BASELINE SURVEY OF THE PROPOSED WESTERN LONG ISLAND SOUND III *DREDGED MATERIAL DISPOSAL SITE*

JANUARY 1982

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1.0 INTRODUCTION

During recent months the New England Division of the U.S. Army Corps of Engineers has been assessing the feasibility of designating a disposal site for dredged material in Western Long Island Sound. As a result of that assessment, one particular area, identified as the WLIS III site, has emerged as potentially the most viable location for disposal. Although general information on the environmental conditions at this site are known, more detailed and site specific data are required for design and management of the disposal operation and post-disposal monitoring effort. Consequently, the Disposal Area Monitoring System (DAMOS) program conducted a baseline survey of the area in late January 1982.

The major objectives of the baseline survey were to determine the overall topography and sediment distribution within the site, to assess the containment potential of the area, to measure the background levels of sediment chemistry and water quality, to describe the benthic population in the site, and to assess the potential impact of disposal on fishing interests in the area. Finally, these data were to be used to define a specific location within the site for installation of a taut wire disposal buoy. This location would then be studied in detail to provide baseline information for future monitoring efforts should the site be designated for disposal.

Because any disposal site in Western Long Island Sound must be located in the general vicinity of active fishing grounds,

a special effort was made by DAMOS investigators to contact local fishermen. This was accomplished through two information forums which were held in Huntington, N.Y. on 18 January, and in Norwalk, Conn. on 28 January, 1982, and through numerous personal communications with individual fishermen and industry representatives.

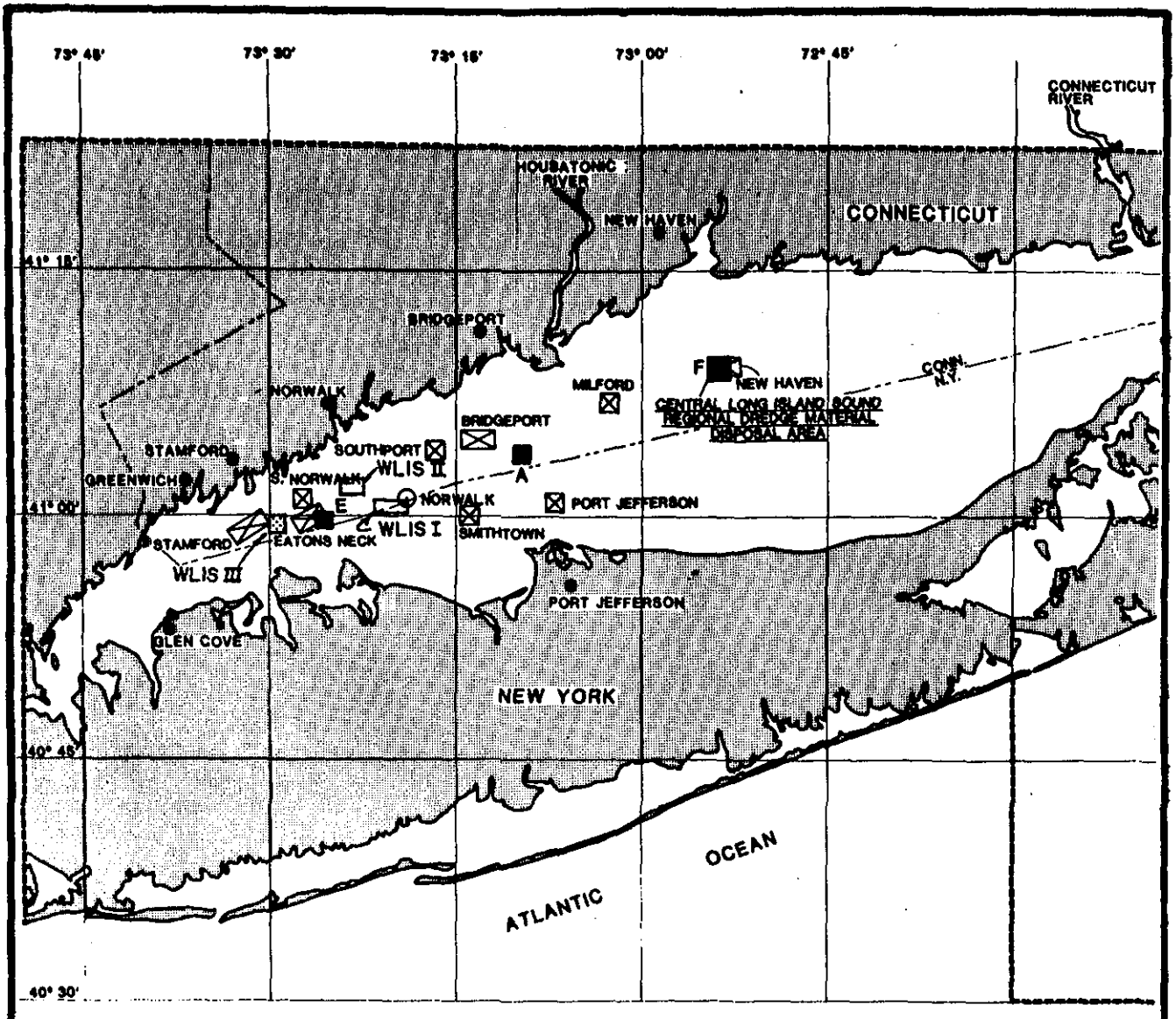
This report provides a summary of the January survey results from WLIS III. Based on the information discussed here a management plan can be developed to insure that controlled disposal of dredged material occurs in a safe and efficient manner.

2.0 OVERALL SITE CHARACTERISTICS

The WLIS III site (Figure 2.0-1) is located 2.5 nautical miles north of Lloyd Point, between two previously used disposal sites designated as the Stamford and Eaton's Neck dumping grounds. The depth in the center of the site is approximately 32 meters and the sediments are known to consist primarily of fine silts and clays. The smooth bottom topography of the site contrasts with the rougher topography of the surrounding area which results primarily from previous disposal operations.

Currents in the area are known to flow generally in an east-west direction with maximum tidal velocities on the order of 25 cm/sec. The wave climate at the site is controlled primarily by the fetch distance, which is only significant in an easterly direction.

Prime lobster fishing grounds are located east and west



KEY:

- ⊠ HISTORICAL DREDGED MATERIAL DISPOSAL SITES
- ■ PROPOSED ALTERNATIVE DREDGED MATERIALS DISPOSAL SITES (DRAFT PEIS, JUNE 1981)
- □ OTHER POTENTIAL SITES (DAMOS AND OTHERS)
- ⊠ PROPOSED SITE - WLIS III

5 0 5 10
STATUTE MILES

5 0 5 10
KILOMETERS

5 0 5 10
NAUTICAL MILES

HISTORICAL & PROPOSED DREDGED MATERIAL DISPOSAL SITES

FIGURE 2.0-1

of the site at the previously used disposal sites; in the vicinity of Cable and Anchor Reef, and in a deep east-west trending channel farther to the east. Benthic macrofaunal assemblages should be composed of polychaete worms, bivalves, etc. which are associated with mud and fine grained sediment types.

The following sections describe the results of measurements undertaken during the January 1982, DAMOS cruise to verify and quantify the above general observations.

2.1 WLIS III Bathymetry and Side Scan Data

In order to evaluate the overall bathymetry and sediment distribution in the disposal area a side scan survey was conducted covering the WLIS III site. Navigation control for this and all other aspects of the cruise was provided by the SAI Navigation and Data Acquisition System which provides $\pm$2 meter position accuracy for all environmental measurements through computerized integration of a micro-wave positioning system and various oceanographic sensors. Shore stations for the microwave positioning system were established at the Eaton's Neck Coast Guard Station at $40^{o}57.23'N$, $73^{o}23.75'W$ and at the Connecticut Light and Power Company in Norwalk, Connecticut at $41^{o}04.25'N$, $73^{o}24.5'W$. Using these points as a reference, a survey grid consisting of eleven, east-west oriented lanes, 3000 meters long and spaced 200 meters apart was established over the proposed disposal site (Figure 2.1-1). A Klein Side Scan Sonar System was towed over this grid using a 100 meter sweep to provide nearly complete coverage of the entire area.

Simultaneous with the side scan survey, a bathymetric

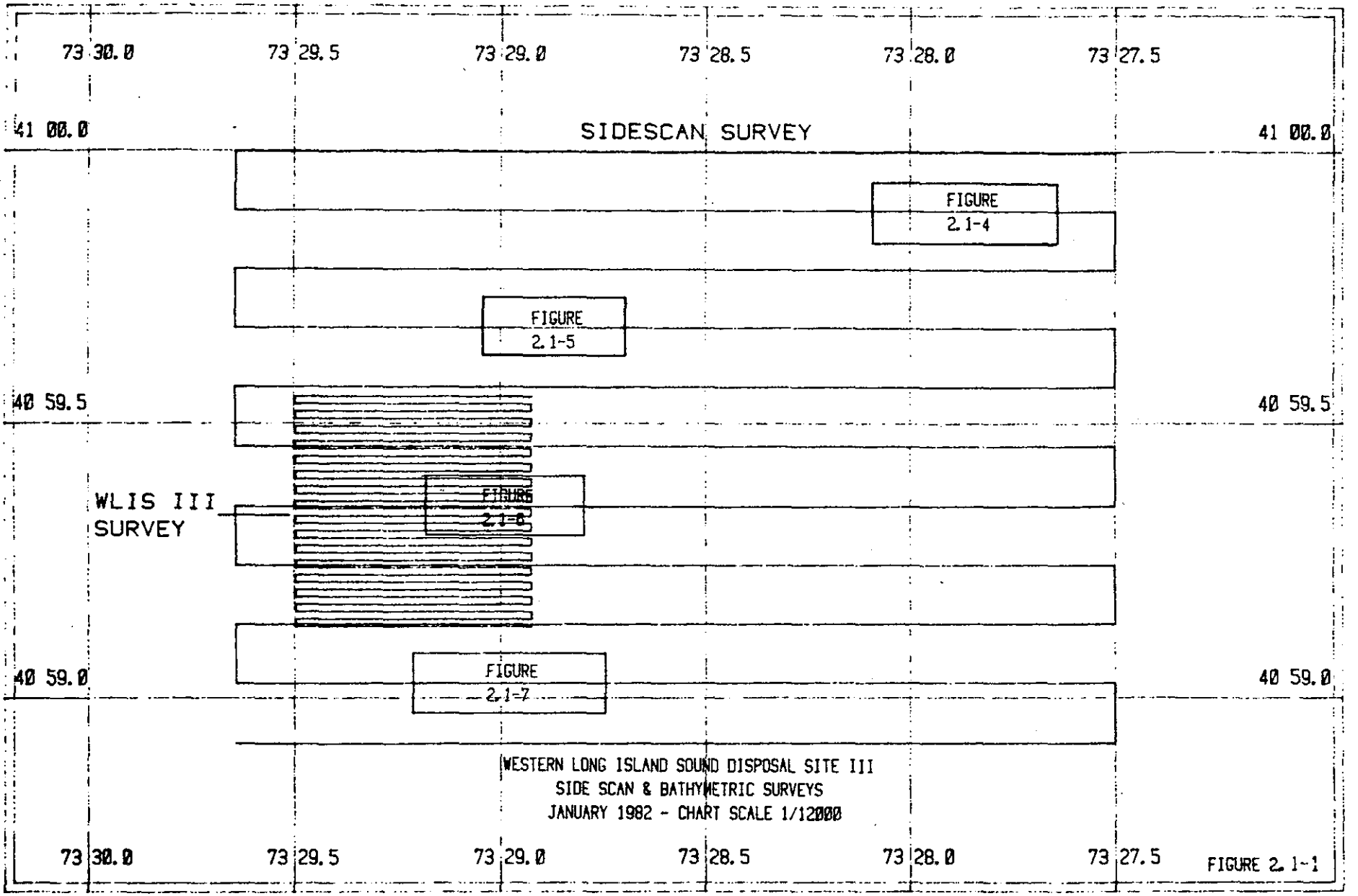

73 30.0
73 29.5
73 29.0
73 28.5
73 28.0
73 27.5
41 00.0
SIDESCAN SURVEY
FIGURE 2.1-4
FIGURE 2.1-5
40 59.5
WLIS III SURVEY
FIGURE 2.1-6
FIGURE 2.1-7
40 59.0
WESTERN LONG ISLAND SOUND DISPOSAL SITE III
SIDE SCAN & BATHYMETRIC SURVEYS
JANUARY 1982 - CHART SCALE 1/12000

FIGURE 2.1-1

survey was obtained using a 24KHZ fathometer system. A contour chart generated from that data is presented in Figure 2.1-2 and a three dimensional view of the site from a north-east perspective is presented in Figure 2.1-3. The area surveyed is an east-west trending trough that deepens to a maximum depth of 34.7 meters in the south western portion of the area. Both the north and south slopes into the trough are fairly uniform although there are some topographic features in the northeast portion of the chart in depths less that 28 meters, and a small promontory about 300 meters wide occurs on the south slope. The bottom of the trough flattens toward the west, so that a natural basin with topographic relief of less than one meter covers a rectangular area of 500 X 1500 meters oriented in an east-west direction. Such a basin would make an excellent disposal site assuming the sediment and current conditions indicated a low-energy, depositional regime that would act as a containment site.

The first step in evaluation of the sediment parameters is an analysis of the side scan data. Representative sections of the side scan records are presented in Figures 2.1-4,5,6, and 7 from the respective locations shown in Figures 2.1-1. Most of the northeast and east sections of the survey site had bottom characteristics similar to Figure 2.1-4 which shows a rough microtopography characteristic of a relatively coarse bottom. Sediment samples taken from the area revealed a coarse shell hash covering the sediment-water interface.

Moving towards the north central portion of the area (Figure 2.1-5) the sediments become finer and the bottom return from the side scan indicates a much smoother surface with

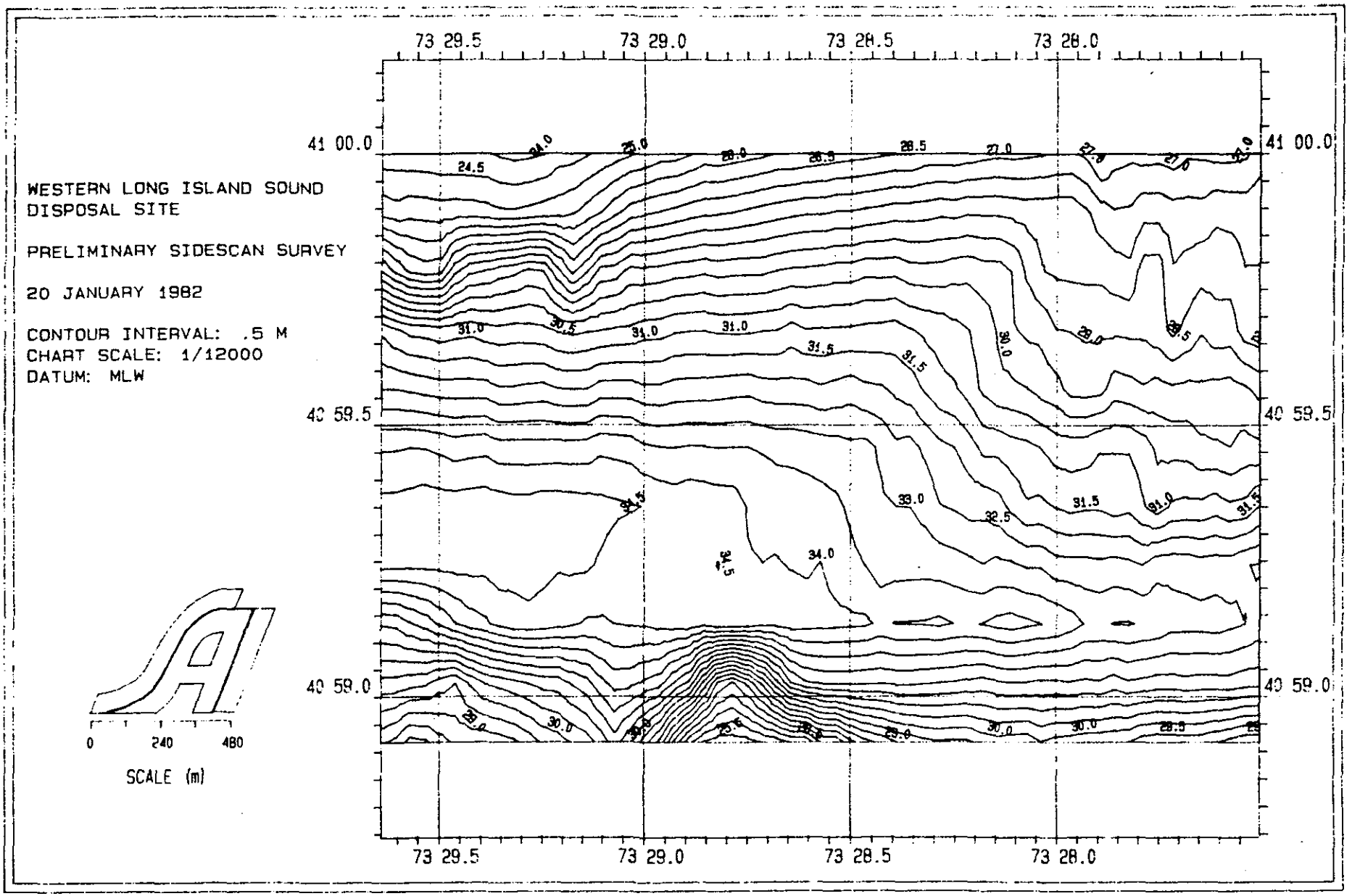

WESTERN LONG ISLAND SOUND
DISPOSAL SITE
PRELIMINARY SIDESCAN SURVEY
20 JANUARY 1982
CONTOUR INTERVAL: .5 M
CHART SCALE: 1/12000
DATUM: MLW
73 29.5
73 29.0
73 28.5
73 28.0
41 00.0
40 59.5
40 59.0
0
240
480
SCALE (m)

Figure 2.1-2

WESTERN LONG ISLAND SOUND DISPOSAL SITE
PRELIMINARY SIDESCAN SURVEY
20 JANUARY 1982
VERTICAL EXAGGERATION: 50X

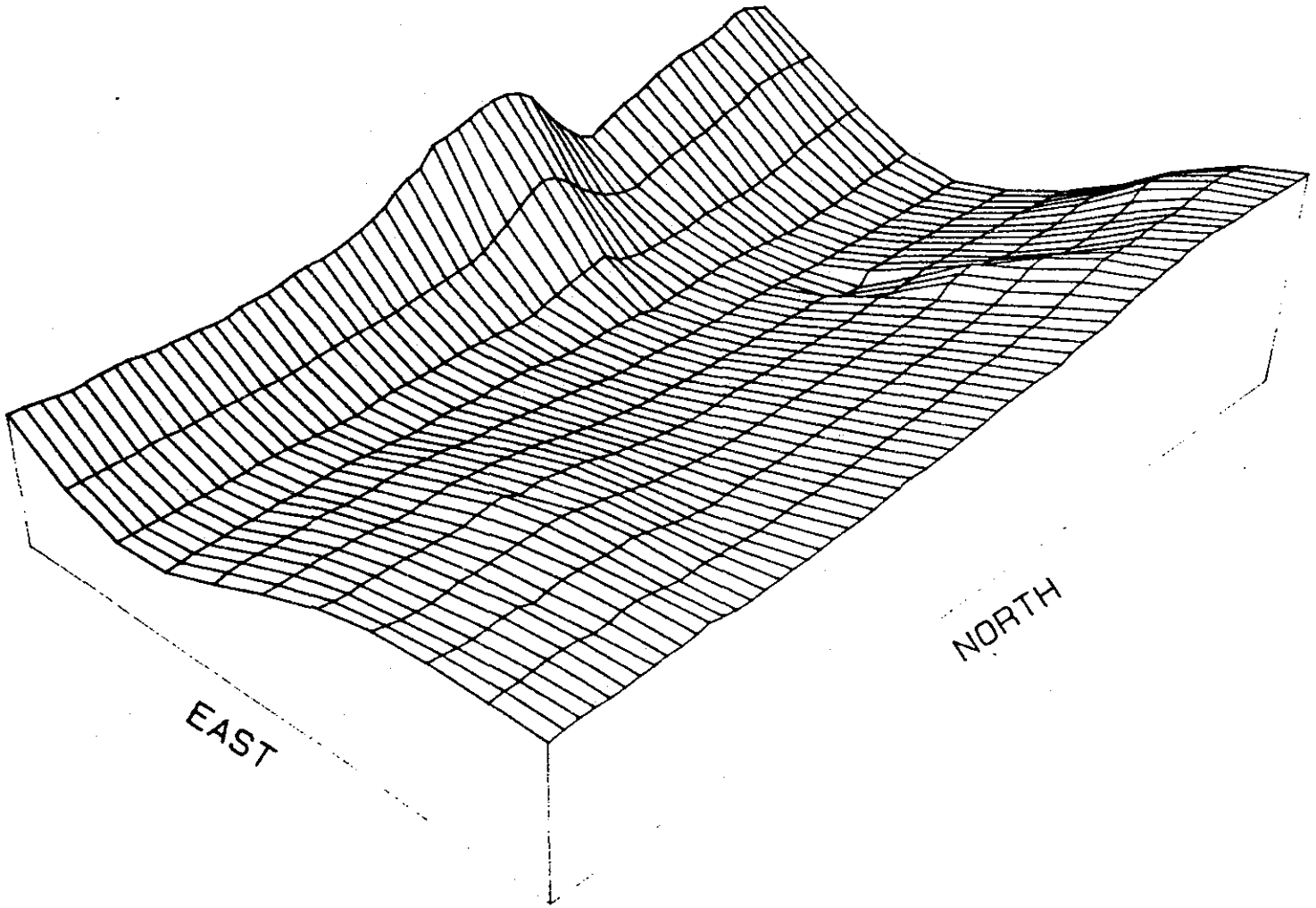
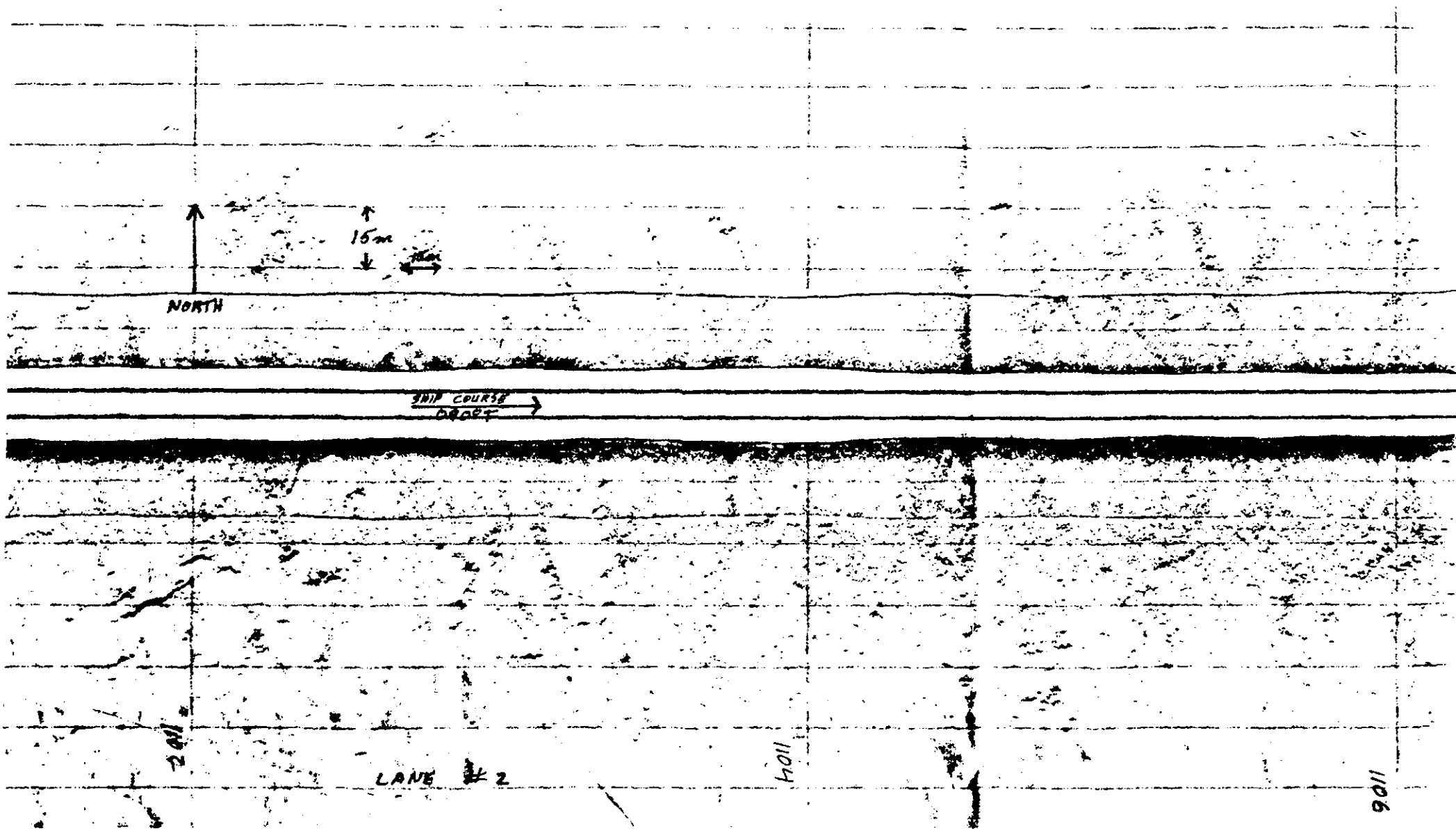
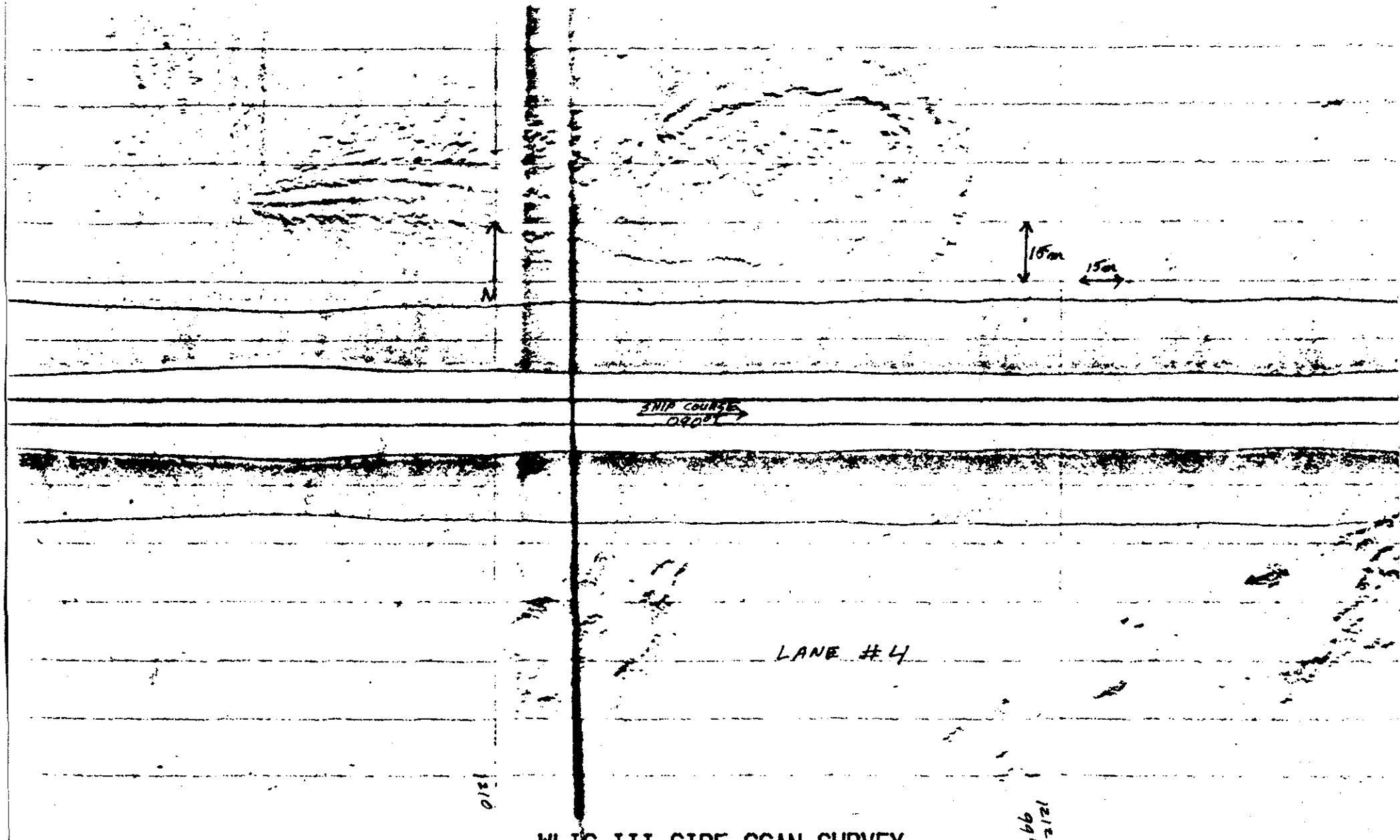


Figure 2.1-3



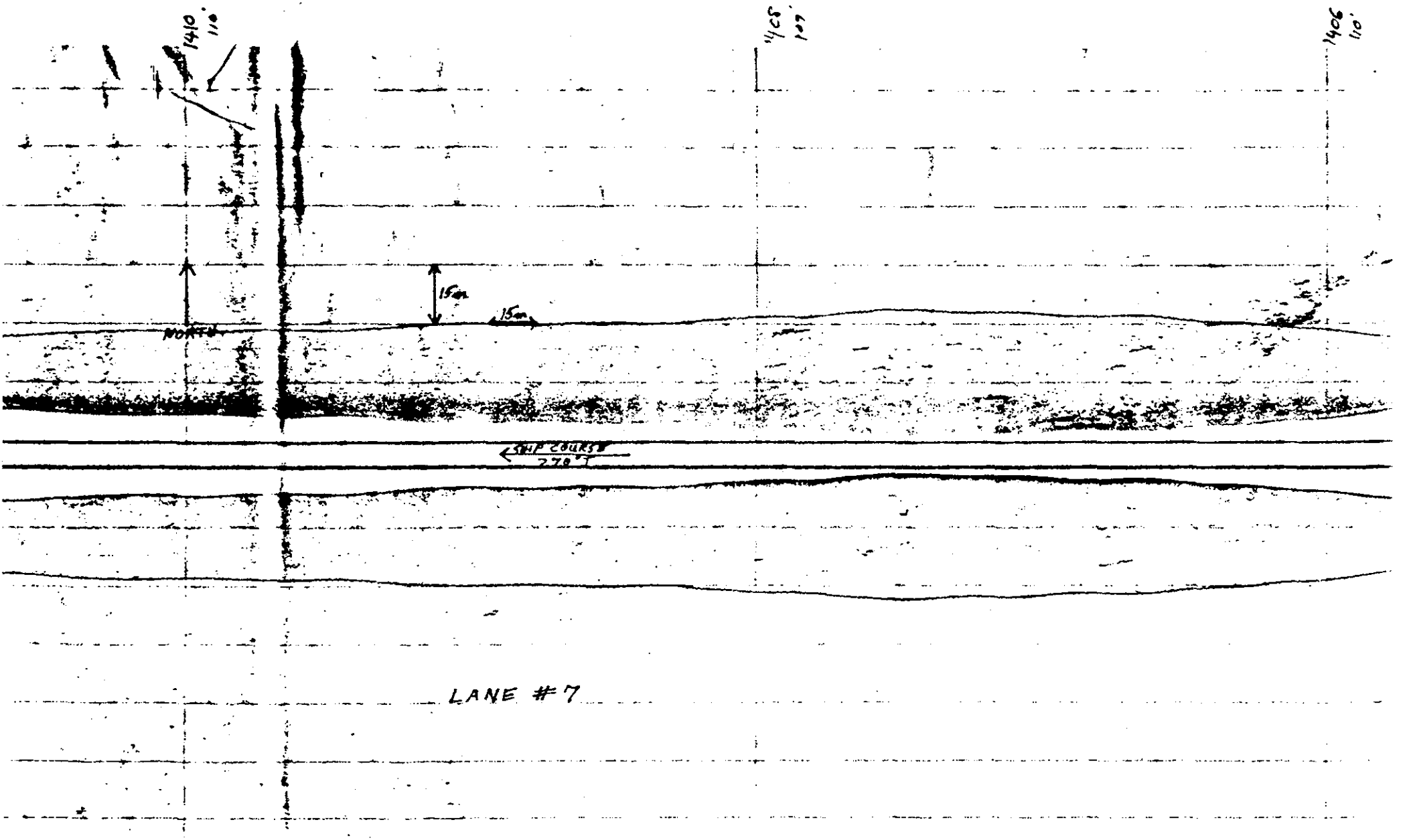
WLIS III SIDE SCAN SURVEY
LANE #2
REPRESENTATIVE BOTTOM RETURN

FIGURE 2.1-4



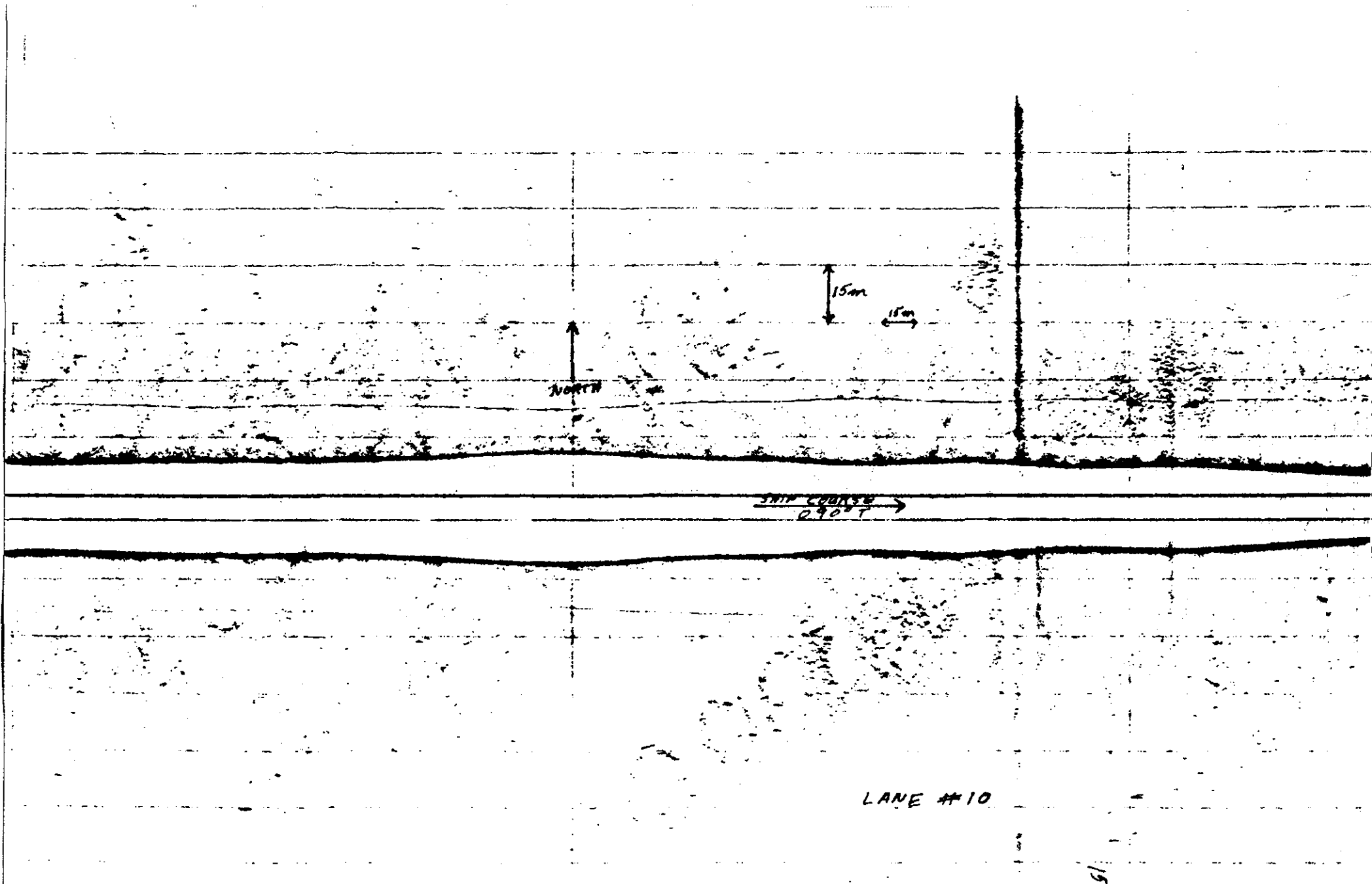
WLIS III SIDE SCAN SURVEY
LANE #4
REPRESENTATIVE BOTTOM RETURN

FIGURE 2.1-5



WLIS III SIDE SCAN SURVEY
LANE #7
REPRESENTATIVE BOTTOM RETURN

FIGURE 2.1-6



WLSS III SIDE SCAN SURVEY
LANE #10
REPRESENTATIVE BOTTOM RETURN

FIGURE 2.1-7

occasional outcrops of coarser material. A large (350m long) scour mark, most likely from an otter trawl indicates some bottom fishing may occur in this softer sediment.

Figure 2.1-6, taken from the bottom of the east-west trough at approximately 34 meters depth, shows an extremely flat bottom with no microtopographic features. A side scan record such as this is indicative of a soft muddy bottom which would be constant in depth and composition over a relatively large area.

The southern slope of the trough (Figure 2.1-7), like the north and east portion of the survey area, has a mottled surface expression indicative of coarser sediment. Characteristic features of the side scan records from this area are elliptical rings with high returns surrounding a low return area. These rings are generally aligned in a southwest to northeast direction and vary in return strength. At this time, the source of these features is unknown, however, they may be the result of lobster pot trawls. Should designation of this site occur, these features would be examined by divers during a subsequent monitoring cruise.

In summary, the side scan records indicate that the trough located in the southwest corner of the WLIS III area would be a suitable disposal site. The sediments in that location are fine grained muds and the bottom is smooth and featureless. The lack of topography suggests that lobster habitat in this region would be negligible and one would expect a relatively low diversity and population density of benthic organisms. Finally, the continuity in the bottom conditions provides a good background for monitoring of disposal operations, since variability in measured environmental parameters would be small.

2.2 Sediment Samples

A series of sediment samples were obtained over the survey area as shown in Figure 2.2-1 to provide physical and chemical data for support of the side scan survey and to obtain representative benthic population samples within the WLIS III site. Two replicate samples were obtained at each site, one for bulk sediment analysis and a second for support of biological investigations. The locations and descriptions of the sediment samples are provided in Table 2.2-1.

The grain size data for these samples (Table 2.2-2) indicate that the sediments were consistent with the side scan records and generally varied according to depth. Samples taken toward the margins of the site, in shallower water, tended to have coarser surface sediments overlying gray cohesive clays and silts. In the deeper areas of the site, the sediments were a dark organic silt that was much less oxidized and had a strong odor. All samples had a thin oxidized surface layer, similar to the fluff layer observed at the Central Long Island Sound Disposal Sites. This oxidized sediment is moved by tidal currents throughout the area while the reduced material remains in place, unless affected by bioturbation. Samples from the proposed disposal point (1869-1887) were fine silty clays with a mean grain size of approximately .01mm and showed very little variability between samples.

Bulk sediment chemistry analyses were performed on all samples obtained from this site. The results of these analyses are presented in Table 2.2-3 and a comparison with data provided in the WLIS III Environmental Impact Statement and DAMOS samples

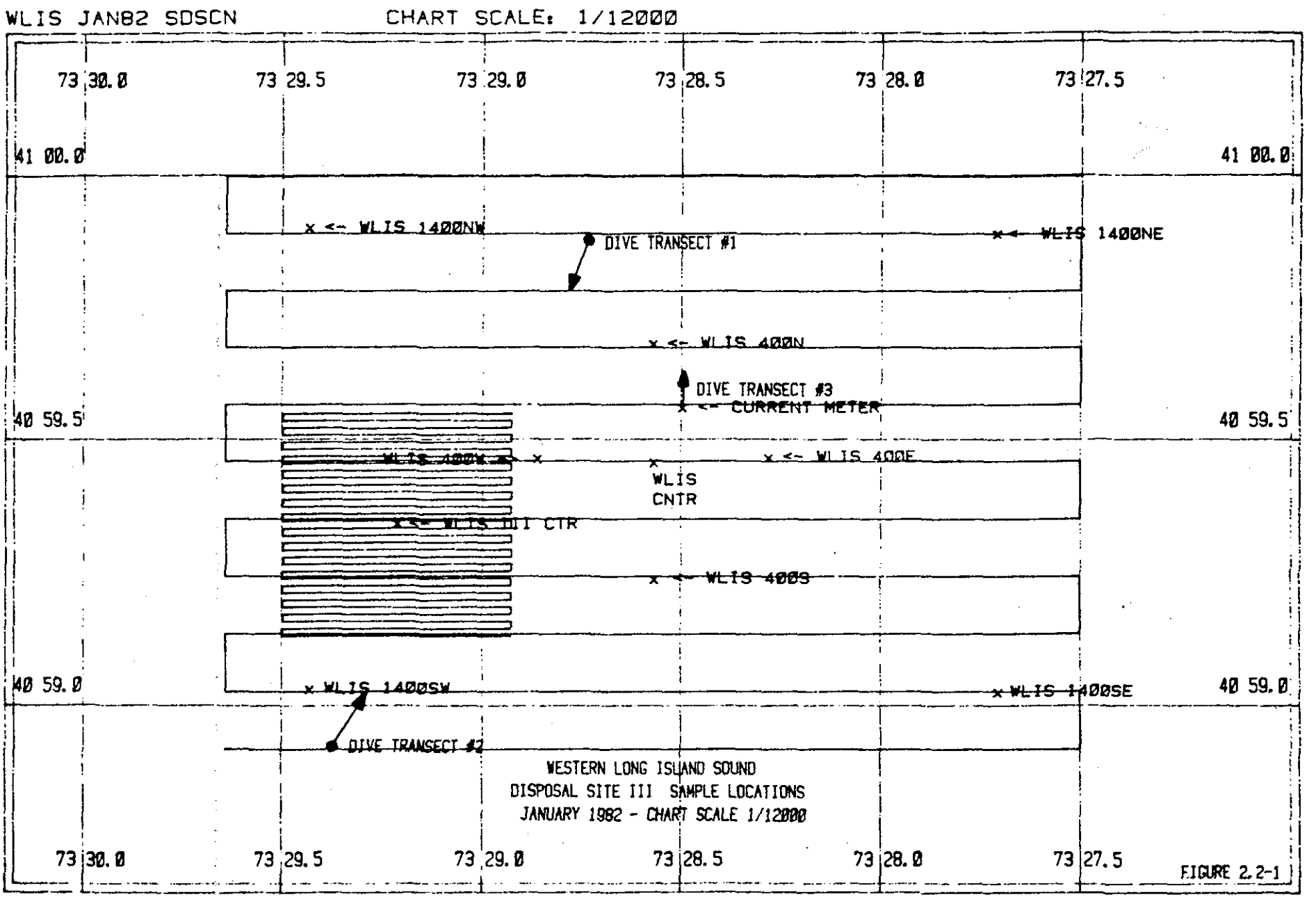

WLIS JAN82 SDSCN
CHART SCALE: 1/12000
73 30.0
73 29.5
73 29.0
73 28.5
73 28.0
73 27.5
41 00.0
40 59.5
40 59.0
x <- WLIS 1400NW
DIVE TRANSECT #1
x <- WLIS 1400NE
x <- WLIS 400N
DIVE TRANSECT #3
x <- CURRENT METER
WLIS 400W
x <- WLIS 400E
WLIS
CNTR
x <- WLIS III CTR
x <- WLIS 400S
x WLIS 1400SW
x WLIS 1400SE
DIVE TRANSECT #2
WESTERN LONG ISLAND SOUND
DISPOSAL SITE III SAMPLE LOCATIONS
JANUARY 1982 - CHART SCALE 1/12000

FIGURE 2.2-1

Table 2.2-1. Location and Description of Sediment Samples Obtained in the Proposed WLIS III Disposal Area

Station Designation	Location	Depth (m)	Red Range	Green Range	Description
WLIS Ctr	40°59.46' 73°28.57'	31.4	10541	7897	oxidized silt layer over dark organic silt, slight odor
400E	40°59.46' 73°28.28'	32.6	10315	7566	oxidized layer with shell hash and some gravel over black organic silt
400N	40°59.68' 73°28.57'	32.0	10195	8255	less oxidized black organic silt with coal cinders and slight odor
400W	40°59.46' 73°28.86'	33.5	10756	8255	small oxidized layer over black organic silt, strong odor
400S	40°59.24' 73°28.57'	35.0	10883	7690	Oxidized layer over black organic silt, strong odor
1400SE	40°59.03' 73°27.71'	32.6	10659	6451	Shellhash and oxidized silt layer over light gray cohesive clay, no odor
1400SW	40°59.03' 73°29.43'	30.8	11868	8613	oxidized silty sand over gray cohesive clay, no odor
1400NW	40°59.90' 73°29.43'	25.3	10601	9358	Coarse sand over silt, no odor
1400NE	40°59.90' 73°27.71'	28.3	9234	7409	shell hash and oxidized silt layer over gray cohesive clay
WLIS III-CTR	40°59.34' 73°29.21'	33.5	11226	8578	fine silt oxidized layer over black organic silt with strong odor, few animals present

TABLE 2.2-2

GRAIN SIZE DATA
WLIS III - JANUARY, 1982

SAMPLE #	LOCATION	DEPTH (m)	25% DIAM (mm)	50% DIAM (mm)	75% DIAM (mm)	MEAN (mm)	SORTING COEFF.
1838	WLIS CTR	31.4	.0040	.0097	.022	.012	.43
1841	400E	32.6	.0085	.0360	.290	.078	.21
1844	400N	32.0	.0025	.0088	.030	.013	.29
1847	400W	33.5	.0021	.0086	.017	.009	.48
1850	400S	35.1	.0026	.010	.024	.012	.33
1853	1400SE	32.6	.0023	.011	.035	.016	.26
1856	1400SW	30.8	.013	.020	.028	.061	.68
1859	1400NW	25.3	.020	.390	.540	.317	.19
1862	1400NE	28.3	.0042	.018	.13	.051	.18
1869	DSPSL PT	34.8	.0019	.013	.023	.013	.29
1871	DSPSL PT	34.8	.0022	.0098	.030	.014	.27
1873	DSPSL PT	34.8	.0020	.0067	.016	.008	.34
1885	DSPSL PT	34.8	.0040	.0093	.016	.010	.5
1887	DSPSL PT	34.8	.0010	.009	.015	.008	.26

SAMPLE NUMBER	STATION	DATE OBTAINED	OIL AND GREASE	PERCENT SOLIDS	PERCENT VOLITILE SOLIDS-NED	PERCENT VOLITILE SOLIDS-EPA	HG	PB	ZN	AS	CD	CR	CU	NI	V	NH3	COD
1838	WLIS-CTR-A	01-19-82	380	33.50	4.49	7.90	0.11	78	210	20	6	120	110	48	160	-	67600
1839	WLIS-CTR-A	01-19-82	380	33.50	4.49	7.80	0.11	78	210	20	6	120	110	48	160	-	67600
1840	WLIS-CTR-B	01-19-82	260	35.92	5.27	8.72	0.20	20	180	8	4	10	46	51	145	842	72000
1841	WLIS-400E-A	01-19-82	270	49.30	3.60	5.94	0.16	63	140	13	3	68	90	31	160	-	61700
1842	WLIS-400E-A	01-19-82	270	49.30	3.60	5.94	0.16	63	140	13	3	68	90	31	160	-	61700
1843	WLIS-400E-B	01-19-82	340	44.02	3.60	6.10	0.20	74	180	9	5	70	82	59	145	460	67000
1844	WLIS-400N-A	01-19-82	260	41.40	4.73	7.48	0.08	81	210	14	3	120	110	44	160	-	61700
1845	WLIS-400N-A	01-19-82	260	41.40	4.73	7.48	0.08	81	210	14	3	120	110	44	160	-	61700
1846	WLIS-400N-B	01-19-82	270	38.08	4.48	7.93	0.20	92	240	10	5	100	140	73	145	789	79000
1847	WLIS-400W-A	01-19-82	580	36.00	5.32	8.37	0.03	77	190	16	3	98	95	39	160	-	67700
1848	WLIS-400W-A	01-19-82	580	36.00	5.32	8.37	0.03	77	190	16	3	98	95	39	160	-	67700
1849	WLIS-400W-B	01-19-82	310	39.42	5.15	8.03	0.05	88	230	10	5	100	160	75	145	556	72000
1850	WLIS-400S-A	01-19-82	240	44.00	5.06	7.75	0.12	69	170	13	6	110	87	46	160	-	65200
1851	WLIS-400S-A	01-19-82	240	44.00	5.06	7.75	0.12	69	170	13	6	110	87	46	160	-	65200
1852	WLIS-400S-B	01-19-82	63	32.97	5.14	8.09	0.05	100	200	9	4	59	100	55	145	735	78000
1853	WLIS1400SE-A	01-19-82	47	46.80	3.28	5.95	0.03	20	84	13	3	53	23	30	160	-	47600
1854	WLIS1400SE-A	01-19-82	47	46.80	3.28	5.95	0.03	20	84	13	3	51	23	30	160	-	47600
1855	WLIS1400SE-B	01-19-82	150	45.97	3.29	5.43	0.05	31	120	8	4	13	26	64	145	739	46000
1856	WLIS1400SW-A	01-19-82	160	57.90	2.26	3.68	0.06	48	110	8	3	56	57	25	160	-	28900
1857	WLIS1400SW-A	01-19-82	160	57.90	2.26	3.68	0.05	46	110	8	3	56	57	25	160	-	28900
1858	WLIS1400SW-B	01-19-82	220	50.15	3.25	5.00	0.10	44	120	7	4	48	70	40	145	508	47000
1859	WLIS1400NW-A	01-19-82	130	58.10	1.65	3.23	0.06	35	81	5	3	45	44	17	160	-	35400
1860	WLIS1400NW-A	01-19-82	130	58.10	1.65	3.23	0.06	35	81	5	3	45	44	17	160	-	35400
1861	WLIS1400NW-B	01-19-82	73	67.44	1.51	2.60	0.05	20	88	7	4	19	47	30	145	356	26000
1862	WLIS1400NE-A	01-19-82	160	50.10	2.40	4.73	0.07	39	110	12	3	64	59	26	160	-	33700
1863	WLIS1400NE-A	01-19-82	160	50.10	2.40	4.73	0.07	39	110	12	3	64	59	26	160	-	33700
1864	WLIS1400NE-B	01-19-82	70	49.91	2.96	5.62	0.05	37	93	7	4	37	39	54	145	455	69000
1866	WLIS-CTR-1	01-19-82	270	34.11	5.00	8.39	0.00	84	210	11	4	89	110	61	145	-	-
1868	WLIS-CTR-2	01-19-82	340	37.98	4.92	7.91	0.00	95	240	9	6	110	140	53	145	-	-
1870	WLIS-CTR-3	01-19-82	320	34.34	5.28	8.56	0.00	96	250	10	10	110	160	60	145	-	-
1872	WLIS-CTR-4	01-19-82	320	32.75	4.66	8.47	0.00	80	230	12	9	98	140	63	145	-	-
1874	WLIS-CTR-5	01-19-82	410	32.80	5.87	8.15	0.00	90	220	8	7	82	130	54	145	-	-
1885	WLIS-CTR-A	01-19-82	130	33.55	5.08	8.19	0.08	25	250	14	4	14	74	63	145	71	99000
1888	WLIS-CTR-C	01-19-82	520	30.76	5.34	8.36	0.05	20	210	11	4	50	91	44	145	832	110000

* SAMPLES 1866-1888 FROM PROPOSED WLIS III DISPOSAL POINT

DISPOSAL AREA MONITORING SYSTEM (DAMOS)
SEDIMENT SAMPLE DATA

WESTERN LONG ISLAND SOUND III DISPOSAL AREA

VALUES IN PARTS PER MILLION (PPM)

Table 2.2-3

from the Central Long Island Sound Disposal Site is shown in Table 2.2-4.

In general, the samples from the WLIS III site have higher concentrations of metals than expected from the EIS data and significantly higher values than Central Long Island Sound. These higher values are particularly apparent in the samples from the designated disposal point where in the case of Cu and Zn the concentrations are nearly double the expected levels.

Hg values for WLIS data are consistantly low, to the extent that problems with the analysis procedures and detection levels should be considered as the most probable explanation rather than actual sediment properties.

The presence of coal cinders, leaves and other terrestrial material suggests that some of the sediment in this site may actually be dredged material that was deposited during previous operations. Since most of the sediment in the basin consists of relatively anoxic, organic silts with relatively high levels of metal concentration it is doubtful that additional disposal of dredged material would significantly alter the existing sediment conditions.

2.3 Current Measurements

An Endeco Type 174 ducted impeller current meter was deployed during the survey period to provide an assessment of the containment potential of the site through a comparison of data previously obtained at the Eaton's Neck Disposal Site. The meter was deployed at $40^{o}59.55'N$, $73^{o}28.51'W$ (Figure 2.2-1) in the standard DAMOS configuration, 1.5 meters above the bottom, at 1230 on 19 January 1982 and retrieved at 1040 on 26 January to provide

TABLE 2.2-4

METAL	WLIS III EIS	CLIS (DAMOS '79)	WLIS	WLIS III DISPOSAL PT.
CR	63	40	71	79
Hg	.26	.26	.09	.02(Trace)
Cu	73	51	76	121
Ni	48	18	41	57
Pb	41	44	56	70
Zn	117	134	150	230

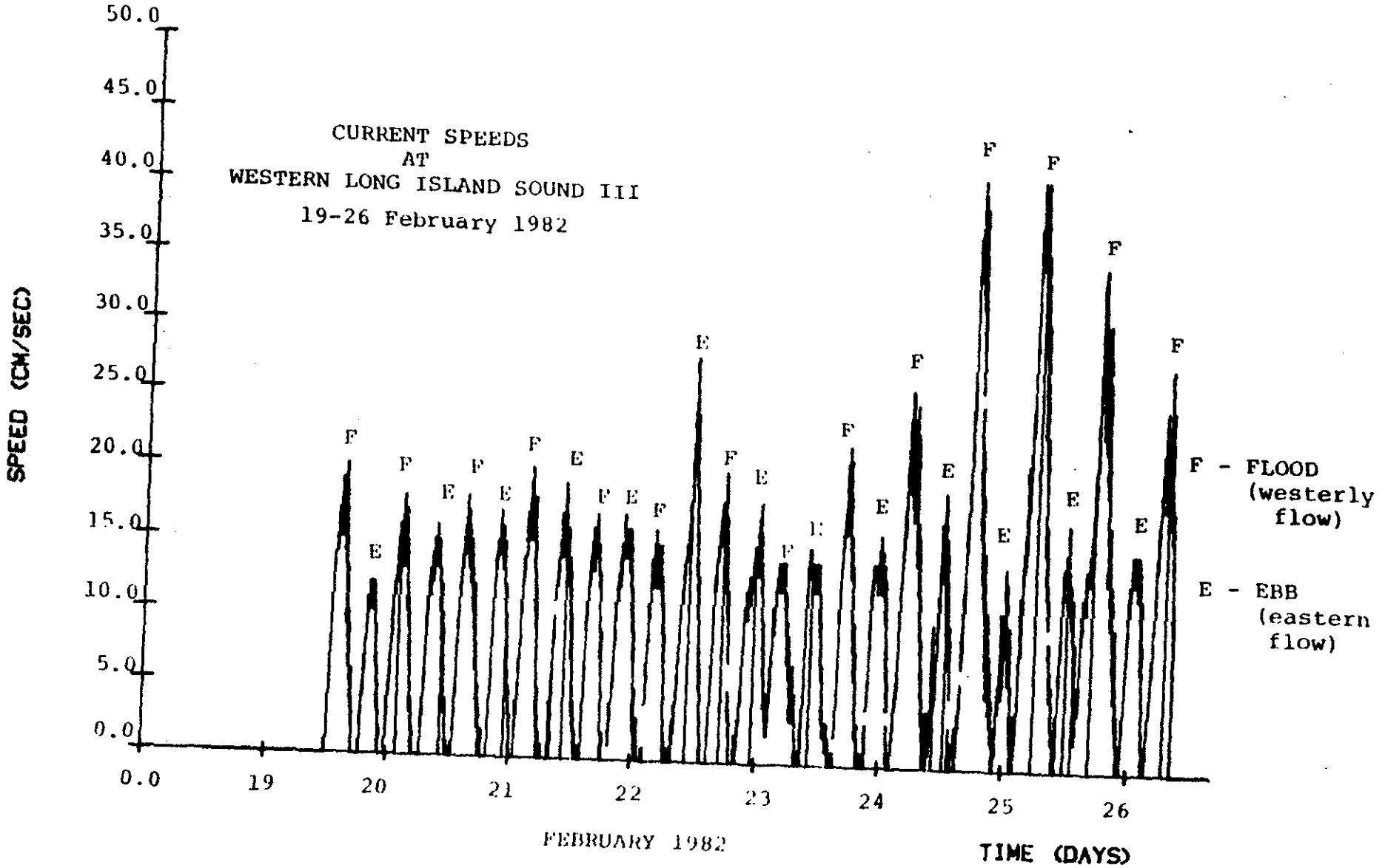
Table 2.2-4. Comparison of Heavy Metal Concentrations from Bulk Sediment Analysis.
(all values = mean PPM)

approximately one weeks worth of data.

The direction sensor on the instrument did not operate correctly during the deployment, however, the speed data were unaffected and the results of the measurement period are presented in Figure 2.3-1. Although the direction is not accurately known, the general flow can be inferred by relating the time to current velocity so that the ebb (easterly) and flood (westerly) cycles can be distinguished.

In general, the peak tidal velocities encountered were slightly higher than those described in the EIS for WLIS III (flood - 15cm/sec, ebb - 25cm/sec) and were stronger in the flood rather than ebb direction. Mean flood velocities were on the order of 20cm/sec while ebb velocities were about 18cm/sec. Toward the end of the survey period, peak velocities for the flood cycle increased dramatically to 45cm/second although the ebb values remained essentially constant. Some of this increase can be attributed to spring tides which showed an increase in height from 1.9 to 2.2 meters at Bridgeport during the survey period. However, most of this velocity increase probably results from high winds which occurred on January 24 and 25. Wind speeds on the 25th were over 30 knots and caused cancellation of survey operations on that day. Such a current response to wind conditions, partcularly from the east, resulting in higher westerly flows is consistant with previous observations both in Western and Central Long Island Sound sites.

Although the velocities associated with the wind conditions are significantly higher than normal conditions at the site, they are not large enough to cause concern over the



FEBRUARY 1982

FIGURE 2.3-1

long term stability of sediments at the WLIS III site. Tidal currents at the New London disposal site are consistently greater than 40 cm/sec, often reaching values of 60-70cm/sec, however, the dredged material deposited at the site remains stable with only slight alterations in surface features attributable to tidal current effects.

2.4 Transmissometer Data

Measurements of turbidity were obtained on 26 January, using a Martek model XMS transmissometer. Vertical profiles were made at 1045 during slack high water, at 1500 near maximum ebb flow and at 1645 during slack ebb conditions. Water samples were obtained with a Niskin bottle at the surface, mid-depth, and bottom for calibration of the transmissometer results. The data obtained from this study are presented in Tables 2.4-1,2 and 3.

Suspended sediment concentrations of 2.65 mg/l were observed at the bottom during the maximum ebb flow. These values are consistent with earlier measurements obtained at the Central Long Island Sound site and are significantly less than recent values (8 - 15 mg/l) observed on natural bottom south of Bridgeport, Connecticut (Bohlen, pers. comm.). On all three profiles, the percent of transmission decreases gradually from surface to bottom although the gradient is steeper on the final profile at slack ebb conditions. On this profile, surface waters appeared clearer and bottom waters more turbid than the other profiles, however, total suspended material values did not support this variability. In summary, the suspended sediment load at the site was not increased to any significant amount by the wind and

Western Long Island Sound III

January 26, 1982

10:45

Depth (m)	Transmission (%)	Water Samples
Surface	18.0	(1A) Surface
		Suspended material: 1.60 mg/L
2	17.5	Salinity: 27.78°/oo
4	17.2	Temperature: -1.0°C
6	17.5	
8	17.5	
10	17.5	
12	17.5	
14	17.5	(1B) 14.6 meters
16	17.7	Suspended material: 1.62 mg/L
18	17.8	Salinity: 27.84°/oo
20	17.6	Temperature: -1.0°C
22	17.2	
24	17.0	
26	16.8	
28	16.6	
30	16.6	
32	14.5	
34	16.0	
36	15.0	
38	15.0	(1C) Bottom
		Suspended material: 1.79 mg/L
		Salinity: 27.86°/oo
		Temperature: -0.5°C

VERTICAL PROFILES OF
WATER COLUMN
TURBIDITY
PROPOSED WLIS III DISPOSAL SITE
TABLE 2.4-1

Western Long Island Sound III

January 26, 1982

15:00

Depth (m)	Transmission (%)
Surface	17.8
2	18.0
4	17.2
6	17.5
8	18.1
10	18.2
12	17.5
14	17.0
16	17.1
18	16.7
20	17.0
22	17.1
24	17.1
26	17.0
28	16.9
30	16.3
32	15.9
34	15.4
36	11.0

Water Samples

(2A) Surface

Suspended material: 2.57[a] 2.27[b] mg/L

Salinity: 27.77 27.80°/oo

Temperature: -1.2°C -1.2°C

(2B) 15.2 meters

Suspended material: 2.26 mg/L

Salinity: 27.81°/oo

Temperature: -1.0°c

(2C) Bottom

Suspended material: 2.65 mg/L

Salinity: 27.80°/oo

Temperature: -1.0°C

VERTICAL PROFILES OF
WATER COLUMN
TURBIDITY
PROPOSED WLIS III DISPOSAL SITE
TABLE 2.4-2

Western Long Island Sound III

January 26, 1982

16:45

Depth (m)	Transmission (%)		Water Samples	
	Down	Up		
Surface				
2	20.5	20.4	(3A) Surface	
4	20.0	20.5	Suspended material:	1.91 mg/L
6	20.2	20.1	Salinity: 27.48°/oo	
8	20.2	19.5	Temperature: -1.7°C	
10	20.2	20.1		
12	20.0	20.2		
14	20.5	19.8	(3B) 11.6 meters	
16	20.4	20.0	Suspended material:	2.64 mg/L
18	20.2	20.0	Salinity: 27.72°/oo	
20	20.1	19.5	Temperature: -1.0°C	
22	18.5	18.2		
24	17.4	18.5		
26	16.8	16.0		
28	15.2	14.6		
30	14.5	14.0		
32	14.9	15.5		
34	14.5	14.0		
	13.8	--	(3C) Bottom	
			Suspended material:	2.27 mg/L
			Salinity: 27.71°/oo	
			Temperature: +0.1°C	

VERTICAL PROFILES OF
WATER COLUMN
TURBIDITY
PROPOSED WLIS III DISPOSAL SITE
TABLE 2.4-3

wave conditions experienced during the previous two days.

2.5 Benthic Sampling

A second sample from each of the sediment sample locations was sieved through a 1mm mesh screen and analyzed to determine the species composition of benthic infauna within the proposed disposal site. In addition, three replicates were analyzed from the proposed WLIS III disposal point. The total species list developed from this analysis is presented in Table 2.5-1, a predominant species list is shown in Table 2.5-2, and a summary of data by station location is given in Table 2.5-3.

The population of benthic macrofauna is similar to that described in the EIS and in a Dredged Material Research Program (DMRP) report (Serafy et al, 1977) except for the dominance of Owenia fusiformis and Pectinaria gouldii which were not present in significant numbers during earlier studies. It is important to note that Owenia, Malinia, Yoldia and Pectinaria were mostly juvenile forms, generally more than 95%. Consequently, one would expect much fewer individuals to survive and that the population sampled here represents an early stage of a recruitment period and that the number of individuals per sample is probably skewed towards higher values.

When grouped by location (Table 2.5-4), data show similarities between populations depending on their relationship to the soft sediment in the deeper water of the site. The center, 400m, and WLIS III samples are all similar in that they have relatively low population densities as compared with the 1400m stations which have approximately twice the population densities

SPECIES DISTRIBUTION: WESTERN LONG ISLAND SOUND, JANUARY 1982

SPECIES	OCCURENCE/ 12 SAMPLES	TOTAL NO. INDIVIDUALS
Phylum Cnidaria		
Class Hydrozoa		
1. Bougainvillea sp.	1	1+
2. Campanulariid sp.	3	3+
3. Sertulavella sp.	2	2+
4. Thuiaria sp.	2	2+
class Anthozoa		
5. Cerianthropsis americanus	3	3
6. Holoclana producta	1	1
Phylum Platyhelminthes		
7. Platyhelminth sp.	1	4
Phylum Rhynchocoela		
8. Cerebratulus sp.	1	1
9. Tubulanus pellucidus	3	3
Phylum Mollusca		
Class Gastropoda		
10. Acteocina canaliculata	1	1
11. Nassarius trivittatus	12	59
Class Pelecypoda		
12. Lyonsia hyalina	8	27
13. Macoma tenta	3	5
14. Mulinia lateralis	7	48
15. Nucula proxima	12	92
16. Pandora gouldiana	4	6
17. Pitar morrhuana	3	3
18. Tellina versicolor	2	5
19. Yoldia limatula	11	69
20. Yoldia sp. (juv.)	3	6
Phylum Annelida		
Class Polychaeta		
21. Ampharete aretica (juv.)	3	4
22. Clymenella torquata	2	2
23. Euclymeninae sp.	6	57
24. Glycera americana	3	3
25. Loimia medusa	4	8
26. Lumbrineris fragilis	1	1
27. Mediomastus ambiseta	3	4
28. Nephtys incisa	12	138
29. Ninoe nigrippes	1	1
30. Owenia fusiformis	12	174

TABLE 2.5-1

SPECIES	OCCURENCE/ 12 SAMPLES	TOTAL NO. INDIVIDUALS
31. Pectinaria gouldii	7	91
32. Pherusa affinis	2	3
33. Phyllodoce avenae	1	1
34. Polycirrus sp.	1	2
35. Sabellaria vulgaris	1	1
36. Spiochaetopterus oculatus	2	2
Phylum Sipunculida		
37. Golfingia minuta	1	1
Phylum Phoronida		
38. Phoronis architecta	5	11
Phylum Arthropoda		
Class Crustacea		
O. Cumacea		
39. Diastylis sculpta	1	1
O. Isopoda		
40. Edotea triloba	1	1
O. Amphipoda		
41. Ampelisca abdita	9	31
42. Leptocheirus pinguis	2	2
43. Unciola irrorata	2	3
O. Decapoda		
44. Cancer irroratus	1	1
45. Panopeus herbstii	1	1
46. Pinnixa chactopterana	3	6
47. Upogibeia affinis	1	1
Phylum Echinodermata		
Class Holothuroidea		
48. Caudina sp.	1	1

TABLE 2.5-1 (CONT)

PREDOMINANT SPECIES LIST, LONG ISLAND SOUND - JANUARY 1982

Total No. Phyla : 9
Total No. Species : 48
Total No. Individuals : 893+

Predominant Species List

Species	Phylum	Feeding Type	Occurrence/ 12 Samples	Total No. Individuals	% Total	Cumul. Total
Owenia fusiformis	AN	DF	12	174	19.48	
Nephtys incisa	AN	DF	12	138	15.45	34.93
Nucula proxima	M	DF	12	92	10.30	45.23
Pectinaria gouldii	AN	DF	7	91	10.19	55.42
Yoldia limatula	M	DF	11	69	7.73	63.15
Nassarius trivittatus	M	SF	12	59	6.61	69.76
Euclymeninae	AN	DF	6	57	6.38	76.14
Mulinia lateralis	M	SF	7	48	5.38	81.52

AN : Annelida
M : Mollusca
DF : Deposit Feeder
SF : Suspension Feeder

TABLE 2.5-2

DATA SUMMARY (TOTAL DISTRIBUTION): WESTERN LONG ISLAND SOUND

JANUARY 1982

	Center	400m N	400m S	400m E	400m W	1400m NE	1400m NW	1400m SE	1400m SW	WLIS III #1	WLIS III #3	WLIS III #7
No. Phyla/Station	4	4	4	3	4	7	5	5	5	5	3	5
No. Species/Station	12	11	13	12	10	21	15	21	23	13	9	13
No. Individuals/Station	55	49	73+	42	36+	90	105+	155+	114	76	39	59+

Total No. Phyla/12 Samples : 9
Total No. Species/12 Samples : 48
Total No. Individuals/12 Samples : 893+

TABLE 2.5-3

TABLE 2.5-4

DATA SUMMARY: DISTRIBUTION BY PHYLA

STATION	CENTER	400m	1400m	WLIS III
No. of Samples	1	4	4	3
Total No. Species	12	25	39	19
Total Nol Individuals	55	200+	464+	174+
Total No. Molluscs/ % Contribution	16/ 29.1	75/ 37.5	140/ 30.2	89/ 51.1
Total No. Annelids/ % Contribution	118/ 327	115/ 57.5	284/ 61.2	74/ 42.5

and are generally located in more shallow depths with coarser sediments.

Figures 2.5-1, 2 and 3 provide an indication of the distribution of population parameters over the proposed disposal area. From 2.5-1 it is apparent that both the number of species and individuals are higher on the margins of the site than in the central depression. This lower population density in the central area further supports selection of a disposal point in the soft mud depression.

2.6 Diver Observations

Three dive transects were made in the WLIS III site to provide visual confirmation of the data obtained by remote measurements and to assess the macrobenthic population of the proposed site. The locations of the dive transects are shown on Figure 2.2-1. The first dive on 18 January 1982, a transect to the southwest (100m) was made in the north central area. On January 19, two diver photographic transects were made, one in the extreme southwest corner (northeast transect 70m) and one at the central current meter position (north transect 70m). The logs obtained from these dives are presented in Tables 2.6-1,2 and 3 and photographs obtained are presented in Figures 2.6-1 through 15.

The visual observations indicated that the sediment was as expected consisting generally of soft silt. Burrows attributed to lobster activity were observed, as were fine imprints from winter flounder and mucal tracings from small hermit crabs. The number of animals observed was relatively small compared with other disposal sites studied.

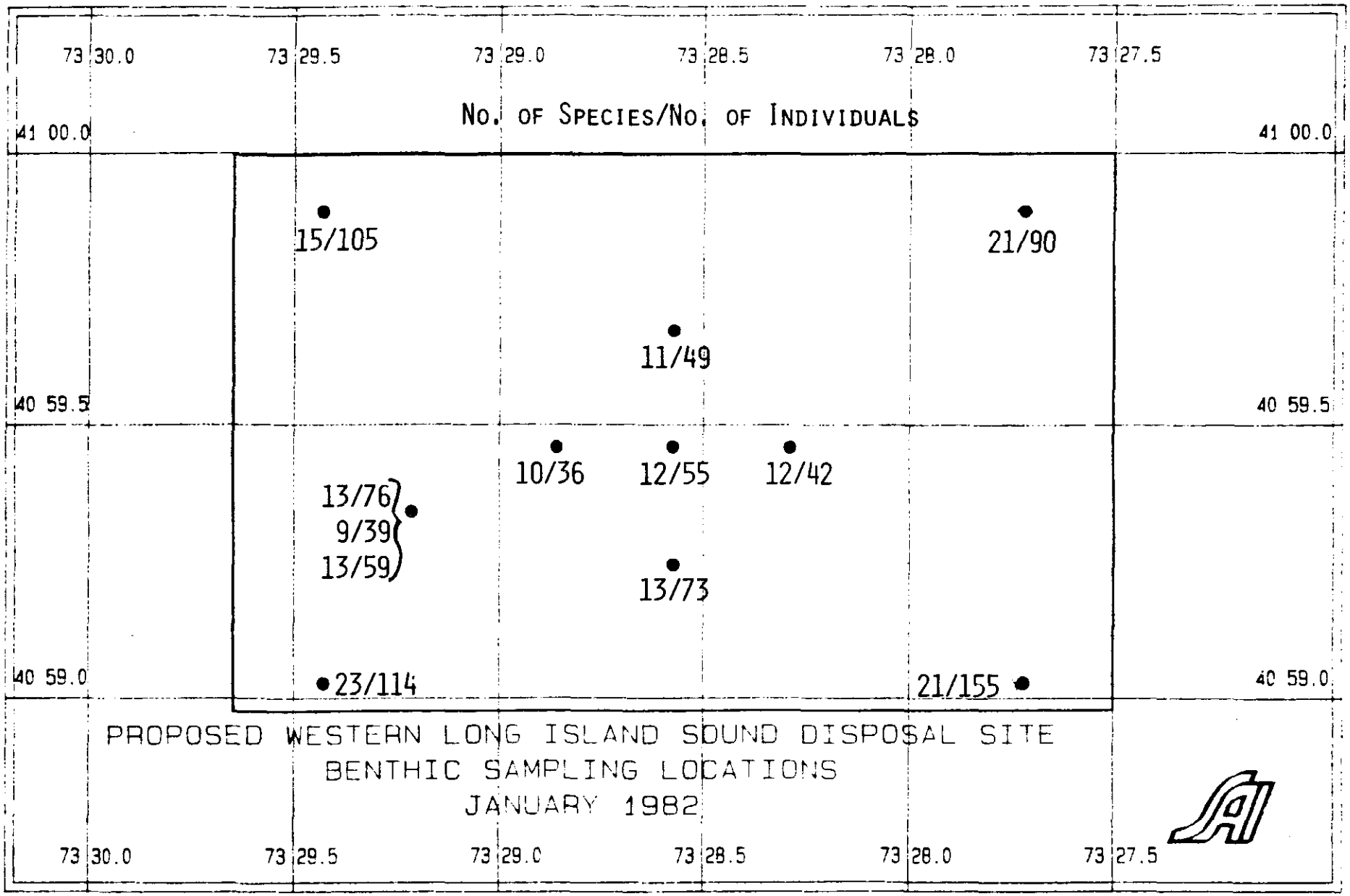

73 30.0
73 29.5
73 29.0
73 28.5
73 28.0
73 27.5
No. of Species/No. of Individuals
41 00.0
40 59.5
40 59.0
15/105
21/90
11/49
10/36
12/55
12/42
13/76
9/39
13/59
13/73
23/114
21/155
PROPOSED WESTERN LONG ISLAND SOUND DISPOSAL SITE
BENTHIC SAMPLING LOCATIONS
JANUARY 1982

Figure 2.5-1

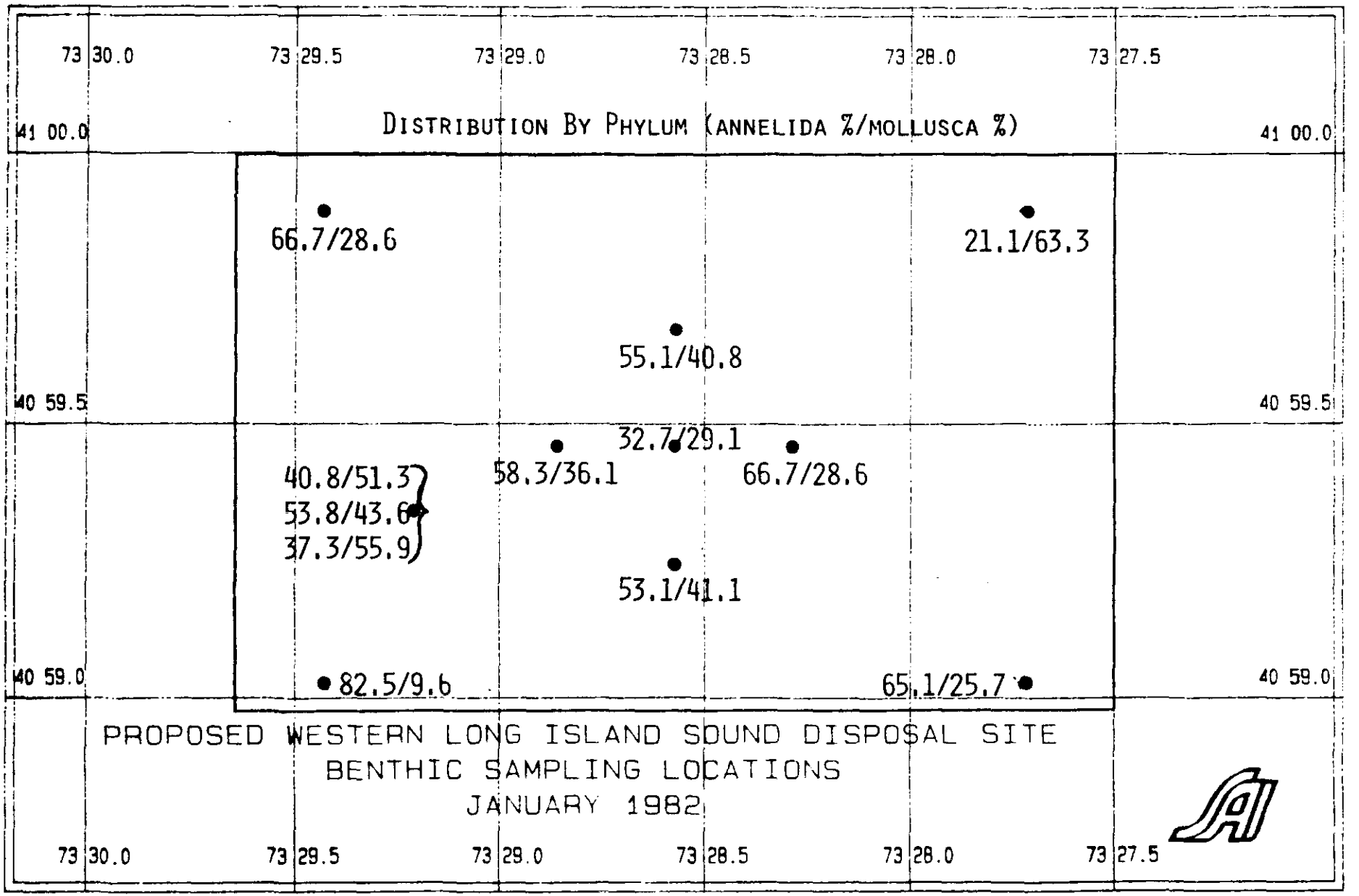

73 30.0
73 29.5
73 29.0
73 28.5
73 28.0
73 27.5
41 00.0
DISTRIBUTION BY PHYLUM (ANNELIDA %/MOLLUSCA %)
41 00.0
66.7/28.6
21.1/63.3
55.1/40.8
40 59.5
40 59.5
32.7/29.1
58.3/36.1
66.7/28.6
40.8/51.3
53.8/43.6
37.3/55.9
53.1/41.1
40 59.0
82.5/9.6
65.1/25.7
40 59.0
PROPOSED WESTERN LONG ISLAND SOUND DISPOSAL SITE
BENTHIC SAMPLING LOCATIONS
JANUARY 1982
73 30.0
73 29.5
73 29.0
73 28.5
73 28.0
73 27.5

Figure 2.5-2

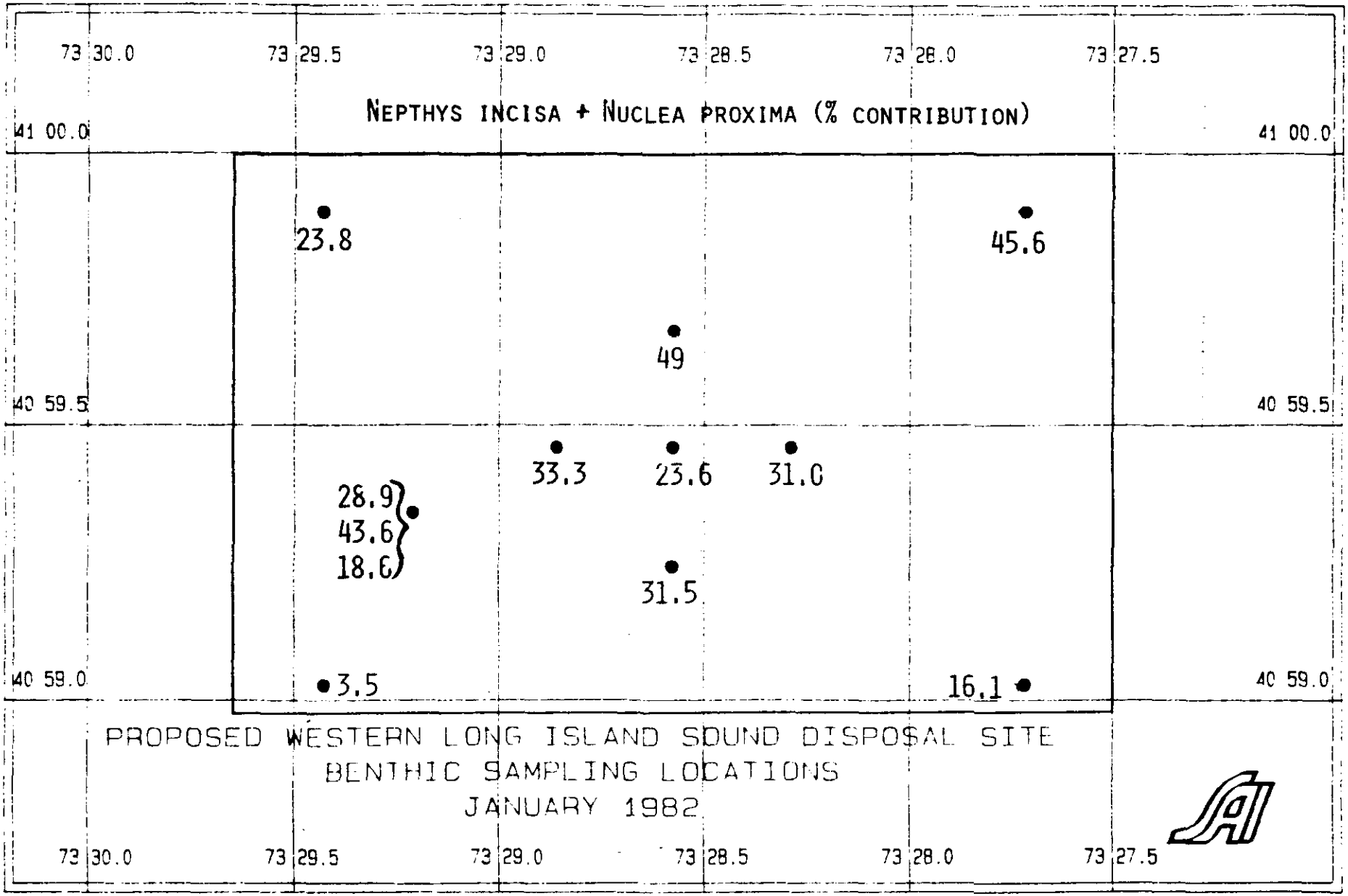

73 30.0
73 29.5
73 29.0
73 28.5
73 28.0
73 27.5
NEPTHYS INCISA + NUCLEA PROXIMA (% CONTRIBUTION)
41 00.0
40 59.5
40 59.0
23.8
45.6
49
33.3
23.6
31.0
28.9
43.6
18.6
31.5
3.5
16.1
PROPOSED WESTERN LONG ISLAND SOUND DISPOSAL SITE
BENTHIC SAMPLING LOCATIONS
JANUARY 1982

Figure 2.5-3

D.A.M.O.S. DIVER MONITORING LOG

DATE: 18 Jan. 82 **LOCATION:** WLIS III Northwest corner (S.W. transect), Site #1.

DIVERS: Stewart DeGoursey **TIME:** 1130-1158 **DEPTH:** 89 ft. **T°C:** 2°C **VISIBILITY:** 2 m+

DIVE (in/out Loran C): 26828.5/43979.3 to southwest (~100m) **DISPOSAL or REFERENCE BUOY L/C:**

I. OBSERVATIONS:

A. BENTHIC CONDITIONS (PHYSICAL) - Bottom current vel. and direction, turbidity, sediment grain size, neffloid layer, surface features (composition), shell hash (% cover), topography (slope/contour/ apron), compaction, bioturbation, perimeter Loran C.

Flood tide (E - W) @ ≤.5 kt. Surface slush ice and particulate matter observed was noticably reduced on bottom. 1-2 cm neffloid layer of unconsolidated material formed veneer on soft silt bottom. Diver penetration to .5 m was indicative of uncompacted sediment condition. No shell mix noted in region, evidence of upland debris (leaf, Phragmites) encountered. Benthic excavations, pockmarking, mounds and burrows observed along entire transect.

B. (BIOLOGICAL) - Diver species count, densities (est. no.) photo log nos., spoil/organism dynamics, behavior, transect observations (on/off) difference, biogenic sediment structures (burrows, tubes, tracks, casts, etc.).

Photo log: (20) 35 mm wide angle lens @ 2.5 ft. (15) 3:1 close up lens @ 6 in. (see representative prints).

Extensive burrowing attributed to lobster, Homarus americanus, and rock crab Cancer irroratus. Surface furrows and mucal trails of Nassarius. Benthic finfish Pseudopleuronectes, Scopthalmus buried to 1-2 cm in sediment.

Species count:
- Nassarius trivittatus (100+)
- Cancer irroratus (10)
- Homarus americanus (6)
- Pagurus longicarpus (2)
- Asterias (12)
- Pseudopleuronectes americanus (3)
- Scopthalmus aquosus (4)
- Merluccius bilinearis (1 juv.)

Not observed: hard substrate, hydroids, Corymorpha, Cerianthus.

II. DISCRETE SAMPLES OR METHODS:

_____ **A. Epibenthic net (30 sec. traverse): on or off spoil, target specie**

__X__ **B. .25 m^2 quadrant count, photography.**

_____ **C. Penetrometer tests, elevation stake readings, sediment trap.**

_____ **D. Mussel deployment - bioaccumulation subsample.**

_____ **E. Sonic beacon placement or electrolyte change.**

_____ **F. Remote bathymetric camera photos.**

_____ **G. Video tape (location, time min. run, tape index).**

_____ **H. Opportunistic collection (i.e. natural mussel bed, Corymorpha Axius).**

TABLE 2.6-1

D.A.M.O.S. DIVER MONITORING LOG

DATE: 19 Jan. 82 **LOCATION:** WLIS III Southwest corner (N.E. transect) Site #2

DIVERS: Stewart Arimoto **TIME:** 1059 - 1122 **DEPTH:** 92 ft. **T°C:** 2°C **VISIBILITY:** 2 m+

DIVE (in/out Loran C): 26830.0/43970.2 **DISPOSAL or REFERENCE BUOY L/C:**

I. OBSERVATIONS:

A. BENTHIC CONDITIONS (PHYSICAL) - Bottom current vel. and direction, turbidity, sediment grain size, neffloid layer, surface features (composition), shell hash (% cover), topography (slope/contour/ apron), compaction, bioturbation, perimeter Loran C.

Ebb < .5 ht W-E. Soft mud with high patch shell fragment (50%) zones (Pecten irradians, Crassostrea); occasional hard underlying cohesive clay patches protruding to adjacent soft sediment surface. Various size and orientation of burrows "grotto structures" at 3-5 m spacing. Brown oxygenated 2-5 cm surface sediment. Finfish fin imprints and mucal trails evident on sediment surface.

B. (BIOLOGICAL) - Diver species count, densities (est. no.) photo log nos., spoil/organism dynamics, behavior, transect observations (on/off) difference, biogenic sediment structures (burrows, tubes, tracks, casts, etc.).

Photo log: (12) Nikonos macro system. Camera flooding required special film processing (not yet available) therefore prints from this transect not included.

Biological activity in this region intermediate to Dive Site #1 and #3. Organisms of smaller size (Decapod crustacea) than Site #1. More patch cluster concentration and distinct (2-3 m) areas of intensive bioturbation.

Species count:
- Nassarius trivattatus (200+) (30 x 30 cm counts (3) = 8, 15) patchy.
- Cancer irroratus (3)
- Homarus americanus (2) juv.
- Scopthalmus aquosus (20)
- Pseudopleuronectes americanus (8) juv.
- Pectinaria (3) casts

II. DISCRETE SAMPLES OR METHODS:

_____ **A. Epibenthic net (30 sec. traverse): on or off spoil, target specie**

X **B. .25 m^2 quadrant count/photography.** 30 x 30 cm square count.

_____ **C. Penetrometer tests, elevation stake readings, sediment trap.**

_____ **D. Mussel deployment - bioaccumulation subsample.**

_____ **E. Sonic beacon placement or electrolyte change.**

_____ **F. Remote bathymetric camera photos.**

_____ **G. Video tape (location, time min. run, tape index).**

_____ **H. Opportunistic collection (i.e. natural mussel bed, Corymorpha Axius).**

TABLE 2.6-2

D.A.M.O.S. DIVER MONITORING LOG

DATE: 19 Jan. 82 **LOCATION:** WLIS III Central current meter position (N transect) Site #3.

DIVERS: DeGoursey Arimoto **TIME:** 1452-1509 **DEPTH:** 107 ft. **T°C:** 1°C **VISIBILITY:** 2 m+

DIVE (in/out Loran C): 26825.6/43976.3 - **DISPOSAL or REFERENCE BUOY L/C:** 26825.7/43976.6 (~70 m)

I. OBSERVATIONS:

A. BENTHIC CONDITIONS (PHYSICAL) - Bottom current vel. and direction, turbidity, sediment grain size, neffloid layer, surface features (composition), shell hash (% cover), topography (slope/contour/ apron), compaction, bioturbation, perimeter Loran C.

Current meter deployment inspection. Ebb end < .25 kt W-E. Flat featureless, very soft fine mud/clay. Fewer biological sediment structures; occasional mounds;(2-3) 3 cm diam. verticle burrows. No hard substrate shell or protrusions noted. Soft unconsolidated neffloid layer (.5cm) evident.

B. (BIOLOGICAL) - Diver species count, densities (est. no.) photo log nos., spoil/organism dynamics, behavior, transect observations (on/off) difference, biogenic sediment structures (burrows, tubes, tracks, casts, etc.).

Photo log: (10) 28 mm wide angle, twin strobe @ 2.5 ft.

A soft sediment, "quiet" depression zone with the least biological sediment reworking of all three sites. Shell fragment mix estimated at < 10%.

Species count:
Mysids (*Neomysis* sp.) ubiquitous (1000+)
Nassarius trivattatus (200+)
Scopthalmus aquosus (17) 10-15 cm
Cancer irroratus (4)
Not observed: *Homarus*, *Cerianthus*

II. DISCRETE SAMPLES OR METHODS:

_____ **A. Epibenthic net (30 sec. traverse): on or off spoil, target specie**

_X_ **B. .25 m² quadrant count/photography.**

_____ **C. Penetrometer tests, elevation stake readings, sediment trap.**

_____ **D. Mussel deployment - bioaccumulation subsample.**

_____ **E. Sonic beacon placement or electrolyte change.**

_____ **F. Remote bathymetric camera photos.**

_____ **G. Video tape (location, time min. run, tape index).**

_____ **H. Opportunistic collection (i.e. natural mussel bed, *Corymorpha Axius*).**

TABLE 2.6-3

Photographic Illustration: WLIS III

Dive Site #1. 18 Jan. 1982.

Figure 2.6-1 Extensive excavations were produced by Homarus americanus. Mud burrows were constructed adjacent to other numerous and different dimension burrow structures.

Figure 2.6-2 The shallow (5-10 cm) dish depression was commonly observed in this transect. Note shell fragments incorporated in soft substrate.

Figure 2.6-3 The winter flounder Psuedopleuronectes americanus exhibits sediment fin movement, sediment consistency maintains fin imprints of foraging pattern.

Figure 2.6-4 The sand dab Scopthalmus aquosus, was observed at times completely covered by fine silt veneer overlay.

Figure 2.6-5 Mucal snail tracings, crab tracks and fin imprints are noted in the vicinity of Cancer irroratus.

Figure 2.6-6 Vertical burrows exceeding (1 m) depth were observed. Juvenile Urophysis have previously occupied similar structures however their origin is assumed due to Squilla or Axius.

Figure 2.6-7 Macrophotograph of Nassarius trivattatus illustrates the fecal/pelletized nephloid layer. The mucal tracing and microtopographic effect on sediment displacement and conditioning are of note.

Figure 2.6-8 Mucal tracings crisscrossed the observational path of the north central transect.

Figure 2.6-9 Cluster concentrations of N. trivattatus occurred throughout transect, presumably due to "group grazing" behavior.

Figure 2.6-10 2 cm burrow entrances detail illustrates the particulate nature of surface sediment, the organic matrix and grannular texture.

Dive Site #3. 19 Jan. 1982.

Figure 2.6-11 Large scale mound of biogenic origin at central deep water site. Mounds of this sort result from excavated and abandoned lobster burrows.

Figure 2.6-12 The most common decapod, Cancer irroratus, was observed to readily move across bottom causing a silt cloud trail. The crabs were also observed burrowed in sediment to the horizon/carapace level. Note conical burrow in left background.

Figure 2.6-13 The eyespots of numerous Mysids (Neomysis) are barely evident in this photo. The organisms are cryptic against a pockmarked dimpled substrate surface.

Figure 2.6-14 A maintained and mature verticle burrow with associate Nassarius trivattatus activity.

Figure 2.6-15 Upland debris (oak leaf) was encountered. The accummulation of silt (~1 mm) illustrates the boundary layer movement of the silt veneer on each tidal cycle. The numerous crab tracks indicate the attraction to objects by the macrobenthos.

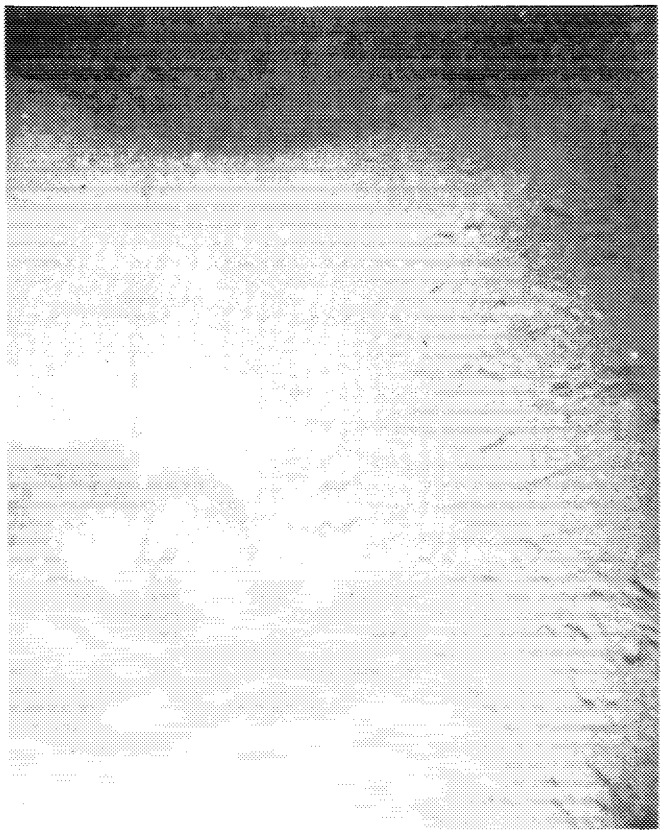


Figure 2.6-1

Figure 2.6-2

Figure 2.6-3

Figure 2.6-4

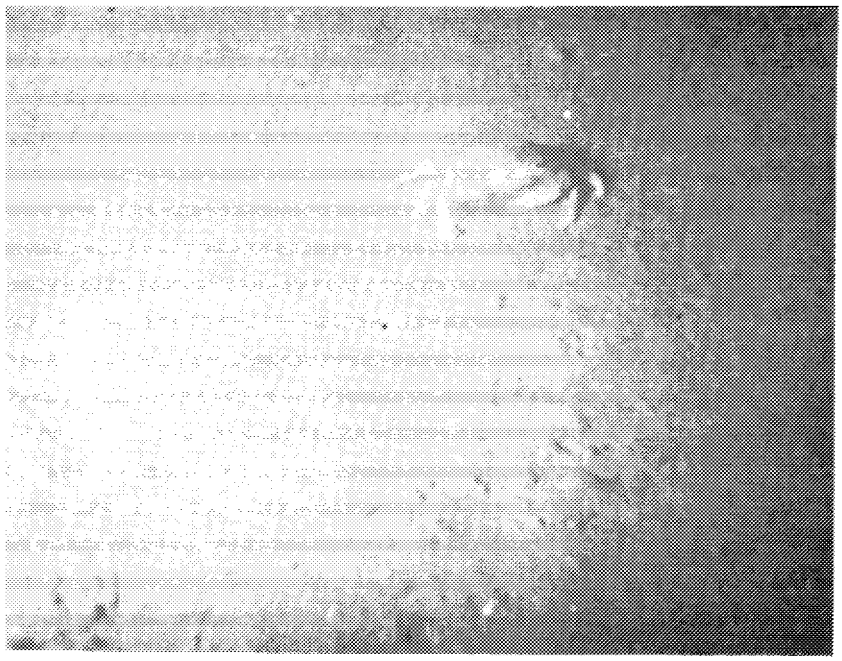
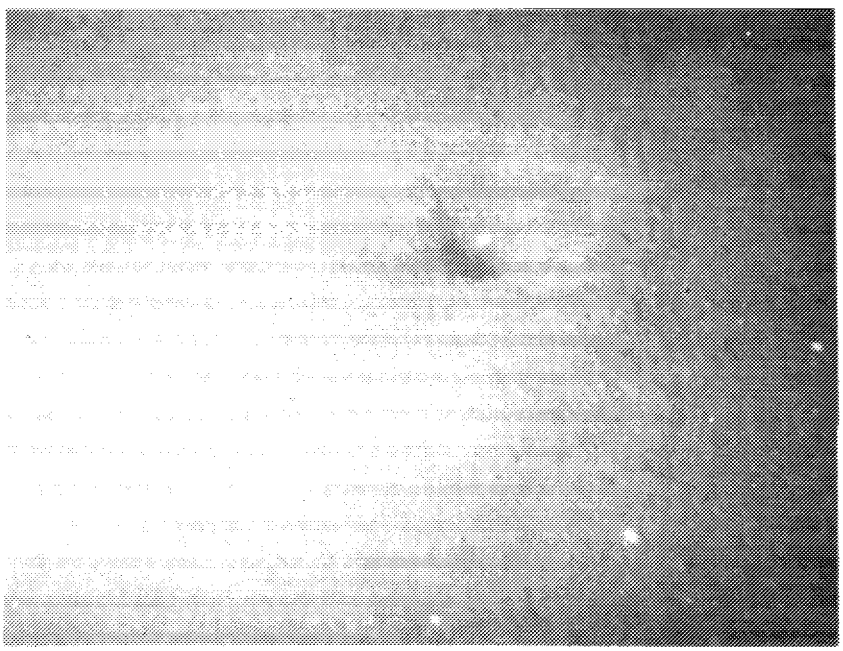


Figure 2.6-5



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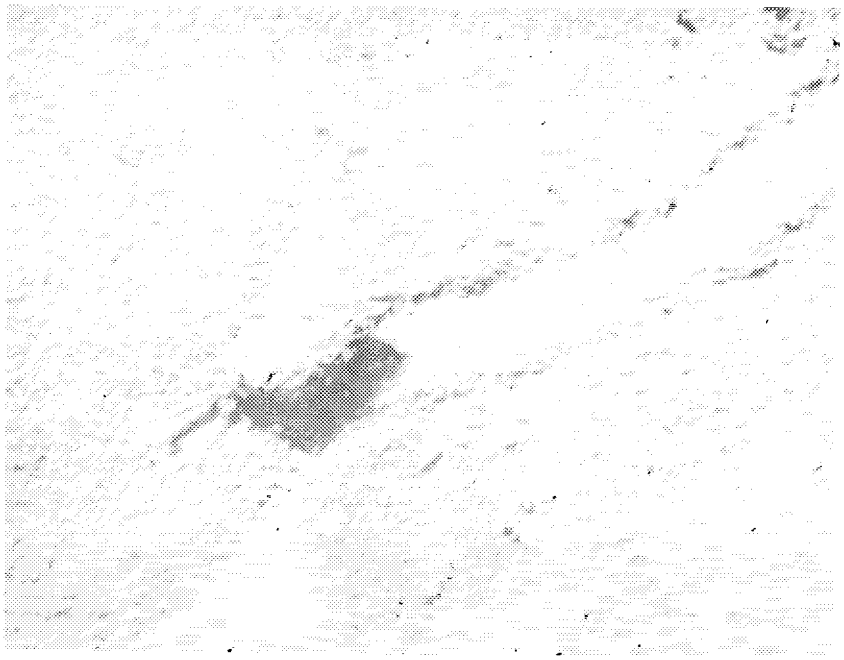

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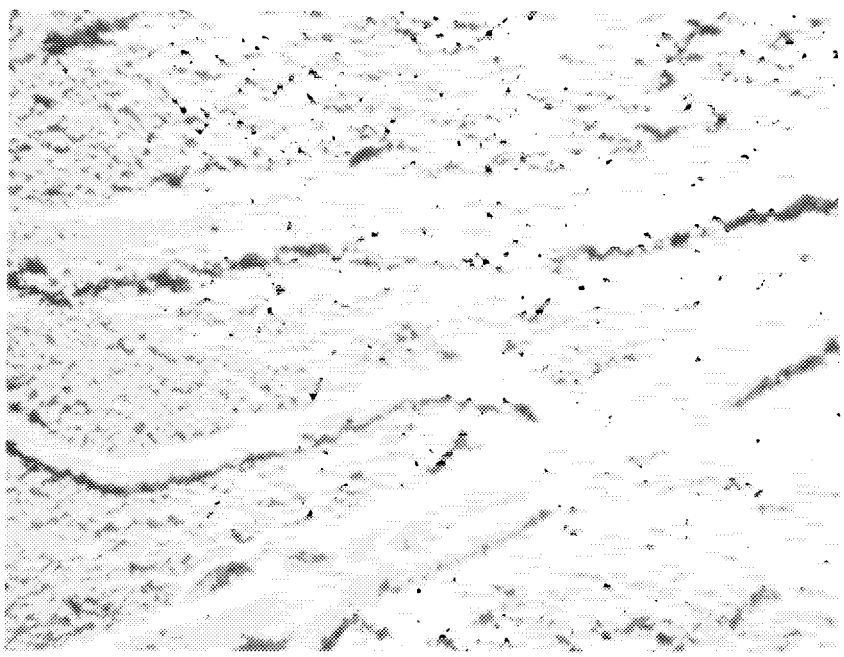

Figure 2.6-8

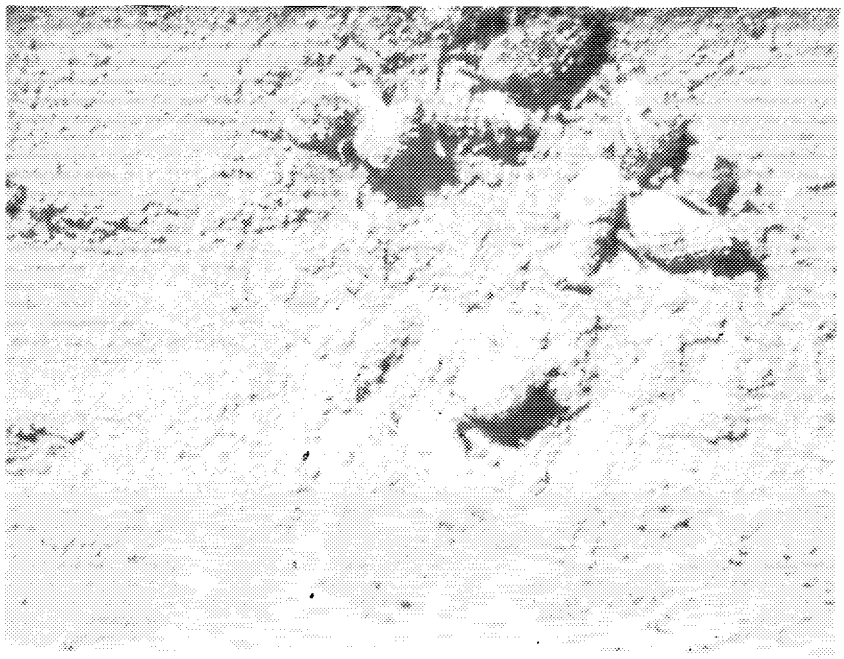

Figure 2.6-9

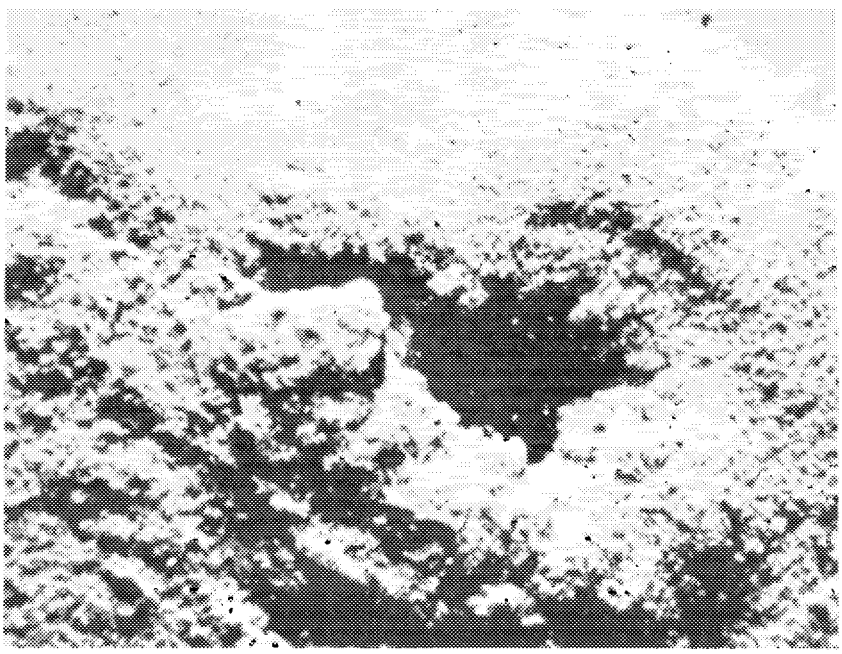

Figure 2.6-10

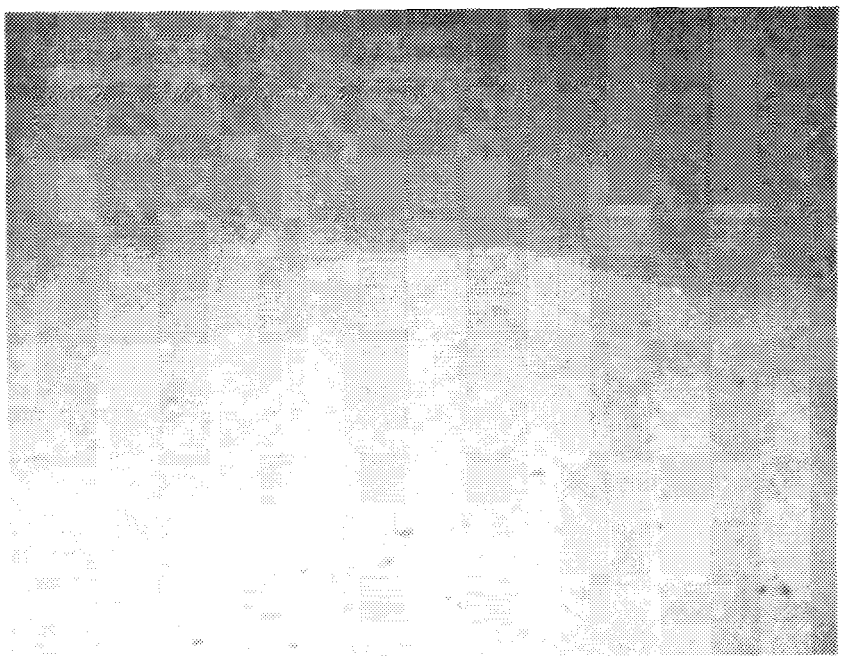

Figure 2.6-11

Figure 2.6-12

Figure 2.6-13

Figure 2.6-14

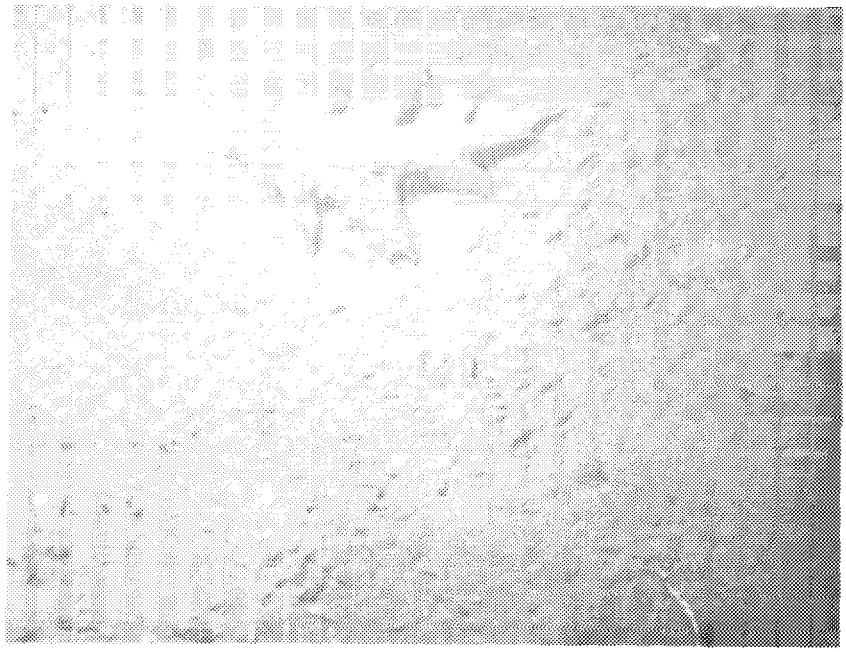

Figure 2.6-15

2.7 Summary

Preliminary evaluation of the data obtained during this survey indicates that the bottom of the trough in the southwest corner of the site should be a suitable containment site for the disposal of dredged material. The sediment and bottom relief indicate a depositional environment that is stable and uniform over a 1500 X 500 meter area which currently consists of relatively anoxic, black organic silts and clays. Peak currents in the site should generally be on the order of 20cm/sec, but could be higher under high wind conditions from an easterly direction.

3.0 SPECIFIC SITE CHARACTERISTICS

Based on the results of the overall bathymetric and side scan surveys, the deep portion of the east-west trough was selected as the location for potential disposal of dredged material within WLIS III. To provide a more detailed evaluation of this site, a smaller survey was established which was centered at $40^{o}59.34'N$, $73^{o}29.21'W$. From experience with disposal at Central Long Island Sound, an 800 meter square grid was established consisting of 32 east-west lanes, spaced 25 meters apart. A bathymetric survey of the grid was run on 26 January 1982, the results of which are presented as a contour chart in Figure 3.0-1 and in three dimensional perspective from the

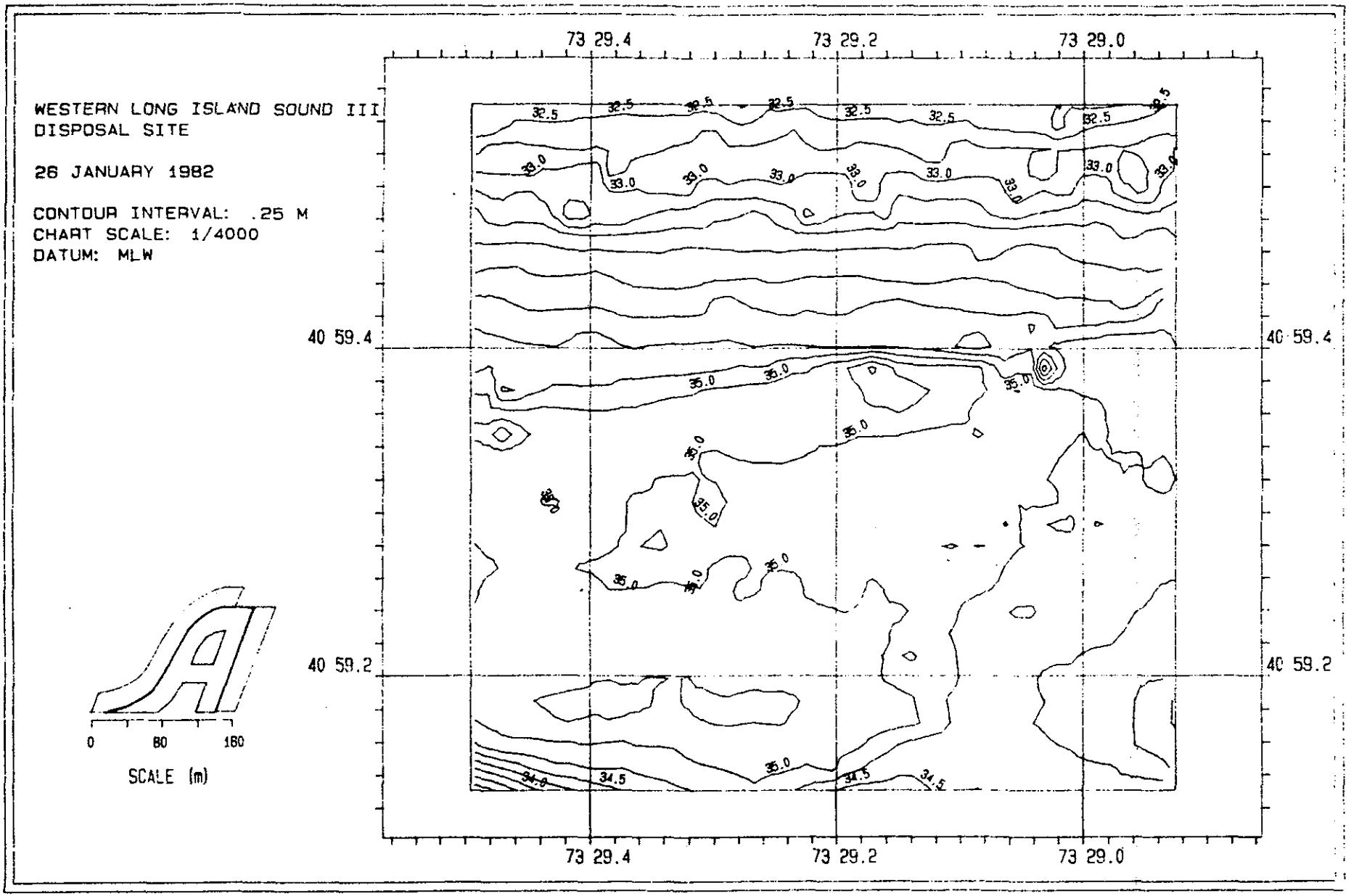
WESTERN LONG ISLAND SOUND III
DISPOSAL SITE
26 JANUARY 1982
CONTOUR INTERVAL: .25 M
CHART SCALE: 1/4000
DATUM: MLW
73 29.4
73 29.2
73 29.0
40 59.4
40 59.2
0
80
160
SCALE (m)

Figure 3.0-1

northeast in Figure 3.0-2.

Close examination of the contour chart indicates that the topography in the survey site is oriented in an east-west direction and that the relief is quite small. The total depth range within the survey is only 1.5 meters from 33.5 to 35 meters in the center of the site. Vertical profiles immediately south of the center (Figure 3.0-3) show very little topography and nearly constant depth at 35 meters. In summary, the survey obtained here provides an excellent baseline for future monitoring of dredged material disposal once such operations occur.

Ten sediment samples were obtained from the center of the survey site for evaluation of benthic population parameters and for definition of background sediment parameters. Data from these samples were included in section 2.2 and 2.3.

4.0 WESTERN LONG ISLAND SOUND FISHERIES INFORMATION FORUMS

The WLIS III site public hearings conducted 27-29 October 1981 and the Draft EIS WLIS III document released December 1981, resulted in several fishing industry inquiries regarding disposal of dredged material in Western Long Island Sound. In response to the concerns relative to fisheries resources, information forums were conducted in Huntington, New York and Norwalk, Conn. The commercial fishing audience in Connecticut was notified by mailing an announcement to all licensed fishermen (shellfish, finfish, lobster) from Bridgeport west. In the western N.Y. area, notification was coordinated by the N.Y. Department of Environmental Conservation (Mr. Anthony Taorimina) and the N.Y.

WESTERN LONG ISLAND SOUND III
BASELINE SURVEY

26 JANUARY 1982
VERTICAL EXAGGERATION: 50X

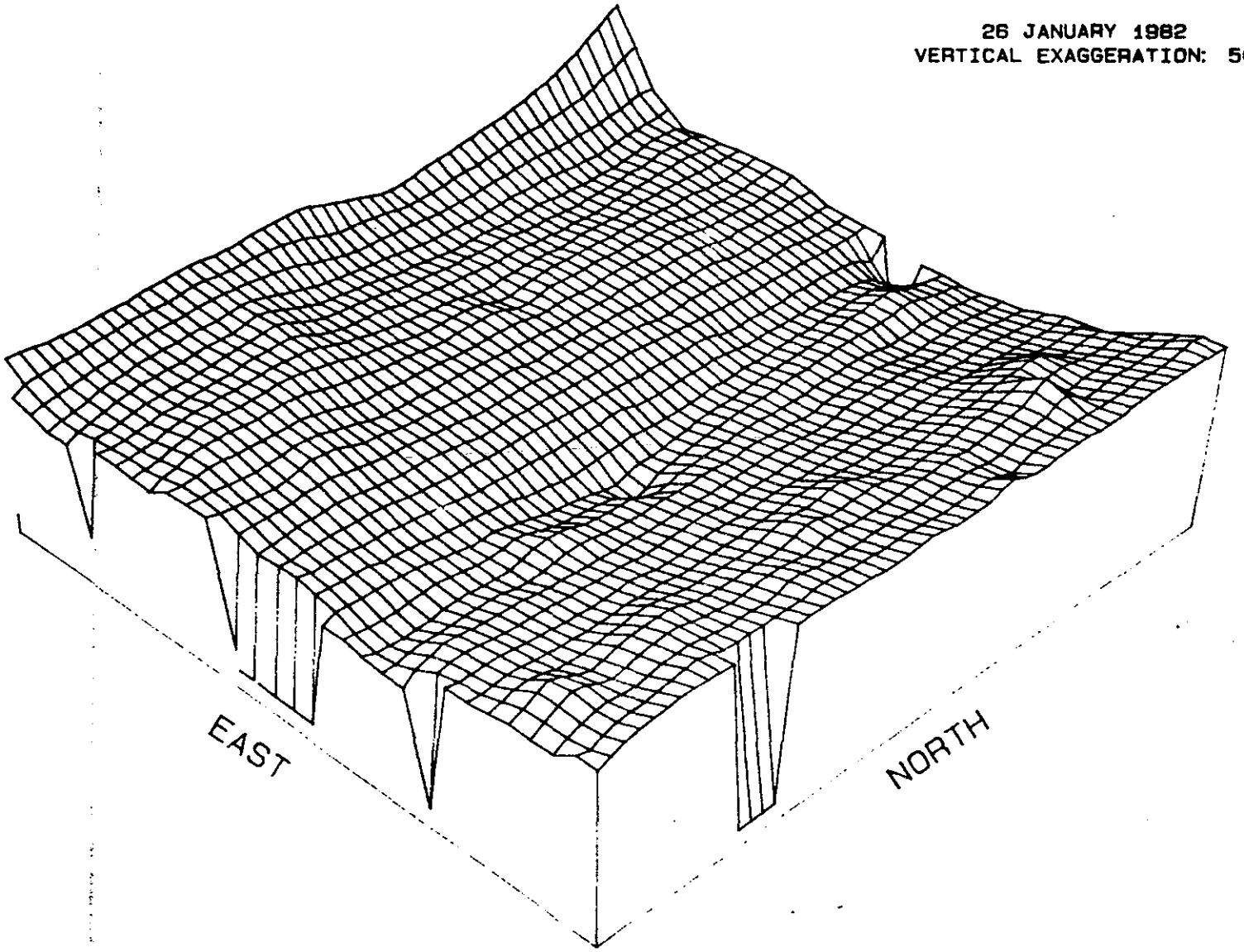

Figure 3.0-2

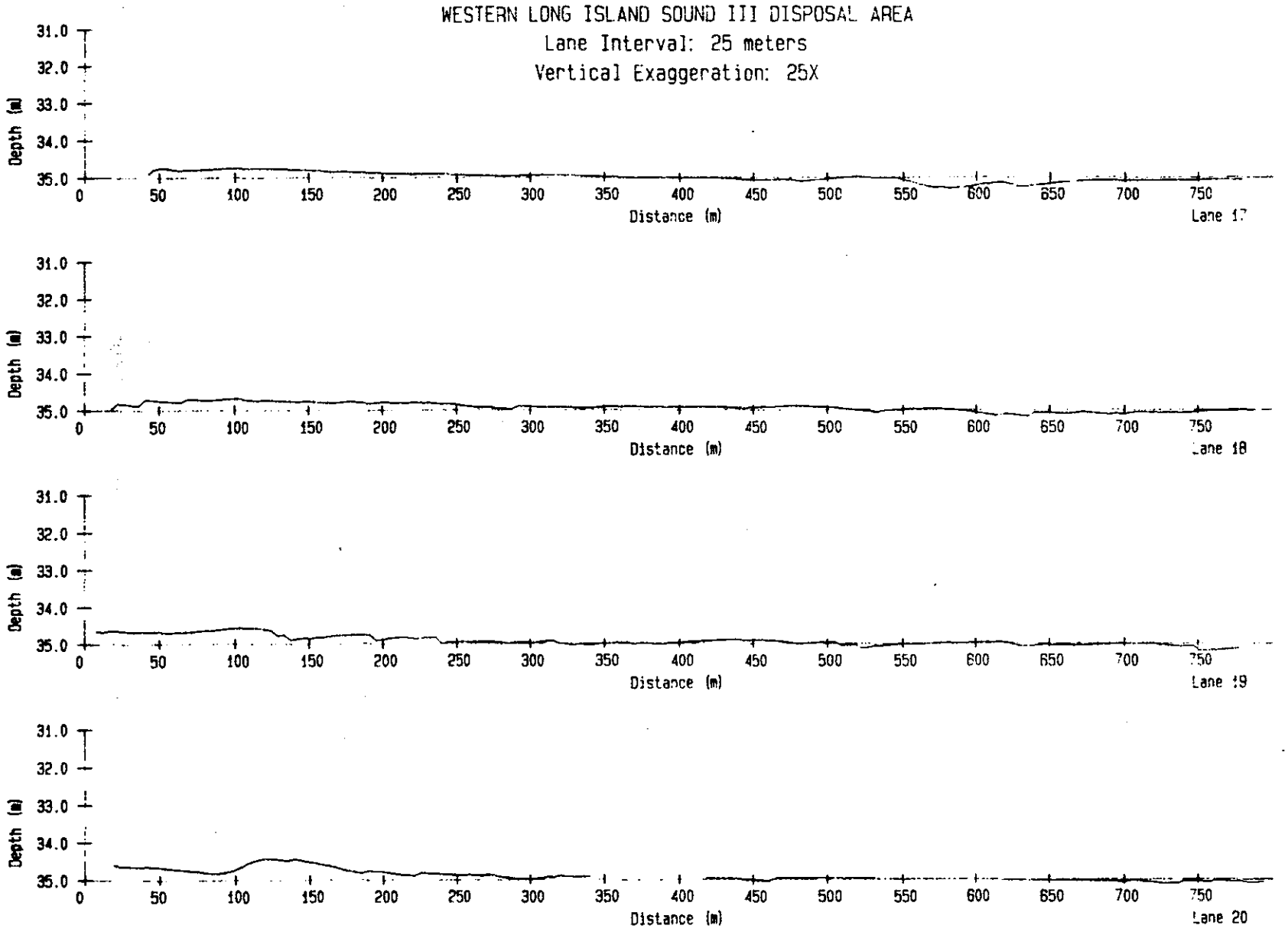
WESTERN LONG ISLAND SOUND III DISPOSAL AREA
Lane Interval: 25 meters
Vertical Exaggeration: 25X
Depth (m)
31.0
32.0
33.0
34.0
35.0
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
Distance (m)
Lane 17
Lane 18
Lane 19
Lane 20

Figure 3.0-3

Sea Grant Advisory Service. The Norwalk forum scheduled for 14 January 1982 was cancelled due to snow, and rescheduled on 28 January.

The format of each information forum included a review of the DAMOS program, indicating the scope (physical oceanographic, sediment chemistry, benthic biology, bioaccumulation experiments, sediment transport, in-situ observation and fishery behavior) and basic results obtained for the areas of investigation in Long Island Sound. Dr. Robert Morton and Dr. Lance Stewart represented the respective physical oceanographic and biological/fisheries aspects of DAMOS program. At each session, considerable time was devoted to audience-investigator exchange on fishery/operation concerns. The following outlines list the major topics discussed by participants.

4.1 Huntington, NY

- Concern over the long range sediment transport of dredge material to impact beach/swim areas.
- Concern over potential toxic impact of contaminants affecting major commercial species (lobster, flounder).
- Misconception on the true "area" (diameter 100-300 m) of ocean bottom smothered by 100-200,000 yd^3 disposal operation.
- Behavior of juvenile and larval lobster in vicinity of barge discharge and disposal pile.
- Concern regarding serious continual degrading of water quality from W - E in L.I.S. and the fear that site selection (WLIS III) would amplify worsening conditions.
- Relation of suspended plume to current vector transport and eventual effect on nearby shellfish beds. (bacterial pollution, seed silt suffocation, oil/hydrocarbon taste accumulation, interference in larval development, hatchery line intake).

- Question on real cost of transport, either to N.Y. Bight or CLIS site. Suggested larger barge, train-barge transport to reduce costs.

- Recommend return to WLIS I site. Appears to be a nonproductive "dead" area, in contrast to this site.

- Recognition of spillage from barge in long distance transport and temptation to short dump (due to cost or weather conditions). Results in uncontrolled disposal and loss of management ability.

- Consternation at fact Flushing Bay material considered for disposal in L.I.S. Correction on material authorized for WLIS III site.

- Statement on necessity of small scale marina need to maintenance dredge. Claim of "clean" sediment contrasted to major industrial harbors.

- Fisherman's Association request to know immediately the precise location and quantity of disposal, to plan trawl courses. Routing of tug/barge path of great importance to reduce loss of pot gear;

- Surprised to learn the comprehensive nature of the monitoring program, the precise measurement (topography) and sampling.

- Inferred input on seasonal change in location and behavior of prime fisheries (lobster, flounder, scup) relative to disposal operations. Several individuals assured cooperation with monitoring team.

- Cited evidence of short dumping in past operations, retrieval of black odiferous mud on pot and trawl gear. Claim inadequate surveillance on board; disregard for prescribed area placement.

- Concern that cloud of contaminated sediment drifts about L.I.S. due to disposal operations.

- How is point disposal controlled: buoy location, "black box" tracking.

- Concern that sequence of disposal may bury large numbers of attracted commercial species. What is system to prevent conical pile-more prone to erosion and spread? What is ability to control order of disposal so pin-point areas are selected.

- What attention (biochemical transfer investigation) has been directed to the dredge site; what is local pollution relative to disposal at sea.

- What are comparison, pro/cons of alternatives: containment island, upland, deep ocean, capping, burrow pits.

- Support by N.Y. DEC voiced and focused on coverage and depth of monitoring effort - if it can't use the scientific information available (DAMOS), then on what is the Dept. of Environmental Conservation to base decisions. Response comment on political collusion.

- Subject of habitat creation for lobster questioned. Elaboration on underwater photo evidence reached point that observations reveal "artificial reef" aspect to topography and relief of disposal mounds. Critical issue cited as pollutant transfer potential and small scale bioaccumulation levels detected in studies to date.

- Discussions resumed on rationale of retaining polluted harbor material in shallow estuary and harbor regions. These sites most prone to storm disturbance, prop wash, fishery reproductive interference, and direct communication to man (swim/boat) alternative to select deep-water target zone and dispose at specific point with capping if necessary, watched closely by a multidisciplinary monitoring program.

- Reiteration on the sensitivity of Eaton Neck site as a productive lobster spawning site with confirmed abundance of berried female lobsters and an attractive rough terrain habitat region. Contrast was made of this site to the flat, relatively featureless WLIS III site.

4.2 Norwalk, Conn.

- Destructive impact suspected to a prime lobster ground, how many die directly as a result of disposal. "Force me to change my grounds and search elsewhere." Conn. Commercial Fisherman's Association letter of opposition was read. Supported change to original WLIS I site.

- Comment on cost of dredge/transport raised; qualification on new cost share formula requiring municipalities to fund 50% maintenance dredge costs adds impetus to closer site selection.

- Issue of user tax posed: would it be feasible to charge a (%) or surcharge to the benefactor of a dredging project (or include in overall estimate) to be put into a fund for 1) compensation to fisheries who can document gear loss or loss of productivity (FCMA similarities) 2) provide supplemental monies for special responsive monitoring studies as the need arises (i.e. toxic evidence in commercial species, unusual fisheries abundance/behavior) 3) direct study efforts at disposal site problems.

- Discouragement voiced at the full cycle situation: WLIS I, II, III, WLIS I recommended by fishing industry; frustration in apparent non-conclusiveness of associated draft EIS's.

- Fisheries statement that Programatic EIS (Dames and Moore) spotty and did not reflect the multiple commercial resource concerns (lobster, finfish, shellfish). Especially the variable seasonal location of species within the confines of WLIS.

- Strong resentment to the fact Connecticut will receive significant quantities of N.Y. dredged material; again question and confusion as to which harbors qualify according to sediment classification criteria. What are estimates for 5 year dredge material volume at WLIS III.

- Statement: This WLIS process conducted backwards, suggested Information Forum before hearing, well in advance, to consider facts, then publicized Public Hearing with monitoring investigators present to respond, then Review Period to receive comment on site selections.

- Exactly what are sediment classification criteria? (D. Cunningham responded) Why is Connecticut willing to take N.Y. spoil. Situation statement presented: If WLIS III could be politically agreed upon as the last LIS site, then the Connecticut dredge material management plan and criteria were most appropriate to minimize ecological impact to WLIS as a whole.

- Recommendation to keep N.Y. material in their waters, further west where water quality was, by opinion, already beyond reclamation.

- Non acceptance to the claim that physical oceanographic data inferred no good "containment" site could be found in the narrower high energy N.Y. region. Felt these sites better because they are further from existing fisheries and additional pollution would not be as noticable.

- Feared decision already made and this forum was attempt at persuasion to accept WLIS III site. Asked what survey conducted to date (DAMOS response) and discussion of chart detail as to preliminary disposal regions. Comments received relative to specific fishery location adjacent to the WLIS III site.

- Fishermen in attendance affirmed the need for more direct contact in knowing the operation schedule, (volume of material, dates, location of disposal) and offered their observations as well as vessels to the monitoring effort.

- Conversation shifted to observations of scattered disposal (short dump or spillage) within the Norwalk offshore area during the Norwalk-Stamford disposal period. No firm evidence of large quantities were reported.

- Questions on observations of the CLIS site "capping" experiments were raised: Present condition? Did the procedure work in your opinion? Is capping necessary or planned for WLIS III? Can the Corps be expected to assist, as in New Haven (north), if needed?

- Opinion expressed that power behind need to select WLIS III was recreational boating with little direct dependence on marine resources for livelihood; comparison of 50' motorsailer needs vs 40' commercial fishing vessel were voiced and frequency of use of the marine environment in question.

- Concern that once declared a Regional Disposal Site the disposal could not be stopped and an "overload" would be experienced in their backyard. Also, if recolonization did occur by prime commercial species within the 6 month summer cessation period what would be the projected loss to the fisheries in smothering of resident species once disposal recommenced.

- Use of a disposal barge recorder to assure accurate placement and navigation in absence of buoy target was endorsed, based on information within the previous DAMOS presentations.

- Elaboration on licensing/permit requirements for dredging contraction was suggested - comment on sloppy low-bid operations of the past proceeded. Inspection on the water-tightness and retention abilities of the scows were suggested in light of transport across certified public/private shellfish beds. Shellfish industry concern for unknown contamination of stock (oyster/clam) authorized for market that might be accidentally affected by scow spillage.

4.3 Additional Information Delivery on DAMOS Program:

12 Jan 82 Connecitut Commercial Fisherman's Assoc. meeting, Fairfield, Conn.

Discussion with approximately 50 members on the content of a previously drafted letter of opposition to WLIS III vs fisheries enhancement evidence resulting from DAMOS investigations.

6 Feb 82 Environmental Leaders Conference. Oceanic Society L.I.S. Taskforce Stamford, Conn.

Discussed Western L.I.S. Dredged Material Disposal Site and the Lack of a Sound-Wide Management Plan. 5 member panel and moderator. Two Connecticut representatives, D. Cunningham, and L. Stewart made presentation and fielded audience inquiries. Presentations on Conn. Dredged Material Management criteria, the DAMOS program procedures, and results, and a legal/economics perspective provided a framework for audience (approx. 100) discussion.

5.0 SUMMARY AND RECOMMENDED DISPOSAL MANAGEMENT PROCEDURES

The results of the baseline survey of the proposed WLIS III disposal site support the findings of the EIS that the area is environmentally suitable for disposal of dredged material. The characteristics of the deep trough in the southwest portion of the area all support the criteria for designation of a containment site. Therefore, application of disposal management procedures designed to enhance the containment process should result in negligible impact to the site and the surrounding environment.

Using these procedures, a taut-wire moored buoy should be installed at the disposal point to control the dumping operation. The tug operators should be instructed to approach the buoy from a specified direction to reduce interference with lobster buoys, dispose of material close aboard one side of the buoy, and depart via another specified route. Based on results from operations at the Central Long Island Sound disposal site, if

such procedures are carefully executed, a mound of sediment approximately 500 meters in diameter, and 3-5 meters thick would be created if about 100,000 m^3 of material were to be dumped.

This mound would effectively isolate most of the material from the water column and should contain the sediment in the immediate vicinity of the dumping point, thereby reducing impact of disposal on the surrounding fisheries.

As a result of the information forums held in Huntington and Norwalk, interaction with the fishing industry has identified a primary concern with the operational aspects of the disposal operation. Monitoring of disposal, either through inspectors or Loran-C recording devices must be accomplished, and any measures that would reduce the risk of short dumping should be applied. Careful adherence to the designated lanes for approach and departure from the disposal point must also be insured. Finally, the scows must be stopped as close alongside the buoy as possible to insure creation of the disposal mound.

In summary, the disposal of dredged material at the WLIS III disposal site can be accomplished in an environmentally sound manner. Because of the sensitive nature of the area related to fishing industries, special emphasis should be placed on the disposal operation to reduce the potential for interference with existing use of the site.