (Table 11) were collected at 6 of the piston core stations, and at 2 floc camera stations, to document surface sediment and fauna (Appendix 2).

(3) A total of 60 nearshore grabs (Table 12) and onshore samples (Table 13) were collected during 2 nearshore launch surveys in the Péninsule de Manicouagan and Sept Isles areas (Figures 3, 4). Significant quantity and quality of heavy minerals (titanium rich sands) were found at Baie Sainte Marguerite in the Sept Isles area. These minerals were reworked from raised deltaic sediments correlative to the deglacial sequence observed offshore on seismic records, and support a simple placer model developed in arctic Canada which suggested a need for second cycling of deltaic sediments by wind and waves to produce economic concentrations of placer sediments.

(4) A new design for the AGC underwater floc camera proved successful, and measurements and water samples were collected at 8 stations (Table 14; Figures 2,3a,4a).

Itinerary:

June 18/0900 - 2230 **(Ship's time - AST)**

- Depart Rimouski, run geophysical lines across estuary to Péninsule de Manicouagan and back
- Launch survey 1400-1900: nearshore and onshore sampling, Pointe a Michel

June 18/2230 - June 19/0130

- Steam to Rimouski, send in launch for equipment

June 19/0130 - 0930

- Run geophysical lines across estuary to Péninsule de Manicouagan

June 19/0930 - 2345

- Collect 11 piston cores and 2 floc camera lowerings

June 19/2345 - June 20/0930

- Run geophysical line along Péninsule de Manicouagan

June 20/0930 - 1345

- Steam to Rimouski, put B. Long ashore and pick up G. Cameron with launch

June 20/1345 - June 21/1100

- Run geophysical line Rimouski to Point des Monts
- Grab and floc camera lowering June 21/0000-0200

June 21/1100 - 1415

- Steam to Sept Isles

June 21/1415 - June 22/0930

- Run geophysical line in and around Sept Isles

June 22/0930 - 1900

- Collect piston cores and grabs, plus floc camera lowering
- Launch survey 1000-1600: nearshore and onshore sampling, Baie Sainte Marguerite

June 22/1900 - June 23/0230

- Steam to south side of île d'Anticosti

June 23/0230 - June 24/1700

- Run geophysical line île d'Anticosti to central Baie des Chaleurs
- Floc camera lowerings June 24/0245-0315 and 0430-0500

June 24/1700 - 2100

- Steam to head of Baie des Chaleurs
- Floc camera lowering 2045-2100

June 24/2100 - June 25/2000

- Run geophysical line from head to central Baie des Chaleurs

June 25/2000 - June 26/0045

- Steam to mouth of Baie des Chaleurs
- Floc camera lowerings June 25/2130-2200 and June 26/0000-0045

June 26/0045 - June 27/0900

- Steam to BIO via Strait of Canso

Geophysical Operations:

Air Gun Seismics:

Bolt model 600B gun
40 in^3 (655 cm^3) chamber with pulse shaper
RIX K88 air compressor (1900 PSI)
NSRF 25' eel and termination unit
AGC high voltage trigger unit
Khron-Hite model 3700R filter (10Hz-30 kHz) and filter amplifier
EPC 4100 Precision Graphic Recorder
RACAL 4-channel tape recorder (15/16 speed)

Ch. 1 - raw signal	Ch. 3 - voice
Ch. 2 - filtered signal	Ch. 4 - trigger

Huntec Seismics:

AGC-3 fish (1000 J) with IKU 50 kHz sidescan transducers
Internal and external hydrophones
Hydro-Mac model 7605-30-A winch (200 m cable)
EPC 4100 PGR (internal)
EPC 4600 PGR (external)
HP 3960 4-channel tape recorder (3 3/4 speed)

Ch. 1 - internal signal	Ch. 3 - external signal
Ch. 2 - trigger/sync	Ch. 4 - voice

Sidescan Sonar:

IKU 50 kHz transducers in Huntec fish
Klein 42IT 2-channel graphic recorder
RACAL 4-channel tape recorder

Ch. 1 - port	Ch. 3 - ref
Ch. 2 - stbd	Ch. 4 - voice

Bathymetry:

Raytheon model 106C-1 transceiver
Hull-mounted 12 kHz transducers
Raytheon model UGR 196E-1 Line Scan Recorder

All geophysical systems were run simultaneously, and recorded on 5 separate graphic recorders (2 for Huntec seismics). All information was also recorded on magnetic tape, except bathymetry which was manually measured at 5 minute intervals and recorded on floppy magnetic disks. The graphic records were automatically annotated at 5 minute intervals using the TSS model 312B Annotator.

Air gun seismics: operations were interrupted on 172/1300Z due to a problem with oil injection in the compressor. This was fixed during the steam to Sept Isles from 172/1400 - 1715Z, when it was discovered that the "V" pulley was slipping on the shaft. At 174/0900Z seismics were interrupted for 3 hours when the compressor developed a faulty intake valve on the second stage. From then until the end

of the cruise the compressor had to be shut down every few hours for 5 minutes to allow pressure to build up. Air guns were replaced occasionally in response to routine wear, but no other significant problems were encountered.

Huntec seismics (from Huntec operator's report by G. Standen): records were of excellent quality, and down-time was relatively low. Electrical problems resulted in the system being brought on board three times. From 171/1005 - 1230Z problems with the pressure line and an intermittent signal resulted in the Cinch Jones connector in the ASU junction box and the buffer board in the ASU being changed. From 171/1800 - 1915Z fuzzy data led to the buffer board in the ASU being changed. From 175/1105 - 1920Z erratic signals were traced to a broken common signal line at the edge connector of the buffer board in the ASU. The system was briefly on board at 172/1130Z to adjust the tail fins, as the pitch indicator was showing 25 degrees plus nose down and the tow cable was vibrating strongly. This problem recurred at speeds in excess of 5.5 knots, probably due to the relatively shallow tow depths (<50 m) over much of the survey area, and so geophysical lines were restricted to less than 5.5 knots for the remainder of the cruise. The tow cable termination showed wear at the end of the cruise, and will have to be reterminated both mechanically and electrically. The winch remote control cable, which was pinched on a previous cruise, was repaired. There is a leak from both sides of the hydraulic motor of the winch, and this should be checked. Problems were encountered keeping the EPC 4600 in sync with the master EPC 4100, and this was minimized by keeping the styli belt as tight as possible. Finally, some data may not have been recorded on magnetic tape, as the HP 3960 tape recorder would slow down and at times stop when the take-up spool was approximately 2/3 full. This is the third field season that the recorder has had this problem. There were no problems with the sidescan operations.

Ship Sampling Operations:

Benthos piston corer:	1800 lb and 1200 lb heads
	10 ft barrels and core liners, split piston
	Benthos gravity core trigger weight
Van Veen grab sampler	

Piston core sites (Table 10; Figures 2-4) were selected from the Huntec high resolution records (Figure 5), and positioned using a combination of geographic navigation and depth. Two 10 ft barrels were used for all sites, while the 1800 lb head was exchanged for the 1200 lb midway. The corer worked well, with full penetration (including the head) of 8.2 m at most sites and cores up to 5.7 m long (Table 10). At station 5 the core liner imploded, and was stuck in the barrel with a 3 m core. At stations 6 and 9 the trigger weight gravity cores were longer than the piston core, suggesting a problem with the piston. Grab samples were collected before each core beginning with station 16, and two grab samples (stations 15 and 28) were also collected during floc camera stations (Table 11). Most cores were split, logged, and subjected to geotechnical analyses and subsampling (Table 10), and these procedures are documented in Appendix 1. Most cores and grabs were also subsampled and described for their foraminiferal content, as documented in Appendix 2.

Launch Sampling Operations: (F. Hein)

Nearshore grabs (Table 12) and onshore samples (Table 13) were collected during launch surveys at two sites: the delta complex of Baie aux Outardes, southwest of the Péninsule de Manicouagan; and Baie Sainte Marguerite in the Sept Isles region (Figures 2-4). Nearshore grabs were collected from the launch using a 1/20 m^3 Van Veen grab sampler and an oceanographic winch, while onshore samples were obtained using trowels and bags. No analyses of the samples were done onboard.

At the Baie aux Outardes site, three offshore sample transects were run with the launch; 5 samples were taken on each of transects A,B and C (Figure 3a). Navigation was by sextant readings. Sediments ranged from fine muddy sand to gravel (Table 12). The spit at the eastern end of the delta complex of Riviere Betsiamites (Pointe a Michel) was selected for onshore survey and sampling (Figure 3b). 12 samples were taken from various sites along the spit (Table 13), including: a lower beach swash zone at low tide (PB1); a site dominated by wave ripples near the crest of the spit (PB2); a plane bed site facing the St. Lawrence (PB3); and, a crestal site with large ebb-oriented ripples (PB4). The total sample area was ≈ 200 m long x 75 m wide, with a total relief of about 2 m from the crest to the swash zone (Figure 3b).

At the Baie Sainte Marguerite site, three offshore sample transects were run perpendicular to the coastline with the launch; 5 or 6 samples were taken on each of transects D,E and F (Figure 4a). Locations were plotted by eye -- estimating distances from prominent river valleys, spits and points, as well as using depth estimates and the navigation chart. Sediments were mainly sand and rarely granule-pebbly sand (Table 12).

The Baie Sainte Marguerite shoreline was examined and sampled at three onshore sections: D,E and G (Figure 4a). At section D, just southwest of Rivière Sainte Marguerite delta, a winter berm deposit was flanked by a small vegetated aeolian ridge (Figure 4b). Heavy mineral concentrations were observed, most just below the aeolian ridge, at the crest of the topmost berm. 6 sample stations were selected (SL1 to SL6), with sample depths at each station ranging from surface to 10 cm (Table 13). Most of the samples were from the seaward side of the aeolian ridge, with the exception of SL4, from the landward side of a back-ridge trough (Figure 4b).

At onshore section E (Figure 4a), a cliff-face was sampled. Approximately 30 - 40 m of section was exposed, consisting mainly of delta foreset sands, overlain unconformably by fluvial gravels and sand, capped by modern soil horizons. 7 samples were collected (SL7 to SL11), at the base of the cliff, the cliff face, and the modern winter berm deposit, with sample depths ranging from surface to 5 cm (Table 13). The highest heavy mineral concentrations were on the modern berm, where there was a prominent garnet-rich heavy mineral accumulation.

Onshore section G was at the eastern end of the bay (Figure 4a). At the far eastern end of the bay there is Precambrian bedrock. About 100 m to the NW is a 30 m cliff face of exposed, massive grey silt/silty clay, possibly a ?glaciomarine section, which is cut by sandy deltaic deposits with prominent foresets, which in turn are unconformably overlain by fluvial gravels and sands. This site is extremely rich in heavy mineral deposits, with up to 0.25 m accumulations of garnet and ilmenite rich sands occurring as a winter berm deposit at the base of the cliff. 4 samples were collected (SLG1 to SLG3, and SLG5), with sample depths ranging from surface to 10 cm. Modern reworking of the glaciomarine deposit appeared to provide a

secondary source for the heavy minerals -- the other source resulted from littoral transport, deposition as a winter berm, and enrichment by aeolian reworking of the berm material.

Floc Camera Lowerings: (K. Asprey)

A modified version of the AGC Floc Camera was deployed at 9 sites selected during the cruise (Table 14; Figures 2-4). The camera system worked well, although station 14 was aborted due to a malfunction of a pressure transducer. The Floc Camera is a three-dimensional camera system designed to measure the size, shape and density of suspended particles in the water column. The system consists of three Olympus OM-2 35 mm cameras equipped with self winders and data backs, a flash unit, a 12 kHz pinger and a National Semi-Conductor Octagon computer equipped with a pressure transducer. All the components are mounted in pressure cases on a pvc/aluminum frame. A program (downloaded from a Corona micro computer to the Octagon computer) controls the camera and gives the option of taking pictures by depth or time. The program also allows data to be transferred from the Octagon back to the Corona after the camera cast. The data consists of frame number, depth and time of each picture, and is saved on 5.25 inch floppy disks.

All photographs were taken on ASA 400 colour film. Pictures were taken at regular depth intervals to a predetermined maximum depth, and thereafter at regular time intervals to the end of the cast (Table 14). The depth and time of each frame recorded during the casts is included with Table 14; the depths are from an uncalibrated pressure transducer and may disagree with seabed depths. During each cast a water sample was collected for calibration purposes at an intermediate depth with a 5 litre Niskin water sampling bottle (Table 14). During the last two stations an Expendable Bathy-Thermograph (XBT) was used to determine the water column stratification.

Navigation: (A. Sherin)

Systems: Decca model Loran C Receiver (on bridge)
Marconi Satellite Receiver (on bridge)
Radar fixes (from Officer of the Watch)

Radar fixes, satellite fixes, and Loran C time delays (TD's) and computed lats and longs were recorded manually every 15 minutes in the General Log. Loran C TD's and lat/longs were also logged at 1 minute intervals from the Loran receiver Seimac RS232C port extensions on the MicroVAXII in the lower lab using a simple program written by Randy Currie; the times of the fixes were obtained using the MicroVAXII system clock.

Loran C lat/longs were computed using corrections to the TD's for overland path provided by Nick Stuifbergen of the Navigation Group of the Canadian Hydrographic Service. These corrections were manually entered into the Decca receiver as required when changing areas. For the Baie des Chaleurs portion of the cruise, navigation watches were established to change the corrections more often. This was required to accomodate the higher gradient of changes because of proximity to land, and to provide the best possible navigational accuracy in rerunning lines from previous cruises.

Once a day the corrected Loran C navigation was plotted and compared to radar and satellite fixes entered by hand from the General Log. The navigation data files were then edited to obtain a "clean" file with the most probable positions. On days when the Loran C was working well, this was a minor task, since agreement was generally good. However, the process of getting a good navigation data set was very time consuming (1) early in the cruise (before the method of applying corrections was established), (2) in Sept Isles harbour (corrections unreliable), or (3) when the Loran C was cycle jumping every few minutes.

On two occasions a launch was deployed to perform nearshore bottom sampling and to sample exposed sections on land. During the first deployment on day 169 at Baie aux Outardes, Bernard Long fixed the positions of the offshore samples using a sextant. These positions were converted to latitude and longitude with a resection program on an HP 45 calculator kindly loaned to us by the Master. During the second deployment on day 173 at Baie Sainte Marguerite, samples were positioned by visually estimating the location of the launch with reference to landmarks. The latitude and longitude were taken from the manually plotted positions on the chart, and should be considered very approximate.

The efficient collection of good navigation data was hampered by several things:

1. The lack of a complete manual on board CSS Dawson for the Decca Loran C receiver.
2. The instability in the 5930Z pattern from Fox Harbour, Labrador, which was very prone to cycle jumping. A more stable mode of operation was obtained by eventually forcing the receiver to not track 5930Z and rely on 5930X and 5930Y for fixing. The instability of 5930Z was problematic mostly in the St. Lawrence Estuary, although it still caused difficulty occasionally in the Baie des Chaleurs.
3. The lack of adequate post-processing software to recalculate lat/longs from logged TD's and to calculate positions from sextant angles.

Suggestions for the future:

1. Documentation of all electronic navigation aids should be checked well before departure to ensure completeness and that responsible staff are familiar with all aspects of their operation.
2. The capability of logging from both Loran C receivers on CSS Dawson be investigated to allow logging of data from two chains.
3. A tool kit of navigation programs be developed to allow for the batch recalculation of geographic position from logged TD's and other common calculations including position from range/range, range/bearing, sextant fixes, etc.
4. The output format of TD corrections provided by the Navigation Group be improved to provide a map format.

Data Curation: (A. Sherin)

All geophysical records and magnetic tapes (sidescan sonar, Huntec DTS internal and external hydrophones, air gun seismics, and 12 kHz echosounder) upon removal from the recorders were marked with start and end day/times and the information entered into a dBase III data base. Output from this data base is attached as Tables 2-8.

Sample sheets prepared by the sampling technicians were collated, checked against the General Log for positioning, and the information entered into a dBase III data base. Follow up work was required to determine the geographic positions of the launch samples from sextant fixes and chart annotations and to gather detailed information on the Floc Camera stations. Output from this database is attached as Tables 9-14.

The dBase III programming worked well with only minor modifications required in the field to reporting programs for floc camera stations, sidescan sonar records and sidescan sonar tapes.

Suggestions for the future:

1. Minor modifications to the dBase III programming to make the presentation more consistent.
2. If watchkeepers kept track of the start day/time for each analog record, then less handling of the records would be necessary to properly annotate the beginning and end of records, reducing significantly the effort required to prepare the records for eventual curation back at BIO.

Acknowledgements:

The cruise was a great success, thanks to the enthusiasm of all who participated while at sea, and of those who helped prepare for the field. Thanks are especially extended to the Master, officers and crew of C.S.S. Dawson.

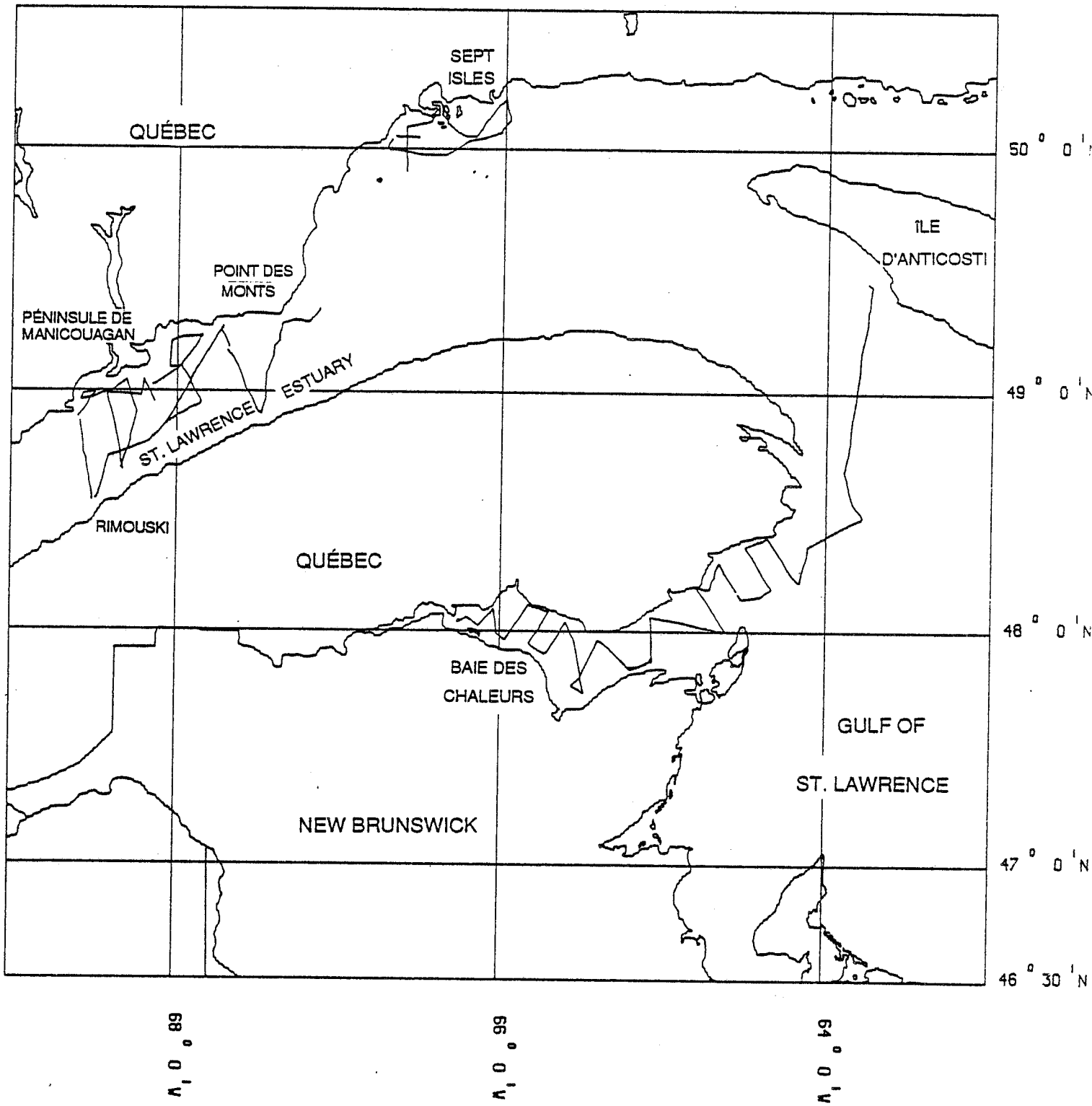


FIGURE 1 - 87-023 Geophysical Tracks

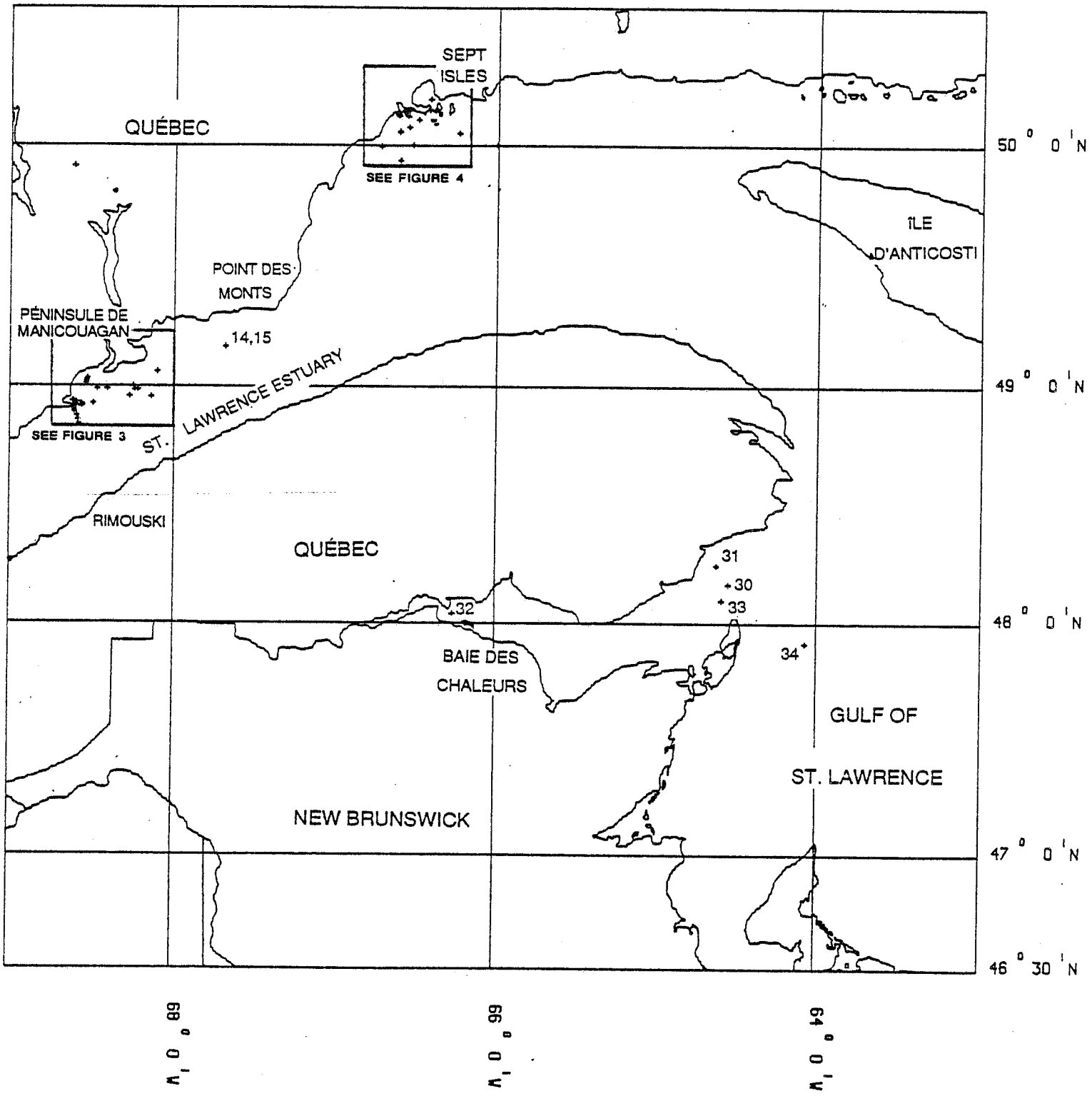


FIGURE 2 - 87-023 Sample Stations. See Table 9 for station information.

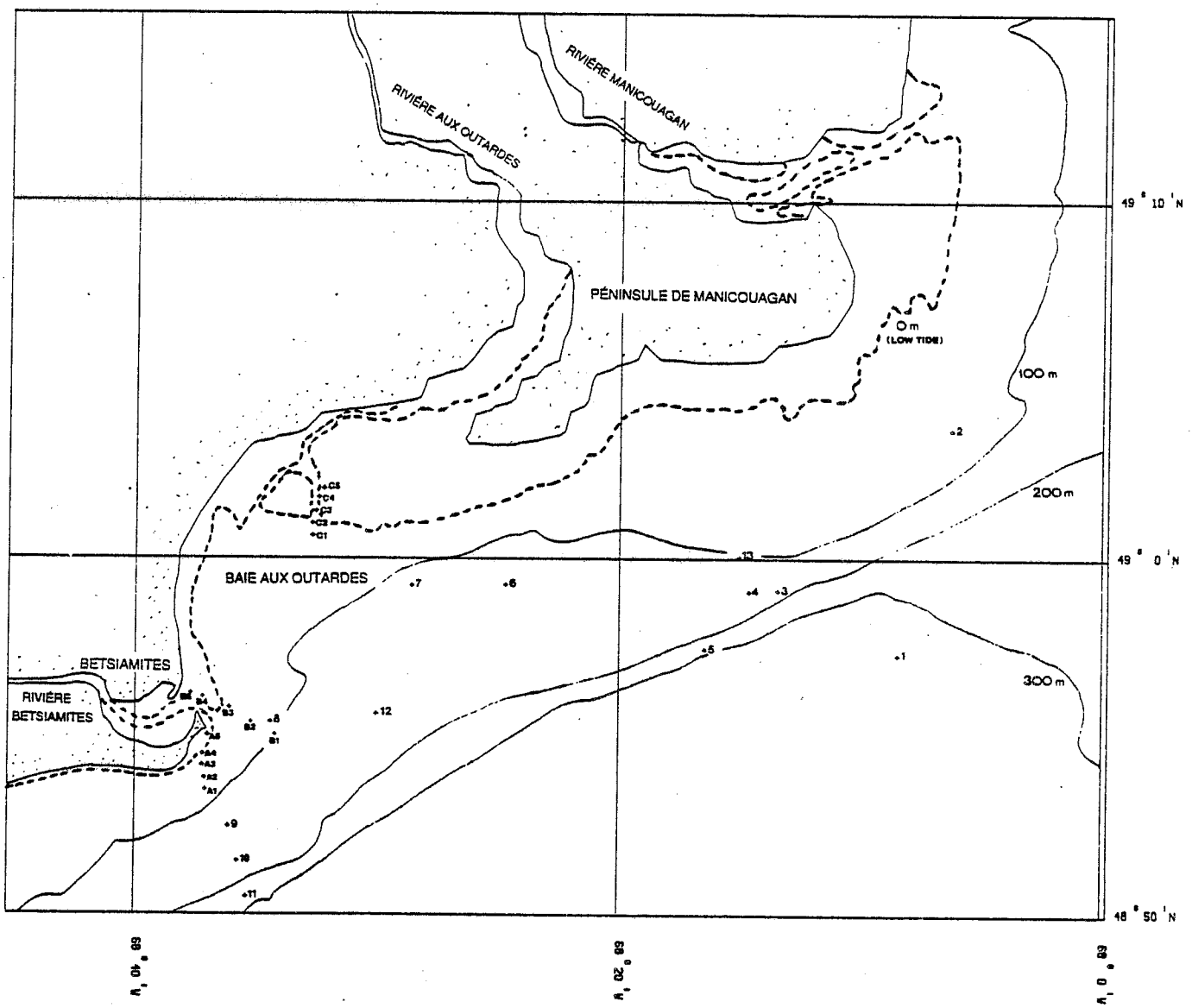
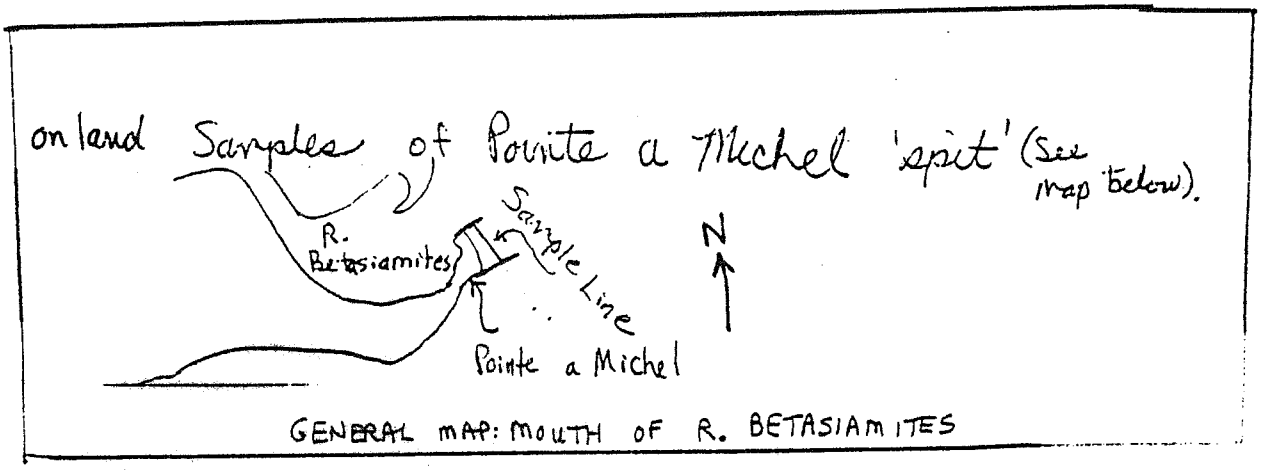


FIGURE 3a -87-023 sample stations in the Péninsule de Manicougan area. Stations with letter prefixes were collected during a launch survey, other stations were collected from the ship. See Table 9 for station information.



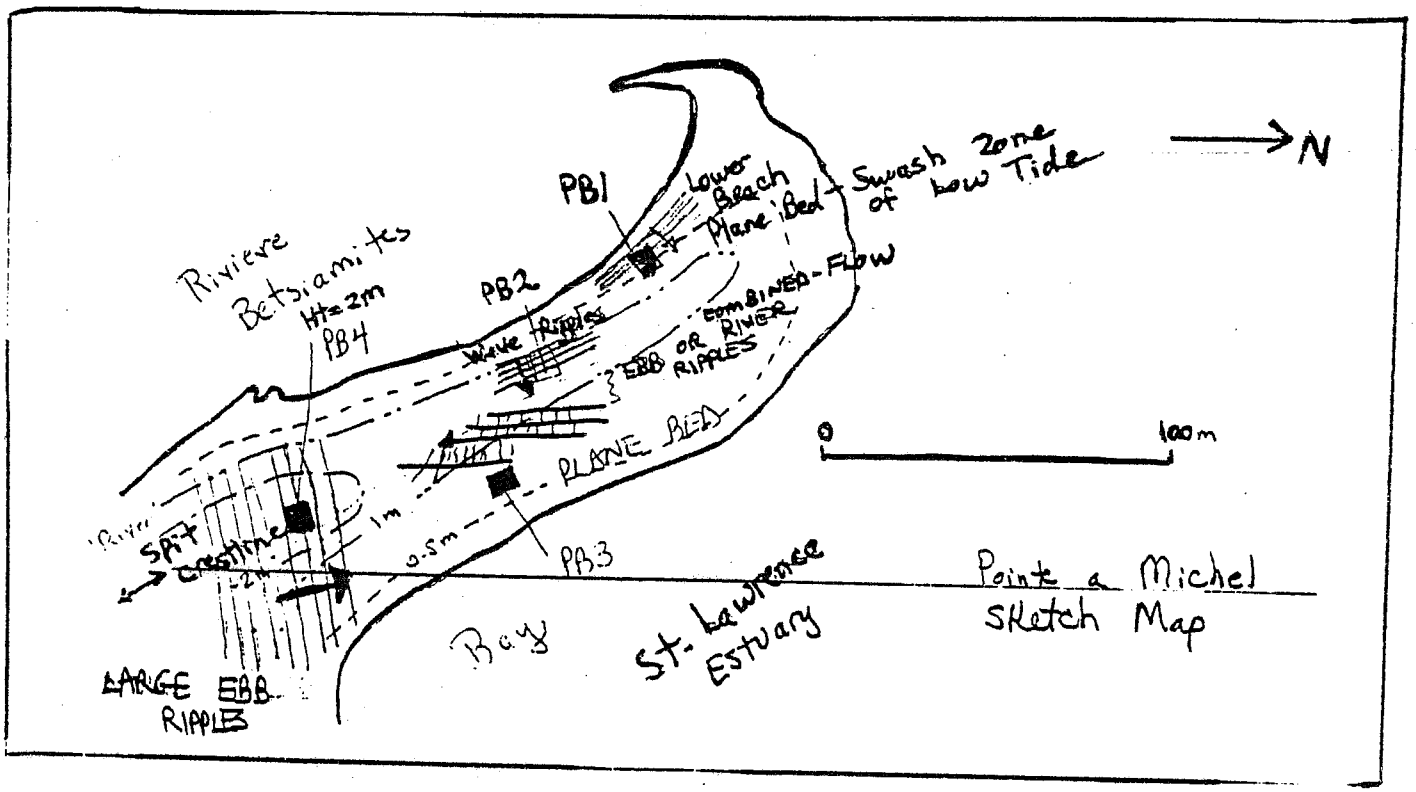


FIGURE 3b - Sketch map of Point a Michel showing onshore sample locations.

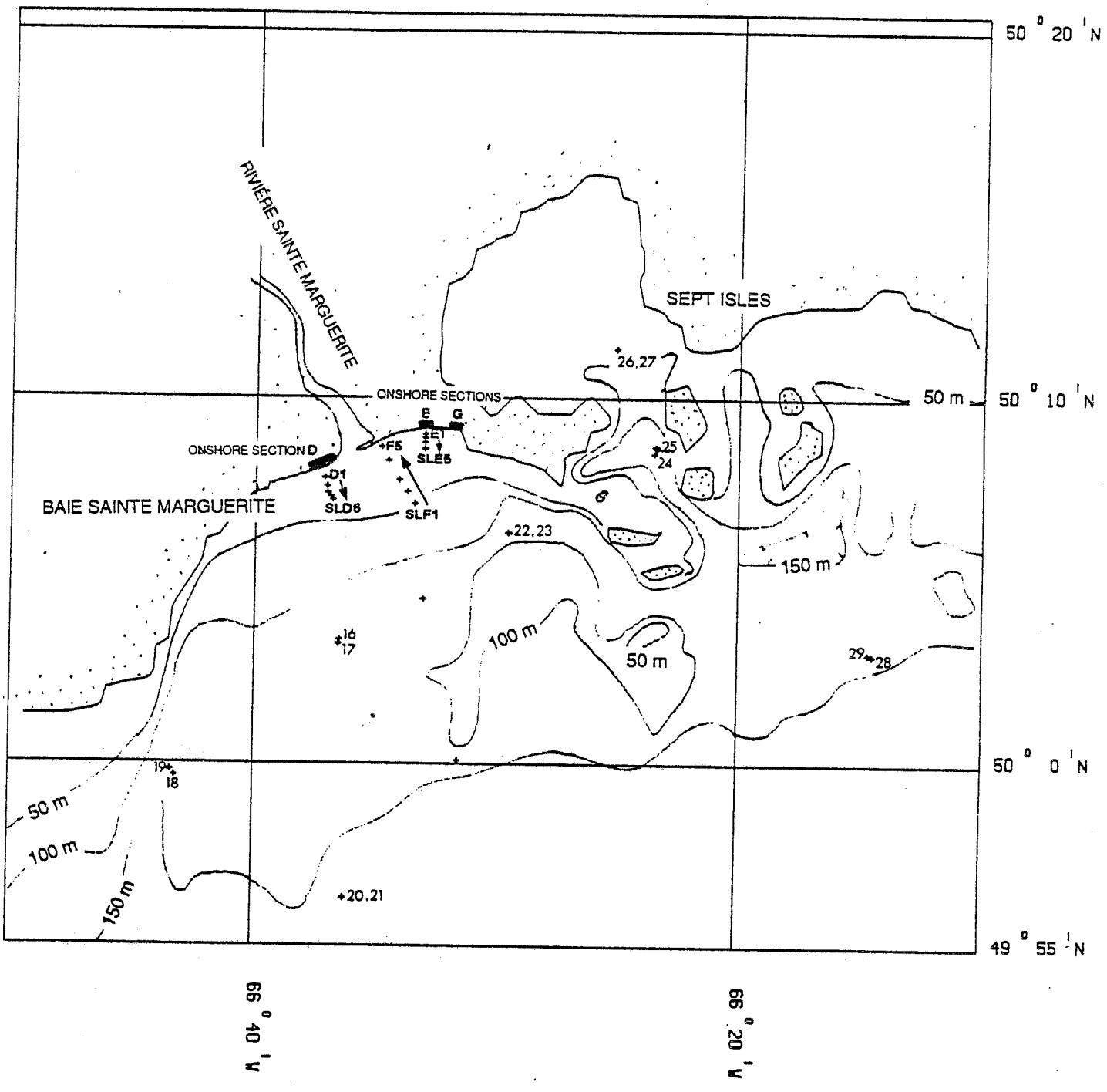


FIGURE 4a - 87-023 sample stations in the Sept Isles area. Stations with letter prefixes were collected during a launch survey, other stations were collected from the ship. See Table 9 for station information.

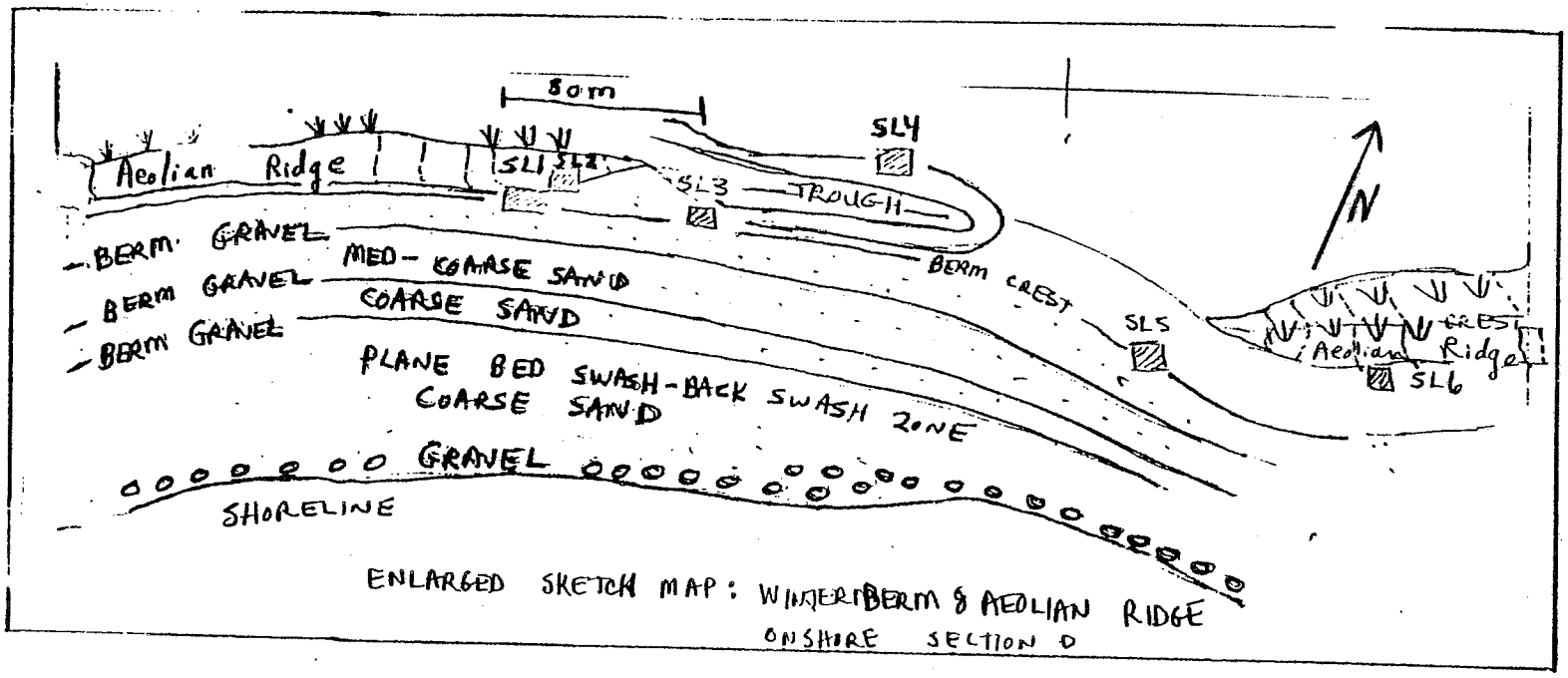


FIGURE 4b - Sketch map of onshore Section D, Baie Sainte Marguerite, showing onshore sample locations.

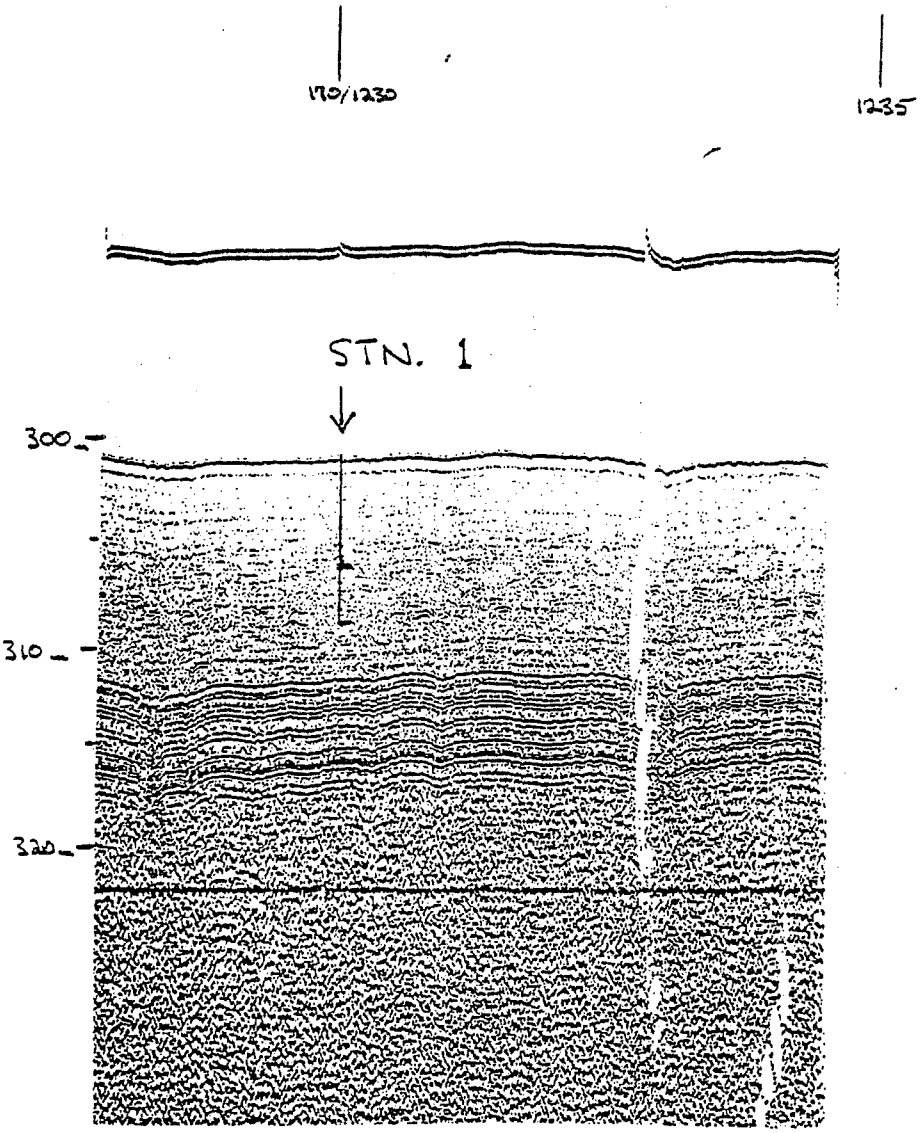


FIGURE 5 - Piston core locations plotted on Huntec DTS seismic reflection records. Locations are accurate with respect to depth, but may be slightly off the seismic line. The depth scales on the left are in metres of water velocity (1.5 km/s). Horizontal scales vary with ship's speed, but the distance between 5 minute fixes is generally 750-1000 m. Core lengths are plotted as both recovered sediment length (upper bar) and apparent sediment penetration (lower bar). See Figures 2-4 for core positions, or Table 10 for station information.

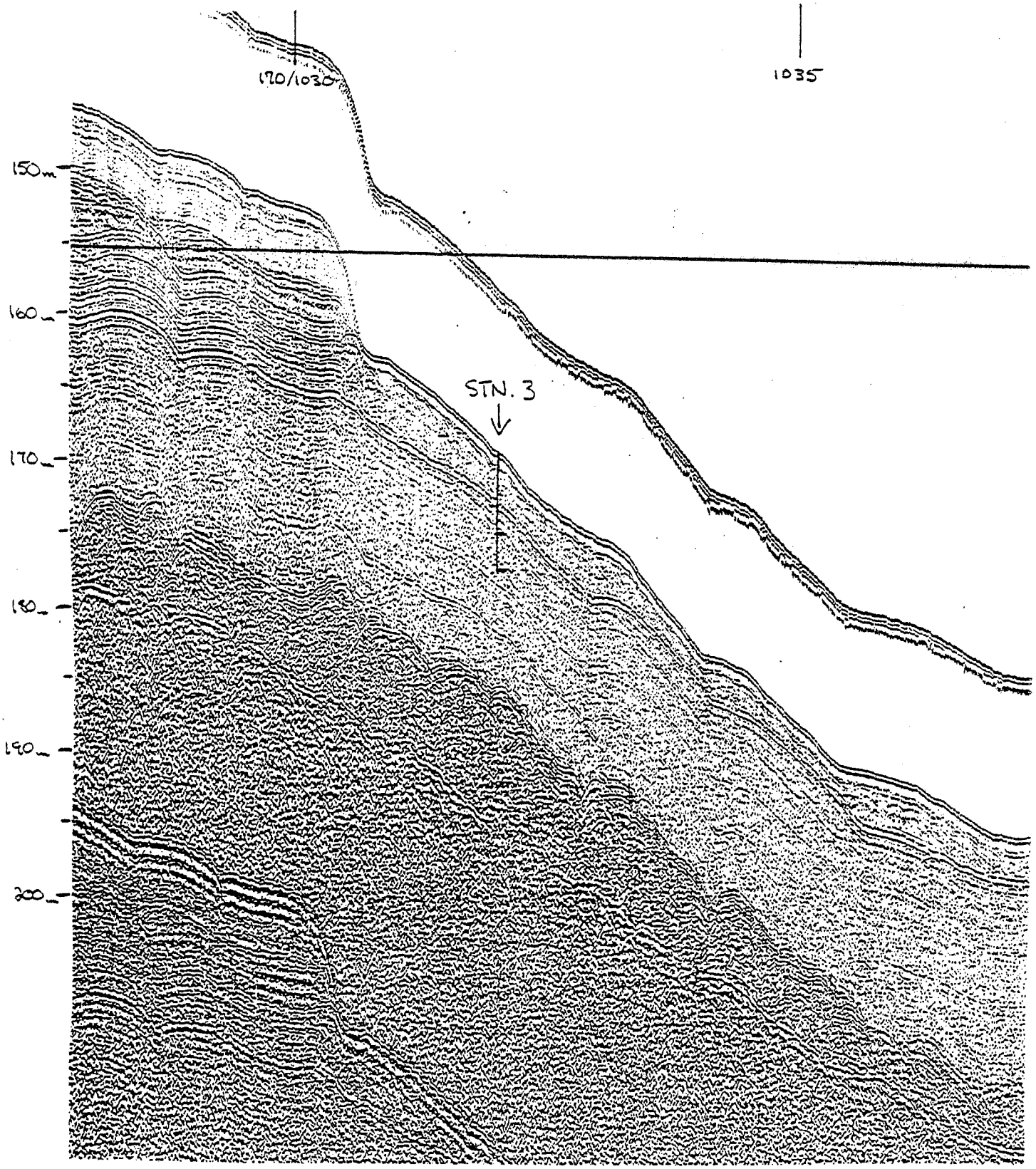


FIGURE 5 (continued)

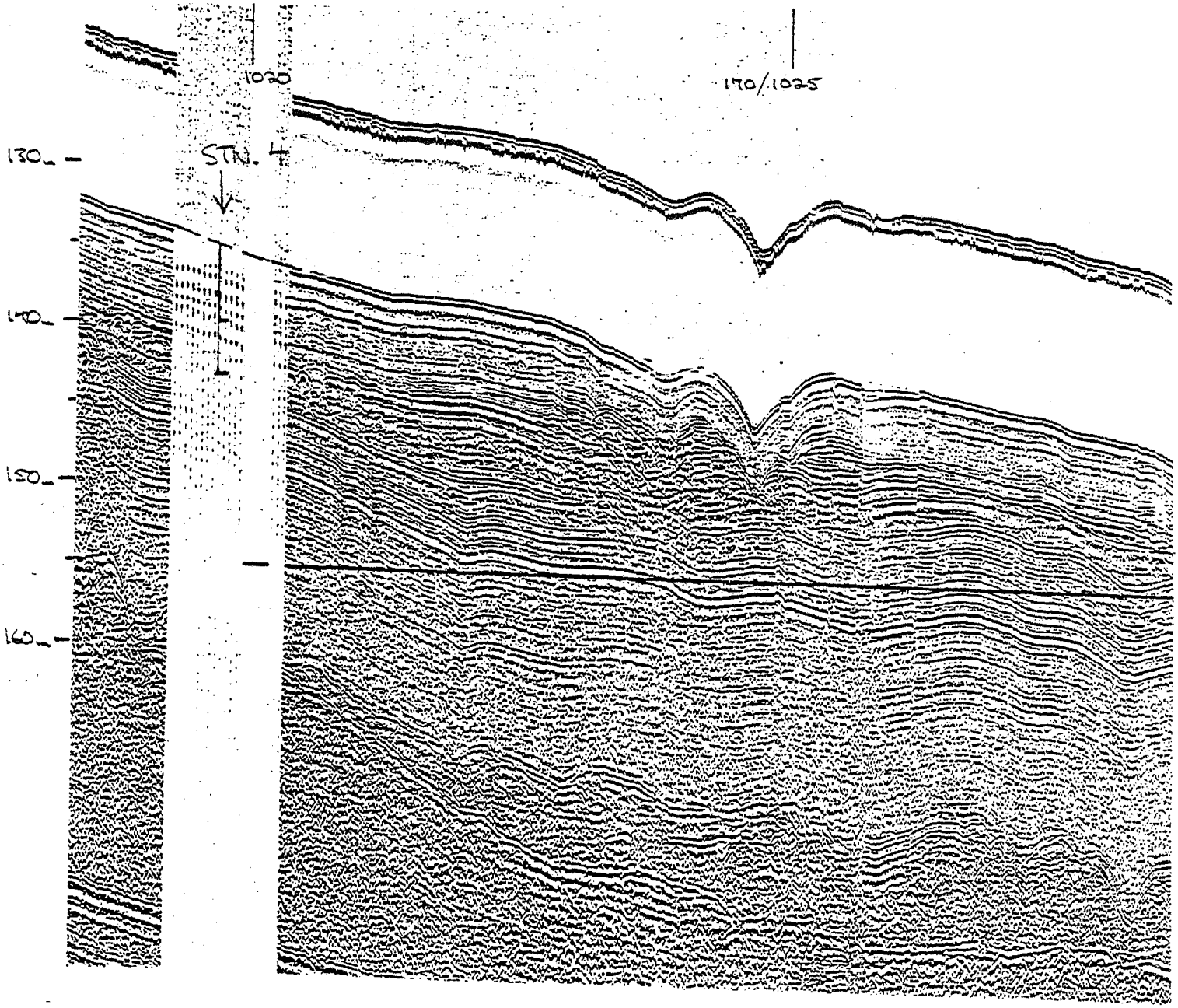


FIGURE 5 (continued)

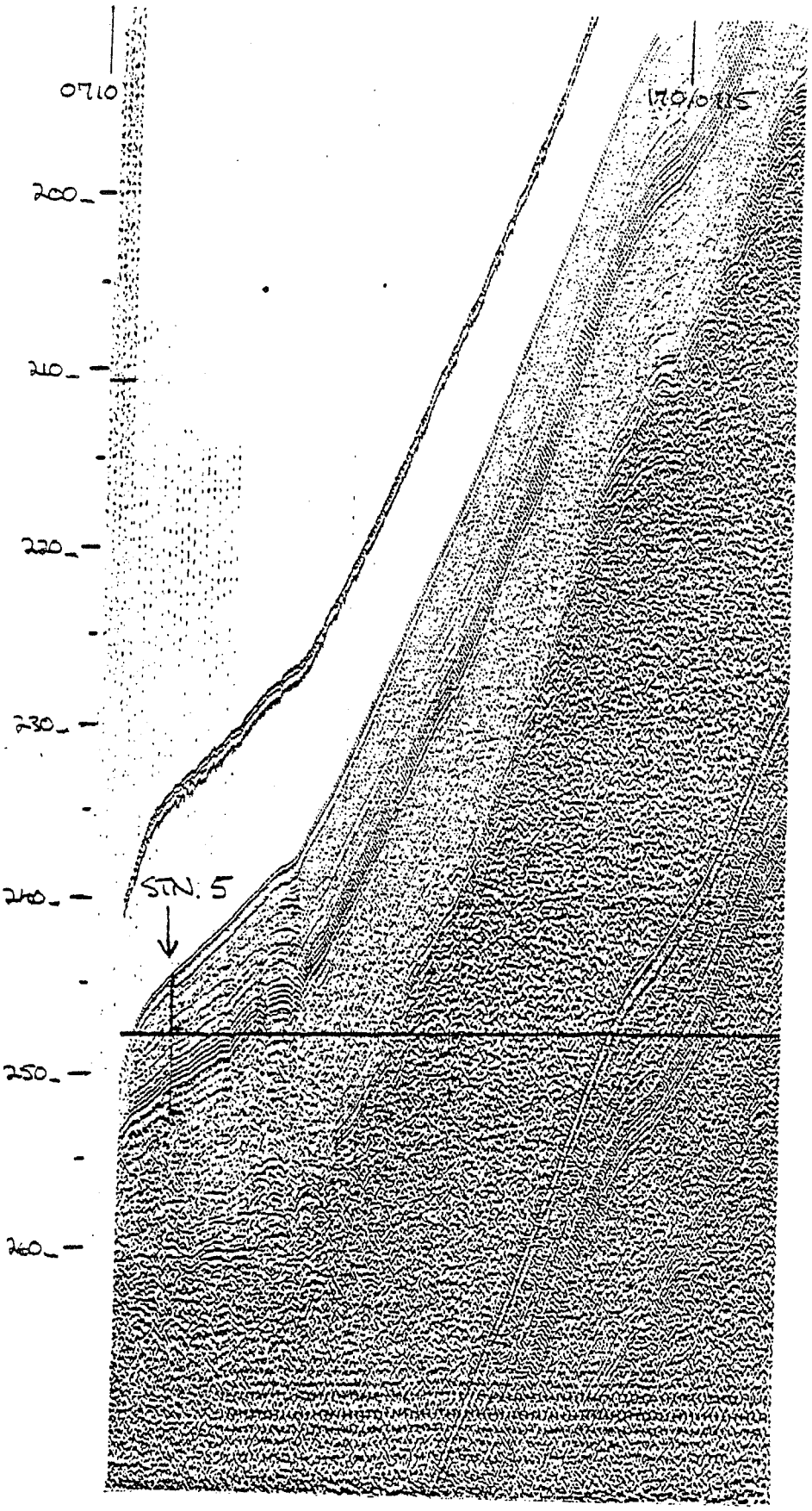


FIGURE 5 (continued)

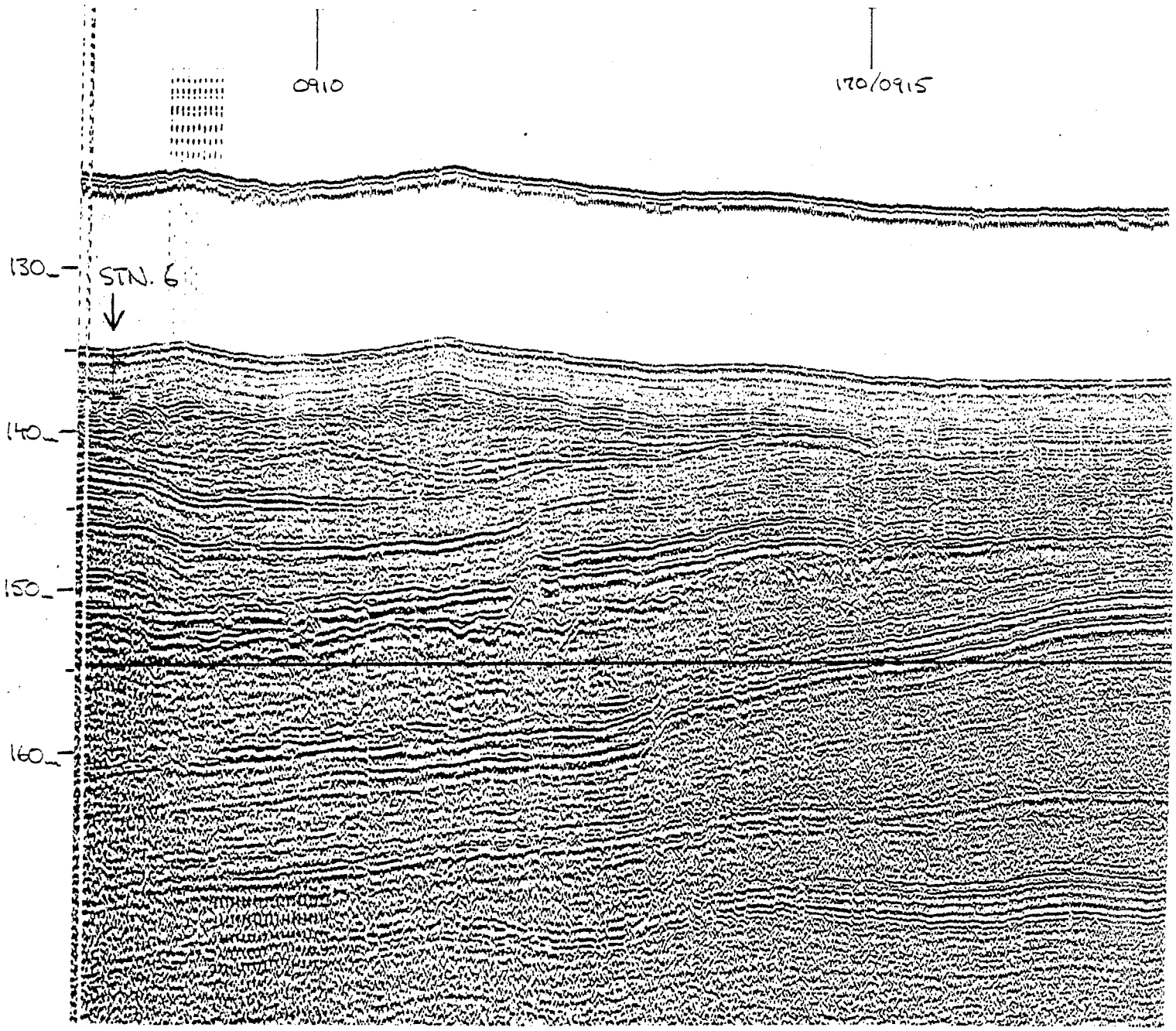


FIGURE 5 (continued)

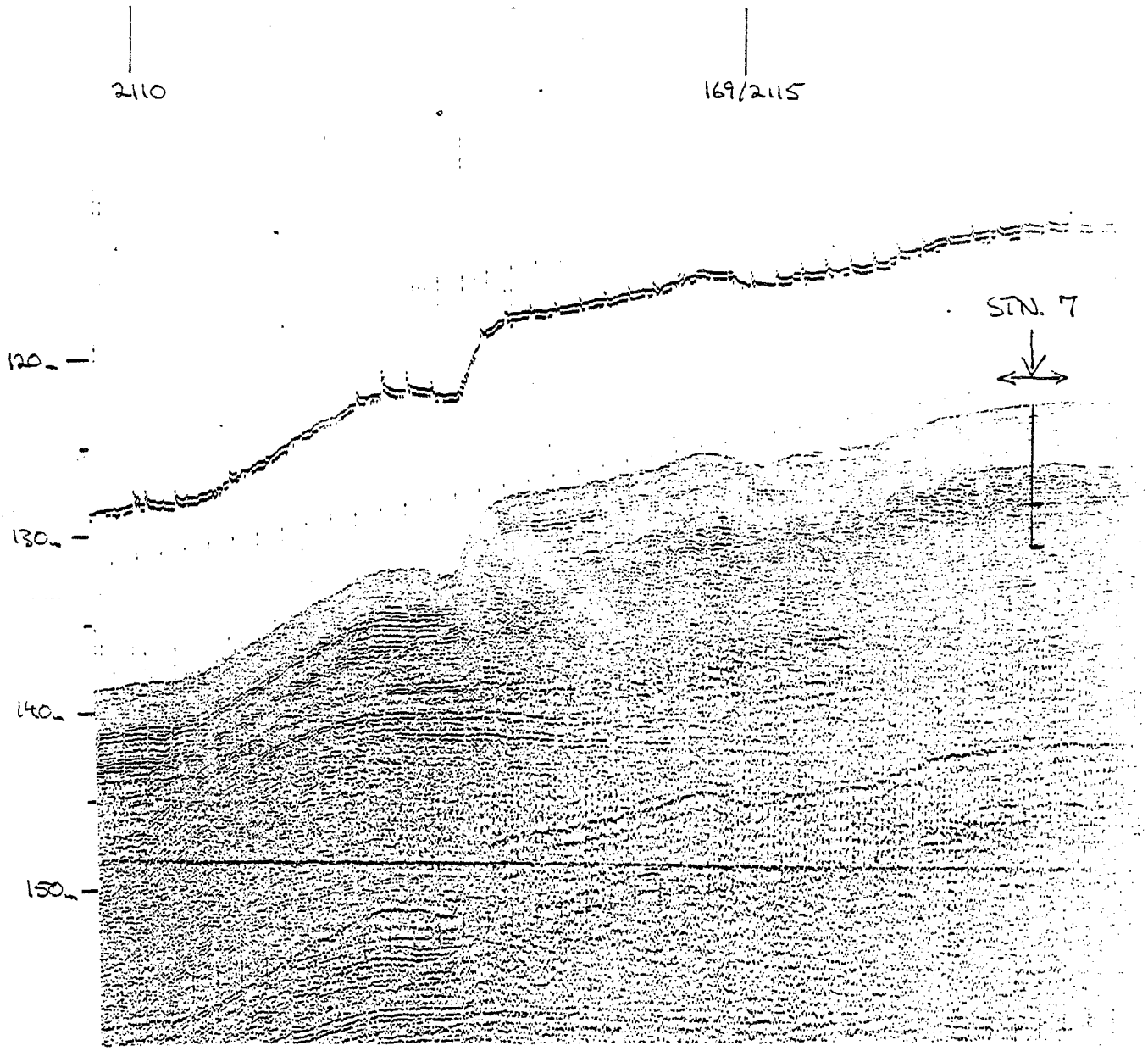


FIGURE 5 (continued)

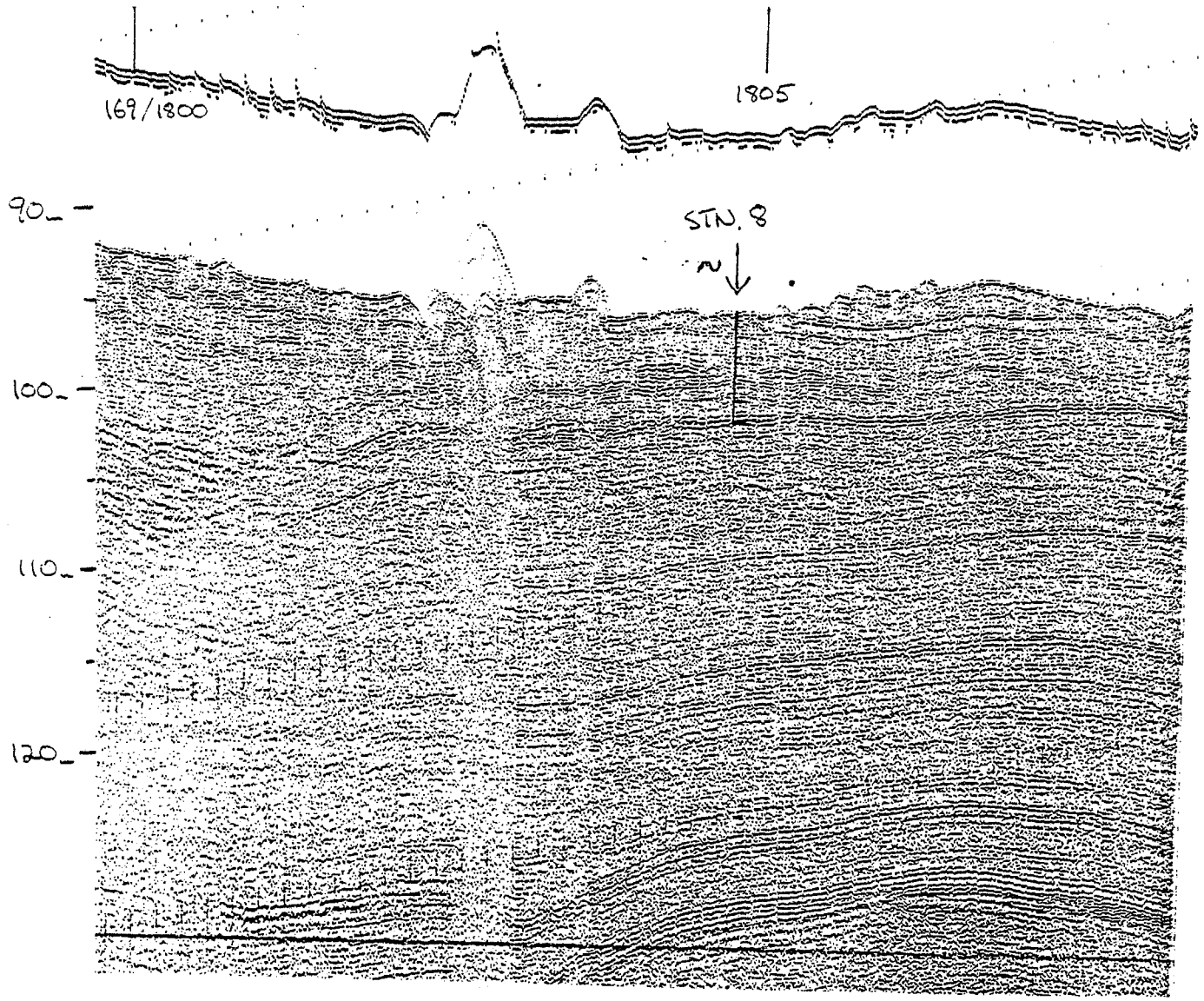


FIGURE 5 (continued)

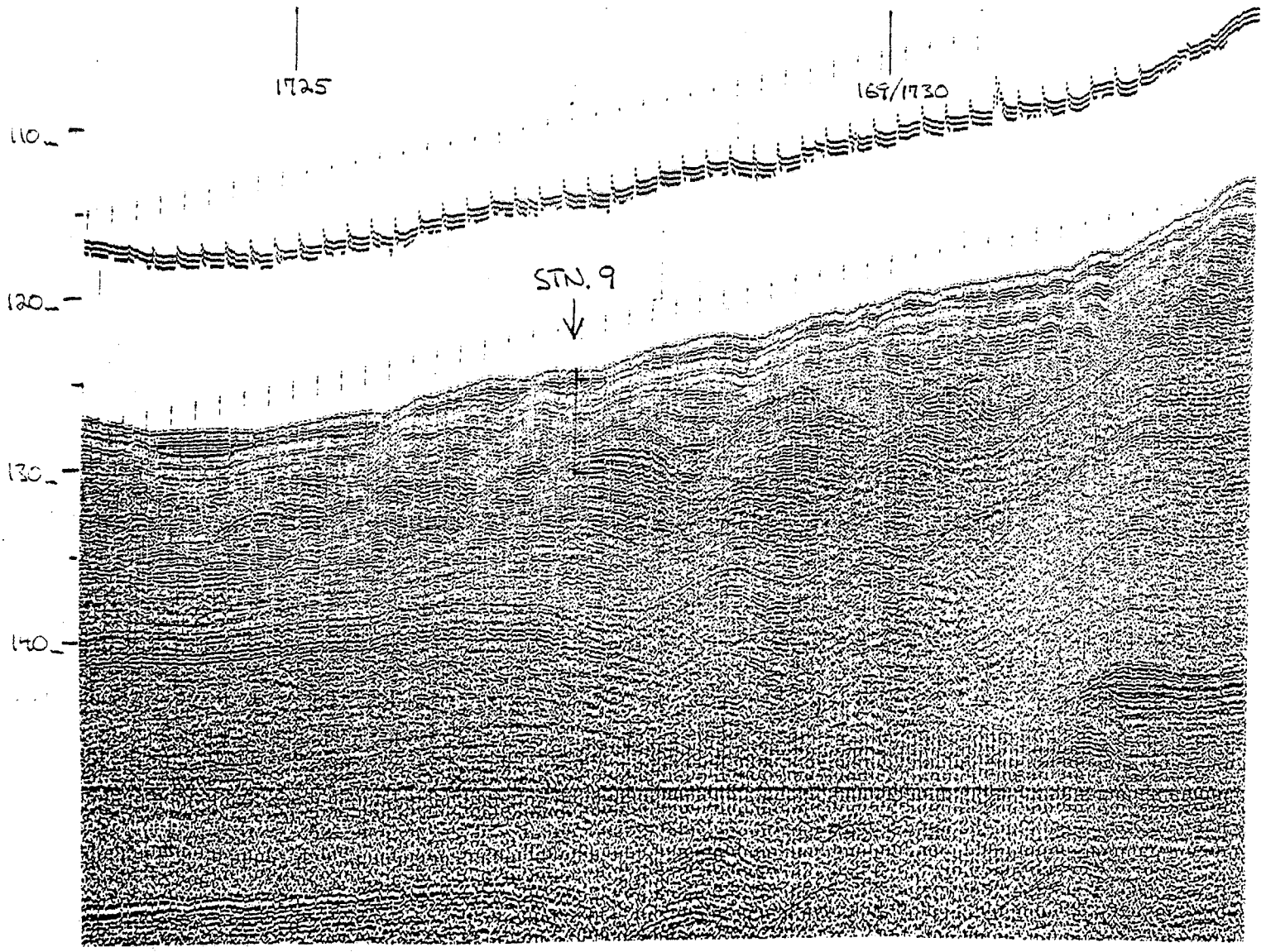


FIGURE 5 (continued)

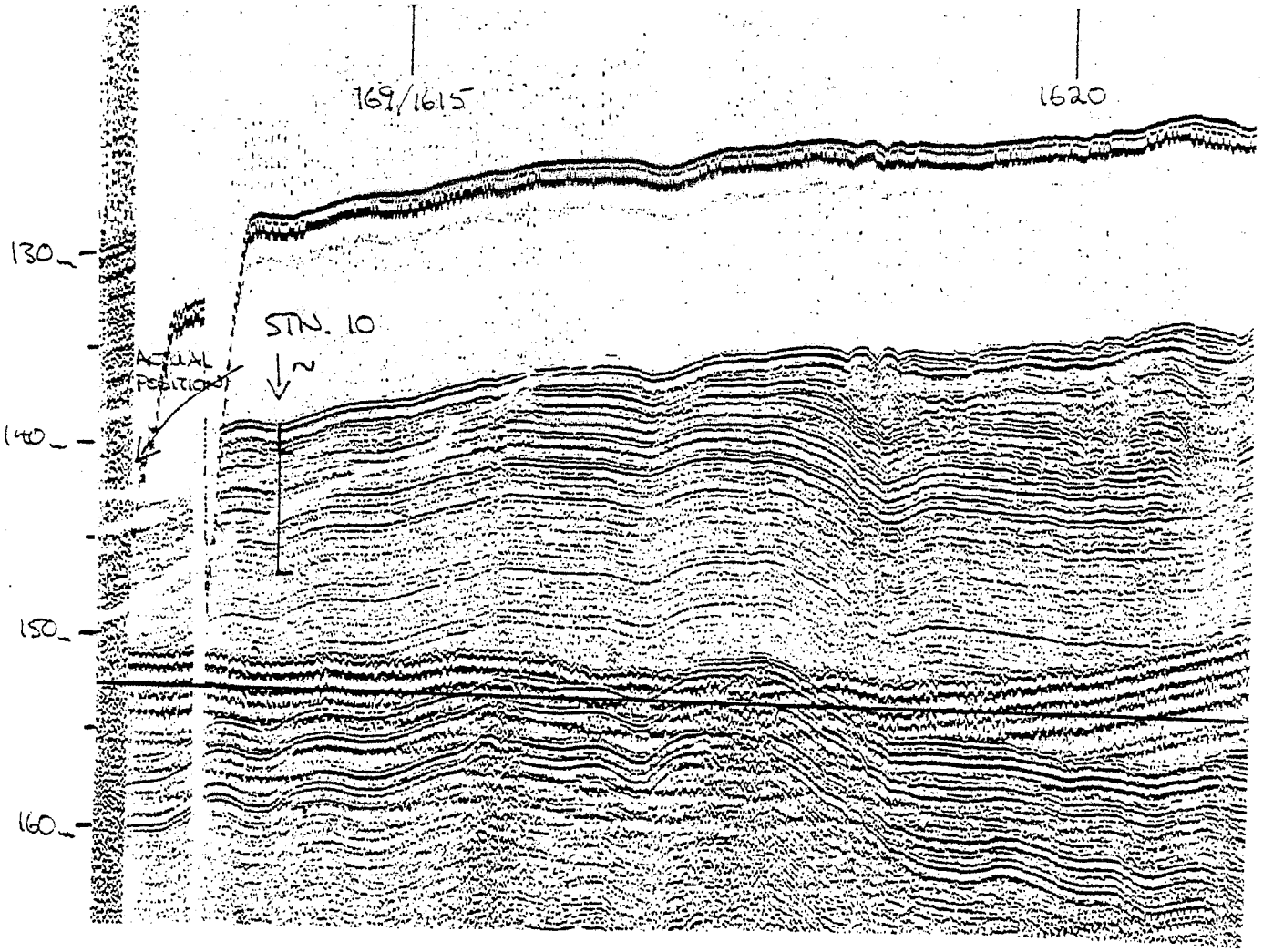


FIGURE 5 (continued)

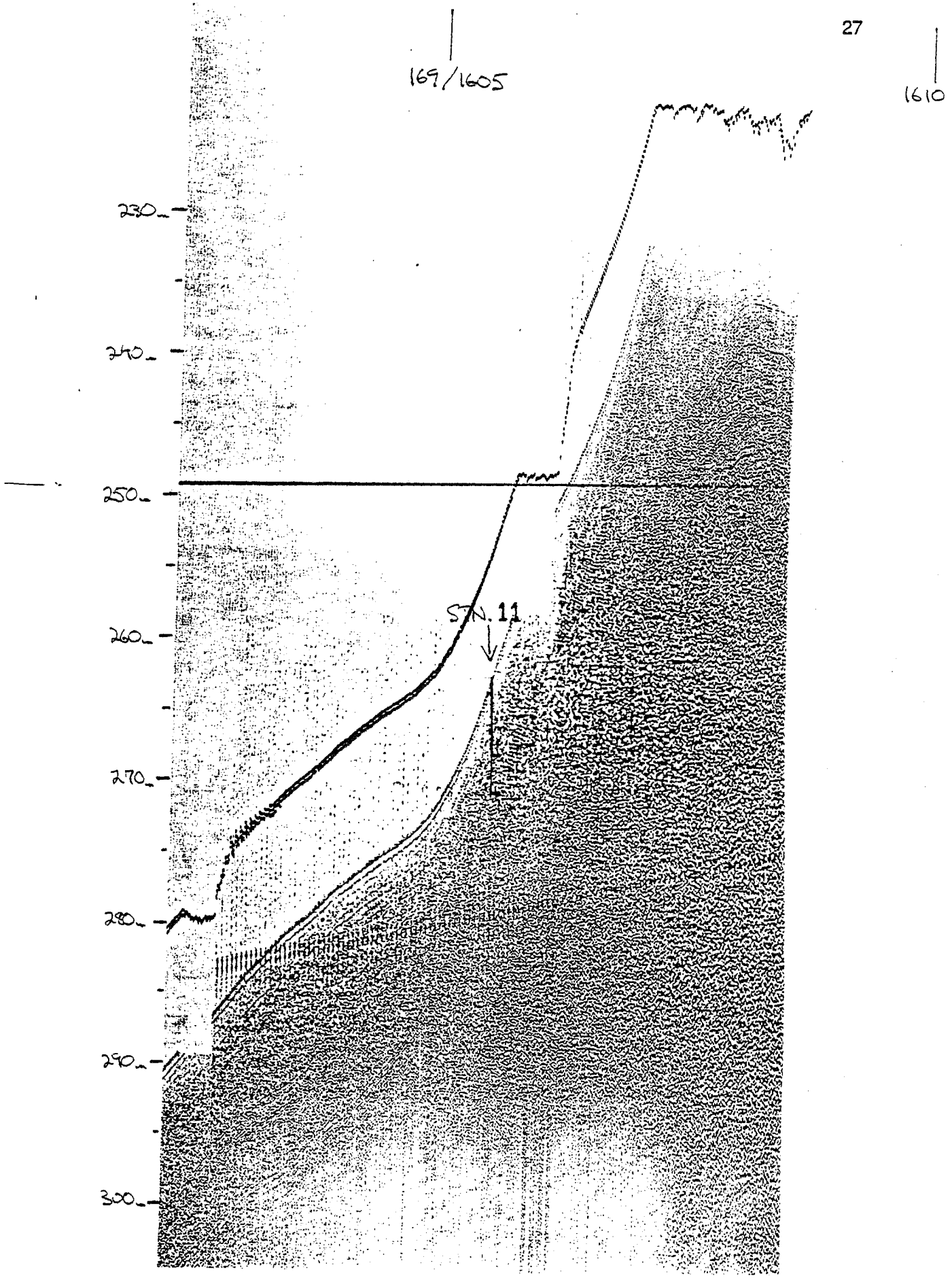


FIGURE 5 (continued)

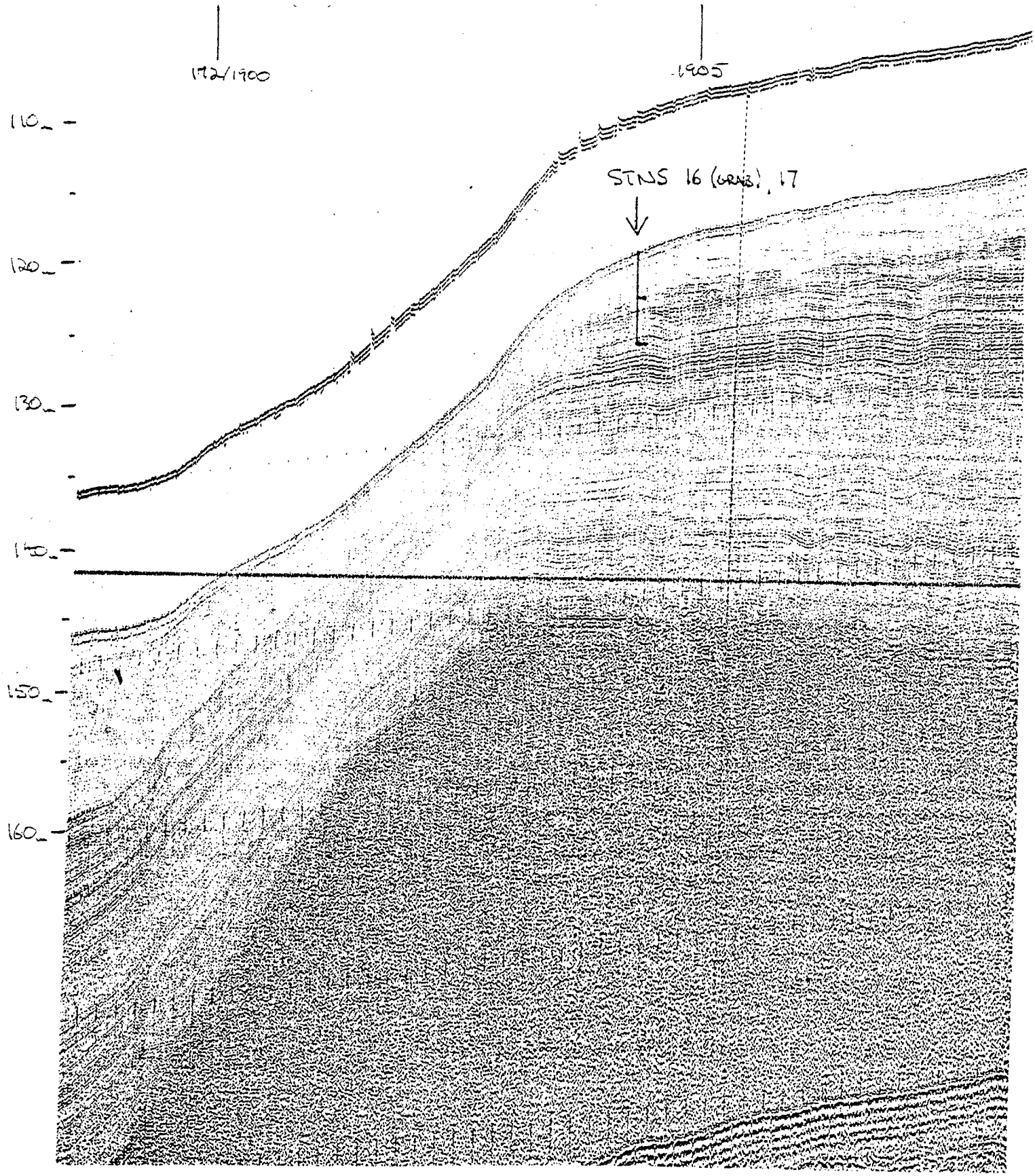


FIGURE 5 (continued)

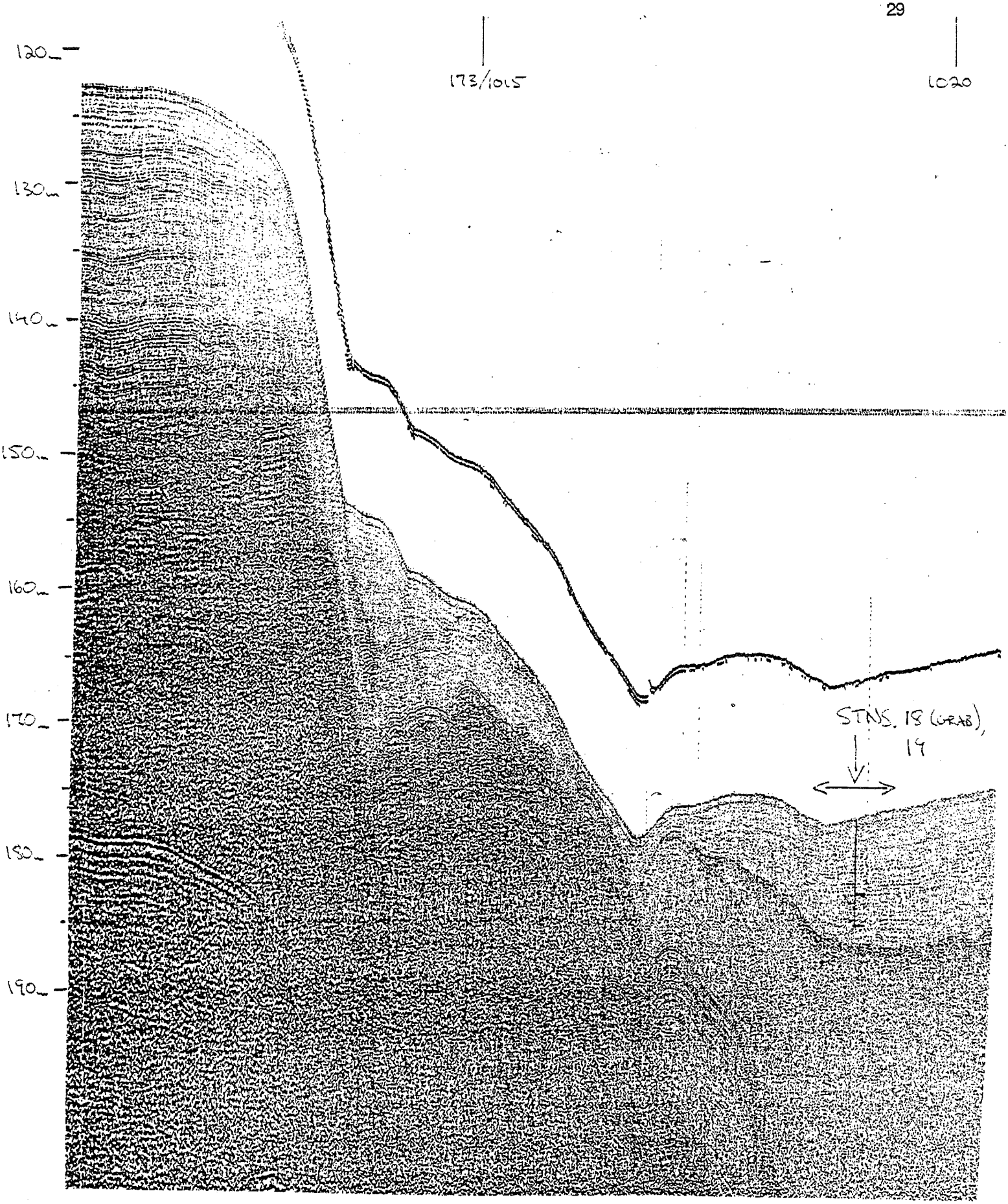


FIGURE 5 (continued)

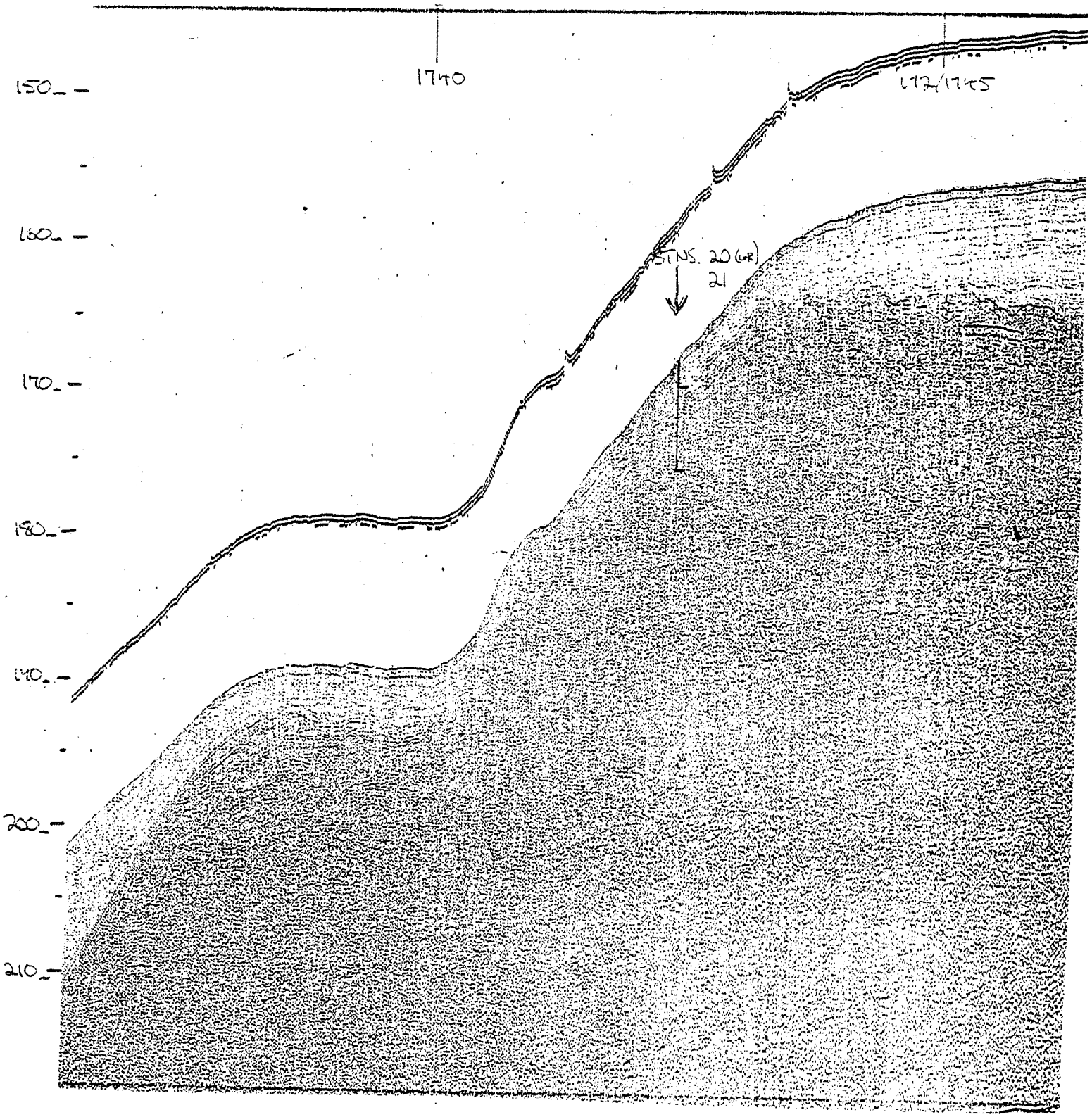


FIGURE 5 (continued)

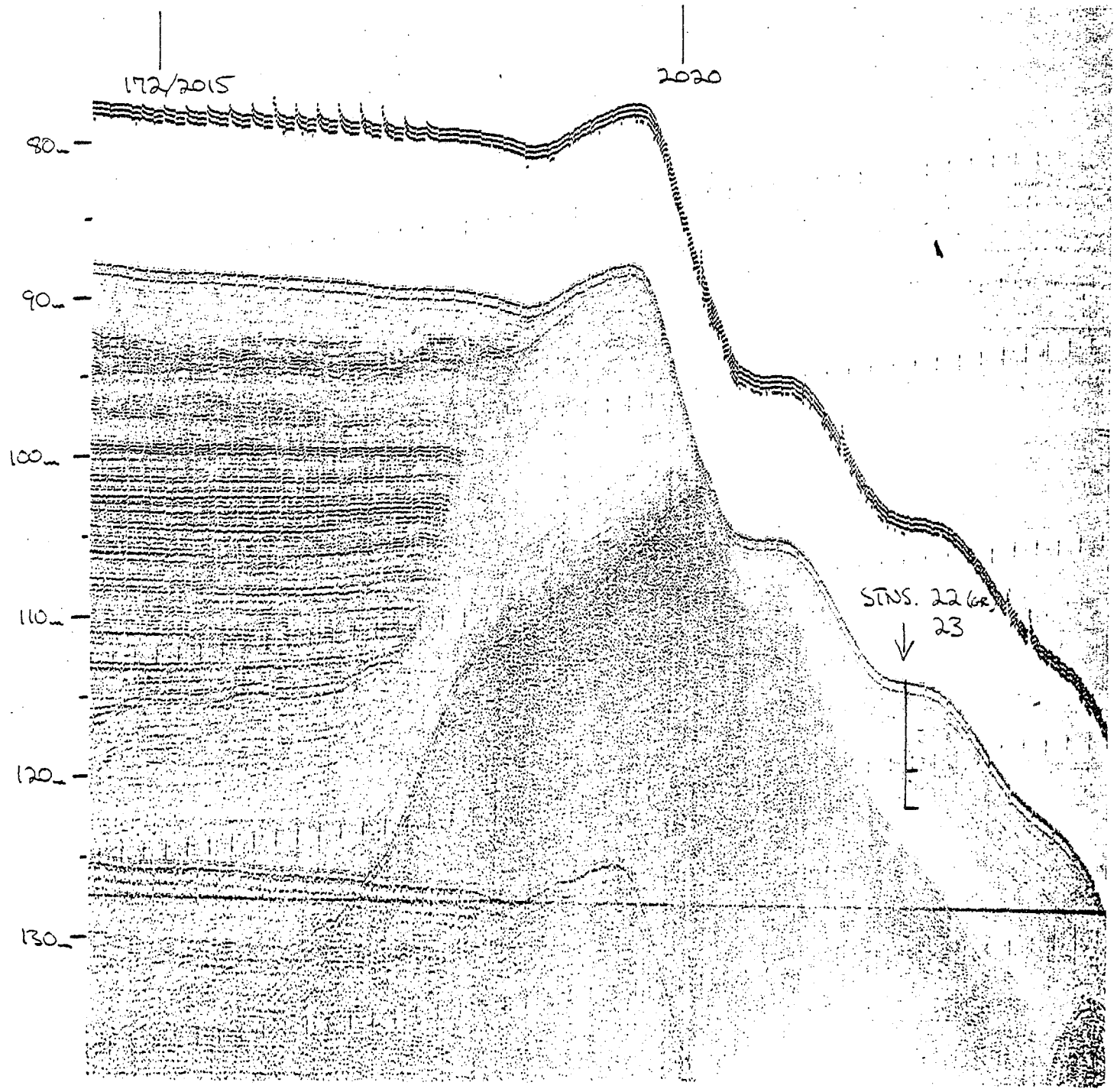


FIGURE 5 (continued)

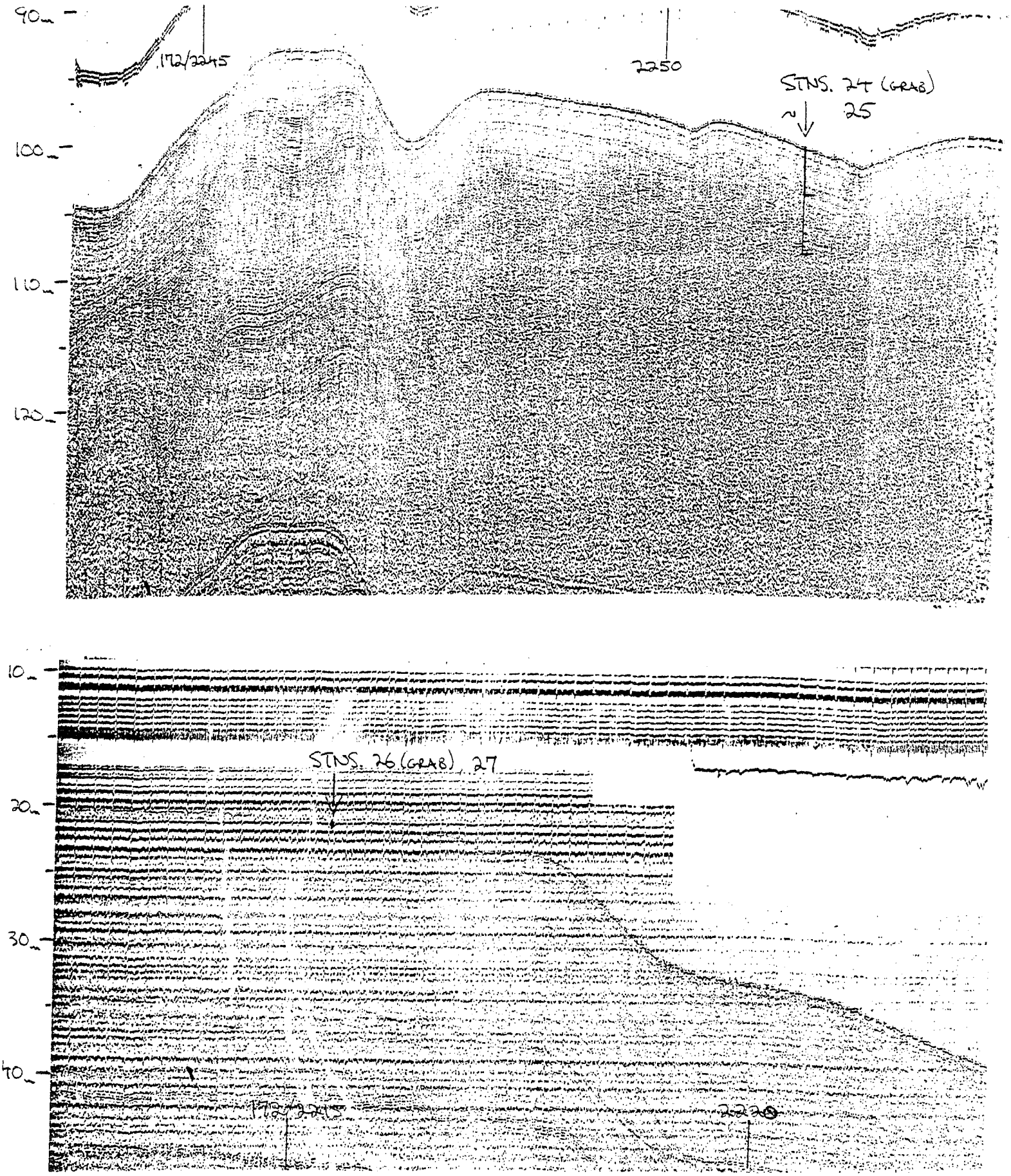


FIGURE 5 (continued)

TABLE 1

87-023 GEOPHYSICAL SUMMARY

AREA	PARAMETER RECORDING PERIODS (GMT) START	STOP	AIRGUN SEISMICS ROLLS	TAPES	HUNTEC SEISMICS ROLLS	TAPES	HUNTEC SIDESCAN ROLLS	TAPES	12 KHZ ROLLS	SURVEY LENGTH (KMs)	NOTES
					I=Internal E=External						
ST.LAWRENCE ESTUARY	169/1235	169/1630	1	1	1I,2E	1-2	1	1-2	1	38	
ST.LAWRENCE ESTUARY	169/1235	169/2130	1	1	1I,2E	2-3	1	2-3	1	32	
ST.LAWRENCE ESTUARY	169/2217	170/0123	1	1	1I,2E	3,4			1	37	
ST.LAWRENCE ESTUARY	170/0430	170/1232	1	1,2	3E,4E,5I	4-6	2	3	2	83	
ST.LAWRENCE ESTUARY	171/0245	171/1239	1	2,3	4E,6E 5I,7I	7-9	2	3	3	100	
ST.LAWRENCE ESTUARY	171/1647	172/0310	2	3,4	8E,9I	9-12	3	4	3	110	
ST.LAWRENCE ESTUARY	172/0500	172/1403	2	4	8E,9I	12-14			3	97	ST.LAWRENCE ESTUARY TOTAL=497KM
SEPT ISLES	172/1721	173/1055	3,4	4,5	10E,12E 11I,13I	14-20	4	4,5	4,5	168	
SEPT ISLES	173/1120	173/1235	4	5	12E,13I	20			5	11	SEPT ISLES TOTAL=177KM
ANTICOSTI TO BAIE DES CHALEURS	174/0536	175/0545	5	6.7	14E,16E 15I,17I	20-28	5,6	5-9	6	230	
BAIE DES CHALEURS	175/0625	175/0730	5	7	16E,17I	28	6	9	6	15	
BAIE DES CHALEURS	175/0756	175/1955	5	7,8	16E,18E 17I,19I	28,29	6,7	9,10	6,7	125	
BAIE DES CHALEURS	176/0010	176/2300	6	8-10	18E,20E 19I,21I	29-36	7-9	10-15	7	225	ANTICOSTI/ BAIE DES CHALEURS TOTAL=595KM

TABLE 2

12 KHZ BATHYMETRY RECORDS 87-023

OLL NUMBERS	START DAY/TIME	STOP DAY/TIME	GEOGRAPHIC LOCATION	RECORDER	NOTES
1	1691125	1700145	ST LAWRENCE ESTUARY	L.S.R.	
2	1700425	1710300	ST LAWRENCE ESTUARY	L.S.R.	
3	1710312	1721400	ST LAWRENCE ESTUARY	L.S.R.	
4	1721720	1730840	SEPT ISLES	L.S.R.	
5	1730850	1732150	SEPT ISLES	L.S.R.	
6	1740535	1751440	GULF OF ST LAWRENCE	L.S.R.	ANTICOSTI TO BAIE DES CHALEURS
7	1751530	1770345	BAIE DES CHALEURS	L.S.R.	

TABLE 3

AIRGUN SEISMIC RECORDS 87-023

OLL NUMBERS	START DAY/TIME	STOP DAY/TIME	GEOGRAPHIC LOCATION	RECORDER	HYDROPHONE	NOTES
1	1691311	1711240	ST LAWRENCE ESTUARY	E.P.C.	N.S.R.F.25	
2	1711650	1721255	ST LAWRENCE ESTUARY	E.P.C.	N.S.R.F.25	SEISMICS ENDED EARLY TO REPAIR COMPRESSOR
3	1721725	1730735	SEPT ISLES	E.P.C.	N.S.R.F.25	
4	1730740	1731240	SEPT ISLES	E.P.C.	N.S.R.F.25	
5	1740540	1761120	GULF OF ST LAWRENCE	E.P.C.	N.S.R.F.25	ANTICOSTI TO BAIE DES CHALEURS
6	1761125	1762300	BAIE DES CHALEURS	E.P.C.	N.S.R.F.25	

TABLE 4

HUNTEC D.T.S. RECORDS 87-023

ROLL NUMBERS	START DAY/TIME	STOP DAY/TIME	GEOGRAPHIC LOCATION	RECORDER	HYDROPHONE	NOTES
1	1691235	1700120	ST LAWRENCE ESTUARY	EPC	INTERNAL	
2	1691235	1700120	ST LAWRENCE ESTUARY	EPC	EXTERNAL	
3	1700435	1701050	ST LAWRENCE ESTUARY	EPC	EXTERNAL	
4	1701100	1711005	ST LAWRENCE ESTUARY	EPC	EXTERNAL	
5	1700430	1711005	ST LAWRENCE ESTUARY	EPC	INTERNAL	
6	1710630	1710700	ST LAWRENCE ESTUARY	EPC	EXTERNAL	REPLAY
7	1710630	1710700	ST LAWRENCE ESTUARY	EPC	INTERNAL	REPLAY
8	1711650	1721400	ST LAWRENCE ESTUARY	EPC	EXTERNAL	
9	1711650	1721400	ST LAWRENCE ESTUARY	EPC	INTERNAL	
10	1721725	1730930	SEPT ISLES	EPC	EXTERNAL	
11	1721725	1730930	SEPT ISLES	EPC	INTERNAL	
12	1730930	1731240	SEPT ISLES	EPC	EXTERNAL	
13	1730930	1731240	SEPT ISLES	EPC	INTERNAL	
14	1740535	1742140	GULF OF ST LAWRENCE	EPC	EXTERNAL	ANTICOSTI TO BAIE DES CHALEURS
15	1740535	1750040	GULF OF ST LAWRENCE	EPC	INTERNAL	ANTICOSTI TO BAIE DES CHALEURS
16	1742145	1751105	BAIE DES CHALEURS	EPC	EXTERNAL	
17	1750045	1751105	BAIE DES CHALEUR	EPC	INTERNAL	
18	1751630	1760605	BAIE DES CHALEURS	EPC	EXTERNAL	
19	1751620	1760836	BAIE DES CHALEURS	EPC	INTERNAL	
20	1760615	1762300	BAIE DES CHALEURS	EPC	EXTERNAL	
21	1760840	1762300	BAIE DES CHALEURS	EPC	INTERNAL	

TABLE 5

87-023 SIDESCAN SONAR RECORDS

ROLL NUMBERS	START DAY/TIME	STOP DAY/TIME	GEOGRAPHIC LOCATION	NOTES
1	1691248	1692130	ST LAWRENCE ESTUARY	
2	1701115	1710920	ST LAWRENCE ESTUARY	NICE SAND WAVES AT 1701130
3	1711700	1720210	ST LAWRENCE ESTUARY	NO SS 1805/ 171 TO 0200/172
4	1721755	1730245	SEPT ISLES	STYLUS TEAR 1732340
5	1741840	1750015	BAIE DES CHALEURS	
6	1750015	1751635	BAIE DES CHALEURS	
7	1751940	1760521	BAIE DES CHALEURS	
8	1760530	1761915	BAIE DES CHALEURS	
9	1761915	1762215	BAIE DES CHALEURS	

TABLE 6

AIRGUN SEISMIC TAPES 87-023

TAPE NUMBERS	START DAY/TIME	STOP DAY/TIME	GEOGRAPHIC LOCATION	NOTES
1	1691311	1700612	ST. LAWRENCE ESTUARY	
2	1700623	1710912	ST. LAWRENCE ESTUARY	
3	1710915	1720205	ST. LAWRENCE ESTUARY	
4	1720208	1722100	ST. LAWRENCE ESTUARY	MANICOUAGAN DELTA TO SEPT ISLES
5	1722104	1731236	SEPT ISLES	
6	1740530	1742139	GULF OF ST LAWRENCE	ANTICOSTI TO BAIE DES CHALEURS
7	17421521	1751128	BAIE DES CHALEURS	
8	1751131	1760358	BAIE DES CHALEURS	
9	1760402	1761636	BAIE DES CHALEURS	
10	1761637	1762300	BAIE DES CHALEURS	

TABLE 7

HUNTEC D.T.S. TAPES 87-023

TAPE NUMBERS	START DAY/TIME	STOP DAY/TIME	GEOGRAPHIC LOCATION	NOTES
1	1691248	1691606	ST. LAWRENCE ESTUARY	
2	1691608	1692008	ST. LAWRENCE ESTUARY	
3	1692009	1700012	ST. LAWRENCE ESTUARY	
4	1700013	1700637	ST. LAWRENCE ESTUARY	
5	1700638	1700949	ST. LAWRENCE ESTUARY	
6	1700951	1701258	ST. LAWRENCE ESTUARY	
7	1710240	1710554	ST. LAWRENCE ESTUARY	
8	1710556	1710855	ST. LAWRENCE ESTUARY	
9	1710857	1711956	ST. LAWRENCE ESTUARY	
10	1711957	1712313	ST. LAWRENCE ESTUARY	
11	1712314	1720230	ST. LAWRENCE ESTUARY	
12	1720231	1720729	ST. LAWRENCE ESTUARY	
13	1720732	1721018	ST. LAWRENCE ESTUARY	
14	1721020	1721808	ST. LAWRENCE ESTUARY	MANICOUAGAN DELTA TO SEPT ISLES
15	1721809	1722120	SEPT ISLES	
16	1722121	1730032	SEPT ISLES	
17	1730034	1730327	SEPT ISLES	
18	1730330	1730637	SEPT ISLES	
19	1730639	1730951	SEPT ISLES	
20	1730953	1740646	SEPT ISLES & GULF OF ST. LAWRENCE	SEPT ISLES/ANTICOSTI TO BAIE DES CHALEURS
21	1740648	1741003	GULF OF ST LAWRENCE	ANTICOSTI TO BAIE DES CHALEURS
22	1741008	1741330	GULF OF ST LAWRENCE	ANTICOSTI TO BAIE DES CHALEURS
23	1741332	1741624	GULF OF ST LAWRENCE	ANTICOSTI TO BAIE DES CHALEURS

TABLE 7 (continued)

HUNTEC D.T.S. TAPES 87-023

TAPE NUMBERS	START DAY/TIME	STOP DAY/TIME	GEOGRAPHIC LOCATION	NOTES
24	1741627	1741943	BAIE DES CHALEURS	
25	1741944	1742238	BAIE DES CHALEURS	
26	1742240	1750142	BAIE DES CHALEURS	
27	1750143	1750454	BAIE DES CHALEURS	
28	1750456	1750915	BAIE DES CHALUERS	
29	1750917	1760420	BAIE DES CHALEUR	
30	1760422	1760724	BAIE DES CHALEURS	
31	1760726	1761031	BAIE DES CHALEURS	
32	1761034	1761340	BAIE DES CHALEURS	
33	1761341	1761641	BAIE DES CHALEURS	
34	1761643	1761930	BAIE DES CHALEURS	
35	1761933	1762244	BAIE DES CHALEURS	
36	1762246	1762305	BAIE DES CHALEURS	

TABLE 8

SIDESCAN SONAR TAPES 87-023

TAPE NUMBERS	START DAY/TIME	STOP DAY/TIME	GEOGRAPHIC LOCATION	NOTES
1	1691255	1691609	ST. LAWRENCE ESTUARY	
2	1691611	1692009	ST. LAWRENCE ESTUARY	
3	1692010	1710510	ST. LAWRENCE ESTUARY	
4	1711713	1722107	ST. LAWRENCE ESTUARY & SEPT ISLES	
5	1722109	1741920	SEPT ISLES	
6	1741920	1742245	SEPT ISLES	
7	1732245	1750214	SEPT ISLES & GULF OF ST. LAWRENCE	SEPT ISLES / ANTICOSTI TO BAIE DES CHALEURS
8	1750216	1750527	BAIE DES CHALEURS	
9	1750531	1751001	BAIE DES CHALEURS	
10	1751003	1760539	BAIE DES CHALEURS	
11	1760542	1760854	BAIE DES CHALEURS	
12	1760856	1761230	BAIE DES CHALEURS	
13	1761232	1761557	BAIE DES CHALEURS	
14	1761559	1761910	BAIE DES CHALEURS	
15	1761912	1762044	BAIE DES CHALEURS	

TABLE 9

SAMPLE INVENTORY 87-023

STATION NUMBER	SAMPLE TYPE	DAY/TIME (GMT)	LATITUDE	LONGITUDE	DEPTH (METRES)	GEOGRAPHIC LOCATION
PB1	LAND	169	48 55.03	68 37.00	NA	POINTE A MICHEL
PB2	LAND	1690000	48 55.03	68 37.00	NA	POINTE A MICHEL
PB3	LAND	1690000	48 55.03	68 37.00	NA	POINTE A MICHEL
PB4	LAND	1690000	48 55.03	68 37.00	NA	POINTE A MICHEL
A1	GRAB	1691500	48 53.50	68 37.08	15	OFFSHORE BETSIAMITES
A2	GRAB	1691515	48 53.83	68 37.12	9.1	OFFSHORE BETSIAMITES
A3	GRAB	1691530	48 54.18	68 37.22	4.6	OFFSHORE BETSIAMITES
A4	GRAB	1691545	48 54.50	68 37.20	6.0	OFFSHORE BETSIAMITES
A5	GRAB	1691600	49 54.8	68 37.28	11	OFFSHORE BETSIAMITES
B1	GRAB	1691610	48 55.05	68 34.20	34	OFFSHORE BETSIAMITES
B2	GRAB	1691615	48 55.40	68 35.20	20	OFFSHORE BETSIAMITES
B3	GRAB	1691620	48 55.80	68 36.10	4.6	OFFSHORE BETSIAMITES
B4	GRAB	1691625	48 56.1	68 37.2	2.4	OFFSHORE BETSIAMITES
B5	GRAB	1691630	48 56.20	68 37.70	1.4	OFFSHORE BETSIAMITES
C1	GRAB	1691800	49 00.63	68 32.70	7.6	BAIE AUX OUTARDES
C2	GRAB	1691810	49 00.98	68 32.72	3.7	BAIE AUX OUTARDES

TABLE 9 (continued)

SAMPLE INVENTORY 87-023

STATION NUMBER	SAMPLE TYPE	DAY/TIME (GMT)	LATITUDE	LONGITUDE	DEPTH (METRES)	GEOGRAPHIC LOCATION
C3	GRAB	1691820	49 01.32	68 32.56	3	BAIE AUX OUTARDES
C4	GRAB	1691830	49 01.70	68 32.45	3	BAIE AUX OUTARDES
C5	GRAB	1691840	49 01.95	68 32.24	2.4	BAIE AUX OUTARDES
1	CORE	1701311	48 57.30	68 08.47	301	ST LAWRENCE ESTUARY
2	CORE	1701422	49 03.62	68 06.26	76	ST LAWRENCE ESTUARY
3	CORE	1701620	48 59.11	68 13.43	169	ST LAWRENCE ESTUARY
4	CORE	1701717	48 59.07	68 14.63	133	ST LAWRENCE ESTUARY
5	CORE	1701811	48 57.46	68 16.44	244	ST LAWRENCE ESTUARY
6	CORE	1701915	48 59.26	68 24.70	135	ST LAWRENCE ESTUARY
7	CORE	1702001	48 59.24	68 28.58	122	ST LAWRENCE ESTUARY
8	CORE	1702119	48 55.40	68 34.40	97	ST LAWRENCE ESTUARY
9	CORE	1702204	48 52.47	68 36.13	124	ST LAWRENCE ESTUARY
10	CORE	1702237	48 51.49	68 35.75	143	ST LAWRENCE ESTUARY
11	CORE	1702311	48 50.49	68 35.36	263	ST LAWRENCE ESTUARY
12	WATER	1710026	48 55.64	68 30.03	140	ST LAWRENCE ESTUARY

TABLE 9 (continued)

SAMPLE INVENTORY 87-023

STATION NUMBER	SAMPLE TYPE	DAY/TIME (GMT)	LATITUDE	LONGITUDE	DEPTH (METRES)	GEOGRAPHIC LOCATION
12	FLOC	1710026	48 55.64	68 30.03	140	ST LAWRENCE ESTUARY
13	WATER	1710151	49 00.05	68 15.05	108	ST LAWRENCE ESTUARY
13	FLOC	1710151	49 00.05	68 15.05	108	ST LAWRENCE ESTUARY
14	FLOC	1720323	49 10.11	67 40.71	260	ST LAWRENCE ESTUARY
15	GRAB	1720358	49 09.96	67 40.94	245	ST LAWRENCE ESTUARY
SL1	LAND	173	50 08.20	66 37.08	NA	BAIE SAINTE MARGUERITE
SL2	LAND	173	50 08.20	66 37.08	NA	BAIE SAINTE MARGUERITE
SL3	LAND	173	50 08.20	66 37.08	NA	BAIE SAINTE MARGUERITE
SL4	LAND	173	50 08.20	66 37.08	NA	BAIE SAINTE MARGUERITE
SL5	LAND	173	50 08.20	66 37.08	NA	BAIE SAINTE MARGUERITE
SL6	LAND	173	50 08.20	66 37.08	NA	BAIE SAINTE MARGUERITE
SL7	LAND	173	50 09	66 33	NA	BAIE SAINTE MARGUERITE
SL8	LAND	173	50 09	66 33	NA	BAIE SAINTE MARGUERITE
SL9A	LAND	173	50 09	66 33	NA	BAIE SAINTE MARGUERITE
SL9B	LAND	173	50 09	66 33	NA	BAIE SAINTE MARGUERITE

TABLE 9 (continued)

SAMPLE INVENTORY 87-023

STATION NUMBER	SAMPLE TYPE	DAY/TIME (GMT)	LATITUDE	LONGITUDE	DEPTH (METRES)	GEOGRAPHIC LOCATION
SL10A	LAND	173	50 09	66 33	NA	BAIE SAINTE MARGUERITE
SL10B	LAND	173	50 09	66 33	NA	BAIE SAINTE MARGUERITE
SL11	LAND	173	50 09	66 33	NA	BAIE SAINTE MARGUERITE
SLD1	GRAB	173	50 07.8	66 37.15	3	BAIE SAINTE MARGUERITE
SLD2	GRAB	173	50 07.57	66 37.05	1.8	BAIE SAINTE MARGUERITE
SLD3	GRAB	173	50 07.48	66 37.02	3.6	BAIE SAINTE MARGUERITE
SLD4	GRAB	173	50 07.4	66 37.02	4.3	BAIE SAINTE MARGUERITE
SLD5	GRAB	173	50 07.3	66 36.9	4.6	BAIE SAINTE MARGUERITE
SLD6	GRAB	173	50 07.2	66 36.82	9.1	BAIE SAINTE MARGUERITE
SLE1	GRAB	173	50 09.00	66 33.00	3.6	BAIE SAINTE MARGUERITE
SLE2	GRAB	173	50 08.9	66 33.00	3.0	BAIE SAINTE MARGUERITE
SLE3	GRAB	173	50 08.78	66 33.00	3.3	BAIE SAINTE MARGUERITE
SLE4	GRAB	173	50 08.6	66 33.0	4.6	BAIE SAINTE MARGUERITE
SLE5	GRAB	173	50 04.5	66 33.0	5.2	BAIE SAINTE MARGUERITE
SLF1	GRAB	173	50 07.1	66 33.4	9.1	BAIE SAINTE MARGUERITE

TABLE 9 (continued)

SAMPLE INVENTORY 87-023

STATION NUMBER	SAMPLE TYPE	DAY/TIME (GMT)	LATITUDE	LONGITUDE	DEPTH (METRES)	GEOGRAPHIC LOCATION
SLF2	GRAB	173	50 07.43	66 33.7	7.6	BAIE SAINTE MARGUERITE
SLF3	GRAB	173	50 07.75	66 34.05	6.0	BAIE SAINTE MARGUERITE
SLF4	GRAB	173	50 08.28	66 34.5	4.6	BAIE SAINTE MARGUERITE
SLF5	GRAB	173	50 08.65	66 34.8	3.0	BAIE SAINTE MARGUERITE
SLG1	LAND	173	50 09	66 31.5	NA	BAIE SAINTE MARGUERITE
SLG2	LAND	173	50 09	66 31.5	NA	BAIE SAINTE MARGUERITE
SLG3	LAND	173	50 09	66 31.5	NA	BAIE SAINTE MARGUERITE
SLG5	LAND	173	50 09	66 31.5	NA	BAIE SAINTE MARGUERITE
16	GRAB	1731345	50 03.39	66 36.47	119	SEPT ISLES
17	CORE	1731401	50 03.27	66 36.51	119	SEPT ISLES
18	GRAB	1731458	49 59.64	66 43.25	176	SEPT ISLES
19	CORE	1731512	49 59.80	66 43.42	176	SEPT ISLES
20	GRAB	1731611	49 56.30	66 36.20	168	SEPT ISLES
21	CORE	1731623	49 56.30	66 36.20	168	SEPT ISLES
22	GRAB	1731732	50 06.32	66 29.50	113	SEPT ISLES
23	CORE	1731743	50 06.32	66 29.50	113	SEPT ISLES

TABLE 9 (continued)

SAMPLE INVENTORY 87-023

STATION NUMBER	SAMPLE TYPE	DAY/TIME (GMT)	LATITUDE	LONGITUDE	DEPTH (METRES)	GEOGRAPHIC LOCATION
24	GRAB	1731839	50 08.50	66 23.50	102	SEPT ISLES
25	CORE	1731848	50 08.80	66 23.40	102	SEPT ISLES
26	GRAB	1731942	50 11.35	66 25.10	21	SEPT ISLES
27	CORE	1731942	50 11.35	66 25.10	21	SEPT ISLES
28	GRAB	1732112	50 03.00	66 14.40	107	SEPT ISLES
29	FLOC	1732136	50 03.05	66 14.55	107	SEPT ISLES
29	WATER	1732136	50 03.05	66 14.55	107	SEPT ISLES
30	WATER	1750606	48 09.95	64 32.83	100	BAIE DES CHALEURS
30	FLOC	1750606	48 09.95	64 32.83	100	BAIE DES CHALEURS
31	FLOC	1750744	48 14.80	64 37.30	96	BAIE DES CHALEURS
31	WATER	1750744	48 14.80	64 37.30	96	BAIE DES CHALEURS
32	FLOC	1752351	48 02.47	66 15.65	30	BAIE DES CHALEURS
32	WATER	1752351	48 02.47	66 15.65	30	BAIE DES CHALEURS
33	WATER	1770045	48 05.91	64 35.34	80	BAIE DES CHALEURS
33	FLOC	1770045	48 05.91	64 35.34	80	BAIE DES CHALEURS
34	FLOC	1770312	47 54.91	64 04.20	72	BAIE DES CHALEURS
34	WATER	1770312	47 54.91	64 04.20	72	BAIE DES CHALEURS

TABLE 10

Piston Core Station Information

PLE JMBER	SAMPLE TYPE	JULIAN DAY/TIME	LATITUDE LONGITUDE	DEPTH (MTRS)	CORER LENGTH (CM)	APP. PENN (CM)	CORE LENGTH (CM)	NO OF SECT	SEISMIC TIME	GEOGRAPHIC LOCATION	NOTES
1	PISTON	1701311	48 57.30 68 08.47	301	610	820	556	4	1701230	ST LAWRENCE ESTUARY	TWC DISTURBED AT TOP, CATCHER EMPTY, SMALL AMOUNT WASHED FOR FORAMS. TWC APP. PEN. 210, LENGTH 88; PISTON CORER- COMPLETE PENETRATION- UNDISTURBED TO D. CATCHER EMPTY WASHED FOR FORAMS. GREY SILTY MUD. SECTIONS: AB 152, BC 157, CD 151, DE 96. SUBSAMPLES: TWC CORE CATCHER FOR FORAMS, PISTON CORE CATCHER WASHED FOR FORAMS. ONE SMALL BAG, SMALL SAMPLE FROM TWC CORE CATCHER.
	PISTON	1701422	49 03.62 68 06.26	76	610	0	96	1		ST LAWRENCE ESTUARY	TWC FELL OVER, WAS EMPTY, NO RECOVERY. PISTON CORE MEDIUM SAND- CATCHER ALMOST EMPTY SECTIONS: AB 96CM. SMALL CATCHER SAMPLE WASHED FOR FORAMS. SUBSAMPLES: 2, 16, 40, 60 CM FOR: ATTERBERG, WATER CONTENT, GRAIN SIZE. CORE DESCRIBED. 0-3, 25-28, 50-53, 74-77 CM FOR FORAMS
	PISTON	1701620	48 59.11 68 13.43	169	610	820	563	4	1701032	ST LAWRENCE ESTUARY	NO OF ATTEMPTS: 3, FIRST ATTEMPT DID NOT TRIP, 2ND ATTEMPT DITTO, 3RD ATTEMPT HURRAH ! TWC APP. PEN. 210, LENGTH: 203, 2 SECTIONS AB 152, BC 51 WITH CUTTER SAMPLE. PISTON CORER SECTIONS: AB 153, BC 150, 3 CM IN BAG FROM BETWEEN SECT. BC AND CD, CD 153,DE 104 WITH CUTTER SAMPLE CORE DESCRIBED. SUBSAMPLES TAKEN AT 5, 30, 40, 80, 120, 150, 200, 300, 390, 450, 550 CM. FOR ATTERBERG, WATER CONTENT & GRAIN SIZE;

TABLE 10 (continued)

Piston Core Station Information

SAMPLE NUMBER	SAMPLE TYPE	JULIAN DAY/TIME	LATITUDE LONGITUDE	DEPTH (MTRS)	CORER LENGTH (CM)	APP. PENN (CM)	CORE LENGTH (CM)	NO OF SECT	SEISMIC TIME	GEOGRAPHIC LOCATION	NOTES
3 (CONTINUED)											3 CM SUBSAMPLES TAKEN AT 0, 25, 35, 60, 97, 151, 201, 250, 297, 350, 397, 450, 500, 550 CM FOR FORAMS.
4	PISTON	1701717	48 59.07 68 14.63	133	610	820	503	4	1701020	ST LAWRENCE ESTUARY	TWC APP. PEN.: 188, TL: 110 ONE SECTION AB 110 WITH CUTTER. PISTON CORER SECTIONS: AB 151, BC146, 5CM IN BAG FROM BETWEEN SECTIONS BC AND CD, CD 153, DE 48 WITH CUTTER SAMPLE. SECTION DE DISTURBED. CORE DESCRIBED. SUBSAMPLES: 2.5, 10, 25, 75, 140, 190, 200, 210, 220, 250, 300, 335, 370, 400, 425, 471 CM FOR ATTERBERG, WATER CONTENT AND GRAIN SIZE; 2-5, 15-18, 193-196, 198-201, 251-254, 225-228, 301-304, 350-354, 402-405, 450-453, 489-492 CM FOR FORAMS
	PISTON	1701811	48 57.46 68 16.44	244	610	810		0	1700711	ST LAWRENCE ESTUARY	TWC APP. PEN.: 180, TL.: 23, ONE SECTION AB 23 WITH CUTTER SAMPLE. TWC DISTURBED. PISTON CORER CUTTER SAMPLE IN TWO BAGS, CORE LINER STUCK IN BARREL. SUBSAMPLES: SMALL FORAM SAMPLE

TABLE 10 (continued)

Piston Core Station Information

SAMPLE NUMBER	SAMPLE TYPE	JULIAN DAY/TIME	LATITUDE LONGITUDE	DEPTH (MTRS)	CORER LENGTH (CM)	APP. PENN (CM)	CORE LENGTH (CM)	NO OF SECT	SEISMIC TIME	GEOGRAPHIC LOCATION	NOTES
6	PISTON	1701915	48 59.26 68 24.70	135	610	300	88	1	1700908	ST LAWRENCE ESTUARY	TWC APP. PEN. 188, TL.:117, ONE SECTION AB 117, NO CATCHER OR CUTTER SAMPLE. SUBSAMPLE: CATCHER WASHED FOR FORAMS. PISTON CORER SECTIONS AB 88 WITH CUTTER. SUBSAMPLES: CATCHER WASHED FOR FORAMS; 9-10, 25, 40, 55, 70 CM FOR ATTERBERG, WATER CONTENT, GRAIN SIZE; 0-3, 30-33, 60-63, 84-87 CM FOR FORAMS. CORE DESCRIBED.
7	PISTON	1702001	48 59.24 68 28.58	122	610	820	557	4	1692117	ST LAWRENCE ESTUARY	TWC APP. PEN.: 188, TL. 129, ONE SECTION AB 129 WITH CATCHER. SUBSAMPLE: SMALL SAMPLE FOR FORAMS PISTON CORER: SECTIONS: AB 149, BC 154, CD 150, DE 104 WITH CATCHER SAMPLE. SUBSAMPLE:CATCHER SAMPLE FOR FORAMS, CORE DESCRIBED; SUBSAMPLES 10, 50, 100, 128, 180, 230, 295, 330, 375, 420, 432, 492, 532 CM FOR ATTERBERG, WATER CONTENT AND GRAIN SIZE; 0-3, 52-55, 100-103, 120-123, 128-130, 150-153, 200-203, 250-253, 300-303, 275-278, 350-353, 400-403, 450-453, 500-503, 547-550 CM FOR FORAMS. 182-184 CM SHELL & 58-59 CM WOOD REMOVED.
8	PISTON	1702119	48 55.40 68 34.40	97	610	610	501	4	1691805	ST LAWRENCE ESTUARY	TWC APP. PEN.: 188, TL: 109, ONE SECTION AB 109, NO CATCHER SAMPLE. SUBSAMPLE: CATCHER WASHED FOR FORAMS. PISTON SECTIONS: AB 151, BC 150, 17 CM IN BAG FROM BETWEEN SECTIONS BC AND CD, CD 150, DE 33 WITH CATCHER SAMPLE. SECTION DE DISTURBED. SUBSAMPLE:CATCHER SAMPLE FOR

TABLE 10 (continued)

Piston Core Station Information

SAMPLE UMBER	SAMPLE TYPE	JULIAN DAY/TIME	LATITUDE LONGITUDE	DEPTH (MTRS)	COREER LENGTH (CM)	APP. PENN (CM)	CORE LENGTH (CM)	NO OF SECT	SEISMIC TIME	GEOGRAPHIC LOCATION	NOTES
9	PISTON	1702204	48 52.47 68 36.13	124	610	610	54	1	1691727	ST LAWRENCE ESTUARY	TWC APP. PEN.: 180, TL.: 122, 1 SECTION AB 122, NO CATCHER SAMPLE. SUBSAMPLE: CATCHER WASHED FOR FORAMS. PISTON SECT.: AB 55 AND CATCHER SAMPLE. SUBSAMPLES: SMALL CATCHER SAMPLE WASHED FOR FORAMS; 2, 4, 15, 23, 26, 30, 40, 48, 49 CM FOR ATTERBERG, WATER CONTENT, GRAIN SIZE; 0-3, 19-22, 40-43, 52-55 CM FOR FORAMS. CORE DESCRIBED
10	PISTON	1702237	48 51.49 68 35.75	143	610	800	133	1	1691630	ST LAWRENCE ESTUARY	TWC APP PEN.: 190, TL: 23, 1 SECTION AB 23. NO CATCHER. PISTON SECT. AB 133, NO CATCHER. SUBSAMPLES AT 5, 20, 35, 54, 70, 79, 86, 94, 99, 110, 120 CM FOR ATTERBERG, WATER CONTENT, GRAIN SIZE; 0-3, 25-28, 50-53, 75-78, 100-103, 129-132 CM FOR FORAMS, SHELL & WOOD AT 31 CM REMOVED. CORE DESCRIBED
1	PISTON	1702311	48 50.49 68 35.36	263	610	820	571	4	1691605	ST LAWRENCE ESTUARY	TWC APP: PEN: 196, TL: 120, 1 SECTION AB 120 WITH CATCHER SAMPLE. SUBSAMPLE: SMALL SAMPLE WASHED FOR FORAMS. PISTON SECTIONS: AB 151, BC 153, 8 CM IN BAG FROM BETWEEN SECTIONS BC AND CD, CD 152, DE 107 WITH CATCHER SUBSAMPLES: SMALL SAMPLE WASHED FOR FORAMS. CORE DESCRIBED. SUBSAMPLES: 0, 40, 70, 110, 140, 170, 200, 240, 280, 330, 380, 420, 450, 500, 520, 550 FOR ATTERBERG, WATER CONTENT AND GRAIN SIZE; 3 CM AT 0, 50, 97, 125, 150 , 201, 251, 300,

TABLE 10 (continued)

Piston Core Station Information

PLE SAMPLE JULIAN LATITUDE UMBER TYPE DAY/TIMELONGITUDE	DEPTH (MTRS)	CORER LENGTH (CM)	APP. PENN (CM)	CORE LENGTH (CM)	NO OF SECT	SEISMIC TIME	GEOGRAPHIC LOCATION	NOTES
PISTON 1731401 50 03.27 66 36.51	119	610	660	331	3	1721904	SEPT ISLES	TWC APP. PEN. 188, TL: 131. CATCHER SAMPLE BAGGED SUBSAMPLE: 20 CC FROM TWC CATCHER FOR FORAMS. PISTON SECTIONS: AB 153, BC 136, C(2) 7CM IN BAG, C(1) 21 CM IN BAG, CD 35. CATCHER SAMPLE IN BAG. SUBSAMPLES: 20 CC OF CATCHER FOR FORAMS; CORE DESCRIBED; 2, 10, 20, 100, 150, 250, 340 FOR ATTERBERG, WATER CONTENT AND GRAIN SIZE; 5-8, 63-66, 103-106, 151-154, 198-201, 251-254, 300-303, 350-353 CM FOR FORAMS.
.9 PISTON 1731512 49 59.80 66 43.42	176	610	800	563	4	1731019	SEPT ISLES	TWC APP. PEN. 180, TL: 121, NO CATCHER. SUBSAMPLE: CATCHER WASHED FOR FORAMS PISTON SECTIONS: AB 148, 3CM BETWEEN AB & BC IN BAG FROM AB, 3CM SECTION IN BAG BEWTEEN SECTION AB & BC FROM BC (CAUSED BY GAS EXPANSION), BC 146, 5 CM IN BAG FROM BETWEEN BC & CD, CD 138, DE 119, CATCHER IN BAG SUBSAMPLE: 20 CC FROM CATCHER FOR FORAMS
PISTON 1731623 49 56.30 66 36.20	168	310	790	2	18	1721742	SEPT ISLES	TWC APP. PEN. 164, TL: 130, SECTION AB 130, NO CATCHER SAMPLE. PISTON SECTIONS: AB 153, BC 29, NO CATCHER SAMPLE

TABLE 10 (continued)

Piston Core Station Information

IPLE UMBER	SAMPLE TYPE	JULIAN DAY/TIME	LATITUDE LONGITUDE	DEPTH (MTRS)	CORER LENGTH (CM)	APP. PENN (CM)	CORE LENGTH (CM)	NO OF SECT	SEISMIC TIME	GEOGRAPHIC LOCATION	NOTES
	PISTON	1731743	50 06.32 66 29.50	113	610	800	568	4	1722022	SEPT ISLES	TWC APP. PEN.: 170, TL: 113, SECTIONS AB 113, NO CATCHER SAMPLE. PISTON SECTIONS: AB 150, BC 151, 3 CM IN BAG FROM BETWEEN AB & BC, CD 151, DE 113, CATCHER SAMPLE IN BAG, SUBSAMPLE: 20 CC CATCHER FORAMS SUBSAMPLES: 2, 5, 100, 150, 250, 300, 350, 400, 450, 520, 550 FOR ATTERBERG, WATER CONTENT, GRAIN SIZE; 0-2, 50-53, 100-103, 147-150, 200-203, 252-255, 302-305, 352-355, 402-405 FOR FORAMS. CORE DESCRIBED.
	PISTON	1731848	50 08.80 66 25.40	102	610	800	368	3	1722252	SEPT ISLES	TWC APP. PEN.: 170, TL: 108, SECT. AB 108, CATCHER SAMPLE IN BAG. PISTON SECTIONS: AB 154, 4 CM IN BAG FROM BETWEEN AB & BC, BC 145, 8 CM IN BAG FROM BETWEEN BC & CD, CD 57, SMALL CATCHER SAMPLE. CORE DESCRIBED. SUBSAMPLES: 5, 45 FOR ATTERBERG, WATER CONTENT & GRAIN SIZE; 0-3, 25-28, 50-53 FOR FORAMS.
	PISTON	1731942	50 11.35 66 25.10	21	610	0	57	1	1722215	SEPT ISLES	TWC ATTEMPTED NO RECOVERY PISTON SECTIONS: AB 57, NO CATCHER SAMPLE

TABLE 11

Ship Grab Station Information

AMPLE NUMBER	TYPE OF GRAB	JULIAN DAY/TIME	LATITUDE LONGITUDE	DEPTH (MTRS)	GEOGRAPHIC LOCATION	NOTES
15	VAN VEEN	1720358	49 09.96 67 40.94	245	ST LAWRENCE ESTUARY	GREY MUD , SOUPY WITH ABUNDANT WORMS. SUBSAMPLE TAKEN FOR FORAMS
16	VAN VEEN	1731345	50 03.39 66 36.47	119	SEPT ISLES	OLIVE GREEN SILTY MUD BLACK MOTTLING- REDUCING ABUNDANT WORMS, SUBSAMPLE: 20 CC FORAMS
18	VAN VEEN	1731458	49 59.64 66 43.25	176	SEPT ISLES	OLIVE GREEN SILTY MUD; BLACK MOTTLING, REDUCING, SUBSAMPLE: 20 CC FOR FORAMS
20	VAN VEEN	1731611	49 56.30 66 36.20	168	SEPT ISLES	MEDIUM COARSE SAND WITH SOME MUD SUBSAMPLE: 20 CC FORAMS
22	VAN VEEN	1731732	50 06.32 66 29.50	113	SEPT ISLES	MUDDY SAND SUBSAMPLE: 20 CC FOR FORAMS
4	VAN VEEN	1731839	50 08.50 66 23.50	102	SEPT ISLES	OLIVE GREEN SILTY MUD SUBSAMPLE: 20 CC FORAMS
6	VAN VEEN	1731942	50 11.35 66 25.10	21	SEPT ISLES	
8	VAN VEEN	1732112	50 03.00 66 14.40	107	SEPT ISLES	OLIVE GREEN SAND AND GRAVEL, MINOR MUD. SAND POORLY SORTED (FINE-COARSE), GRAVEL UP TO 6 CM AND SUBANGULAR TO SUBROUNDED. BINOCULAR EXAMINATION SHOWS SAND IS LARGELY SUBANG. SOFT & SOUPY. SHELLS AND STARFISH.

TABLE 12

Launch Grab Station Information

SAMPLE NUMBER	TYPE OF GRAB	JULIAN DAY/TIME	LATITUDE LONGITUDE	DEPTH (MTRS)	GEOGRAPHIC LOCATION	NOTES
A1	VAN VEEN	1691500	48 53.50 68 37.08	15	OFFSHORE BETSIAMITES	MEDIUM TO COARSE GRAINED MICACEOUS SAND WITH CONCENTRATION OF HEAVIES. TRANSECT A RUN FROM BUOY TO SMALL BAY ON POINT A MICHEL, POSITIONS BY SEXTANT FIXES
A2	VAN VEEN	1691515	45 53.83 68 37.12	9.1	OFFSHORE BETSIAMITES	FINE GRAINED MICACEOUS QUARTZ SAND WITH CONCENTRATION OF HEAVIES AND RED SAND GRAINS. TRANSECT A
A3	VAN VEEN	1691530	48 54.18 68 37.22	4.6	OFFSHORE BETSIAMITES	VERY COARSE TO GRANULAR SAND. LARGE OSCILLATION RIPPLES WITH CONCENTRATIONS OF TRANSPORTED CLAMSHELL DEBRIS IN THE TROUGHS. TRANSECT A
A4	VAN VEEN	1691545	48 54.50 68 37.20	6.0	OFFSHORE BETSIAMITES	FINE MICACEOUS QUARTZ SAND TRANSECT A
A5	VAN VEEN	1691600	49 54.8 68 37.28	11	OFFSHORE BETSIAMITES	FINE MICACEOUS QUARTZ SAND, BIOTITE AND SOME DARK HEAVIES. TRANSECT A
B1	VAN VEEN	1691610	48 55.05 68 34.20	34	OFFSHORE BETSIAMITES	FINE MUDDY MICACEOUS SAND, SEEMED TO BE A CAP OF MUD ON TOP OF THE SAND. TRANSECT B IN LINE WITH CHURCH AT POINTE DE BETSIAMITES, POSITIONS BY SEXTANT FIXES.
B2	VAN VEEN	1691615	48 55.40 68 35.20	20	OFFSHORE BETSIAMITES	SILTY FINE SAND. TRANSECT B
B3	VAN VEEN	1691620	48 55.80 68 36.10	4.6	OFFSHORE BETSIAMITES	COARSE QUARTZ-RICH SAND WITH SMALL AMOUNT OF MUD. TRANSECT B.
B4	VAN VEEN	1691625	48 56.1 68 37.2	2.4	OFFSHORE BETSIAMITES	GRAVEL. TRANSECT B.
B5	VAN VEEN	1691630	48 56.20 68 37.70	1.4	OFFSHORE BETSIAMITES	GRAVELLY SAND, SLIGHTLY FINER THEN 87-023 B4 TRANSECT B.

TABLE 12 (continued)

Launch Grab Station Information

SAMPLE NUMBER	TYPE OF GRAB	JULIAN DAY/TIME	LATITUDE LONGITUDE	DEPTH (MTRS)	GEOGRAPHIC LOCATION	NOTES
C1	VAN VEEN	1691800	49 00.63 68 32.70	7.6	BAIE AUX OUTARDES	FINE TO VERY FINE SAND. TRANSECT C IN BAIE AUX OUTARDES, POSITIONS BY SEXTANT FIXES.
C2	VAN VEEN	1691810	49 00.98 68 32.72	3.7	BAIE AUX OUTARDES	TRANSECT C.
C3	VAN VEEN	1691820	49 01.32 68 32.56	3	BAIE AUX OUTARDES	FINE SAND. TRANSECT C.
C4	VAN VEEN	1691830	49 01.70 68 32.45	3	BAIE AUX OUTARDES	SAND. TRANSECT C.
C5	VAN VEEN	1691840	49 01.95 68 32.24	2.4	BAIE AUX OUTARDES	COARSE GRANULE SAND. TRANSECT C.
SLD1	VAN VEEN	173	50 07.8 66 37.15	3	BAIE SAINTE MARGUERITE	TRANSECT D, POSITIONS APPROXIAMATE
SLD2	VAN VEEN	173	50 07.57 66 37.05	1.8	BAIE SAINTE MARGUERITE	TRANSECT D.
SLD3	VAN VEEN	173	50 07.48 66 37.02	3.6	BAIE SAINTE MARGUERITE	TRANSECT D.
SLD4	VAN VEEN	173	50 07.4 66 37.02	4.3	BAIE SAINTE MARGUERITE	TRANSECT D.
SLD5	VAN VEEN	173	50 07.3 66 36.9	4.6	BAIE SAINTE MARGUERITE	TRANSECT D.
SLD6	VAN VEEN	173	50 07.2 66 36.82	9.1	BAIE SAINTE MARGUERITE	TRANSECT D.
SLE1	VAN VEEN	173	50 09.00 66 33.00	3.6	BAIE SAINTE MARGUERITE	TRANSECT E, POSITIONS APPROXIAMATE.
SLE2	VAN VEEN	173	50 08.9 66 33.00	3.0	BAIE SAINTE MARGUERITE	TRANSECT E.
SLE3	VAN VEEN	173	50 08.78 66 33.00	3.3	BAIE SAINTE MARGUERITE	TRANSECT E.

TABLE 12 (continued)

Launch Grab Station Information

SAMPLE NUMBER	TYPE OF GRAB	JULIAN DAY/TIME	LATITUDE LONGITUDE	DEPTH (MTRS)	GEOGRAPHIC LOCATION	NOTES
SLE4	VAN VEEN	173	50 08.6 66 33.0	4.6	BAIE SAINTE MARGUERITE	TRANSECT E.
SLE5	VAN VEEN	173	50 04.5 66 33.0	5.2	BAIE SAINTE MARGUERITE	TRANSECT E.
SLF1	VAN VEEN	173	50 07.1 66 33.4	9.1	BAIE SAINTE MARGUERITE	TRANSECT F, POSITIONS APPROXIAMATE.
SLF2	VAN VEEN	173	50 07.43 66 33.7	7.6	BAIE SAINTE MARGUERITE	TRANSECT F.
SLF3	VAN VEEN	173	50 07.75 66 34.05	6.0	BAIE SAINTE MARGUERITE	TRANSECT F.
SLF4	VAN VEEN	173	50 08.28 66 34.5	4.6	BAIE SAINTE MARGUERITE	TRANSECT F.
SLF5	VAN VEEN	173	50 08.65 66 34.8	3.0	BAIE SAINTE MARGUERITE	TRANSECT F.

TABLE 13

Onshore Station Information

SAMPLE NUMBER	DAY/TIME	SAMPLER	LATITUDE LONGTITUDE	GEOGRAPHIC LOCATION	NUMBER OF SUBSAMPLES	NOTES
PB1	169	TROWEL	48 55.03 68 37.00	POINTE MICHEL	A PB1-1 SURFACE PB1-2 2-5 CM PB1-3 10-15 CM	LOWER BEACH, PLANE BED, SWASH ZONE AT LOW TIDE.
PB2	169	TROWEL	48 55.03 68 37.00	POINTE MICHEL	A PB2-1 SURFACE PB2-2 2-5 CM PB2-3 10-15 CM	APPROX. 1 M ABOVE LOW TIDE WAVE RIPPLES; SAMPLE TAKEN ON NORTH SIDE OF SPIT.
PB3	169	TROWEL	48 55.03 68 37.00	POINTE MICHEL	A PB3-1 SURFACE PB3-2 2-5 CM PB3-3 10-15 CM	APPROX. 0.5 M ABOVE LOW TIDE ON SOUTH SIDE OF SPIT.
PB4	169	TROWEL	48 55.03 68 37.00	POINTE MICHEL	A PB4-1 SURFACE PB4-2 2-5 CM PB4-3 10-15 CM	APPROX. 2 M. ABOVE LOW TIDE ON SPIT CRESTLINE.
SL1	173	TROWEL	50 08.20 66 37.08	BAIE SAINTE MARGUERITE	1 AT 10 CM	SECTION D WEST OF BAY MOUTH BAR OF RIVIERE SAINTE MARGUERITE IN LEE OF AOELIAN RIDGE ON WINTER BERM 25 M ABOVE TIDE MARK.
SL2	173	TROWEL	50 08.20 66 37.08	BAIE SAINTE MARGUERITE	1 AT SURFACE	SECTION D MOUTH OF RIVIERE SAINTE MARGUERITE LEEWARD OF AEOLIAN RIDGE, 25 M. ABOVE TIDE MARK.
SL3	173	TROWEL	50 08.20 66 37.08	BAIE SAINTE MARGUERITE	1 AT 10 CM	SECTION D MOUTH OF RIVIERE SAINTE MARGUERITE, SHOREWARD OF TROUGH ON WINTER BERM.
SL4	173	TROWEL	50 08.20 66 37.08	BAIE SAINTE MARGUERITE	1 AT SURFACE 1 AT 5 CM.	SECTION D MOUTH OF RIVIERE SAINTE MARGUERITE LANDWARD OF TROUGH ON WINTER BERM, APPROX. 25 M. ABOVE TIDE MARK.
SL5	173	TROWEL	50 08.20 66 37.08	BAIE SAINTE MARGUERITE	1 AT SURFACE	SECTION D MOUTH OF RIVIERE SAINTE MARGUERITE; CREST OF TOP MOST BERM.
SL6	173	TROWEL	50 08.20 66 37.08	BAIE SAINTE MARGUERITE	1 AT SURFACE	SECTION D MOUTH OF RIVIERE SAINTE MARGUERITE; TOP MOST BERM JUST BELOW CREST OF AEOLIAN RIDGE.

TABLE 13 (continued)

Onshore Station Information

SAMPLE NUMBER	DAY/TIME	SAMPLER	LATITUDE LONGTITUDE	GEOGRAPHIC LOCATION	NUMBER OF SUBSAMPLES	NOTES
SL7	173	TROWEL	50 09 66 33	BAIE SAINTE 1 AT SURFACE MARGUERITE		SECTION E 2 KM. WEST OF EAST END OF PLAGE ST. MARGUERITE. BASE OF CLIFF.
SL8	173	TROWEL	50 09 66 33	BAIE SAINTE 1 AT 5 CM MARGUERITE		SECTION E BASE OF CLIFF.
SL9A	173	TROWEL	50 09 66 33	BAIE SAINTE 1 AT SURFACE MARGUERITE		SECTION E CLIFF FACE; RAISED FLUVIAL DEPOSIT.
SL9B	173	TROWEL	50 09 66 33	BAIE SAINTE 1 AT SURFACE MARGUERITE		SECTION E MODERN BERM.
SL10A	173	TROWEL	50 09 66 33	BAIE SAINTE 1 AT SURFACE MARGUERITE		SECTION E CLIFF FACE; RAISED DELTA FORESET SANDS.
SL10B	173	TROWEL	50 08 66 33	BAIE SAINTE 1 AT SURFACE MARGUERITE		SECTION E GARNET LAYER ON MODERN BERM.
SL11	173	TROWEL	50 09 66 33	BAIE SAINTE 1 AT SURFACE MARGUERITE		SECTION E CLIFF FACE: SLUMP UNIT ON FORESETS.
SLG1	173	TROWEL	50 09 66 31.5	BAIE SAINTE 1 AT 10 CM. MARGUERITE		SECTION G EAST END OF PLAGE SAINTE MARGUERITE. BASE OF CLIFF 100 M. PLUS ALONG STRIKE FROM SLG 2 & 5
SLG2	173	TROWEL	50 09 66 31.5	BAIE SAINTE 1 AT SURFACE MARGUERITE		SECTION G BASE OF CLIFF.
SLG3	173	TROWEL	50 09 66 31.5	BAIE SAINTE 1 AT SURFACE MARGUERITE		SECTION G BASE OF CLIFF 100 M. PLUS ALONG STRIKE FROM SLG 2 & 5
SLG5	173	TROWEL	50 09 66 31.5	BAIE SAINTE 1 AT SURFACE MARGUERITE		SECTION G BASE OF CLIFF.

TABLE 14

Floc Camera Station Information

STAT NUMBER	JULIAN DAY/TIME	LATITUDE	LONGITUDE	DEPTH (MTRS)	GEOGRAPHIC LOCATION	BOTTLE VOLUME (LITRES)	BOTTLE DEPTH (M)	FIRST DEPTH (M)	DEPTH INT (M)	MAX DEPTH (M)	TIME INT (SEC)
12	1710026	48 55.64	68 30.03	140	ST LAWRENCE ESTUARY	1	30	10	10	100	15
13	1710151	49 00.05	68 15.05	108	ST LAWRENCE ESTUARY	1	20	10	10	80	30
14	1720323	49 10.11	67 40.71	260	ST LAWRENCE ESTUARY	FLOC CAMERA MALFUNCTIONED DUE TO NEW PRESSURE TRANSDUCER					
29	1732136	50 03.05	66 14.55	107	SEPT ISLES	1	50	10	10	90	30
30	1750606	48 09.95	64 32.83	100	BAIE DES CHALEURS	1	40	1	10	80	20
						CAMERA LOWERED TO 90 M.					
31	1750744	48 14.80	64 37.30	96	BAIE DES CHALEURS	1	40	1	10	80	20
32	1752351	48 02.47	66 15.65	30	BAIE DES CHALEURS	1	10 25	1	3	25	15
33	1770045	48 05.91	64 35.34	80	BAIE DES CHALEURS	1	50	1	5	70	15
						CAMERA 2 WAS OPENED BEFORE REWINDING					
34	1770312	47 54.91	64 04.20	72	BAIE DES CHALEURS	1	50	1	5	65	15
						HELD AT 68 M FOR 4 MIN.; WIRE ACROSS LENSE OF CAMERA 2					

TABLE14(continued)
FRAME TIMES AND DEPTHS

STN. 12 FLOC CAMERA

Frame no.	depth (cm)	time (min - sec.)
1	1162	26 47 0
2	2075	26 54 0
3	3071	27 7 0
4	4150	27 22 0
5	5063	27 39 0
6	6059	27 55 0
7	7055	29 52 0
8	8051	30 14 0
9	9296	30 25 0
11	10043	30 29 0
12	10707	30 30 0
13	10873	30 31 0
14	11371	30 31 15
15	12118	30 31 30
16	12616	30 31 45
17	13197	30 32 0
18	13695	30 33 0
19	14110	30 34 0
21	14442	30 35 0
22	14774	30 36 0
23	15106	30 37 0
24	15687	30 38 0
25	16185	30 39 0
26	16849	30 40 0
27	17181	30 41 0
28	17928	30 42 0
29	18426	30 43 0
31	18758	30 44 0
32	19256	30 45 0
33	19588	30 46 0

STN. 13 FLOC CAMERA

Frame no.	depth (cm)	time (min - sec)
1	1162	31 31 0
2	2158	31 43 0
3	3071	31 51 0
4	4150	31 59 0
5	5063	32 16 0
6	6142	32 17 0
7	7055	32 24 0
8	8051	32 41 0
9	8300	32 42 0
11	9213	32 43 0
12	11620	32 43 30
13	13612	32 44 0
14	14193	32 45 0
15	14525	32 46 0
16	15106	32 47 0
17	15604	32 48 0
18	16019	32 49 0
19	16434	32 50 0
21	16932	32 51 0
22	17596	32 52 0
23	18011	32 53 0
24	18426	32 54 0
25	18924	32 55 0
26	19173	32 56 0
27	19588	32 57 0
28	19588	32 58 0
29	19339	32 59 0
31	18924	33 0 0

STN. 29 FLOC CAMERA

Frame no.	Depth (cm)	Time (min-sec)
1	1079	37 40 0
2	2158	37 43 16
3	3071	37 43 30
4	4067	37 43 45
5	5146	37 43 59
6	6059	37 44 0
7	7138	37 58 0
8	8051	38 8 0
9	9047	38 11 0
11	9545	38 12 0
12	9545	38 13 0
13	9545	38 14 0
14	9545	38 15 0
15	9545	38 16 0
16	9545	38 17 0
17	9545	38 18 0
18	9545	38 19 0
19	10043	38 20 0
21	10541	38 21 0
22	10956	38 22 0
23	11786	38 23 0
24	12367	38 24 0
25	12865	38 25 0
26	15189	38 25 30
27	17596	38 26 0
28	18260	38 27 0
29	19007	38 28 0
31	19090	38 29 0

STN. 30 FLOC CAMERA

FRAME NO.	DEPTH (CM)	TIME (MIN-SEC)
1	166	5 21 0
2	1162	6 15 55
3	2158	6 24 0
4	3237	6 30 0
5	4150	6 35 0
6	5146	6 39 0
7	6225	6 40 0
8	7138	6 42 0
9	7719	6 43 0
11	7968	6 44 0
12	7968	6 45 0
13	7719	6 46 0
14	7719	6 47 0
15	7719	6 48 0
16	7719	6 49 0
17	7719	6 50 0
18	8217	6 51 0
19	9213	6 52 0
21	10209	6 53 0
22	10790	6 54 0
23	11039	6 55 0
24	12367	6 55 20
25	13197	6 55 40
26	14193	6 56 0
27	14691	6 57 0
28	15189	6 58 0
29	15770	6 59 0
31	16600	7 0 0

TABLE14(continued)
FRAME TIMES AND DEPTHS

STN. 31 FLOC CAMERA

FRAME NO.	DEPTH (CM)	TIME (MIN-SEC)
1	249	24 32 0
2	1245	24 52 0
3	2158	25 5 0
4	3237	25 5 11
5	4150	25 5 27
6	5146	25 5 43
7	6308	25 5 55
8	7138	25 11 0
9	7304	25 12 0
11	7221	25 13 0
12	7221	25 14 0
13	7138	25 15 0
14	7553	25 16 0
15	8051	25 17 0
16	8300	25 18 0
17	9545	25 19 0
18	10209	25 20 0
19	10624	25 21 0
21	10956	25 22 0
22	11786	25 23 0
23	12367	25 24 0
24	13031	25 25 0
25	13778	25 26 0
26	14442	25 27 0
27	15189	25 28 0
28	15687	25 29 0
29	16434	25 30 0
31	16932	25 31 0

STN. 32 FLOC CAMERA

FRAME NO.	DEPTH (CM)	TIME (MIN-SEC)
1	166	20 46 0
2	498	23 0 0
3	830	23 1 0
4	1079	23 6 0
5	1411	23 10 0
6	1660	23 16 0
7	1909	23 18 0
8	2241	23 27 0
9	2656	23 33 0
11	2656	23 34 0
12	2822	23 35 0
13	2822	23 36 0
14	2988	23 37 0
15	2988	23 38 0
16	2988	23 39 0
17	2988	23 40 0
18	2988	23 41 0
19	3154	23 41 15
21	3901	23 41 30
22	4233	23 41 45
23	4565	23 42 0
24	4565	23 43 0
25	4731	23 44 0
26	4814	23 45 0
27	4980	23 46 0
28	5146	23 47 0
29	5146	23 48 0
31	5146	23 49 0

STN. 33 FLOC CAMERA

FRAME NO.	DEPTH (CM)	TIME (MIN-SEC)
1	332	23 44 0
2	664	23 47 0
3	1162	23 56 0
4	1743	24 13 0
5	2241	24 40 0
6	2656	24 40 16
7	3154	24 40 34
8	3652	24 40 55
9	4150	25 8 0
11	4648	25 26 0
12	5229	25 50 0
13	5727	25 57 0
14	6142	26 0 0
15	6640	26 8 0
16	6972	26 9 0
17	7055	26 10 0
18	7221	26 11 0
19	7304	26 12 0
21	7636	26 13 0
22	7636	26 14 0
23	8383	26 14 15
24	9130	26 14 30
25	9628	26 14 45
26	9960	26 15 0
27	9877	26 16 0
28	9960	26 17 0
29	9877	26 18 0
31	9628	26 19 0

STN. 34 FLOC CAMERA

FRAME NO.	DEPTH (CM)	TIME (MIN-SEC)
1	249	3 24 56
2	664	3 35 0
3	1162	4 11 0
4	1743	4 51 0
5	2241	5 21 0
6	2656	5 40 0
7	3154	5 55 9
8	3652	5 55 39
9	4233	6 16 0
11	4648	6 40 0
12	5146	7 8 0
13	5727	7 25 0
14	6142	7 38 0
15	6225	7 39 0
16	6225	7 40 0
17	6557	7 41 0
18	6557	7 42 0
19	6557	7 43 0
21	6640	7 44 0
22	7138	7 44 15
23	7138	7 44 30
24	7304	7 44 45
25	7304	7 45 0
26	7304	7 46 0
27	7719	7 47 0
28	7719	7 48 0
29	7719	7 49 0
31	7719	7 50 0

APPENDIX 1

Piston Core Descriptions and Geotechnical Analyses

by

Frances J. Hein

PURPOSE

The purpose of this report is four-fold:

1. To describe the sedimentary structures observed by visual examination of split cores recovered on board CSS Dawson cruise 87-023, collected 19-29 June 1987.

2. To summarize the geotechnical measurements done on board, including peak and remolded shear strengths.

3. To propose a preliminary sedimentary facies scheme on the basis of lithology and sedimentary structures.

4. To identify possible correlative lithostratigraphic units and establish preliminary correlations between cores.

SAMPLING METHODS AND DESCRIPTION OF SITES

A total of 17 piston core stations were occupied (Table 10): 11 cores were taken in water depths ranging from 76 m to 250 m offshore Péninsule de Manicouagan (Figure 3), and 6 cores were taken in water depths ranging from 25 m to 280 m offshore Sept Iles (Figure 4). Of these, the following were not analyzed on board: core 1 (fine-grained basinal facies, not of present interest to this study), core 5 (the liner stuck in the barrel), core 8 (disturbed and shaken onboard), core 19 (sealed for gas) and core 25 (bottom 3 sections sealed for gas). The remaining cores were split onboard and logged visually with color designations of the Munsell color chart. At prominent facies changes, vane shear strength measurements (peak and remolded) were measured, using the mini-vane apparatus and software system provided by Kate Moran (AGC). If there were no significant downcore facies variations then the strength measurements were generally done at a 0.5 m downcore spacing. 116 measurements were conducted onboard (Table A attached). At each site a subsample was taken for further analysis, including water content, grain size, petrography and carbon content (Table A). Facies designations were made on the basis of lithology, sedimentary structures, grading patterns, and to a lesser extent on color. Color designations are not highly accurate due to poor lighting conditions.

FACIES DESCRIPTION AND CORRELATIONS

The core descriptions are attached as Table B. Summary diagrams showing the distribution of the major facies are attached as Table C (offshore Sept Iles) and Table D (offshore Péninsule de Manicouagan). A brief summary of these findings is given below.

The core stratigraphy offshore Sept Iles is quite simple (Table C). The topmost unit consists of a yellow-tan, coarse granule sand, with very poor sorting which is incised into the underlying units (A, cores 23 and 17, Table C). This may be correlative with the organic, yellow sand and silt, bioturbated interval at the top of core 25. Underlying A, is a dominantly massive, structureless, sandy silt unit which shows at most a few scattered reduction burrows. This is the B horizon of cores 23 and 17 (Table C). At the top of B in core 17, this unit becomes more clayey (Table C). The lowermost horizon is similar to B but apparently lacks biogenic features and is finer grained. It was only penetrated by core 23 (Table C), where it is a completely massive and structureless sandy silty clay. The absence of biogenic traces suggests either that sedimentation rates were very high or that bottom water conditions were not favourable for the establishment of an epifaunal and benthifaunal population. It is difficult to know the age of these units. A preliminary hypothesis suggests that Horizon C may represent a glacial-stage of high sedimentation. Horizon B would be a stage of mainly fine-grained sedimentation, but still fairly high such that the sediment was not completely reworked by bioturbation. Horizon A may represent erosion and infill by recent fluvial or deltaic channel sands.

The core stratigraphy offshore Péninsule de Manicouagan is a much more complicated pattern than that seen offshore Sept Iles. Many of the units are quite lenticular and the event-correlations may be somewhat more complex (Table D). At least seven major episodes of sedimentation are recorded in the cores from this site. These correlations will be discussed from the oldest to the youngest.

At the base of all of the deeper cores is Horizon G, consisting of a graded-laminated sequence of sand -> sandy silt -> silt (clay). The graded-laminated units occur on a fine scale (i.e. sands are generally a few mm thick, overlying silts are ~ 1 cm thick). In some sites the laminations are better preserved (core 3, Table D), where bioturbation appears to have been less intense. A few of the thicker graded-laminated units may be turbidites, some of which are apparently correlative between cores (i.e. 4.3 and 4.4 m depth, cores 7 and 4, Table D). The next overlying unit, Horizon F, is mainly a structureless sandy silt, which is mottled. This unit has few of the primarly sedimentary structures preserved, with the exception of possible swirl structures and wispy-lamination in core 4 (Table D, core 4, depth 3.2-3.4 m). Horizon E is quite variable in its facies pattern. In core 7, there are possible dropstones within a mainly sandy silt unit (core depth 1.8-2.6 m, Table D). This is then succeeded by a very coarse granular, gravel sand with two distinct sand beds at 1.5 and 1.6 m depth. In core 4 (Table D) Horizon E consists of a series of alternating graded-laminated sand -> silt, with an interfingering of massive sandy silt or clay. Bioturbation levels increase from 1.8 to 1.5 m depth. In core 3 the Horizon E is mainly a structureless sandy silt, with a few scattered reduction burrows. Near the top, from 1.35 to 1.75 m depth there is an increase in the amount of swirl structures, wispy-lamination and biogenic traces. In core 11 Horizon E is mainly graded-laminated toward the base, becoming a massive sandy silt towards the upper half. The next Horizon D is only 10 - 15 cm thick, consisting of a massive sand with heavy mineral enrichment at core 7; a graded-laminated sandy

silt unit in cores 3, 4 and 10. Horizon C is similar to Horizon F, consisting of a mottled structureless sandy silt. It occurs in cores 3, 4, 7 and 10. Horizon B is similar to Horizon G, consisting of a graded-laminated sequence of sand -> sandy silt -> silt (clay). The graded-laminated units occur on a fine scale (i.e. sands are generally a few mm thick, overlying silts are ~ 1 cm thick). The topmost unit, Horizon A, was only recovered in three of the piston cores -- it may be present in the trigger weight cores, although these have not yet been studied. Horizon A is a yellowish/tan generally coarse granular sand with shelly debris. The unit may be completely structureless, as in core 2; it may show burrowing and wispy-lamination, topped by wave-ripple lamination, as in core 7; or it may initially be structureless, succeeded by graded-laminated sand -> silt, which is then capped by low-angle (? cross-bedded) sand -> silt, succeeded at the top by another structureless coarse shelly sand.

It is very difficult to propose a sequence of depositional episodes to account for the complex stratigraphy observed in the cores offshore Manicouagan, without incorporation of the results from the seismic surveys and paleontological work. The lower graded-laminated Horizon G may represent glacial-marine deposition from the Goldthwait Sea. This influence may have extended up until deposition of the top of Horizon E, if the outsized pebbles in core 7 are indeed dropstones. Holocene deposits would be represented by Horizons C and B, with the Recent transgression marked by Horizon A. These interpretations are extremely speculative at this time and warrant further investigation.

The only significant accumulations of heavy mineral concentrations were noted in cores 7 and 9, offshore Manicouagan. Significant accumulations of natural gas occurred in cores 19 and 25, offshore Sept Iles.

TABLE A
87-023 MINI-VANE SHEAR RESULTS AND GEOTECH SAMPLES

CORE	(cm) DEPTH	(KPa) PEAK SHEAR STRENGTH	(KPa) REMOLDED SHEAR STRENGTH	SENSI-TIVITY	SAMPLE
PC06	10	3.22	1.34	2.4	3647
PC06	25	5.86	47.63	0.1	REDONE
PC06	25	----	1.33	4.4	3649
PC06	40	4.82	1.47	3.3	3650
PC06	55	5.35	3.22	1.7	3651
PC06	70	10.57	2.68	3.9	3652
PC02	02	2.55	1.20	2.1	3648
PC02	16	2.14	1.74	1.2	3653
PC02	40	4.01	1.61	2.5	3654
PC02	60	10.17	2.14	4.8	3655
PC10	05	5.23	1.87	2.8	3657
PC10	20	6.69	2.28	2.9	3658
PC10	35	6.16	1.07	5.8	3659
PC10	54	3.48	0.80	4.4	3660
PC10	70	5.62	1.34	4.2	3661
PC10	79	5.49	0.94	5.8	3662
PC10	86	5.09	2.42	2.1	3663
PC10	94	8.30	1.87	4.4	3664
PC10	99	7.77	?	?	3665
PC10	110	4.55	5.09	0.89	REDONE
PC10	110	-----	4.55	0.0	REDONE
PC10	110	-----	1.60	2.8	3666
PC10	120	7.36	5.68	1.3	3668
PC09	02	2.55	?	?	3699
PC09	04	2.14	0.54	4.0	3670
PC09	15	5.62	2.68	2.1	3667
PC09	23	4.69	2.40	2.0	3671
PC09	26	2.28	0.54	4.2	3672
PC09	30	4.81	2.00	2.4	3674
PC09	40	5.49	2.68	2.0	3673
PC09	48	4.42	35.62 ?	0.1	3676
PC09	49	16.74	3.48	4.8	3675

TABLE A (continued)
87-023 MINI-VANE SHEAR RESULTS AND GEOTECH SAMPLES

CORE	(cm) DEPTH	(KPa) PEAK SHEAR STRENGTH	(KPa) REMOLDED SHEAR STRENGTH	SENSI-TIVITY	SAMPLE
PC11	00	2.84	1.47	1.9	3677
PC11	40	4.54	2.54	1.8	3678
PC11	70	4.96	1.74	2.9	3680
PC11	110	3.88	1.74	2.2	3679
PC11	140	8.43	8.43	0.0	REDONE
PC11	140	----	0.67	12.6	3681
PC11	170	?	3.21	?	3682
PC11	200	6.56	2.40	2.7	3683
PC11	240	6.29	1.61	3.9	3698
PC11	280	10.17	2.00	5.1	3700
PC11	330	4.02	4.56	0.8	REDONE
PC11	330	-----	4.42	0.9	REDONE
PC11	330	-----	1.61	2.5	3699
PC11	380	10.44	2.41	4.3	3685
PC11	420	9.37	2.41	3.9	3686
PC11	450	15.13	1.20	12.6	3687
PC11	500	9.91	5.89	1.7	3688
PC11	520	7.23	3.08	2.3	3689
PC11	550	20.48	11.24	1.8	3690
PC04	2.5	3.08	1.74	1.8	3691
PC04	10	4.95	1.21	4.1	3692
PC04	25	4.28	1.21	3.5	3693
PC04	75	4.55	3.35	1.4	3675
PC04	140	7.24	3.88	1.9	3694
PC04	190	6.69	1.87	3.6	3696
PC04	200	10.84	0.40	27.1	3702
PC04	210	4.02	1.47	2.7	3704
PC04	220	39.36	3.75	10.5	3697
PC04	250	7.90	3.21	2.5	3701
PC04	300	?	3.34	?	3714
PC04	335	4.42	0.54	8.2	3706
PC04	370	9.64	1.60	6.0	3708
PC04	400	8.57	3.35	2.6	3712
PC04	425	6.69	2.41	2.8	3710
PC04	471	8.70	2.28	3.8	3716

TABLE A (continued)
87-023 MINI-VANE SHEAR RESULTS AND GEOTECH SAMPLES

CORE	(cm) DEPTH	(KPa) PEAK SHEAR STRENGTH	(KPa) REMOLDED SHEAR STRENGTH	SENSI-TIVITY	SAMPLE
PC07	10	1.47	3.75	0.40	REDONE
PC07	10	-----	1.87	0.78	REDONE
PC07	10	-----	2.54	0.58	REDONE
PC07	10	-----	1.39	1.1	3718
PC07	50	5.62	0.94	6.0	3719
PC07	100	6.42	3.74	1.7	3717
PC07	128	3.34	1.61	2.1	3715
PC07	180	6.96	2.67	2.6	3713
PC07	230	4.96	3.07	1.6	3711
PC07	295	12.18	3.48	3.5	3709
PC07	330	13.11	4.96	2.6	3707
PC07	375	11.37	1.88	6.0	3705
PC07	420	8.03	1.20	6.7	3703
PC07	432	12.59	1.07	11.8	3720
PC07	492	3.08	8.15	0.38	REDONE
PC07	492	-----	7.23	0.43 ?	3722
PC07	532	14.19	4.41	3.2	3724
PC03	05	?	2.27	?	3725
PC03	30	3.35	1.74	1.9	3721
PC03	40	2.54	0.80	3.2	3723
PC03	80	2.68	1.07	2.5	3728
PC03	120	5.35	1.06	5.0	3726
PC03	150	7.23	2.81	2.6	3730
PC03	200	10.00	4.95	2.0	3732
PC03	300	17.40	4.02	4.3	3727
PC03	390	17.28	38.02	0.45 ?	REDONE
PC03	390	-----	8.04	2.1	3729
PC03	450	20.08	8.27	2.4	3731
PC03	550	17.05	3.49	4.9	3733
PC25	05	4.15	?	?	3334
PC25	45	4.01	0.70	5.7	3735

TABLE A (continued)
87-023 MINI-VANE SHEAR RESULTS AND GEOTECH SAMPLES

CORE	(cm) DEPTH	(KPa) PEAK SHEAR STRENGTH	(KPa) REMOLDED SHEAR STRENGTH	SENSI-TIVITY	SAMPLE
PC17	02	8.0 ?	2.84	2.8 ?	3737
PC17	10	0.69	0.00(1)	690 ?	3736
PC17	20	6.29	0.40	15.7	3754
PC17	100	7.63	5.23	1.5	3750
PC17	150	25.91	2.43	10.7	3752
PC17	250	17.07	6.72	2.5	3755
PC17	340	13.10	2.74	4.8	3753
PC23	O2	3.05	0.00 (1)	305	3751
PC23	05	4.88	3.65	1.3	3748
PC23	100	5.79	0.91	6.3	3746
PC23	150	10.68	3.04	3.5	3749
PC23	250	15.04	2.51	6.0	3747
PC23	300	7.01	2.02	3.5	3744
PC23	350	9.53	4.01	2.4	3745
PC23	400	2.00	1.00	2.0	3742
PC23	450	6.51	0.50	13.0	3743
PC23	520	7.54	1.30	5.8	3740
PC23	550	4.01	1.00	4.0	3741

TABLE B
87-023 Core Descriptions

87-023-002P

00-10 cm. (Munsell Colour: 5Y4/4). Coarse Granular Sand, 1-2 mm grain size
10-37 cm. (Munsell Colour: 5Y4/4). Coarse Granule to Gravelly Sand, with shelly debris distributed throughout, 2-5 mm grain size.
37-77 cm. (Munsell Colour: 5Y4/4). Coarse Granule Sand, fragmented shell @ 70 cm depth (subsampled), 1-3 mm grain size.

87-023-003P Section ED 0-102 cm

Top 4 cm disturbed.
00-32 cm. (Munsell Colours: 5Y6/1; 5Y5/1). Sandy Silt, bioturbated, 0.5-1mm grain size (mainly as burrow infills), the 'background' sediment consists of 0.5 mm grains dispersed in a silt. Irrregular, bioturbated or loaded base.
32-102 cm. (Munsell Colours: 5Y6/1; 5Y5/1). Massive grey sandy clay. Structureless. Dispersed sand grains, 0.3-0.5 mm. Isolated vague burrows/ mottled zones and some slightly darker reduced bioturbated patches. @ 102 cm a sand ball (?) 4 cm high x 2 cm wide (either an intraclast or an injection feature, appears to be more likely an intraclast)

87-023-003P Section DC 102-252 cm

102-122 cm. (Munsell Colour: 5Y7/1). Massive Light Grey Clay with scattered reduced burrows, especially in the lower half of this interval.
122-133 cm. (Munsell Colour: 5Y6/1; 5Y5/1). Light Swirl Structures (? bioturbation or flow banding) in a slightly darker unit. Graded-laminated units, grain size of darker sands are 0.5-1 mm concentrated in a lower 2-3 mm base, which grades into about 1 cm thick interval of lighter sandy silt, in which sand 0.3-0.5 mm dispersed in silt.
133-162 cm. (Munsell Colour: 5Y6/1; 5Y5/1). Massive Sandy Silt, with dispersed 0.2 mm sand grains in a silt. Vague swirl structures 133-143 cm. Burrow density increases 143-153 cm; Vague lamination and swirl structures 153-162 cm.
162-252 cm. (Munsell Colour: 5Y6/1; 5Y5/1). Massive grey mainly structureless silt with dispersed sand grains, 0.2-0.3 mm grain size, somewhat more concentrated as darker burrow infills.

TABLE B (continued)
87-023 Core Descriptions

87-023-003P Section CB 256-401 cm

256-262 cm. (Munsell Colour: 5Y6/1). Massive structureless sandy silty mud, very fine sand (0.19 mm) dispersed in a silty mud.
262-365 cm. (Munsell Colour: 5Y5/1). Mottled sandy silty mud, mainly very fine sand (0.19 mm grain size) dispersed in a silty mud.
365-401 cm. (Munsell Colours: 5Y5/1; 5Y6/1). Banding consisting of slightly darker 5Y5/1 alternating with slightly lighter grey 5Y6/1. Vaguely laminated/stratified and burrowed. (?Glacial- Marine)

87-023-003P Section BA 401-554 cm.

401-554 cm. (Munsell Colours: 5Y5/1; 5Y6/1). Banding consisting of slightly darker 5Y5/1 alternating with slightly lighter grey 5Y6/1. Vaguely laminated/stratified and burrowed. (?Glacial- Marine)

87-023-004P Section ED 0-44 cm.

Top 2-3 cm slumped forward in liner,

00-14 cm. (Munsell Colour: 5Y6/1). Mottled Light Grey silty sand-sandy silt. Sand is 0.5-1 mm grain size, either concentrated as burrow infills or more dispersed within the background sediment. Vaguely laminated -- although the predominant structure is due to bioturbation. Sharp, irregular, ? eroded base.
14-44 cm. (Munsell Colour: 5Y6/1).Structureless light grey clayey silty with a few scattered sand-infilled burrows (1-2 cm diameter, grain size of infill 0.3-0.5 mm). A few scattered swirl structures.

87-023-004P Section DC 44-195 cm.

44-102 cm. (Munsell Colour: 5Y6/1). Bioturbated medium to light grey silty clay with some sand infilled burrows. Vague swirl structures and vague lamination. Possible Chondrites burrows @ 80 cm and 90 cm depth. Some of the other horizontal and vertical burrows have an organic lining.
102-120 cm. (Munsell Colour: 5Y6/1). Massive silty clay, ? bioturbated, a few scattered sand-filled burrows (grain size of infill 0.19-0.2 mm)
120-130 cm. (Munsell Colour: 5Y6/1; 5Y5/1). Vaguely banded, consisting of dark sands (5Y5/1) graded into a light grey (5Y6/1) silt/clay. Dark sands are sharp based, and average ~ 2 cm thick; the upper silts are 2-2 1/2 cm thick.

TABLE B (continued)
87-023 Core Descriptions

130-150 cm. (Munsell Colour: 5Y6/1). Massive silty clay with a minor amount of dispersed very fine sand (< 0.2 mm).

150-175 cm. (Munsell Colour: 5Y6/1; 5Y5/1). Vaguely wispy-laminated/mottled fine sand dispersed and as more concentrated burrow infills within a background of silty clay. Banding consists of alternating dark (5Y5/1) and light (5Y6/1) units, 1-2 cm thick, which are mainly disrupted due to bioturbation.

175-195 cm. (Munsell Colour: 5Y6/1; 5Y5/1). Graded-laminated dark (5Y5/1) fine sands, 2-3 mm thick, alternating with lighter (5Y6/1) and thicker, 0.5-1 cm thick, silts and clays with a minor amount of dispersed sand. Graded-laminated (slightly burrowed).

87-023-004P Section CB 196-341 cm.

196-197 cm. (Munsell Colour: 5Y6/1). Massive light grey silt, irregular bioturbated base.

197-203 cm. (Munsell Colour: 5Y6/1; 5Y5/1). Graded-laminated medium to fine sand, coarsens again from 197-198 cm (? amalgamation of two sands). @ 203 cm grain size 0.3-0.5 mm, laminations outlined by dark heavy mineral concentrations, laminae < 1 mm thick, alternating with quartz-rich sand laminae. @ ~ 200 cm depth the base of the next unit is loaded/bioturbated sand; grain size at the base is 0.3-0.5 mm which increases to 0.5 mm at the top (? inversely graded or amalgamated sand).

203-218 cm. (Munsell Colour: 5Y6/1; 5Y5/1). Vaguely banded/laminated and bioturbated sand -> silty sand -> silt. Grain size of the basal darker sands (5Y5/1) is 0.3-0.5 mm and thickness is ~ 1 cm; overlying silty sand/silt is lighter (5Y6/1) and is generally 1-2 cm thick. Contacts are very irregular, ? bioturbated or loaded. (? Turbidites)

218-220 cm. (Munsell Colour: 5Y6/1; 5Y5/1).Graded sand -> silty sand -> silt. (? Turbidite) Sand at 220 cm depth is 0.75- 1 cm thick, with an irregular loaded base. Internally it is vaguely laminated, with laminations (< 1mm thick) defined by alternating dark heavy mineral and more quartz rich layers. This is overlain gradationally by a mainly structureless, normally graded sand silty to silt unit.

220-265 cm. (Munsell Colour: 5Y6/1; 5Y5/1). Massive structureless sandy silt. Vague pockets of preserved 'graded-laminated' rhythmites @ 241-249 cm depth; from 249-265 cm possible swirl structures or internal folds.

265-341 cm. (Munsell Colour: 5Y6/1; 5Y4/1, reduced burrows 5Y3/1). Vaguely laminated, with possible folds, internal swirl structures or large scale bioturbation effects. Medium grey (5Y4/1) to light grey (5Y6/1) silty and fine to very fine sand. Mainly structureless, aside from the few 'wisps' of lamination and faint swirl structures.

TABLE B (continued)
87-023 Core Descriptions

87-023-004P Section BA 341-489 cm

341-377 cm. (Munsell Colour: 5Y6/1). Massive bioturbated grey sandy silt.

377-414 cm. (Munsell Colour: 5Y4/1; 5Y6/1) Graded-laminated sands to sandy silts. Darker (5Y4/1) sand laminae are 3-5 mm thick, grain size 0.2-0.3 mm and have a concentrated or clast-supported texture. These grade into the thicker, 0.3-1 cm, sandy silts, which are lighter coloured (5Y6/1) and have some dispersed fine to very fine sand (<0.2 mm grain size). The basal sand laminae all have abrupt (? scoured) contacts.

414-424 cm. (Munsell Colour: 5Y6/1) Graded sand-> sandy silt -> silt/clay (1 bed, ? turbidite). Sharp based, irrregular, possibly loaded or bioturbated. Sand is concentrated in the lower 0.5 cm, grain size 0.2-0.3 mm. This grades into a sandy silt in which sand (0.2-0.3 mm grain size) is dispersed within the silt. This grades into a mainly silty clay at the top. Vaguely laminated from 414 - 420 cm; more massive from 420-424 cm. ? small microfaults in the laminae @ 420 cm.

424-430 cm. (Munsell Colour: 5Y6/1) Slightly disturbed. Graded-laminated sand -> sandy silt -> silt. Bioturbated top. Irregular, ? bioturbated base. Sand, 0.5-1 mm grain size, is concentrated in lower few cm or so at the base and has laminae defined by alternations of quartz-rich and dark heavy mineral bands. One escape sand-filled burrow extends upsection from the coarse-grained laminated sandy base. Grain size of the burrow infill is 0.3-0.5 mm. The upper part of the bed has medium sand, 0.3-0.5 mm grain size, dispersed in silt. The top cm or so is mainly silt (? Turbidite).

430-440 cm. (Munsell Colour: 5Y6/1; 10R4/6) Graded-laminated very fine sand -> silt -> red clay caps. Appear almost to be rhythmites, but with irregular thickness variations. Irregular, bioturbated bases on the red (10R4/6) clays, and also on the base of some of the < 1mm thick sand laminae. Grain size of the sand is a maximum of 0.5 mm; more typically 0.19-0.25 mm in the lower 2-3 mm of each graded-laminated unit. The basal sands are overlain by ~ 1cm thick sandy silt unit, in which fine-medium grained sand (< 0.25 mm - 0.3 mm) is dispersed within the silt. This sandy silt is then topped by thin reddish clays, 2-3 mm thick. There is a small convolute fold (? due to core disturbance) @ 428-434 cm depth.

440-470 cm. (Munsell Colour: 5Y6/1) Massive structureless medium grey sandy silt, with sand grains 0.19-0.2 mm dispersed in the silt, or else concentrated as a few wispy-laminated intervals or bhorizontal mottles. Vague swirl structures (? due to bioturbation or natural disturbance).

TABLE B (continued)
87-023 Core Descriptions

470-471 cm. (Munsell Colour: 10R4/6) Red sandy silty clay, massive, Irregular base and top. Dispersed fine to medium sand (0.3-0.5 mm) in a silty clay. (? bioturbated or loaded contacts).
471-489 cm. (Munsell Colour: 5Y6/1). Massive medium grey structureless clayey silt. ? Vague burrows or stratification.

87-023-006P Section BA 0-80 cm

Top 8 cm of core slid forward during split.

05-13 cm. (Munsell Colour: 5Y5/2). Massive grey sandy silty mud.
13-14 cm. (Munsell Colour: 5Y3/1; 5Y2.5/1) Sharp based massive grey sand with vague dark laminae (5Y2.5/1) alternating with lighter 5Y3/1. Grain size 0.3 mm.
14-31 cm. (Munsell Colour: 5Y3/1; 5Y2.5/1) Banded, graded sand to silty sand. The darker more concentrated sands are 5Y2.5/1, which grade into the lighter 5Y3/1 silty sand. Sands are medium to coarse grained 0.5 - 1 mm+, in units of 2-3 cm thick; the overlying silty sands are 1-2 cm thick.
31-63 cm. (Munsell Colour: 5Y3/1; 5Y2.5/1). Thinly banded, graded sand to silty sand. The darker (5Y2.5/1) sands are coarse to very coarse grained , 1-1.5 mm grain size, in laminae up to 5 mm thick. The overlying lighter (5Y3/1) silty sands are vaguely mottled and are 1-2 cm thick.
63-70 cm. (Munsell Colour: 5Y5/2). Graded sand to silty sand. Medium to coarse grained sand (0.5 mm - > 1 mm grain size) graded into silty sand. The basal sand occurs between 67-70 cm depth. Sharp based. Upper part is mainly silty medium sand (maximum grain size 0.5 mm). (One bed, ? Turbidite)
70-80 cm. (Munsell Colour: 5Y5/2). Graded-laminated sands to silty sands. Very coarse sand (1-2 mm grain size at 80 cm) which grades to a coarse sand (1 mm grain size) at 70 cm depth. Vague laminations occur between 70-75 cm depth. (One bed, ? Turbidite).

87-023-007P Section ED 0-103 cm

00-05 cm. Disturbed. Silty sand, 0.5-1 mm sand in a silty mud.
05-60 cm. (Munsell Colour: 10YR6/4; 10YR4/1) Yellowish-tan 'wave-rippled' laminated and bioturbated sands with silty sand interlaminae. Scale of rippling is 2-3 cm thick formsets. Individual sand laminae are 2-3 mm thick, grain size is 0.5- 1mm; silty sand and silt interlaminae are 2-5 mm thick. Some zones are extensively bioturbated: 23-28 cm, 35-37 cm, 50-53 cm. Cross-bedding dips consistently in several directions. Wood sample retrieved 58-59 cm.

TABLE B (continued)
87-023 Core Descriptions

87-023-007P Section ED 0-103 cm

60-103 cm. (Munsell Colour: 10YR5/1) Vague banded/laminated and burrowed alternating dark sands and light medium grey silty sand. Sand/silt laminae appear to be 'wave-rippled' but the bioturbation level has increased such that primary laminations are only vaguely defined. Maximum sand grain size is 0.5-1 mm, thickness 2-3 mm thick; in the sandy silt the maximum grain size is 0.2-0.3 mm dispersed in the silt. There is more intense bioturbation @ 71-73 cm, 78-80, 88-91 and 98-103 cm.

87-023-007P Section DC 103-252 cm

103-123 cm. Bioturbated/mottled sand, sandy silt. Some of the burrows are infilled with openwork medium to coarse sand (0.5-1 mm grain size); others are vague reduced mottled patches. Vague remnant lamination of alternating dark sand, medium to fine grained, and lighter sandy silt -- laminations appear to be horizontal and parallel.

123-130 cm. Ungraded dark sand, 0.5-1 mm grain size, mainly quartrz, biotite and heavy mineral concentrations.

130-180 cm. Bioturbated/mottled gravel/granule sand, sandy silt. Some of the burrows are infilled with openwork medium to coarse sand (0.5-1 mm grain size); others are vague reduced mottled patches. Vague remnant lamination of alternating dark sand, medium to fine grained, and lighter sandy silt -- laminations appear to be horizontal and parallel. Dispersed coarser clasts (granule to pebble size) throughout.More concentrated sand laminae @ 158, 167 cm: grain size 0.3-0.5 mm.

180-252 cm. Massive vaguely laminated and bioturbated sandy silt. Shell debris retrieved from 183 cm depth for age determination. Some open sand filled irregular burrows scattered throughout, grain size of infill is up to 1 mm. A ? Dropstone pebble (~ 2.5 cm across) @ 227 cm depth; smaller granule @ 216 cm depth.

252-406. Massive vaguely laminated and bioturbated sandy silt. Sand occurs as concentrations of open-work infills of burrows. Sand concentrated @ 290-298; 320 cm depth as 'remnant laminae' which have been admixed by bioturbation. % of Sand decreases from 320-350 cm; % Sand increases from 370-380 cm; % Sand decreases from 380-406 cm. The maximum sand is 1-2 mm mainly as burrow infills.

TABLE B (continued)
87-023 Core Descriptions

87-023-007P Section CB 406-533 cm (? Correct Section #)

406-531 cm. As interval 252-406. More concentrated sand lenses ('remnant laminae", burrow infills) @ 430,434, 440, 450 cm. Sand lenses are 0.75-1 cm thick in irregular bands 1-3,5 cm across. Mottling is extensive from 406-424 cm and infill of burrows is mainly medium sand, 0.5-1 mm grain size. Below this interval the mottling is slightly less extensive and the sand size increases within the burrow infills to 1-1.5 mm. There are more even beds preserved @ 430,434,485 and 498 cm. The "remnant bedding' @ 485 & 498 has bioturbated tops and irregular, bioturbated or loaded bases, and occur within graded intervals. As such these may represent remnant turbidite bands. The other beds @ 430 and 434 cm are not in graded intervals but as alternations of coarse sand and silt, with sharp base and top and may represent bioturbation of material transported by ice-rafting or as concentrated sandy mass-flows (as opposed to the graded remnant banding @ 485 & 498 which were much more muddy sediment gravity flows).

531-533 cm. Concentrated graded sand, 1-2 mm grain size at base to 0.75-1mm grain size at top (One bed, ? Turbidite).

87-023-007P Section BA 533-555 cm (? Correct Section #)

533-555 cm. Laminated dark sands alternating with silty sands. Appear to be 'rhythmitic' (? Glacial varving). Grain size consists of 0.5-1 mm concentrated in the basal 3-5 mm of each couplet, overlying this is a sandy silty, with dispersed 0.3-0.5 mm in silt, in units 0.5-1 cm thick.

87-023-009P

00-04 cm. (Munsell Colour: 5y4/1). Graded grey massive sand – silty sand with scattered small shell fragments. Grain size 1-2 mm, mainly quartz and biotite; top 3-4 cm is more silty with dispsersed sands, 0.5-1 mm grain size.

04-22 cm. (Munsell Colour: 5y4/1) Graded-laminated/burrowed sands--silty sands. Basal sands of each couplet are 0.5 mm grain size, 0.5-1 cm thick; overlying silty sands consist of 0.3-0.5 mm sand dispersed in a silty, 1 cm thick. Gradational contact between sands and silty sands. Vague burrowed boundaries between beds.

TABLE B (continued)
87-023 Core Descriptions

87-023-009P

22-24 cm. (Munsell Colours: 5Y6/2; 5Y4/1). Granules alternating with sandy silt. ? burrowed remnants of graded-laminated units. Granule bands are sharp-based, grain size 2-5 mm, consisting of quartz, red-iron stained (brick coloured) quartz grains, in 2-3 mm thick laminae; which grade into silty sands with a grain size of 0.3-0.5 mm.
24-26 cm. (Munsell Color: 5Y5/2) Green tan sandy silt. Irregular base and top, ? bioturbated. Scattered 1-2 mm granules a base as burrow infills (?)
26-28 cm. (Munsell Color: 5Y7/1) Light grey silt lens, irregular ? burrowed or liquefied; irregular, ? burrowed base.
28-29 cm. (Munsell Color: 5Y4/1) Dark medium grey sandy silt, grain size 0.3-0.5 mm dispersed in a silt. Irregular lens -- ? burrowed remnant of a bed. @ base a 2 mm thick irregular light grey silt lens as @ 26-28 cm (? liquefied injections??).
29-46 cm. (Munsell Colors: 5Y6/2; 5Y6/1) Vaguely graded-laminated/bioturbated ssands-- silty sands as in 4-22 cm. grain size @ base is dispersed 2-3 mm quartz grains in a silt. Vague laminations defined by alternating darker (5Y6/1) concentrated (2-3 mm thick) and dispersed lighter (5Y6/2) (3-5 mm) thick laminae.
46-48 cm. (Munsell Color: 5Y7/1) Massive grey silt. Irregular, ? bioturbated base.
48-50 cm. (Munsell Color: 10R3/4) Reddish, garnet (?) rich dark sand, 1-2 mm grain size.
50-55 cm. (Munsell Color: 5Y3/1) Graded coarse sand to fine to medium sand. grain size in lower cm is 0.5-2 mm; grain size in upper 4 cm is o.3-0.5 mm.

87-023-010P

Top 7 cm has slid forward.

00-02 cm. (Munsell Color: 5Y4/1to 5Y5/2) Coarse sand, 0.5-1mm grain size, with shell fragments. ? Vaguely laminated.
02-34 cm. (Munsell Color: 5Y4/1to 5Y5/2) Vaguely graded-laminated / bioturbated sands. Sands are 1-12 mm grain size, mainly quartz, heavy minerals, biotite. The sands are sharp-based, lenticular, laminae dipping at ~ 10 - 15° to the horizontal, and a thickness of 0.5- 1 cm. Mottled . These sands grade into silty sand, 2-5 cm thick, which are mainly structureless. @ depths of 02-07 cm sands become coarser grained, reaching a maximum grain size 0f 3-5 mm. Large shell fragment @ 31 cm.

TABLE B (continued)
87-023 Core Descriptions

87-023-010P

34-36 cm. (Munsell Color: 5Y4/1). Grey sand, 0.5-1 mm. Structureless, Sharp base and sharp top.
36-48 cm. (Munsell Color: 5Y5/1) Light grey silty sand, maximum grain size 1-2mm, shelly debris, quartz sand. Irregular, ? scoured or loaded base.
48-53. (Munsell Color: 5Y5/1) Light-medium grey silty sand, maximum grain size 1-2 mm; % sand increases toward centre -- siltier toward the top and toward the basal 1 cm of the bed.
53-55 cm. (Munsell Color: 10YR6/1) Light grey massive silt.
55-68 cm. (Munsell Colors: 5Y4/1to 5Y5/2) Vaguely graded-laminated sand to silty sand. Mottled darker sands (5Y4/1) alternating with lighter (5Y5/2) sandy silt/ silty sand. The conenctrated sands are 0.5-1 mm grain size, in laminae 1-2 cm thick ; the lighter silty sands/ sandy silts are 0.5 mm dispersed in a silt, in laminae 2 mm thick.
68-80 cm. (Munsell Color: 5Y5/1) Coarse granule silty sand, grain size 0.5-2 mm. Shell debris @ 74 cm. Irregular, ? loaded base.
80-95 cm. (Munsell Color: 5Y4/1) Graded sand to silty sand. Sand more concentrated in lower 5 cm of bed, grain size 0.5-1 mm; upper part is more silty, consisiting of 0.5-1 mm grains dispersed in a silt.
95-132 cm. (Munsell Color: 5Y6/1) Light grey bioturbated silty sand, 0.3 mm grains dispersed in a silt. In upper 5 cm there are dark irregular, reduced burrows

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87-023-011P Section ED 0-101 cm

00-04 cm. (Munsell Color: 5Y4/2) Soupy medium grey silty sand, o.3-0.5 mm dispersed in a silt.
04-25 cm. (Munsell Colors: 5Y3/1to 5Y5/2) Vaguely graded-laminated sands to sandy silts. The basal darker sands (5Y4/1) laminae are 0.5-1 mm grain size, 0.5-1 cm thick; these grade into a lighter sandy silt/ silty sand (5Y5/2), 0.3-0.5 mm dispersed in a silt, 1-2 cm thick. The laminations are discontinuous to wispy across-core and may be bioturbated remnants.
25-64 cm. (Munsell Color: 5Y4/1to 5Y5/2) Graded-laminated fine sand to silt. Laminations are better defined, comprised of alternating dark (5Y4/1) fine sands 0.3-0.5 mm grain size , laminae 0.5-0.75 cm thick; graded into lighter grey/tan (5Y5/2) silts, 1-1.5 cm thick.
64-101 cm. (Munsell Color: 5Y4/1to 5Y5/2) Vaguely graded-laminated sands to sandy silts. The basal darker sands (5Y4/1) laminae are 0.3-0.5 mm grain size, 0.5 cm thick; these grade into a lighter sandy silt/ silty sand (5Y5/2), 0.25-0.3 mm dispersed in a silt, 1-1.5 cm thick. The laminations are discontinuous to wispy across-core and may be bioturbated remnants.

TABLE B (continued)
87-023 Core Descriptions

87-023-011P Section DC 101-254 cm.

101-146 cm. (Munsell Color: 5Y4/1to 5Y5/2) Vaguely graded-laminated/ burrowed sand -> silty sand -> sandy silt. The basal dark (5Y4/1) sands, grain size 0.5- 1 mm, 0.5- 1 cm thick; grade into lighter 5Y5/2) sandy silts, with dispersed 0.3-0.5 mm sands in a silt background. Bioturbated throughout. More concentrated prominent sand laminae @ 124, 125 cm.

146-147 cm. (Munsell Color: 5Y4/1to 5Y5/2) As above unit 101-146 cm, but intensity of bioturbation has decreased with better preservation of primary laminations. Darker sands range in thickness from 0.5 mm - 0.5 cm.

147-180 cm. (Munsell Color: 5Y5/1) Massive sandy silt, dispersed fine sand 0.3 mm grain size in a silt.

180-205 cm. (Munsell Color: 5Y5/1) Vaguely graded-laminated/ mottled fine sand to silt. Graded laminations more defined @ 200-205 cm depth, same as in 101-146 cm depth.

205-218 cm. (Munsell Color: 5Y5/1) Vaguely laminated/ mottled fine to medium sand in a silt.

218-230 cm. (Munsell Color: 5Y5/1) As above unit 101-146 cm, but intensity of bioturbation has decreased with better preservation of primary laminations. Darker sands range in thickness from 0.5 mm - 3 cm.

230-254 cm. (Munsell Color: 5Y5/1) Vaguely laminated/ mottled sand, 0.3-1 mm dispersed in a silt.

87-023-011P Section CB 262-408 cm.

262-300 cm. (Munsell Color: 5Y5/1) Vaguely laminated/ mottled sandy silty clay, 0.3 mm sand dispsersed in a silty clay. Where sand is more concentrated as burrow infills it reaches a maximum grain size 0f 0.3-0.5 mm.

300-328 cm. Massive dispersed sand and shell fragments in a silty clay. Vague mottles 326-328 cm.

328-333 cm. (Munsell Colors: 5Y5/1; 5Y6/2) Laminated sands and silts. Dark grey concentrated sands (5Y5/1), grain size 0.3f-0.5 mm, thickness 0.5- 1 cm; alternating with lighter (5Y6/2) sandy silts, with 0.3 mm sand dispersed in a silt, 1-1.5 cm thick. One graded sand to silty sand from 331-333 cm, grain size @ base 0.5-1 mm.

333-351 cm. (Munsell Color: 5Y5/1) Sandy silty with dispersed sand, 0.5 mm in a silt. Vague wispy-laminations (? cross-cutting), possible swirl structures (? internal folds or large scale bioturbation).

TABLE B (continued)
87-023 Core Descriptions

87-023-011P Section CB 262-408 cm.

351-380 cm. (Munsell Color: 5Y5/1) Mottled sandy silty mud, 0.5 mm dispersed in a silty mud. Shell fragment @ 374 cm.
380-408 cm. (Munsell Color: 5Y4/1; 5Y4/2) Somewhat less mottled than unit above with better preservation of laminations, consisting of alternating darker (5Y4/1) and lighter (5Y4/2) sandy silty muds, 0.5 mm dispersed in silty mud.

87-023-011P Section BA 408-560 cm.

408-434 cm. (Munsell Color: 5Y5/1; 5Y6/2) . Medium (5Y6/2) to dark (5Y5/1) grey silty sand/ sandy silty clay , 0.2 mm dispersed in a silty clay. Vague swirl structures and mottling (?).
434-505 cm. (Munsell Color: 5Y6/2; 5Y3/1). Mottled sandy silt, dispersed 0.2 mm in a light (5Y6/2) silty clay, with dark (5Y3/1) reduced burrows, which are slightly coarser-grained, 0.2-0.3 mm concentrated.
505-531 cm. (Munsell Color: 5Y6/1) . Light grey structureless silt (? Glacial, ? Goldthwait Sea ?? deposits)
531-560 cm. (Munsell Color: 5Y4/1; 5Y6/1). Well defined graded-laminated cycles of darker (5Y4/1) sandy silt, 0.19 mm sand dispersed in silt, lamina thickness 0.5- 2 cm thick; alternating with lighter (5Y6/1) siltier laminae, 1-3 cm thick.

87-023-017P

00-05 cm. (Munsell Color: 10YR4/3) Brown-yellow sand with a prominently scoured base (~ 4-5 cm of erosion down into underlying clay).Coarse sand (1-3 mm grain size, poorly sorted, and unstratified). (? Fluvial)
05-13 cm. (Munsell Color: 5Y5/1; 5Y3/1). Light Grey clay with dark (5Y3/1) reduced burrow patches).
13-35 cm. (Munsell Color: 5Y5/1; 5Y5/3) Silt. Grey (5Y5/1) with light yellow grey (5Y5/3) swirl structures.
35-201 cm. (Munsell Color: 5Y5/1; 5Y3/1) Grey structureless silt, with scattered dark (5Y3/1) sand-infilled burrows @ 117 cm & 166 cm.
201-352 cm. (Munsell Color: 5Y5/1) Massive grey structureless silty mud. Few scattered dark (5Y3/1) sand-infilled burrows, grain size 0.5 mm. Shell @ 270 cm; Sand-filled burrows more prominent 300-303 cm; Vague swirl structures 330-340 cm.

TABLE B (continued)
87-023 Core Descriptions

87-023-25P Section DC 00-52 cm.

00-52 cm. (Munsell Color: 5Y3/2; 5Y4/1) Mottled black organic and medium grey sandy silt. Medium to coarse sand dispersed in a silty mud. Many small gas-escape structures. (? Deltaic/Tidal Flat deposits)

Rest of core sealed for gas subsampling.

87-023-23P

Upper 2 cm or so has slid forward -- logged as 0-2 cm.

00-02 cm. (Munsell Color: 10YR4/3) Yellow-brown coarse sandy, poorly sorted, unstratified deposit; cut ~ 4 cm into underlying mud. (?Fluvial)

02-406 cm. (Munsell Color: 5Y5/1) Massive Light grey silty mud. Scattered dark sand-filled burrows, grain size 0.5 mm. Mottles are vaguely defined.

406-555 cm. (Munsell Color: 5Y6/1) Very fine sand dispersed in a silty clay. Massive, structureless, little or no bioturbation.

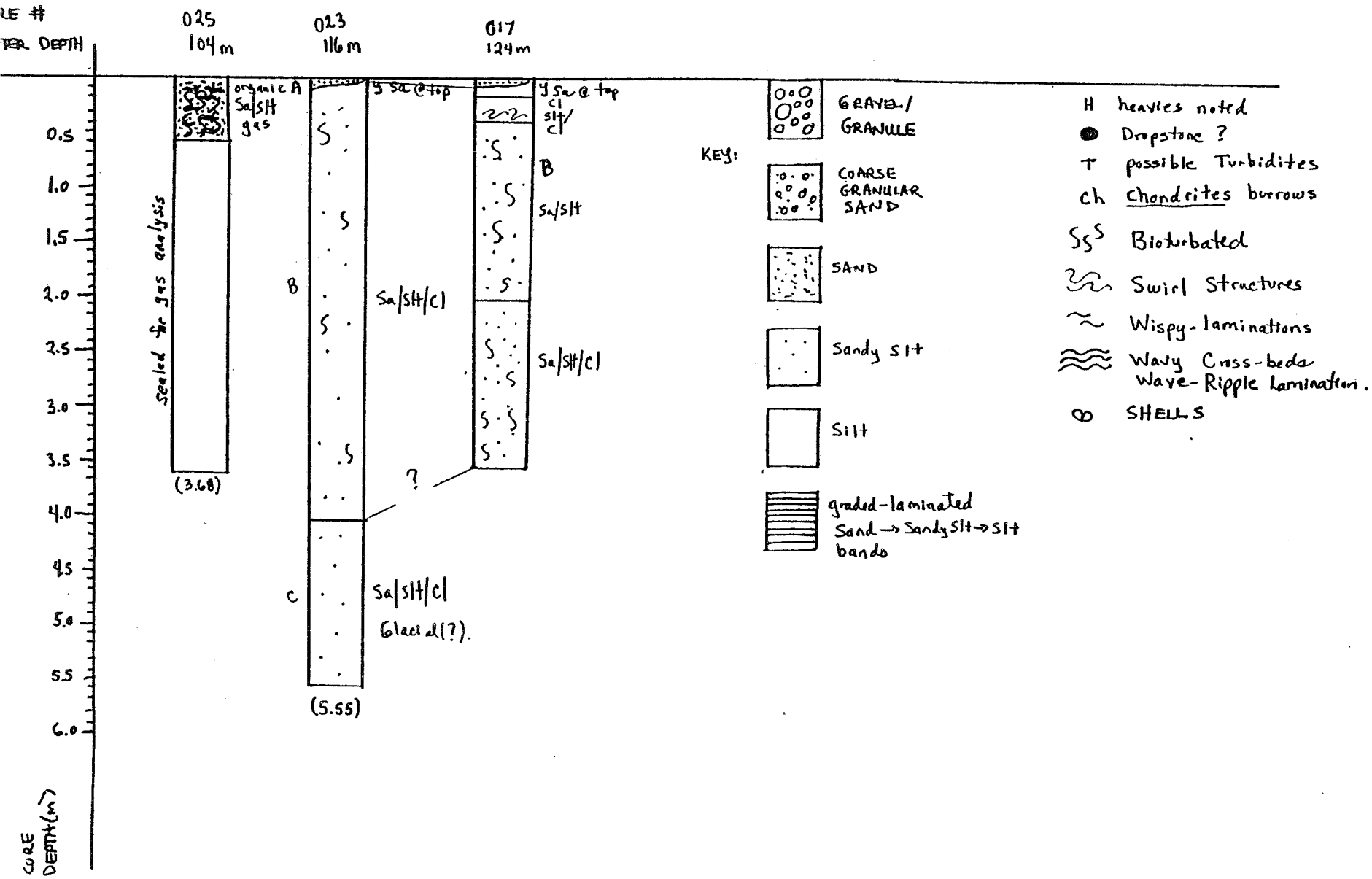

TABLE C - Preliminary facies and correlations for cores from the Sept Isles area.

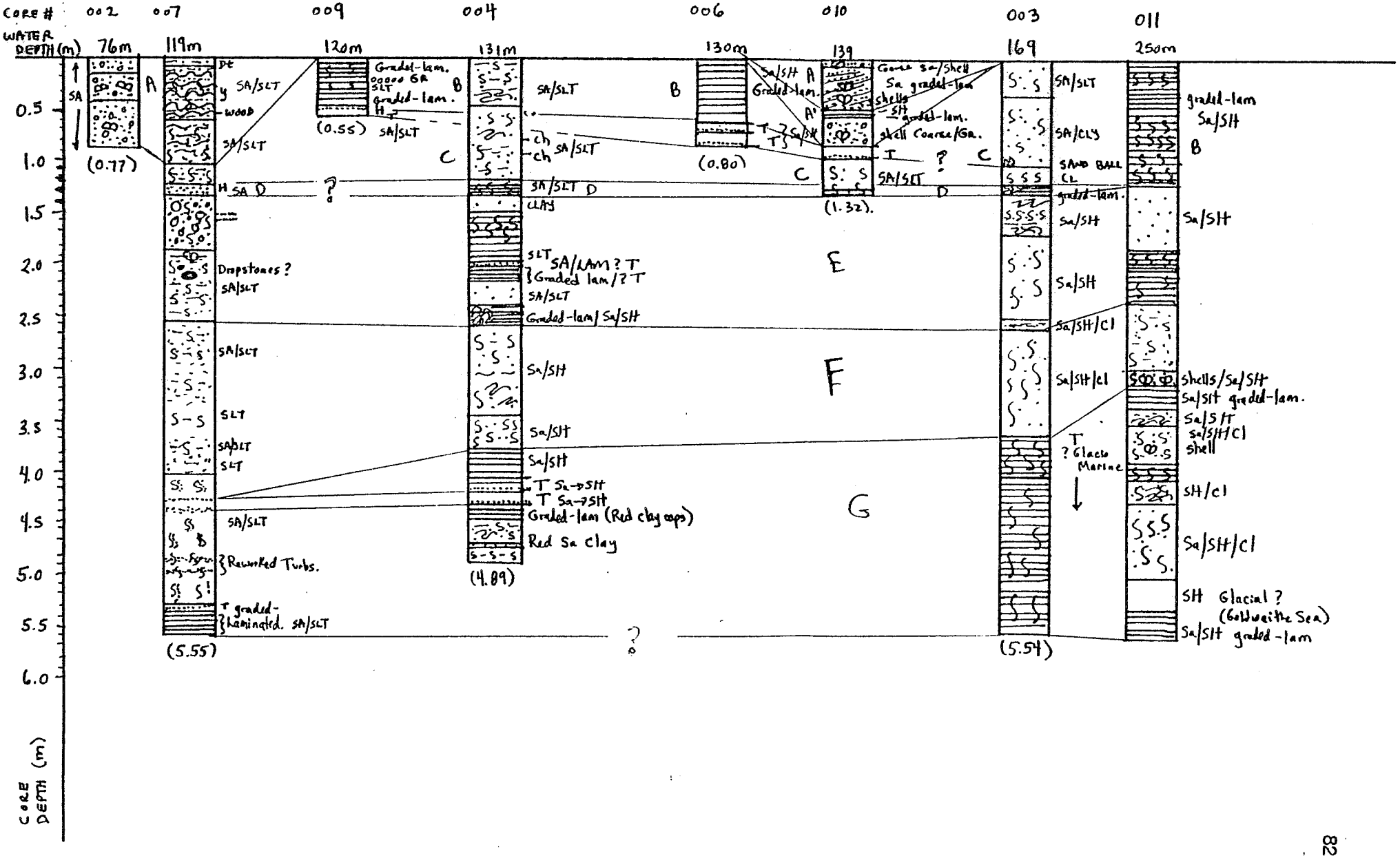

TABLE D - Preliminary facies and correlations for cores from the Péninsule de Manicouagan area.

APPENDIX 2

Foraminiferal Analyses

by

A. Miller

Sampling and Processing Methods

Quantitative (20cc) sediment samples were taken from the grab samples, and the core catchers before the cores were sealed. When the core catcher contained less than 20cc of sediment (i.e. a thin coating), a qualitative sample (unmeasured) was collected instead. All samples were washed with tap water through 500μ and 63μ steel seives. Washed samples were stored in a mixture of water, methanol (as a preservative) and $CaCl_2$ buffer (to balance the pH and prevent dissolution).

After splitting, describing and geotechnical measurements and subsampling were complete, the cores were subsampled for foraminiferal studies. 20cc samples were taken at approximately 50cm intervals and at marked lithologic boundaries. Subsamples were stored in sealed plastic vials in sea water and buffer.

Subsample Collection

Gulf of St. Lawrence

- 1 subsample from grab 15 for surface fauna control (processed and examined)
- 18 core catcher samples from: 1P, 1TW, 2P, 3P, 3TW, 4TW, 5P, 5TW, 6P, 6TW, 7P, 7TW, 8P, 8TW, 9P, 9TW, 11P, 11TW (processed and examined)
- 77 subsamples from 8 piston cores as follows: 2P (4 subsamples), 3P (14), 4P (15), 6P (4), 7P (15), 9P (4), 10P (6), 11P (15); see Table 10 for subsample depths

Sept Isles

- 6 subsamples from grabs 16, 18, 20, 22, 24 and 26 (processed and examined)
- 4 core catcher samples from: 17P, 19P, 19TW and 23P (processed and examined)
- 23 subsamples from 3 piston cores as follows: 17P (8), 23P (12), and 25P (3); see Table 10 for subsample depths

Observations

Grab sample 15 from the Gulf of St. Lawrence contained a deep estuarine/open marine calcareous fauna, dominated by Globobulimina auriculata; co-dominated by Islandiella helenae, I. norcrossi, and I. islandica. Also present are Cassidulina reniforme, Nonionellina labradorica, Bulimina exilis and minor occurrences of Glandulina sp., Oolina sp., Lagena sp., Quinqueloculina seminula, Bulimina aculeata.

This modern fauna is also present in the following core catcher samples: 1P, 1TW, 3TW, 04TW, 5TW, 6TW, 7P, 7TW, 9TW and 11TW.

The remaining core catcher samples contain the following:

2P: sandy sparse fauna, Cibicides lobatalus and I. norcrossi. Possibly a bank fauna or indicative of high wave energy.

3P, 5P: almost entirely fecal pellets and clays. Contains a sparse fauna, Globobulimina auriculata and I. helenae.

6P: almost barren, few G. auriculata.

8TW: barren

8P: Islandiella spp.

9P: very sandy, barren

11P: clays, barren

Results

Most cores do not penetrate sediments older than Holocene though 11P may penetrate a glacial marine sequence. None of the core catcher samples contain a classic glacial marine fauna. The absence of Elphidium excavatum in almost all samples is noted.

Based on core lengths and catcher samples, a substantial portion of sediment is missing from the tops of cores 6P and 9P.

Cores 2P and 8P come from the shallowest water depths, which may in part reflect their sparse faunas at the base.