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DEPLOYMENT OF
DREDGED MATERIAL DISPOSAL BUOYS
AT THE
CENTRAL LONG ISLAND SOUND
AND
WESTERN LONG ISLAND SOUND
DISPOSAL SITES
CONTRIBUTION #16

SCIENCE Applications, INC.

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DREDGED MATERIAL DISPOSAL BUOYS
AT THE
CENTRAL LONG ISLAND SOUND
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WESTERN LONG ISLAND SOUND
DISPOSAL SITES**

CONTRIBUTION #16

MARCH 22, 1982

CONTRACT #DACW33-82-D-0002

**Submitted to:
U.S. Army Corps of Engineers
New England Division
424 Trapelo Road
Waltham, MA 02154**

**Submitted by:
Robert W. Morton
Science Applications, Inc.
Ocean Science & Technology Division
202 Thames Street
Newport, Rhode Island 02840**



1.0 INTRODUCTION

Point dumping of dredged material at specified disposal points has recently become a standard management procedure for disposal of dredged harbor sediment in Long Island Sound. In order to accomplish this procedure, marker buoys with an extremely small watch circle are required to reduce the effective spreading of material on the bottom. The dredging of the Mill and Quinnipiac Rivers in New Haven and several harbors in Western Long Island Sound has created a need for two such buoys, one at the Central Long Island Sound Disposal Site and one at the recently designated Western Long Island Sound Disposal Site. These buoys were deployed as part of the Disposal Area Monitoring System (DAMOS) on March 19, 1982.

2.0 LOCATION

The designated points for deployment of the disposal buoys were selected based on management criteria developed at the New England Division to be compatible with past and future projects and to insure minimal environmental impact from the disposal operations.

At the Central Long Island Sound Disposal Site (Fig. 2.0-1) the buoy was located in the southwest corner of the area in order to reduce interference with ongoing monitoring of the Stamford-New Haven and Norwalk projects as well as future measurements that may be conducted jointly with the Narragansett Research Laboratory of EPA in the northeast portion of the site. The coordinates of the point designated for disposal of Mill and

CLIS

CHART SCALE: 1/25000

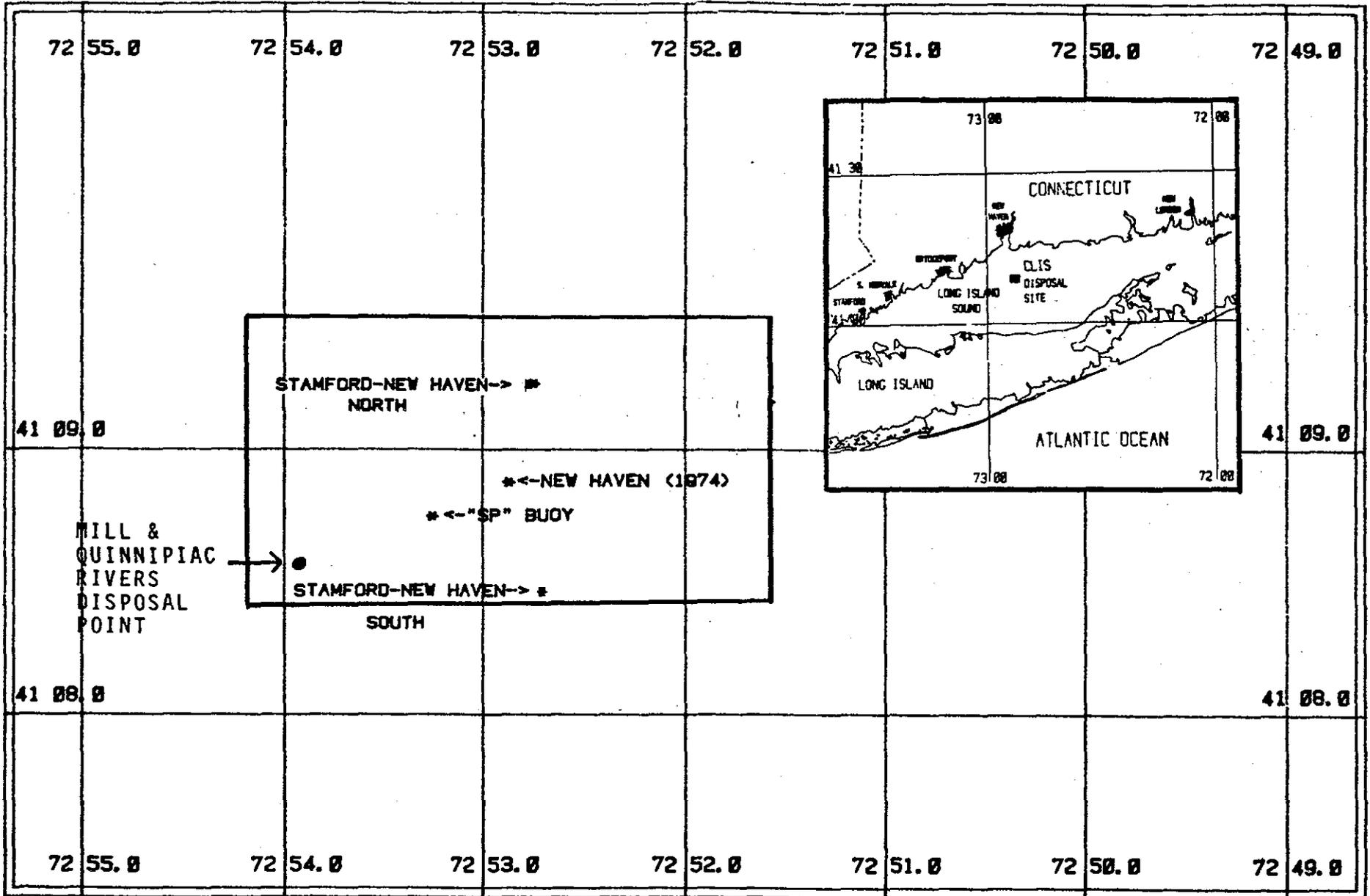


Figure 2.0-1

Quinnipiac River sediments were:

41°08.6'N

72°53.9'W

The point designated for disposal in the Western Long Island Sound Site (Fig. 2.0-2) was based on results of a baseline survey of the entire WLIS site conducted in January 1982. During that survey, a topographic depression in the southwest corner of the area was found to be suitable for disposal, and a baseline bathymetric survey of an 800 square meter area was conducted. Based on the results of that survey, the coordinates for the disposal buoy were specified as:

40°59.34'N

73°29.21'W

3.0 MOORING DESIGN

Previous disposal buoys have been installed with an elastic tether mooring design which has been successful in maintaining the desired small watch circle. However, the requirement for frequent relocation of the disposal point has prompted development of a different design since it was usually impossible to move the tethered mooring once disposal had occurred.

The design used on these moorings makes use of a suspended weight and nylon line to provide shock absorbing capabilities while maintaining the desired tension to produce a small watch circle radius. Calculations of tension and drag coefficients using SAI mooring design software indicate that horizontal displacements of the surface buoy will be less than

WLIS JAN82 SDSCN

CHART SCALE: 1/12000

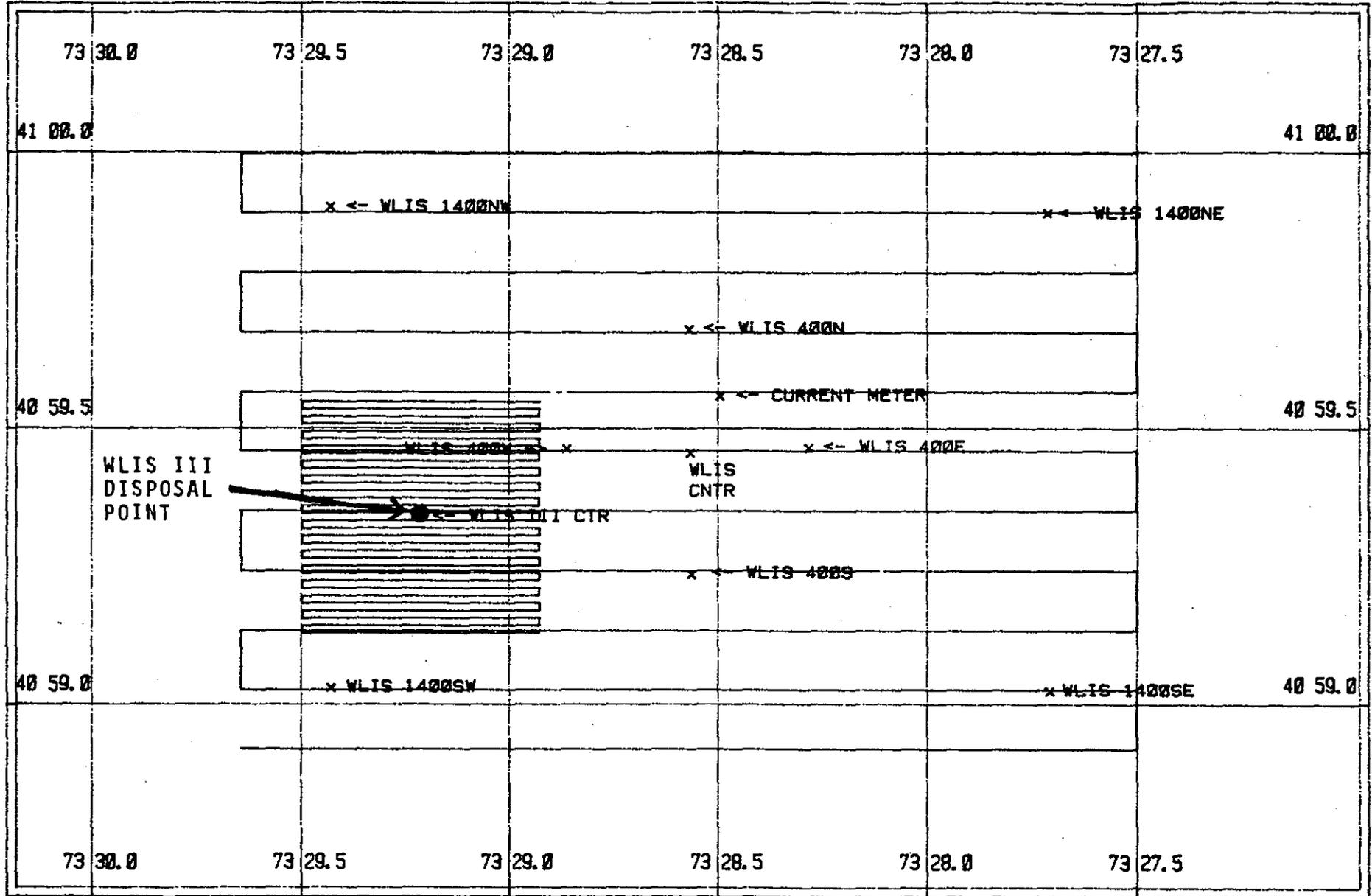


Figure 2.0-2

five meters with the worst case occurring at slack low water. A schematic diagram of each mooring, indicating the significant components is presented in Figure 3.0-1 a and b.

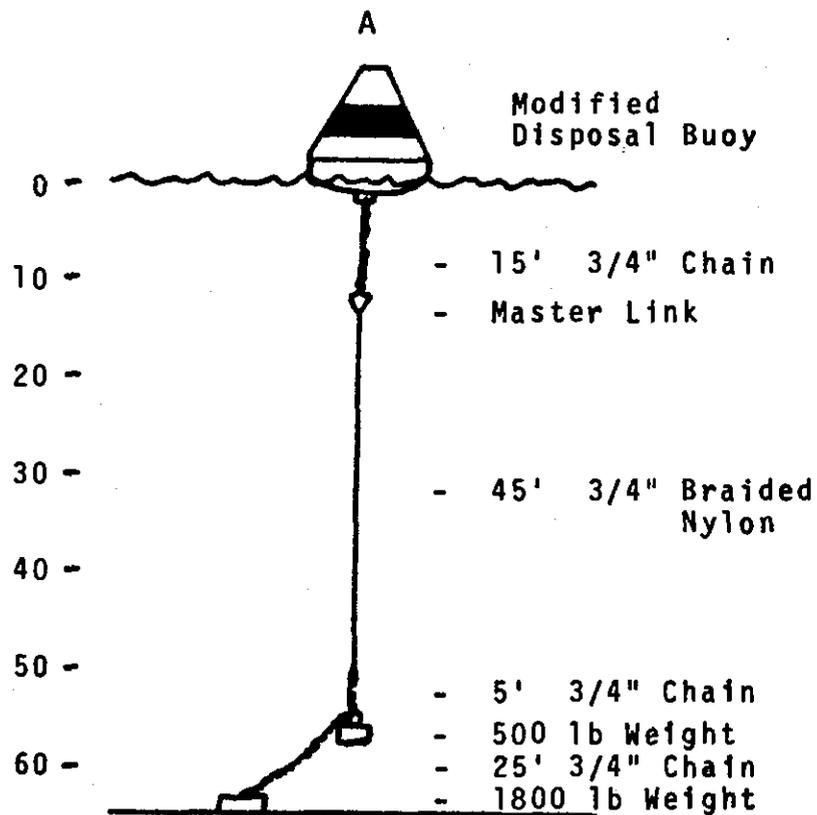
In order to facilitate relocation of the buoy, a master link was included just above the nylon line. This master link will permit a diver to easily shackle a lifting cable into the mooring which could then be used to lift the anchor weight through the accumulated dredged material. Once free of the sediment, it can be dragged to a new location without the necessity for redeploying the entire mooring. Using this technique, the mooring could be easily moved several times as long as the depth in the site does not vary by more than a few meters.

In addition to changes in the mooring design, several modifications have been made to the marker buoy as well. Most significant of these is a change to a more powerful light. A Tideland Model ML-155 flashing 4 second light was installed inside the superstructure of the buoy with sufficient battery power stored in the base of the buoy to last for one year. Since these lights are relatively expensive, the superstructure was reinforced and engineered so that any wires or lines that struck the buoy would ride over the assembly without damage.

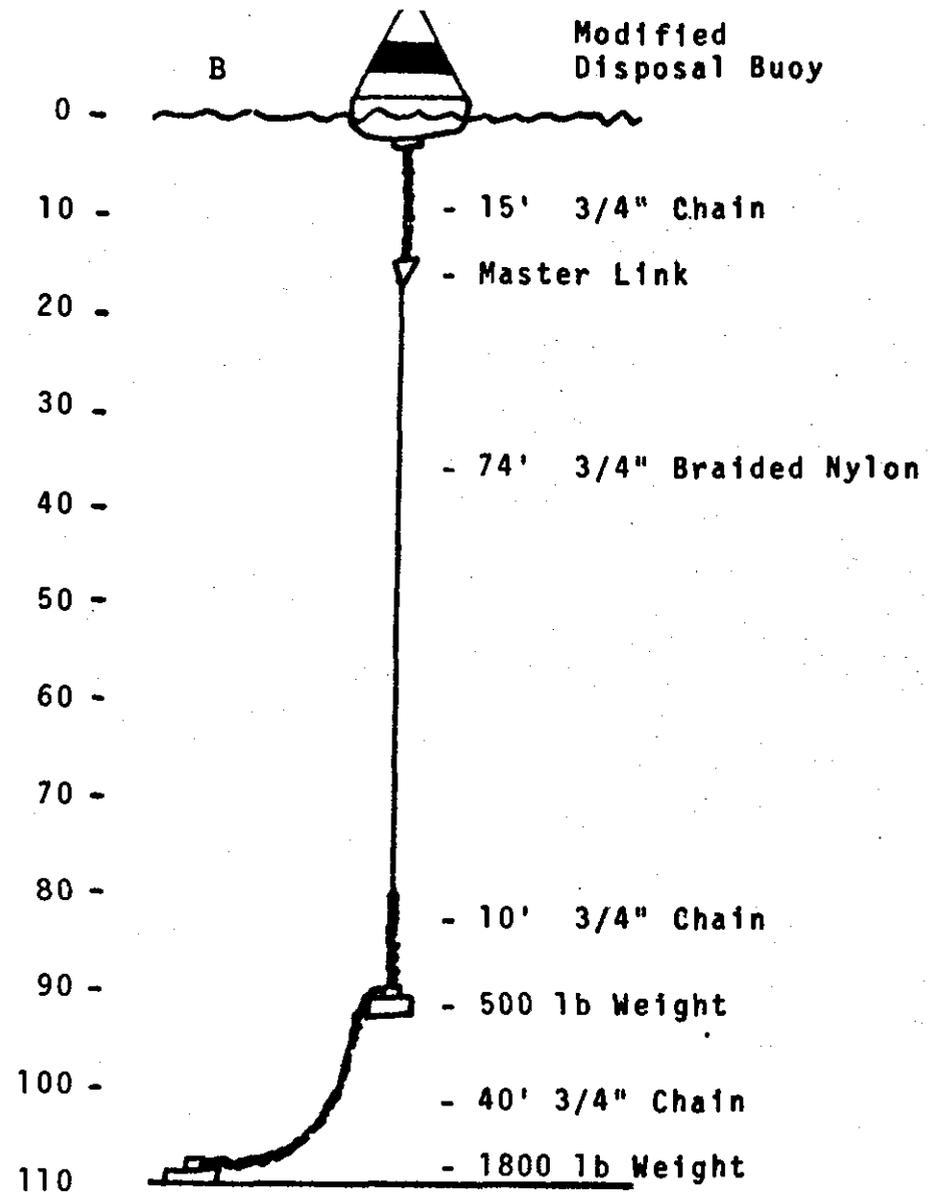
Increased visibility and radar reflectivity were attained through addition of four aluminum radar reflectors to the superstructure. Finally, reflective tape was applied to various parts of the buoy to increase the nighttime visibility of the marker.

4.0 DEPLOYMENT

Both buoys were deployed from the R/V UCONN on 19 March



CENTRAL LONG ISLAND SOUND
DISPOSAL SITE



WESTERN LONG ISLAND SOUND
DISPOSAL SITE

MOORING DESIGN SCHEMATICS
LONG ISLAND SOUND DISPOSAL BUOYS

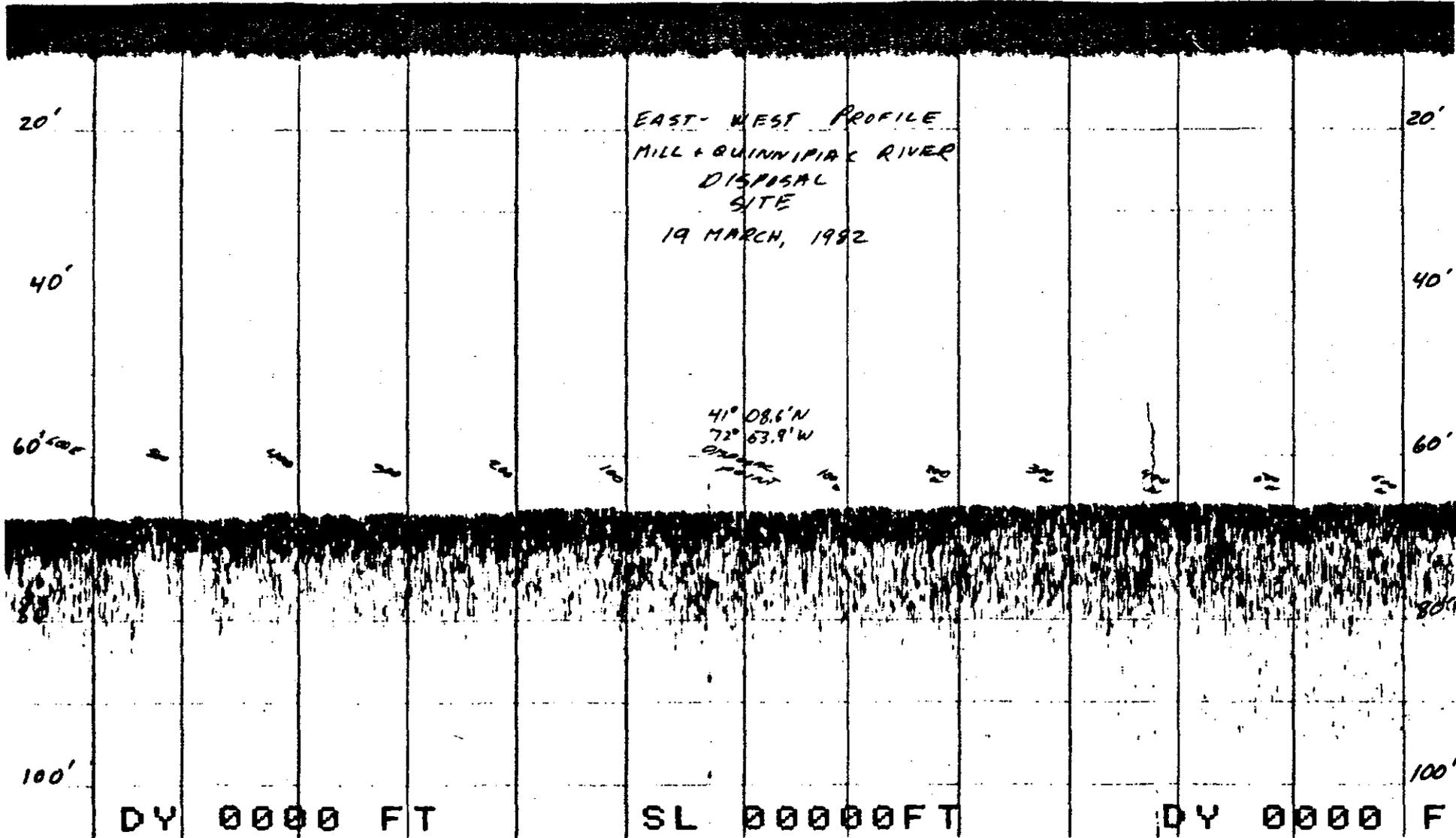
1982. Navigation control was provided by the SAI Navigation and Data Acquisition System with the trisponder shore stations located at the standard DAMOS positions.

Since a detailed baseline survey of the Mill and Quinnipiac River Site had not yet been completed, a depth profile was made from 600 m east to 600 m west of the proposed disposal point (Fig. 4.0-1). As expected, the bottom was extremely flat, at a depth of approximately 20 meters (66 feet, uncorrected).

After checking the depth, the buoy was deployed at the designated point of $40^{\circ}08.6'N$, $72^{\circ}53.8'W$ (Fig. 4.0-2). Following deployment, the position was verified by bringing the ship alongside. Measured Trisponder ranges for the buoy were 17280 m from Stratford Point, and 11740 m from Lighthouse Point. Loran-C time delays were measured on the 9960 chain from the X and Y slaves as 26552.4 and 43997.1 μ sec respectively. From this position the "SP" buoy marking the permit dumping location bears $095^{\circ}M$ at 800 meters.

The WLIS III buoy was deployed in a similar manner, however, since a baseline survey had recently been completed no depth profile was made. A check of the depth as approximately 34 meters (112', uncorrected) was sufficient to verify buoy design criteria. The marker was deployed at the designated point of $40^{\circ}59.34'N$, $73^{\circ}29.21'W$ (Fig. 4.0-3) and position checks similar to those at the CLIS site were made.

The Trisponder ranges were 11236 meters from the power station dock in Norwalk, Connecticut and 8572 meters from the Eaton's Neck Lighthouse. Loran-C readings were again taken from the X and Y slaves as 26830.6 and 43975.0 μ sec.



DEPTH PROFILE ACROSS DESIGNATED DISPOSAL POINT

MILL AND QUINNIPIAC RIVERS

Figure 4.0-1

WLIS III JAN82

CHART SCALE: 1/4000

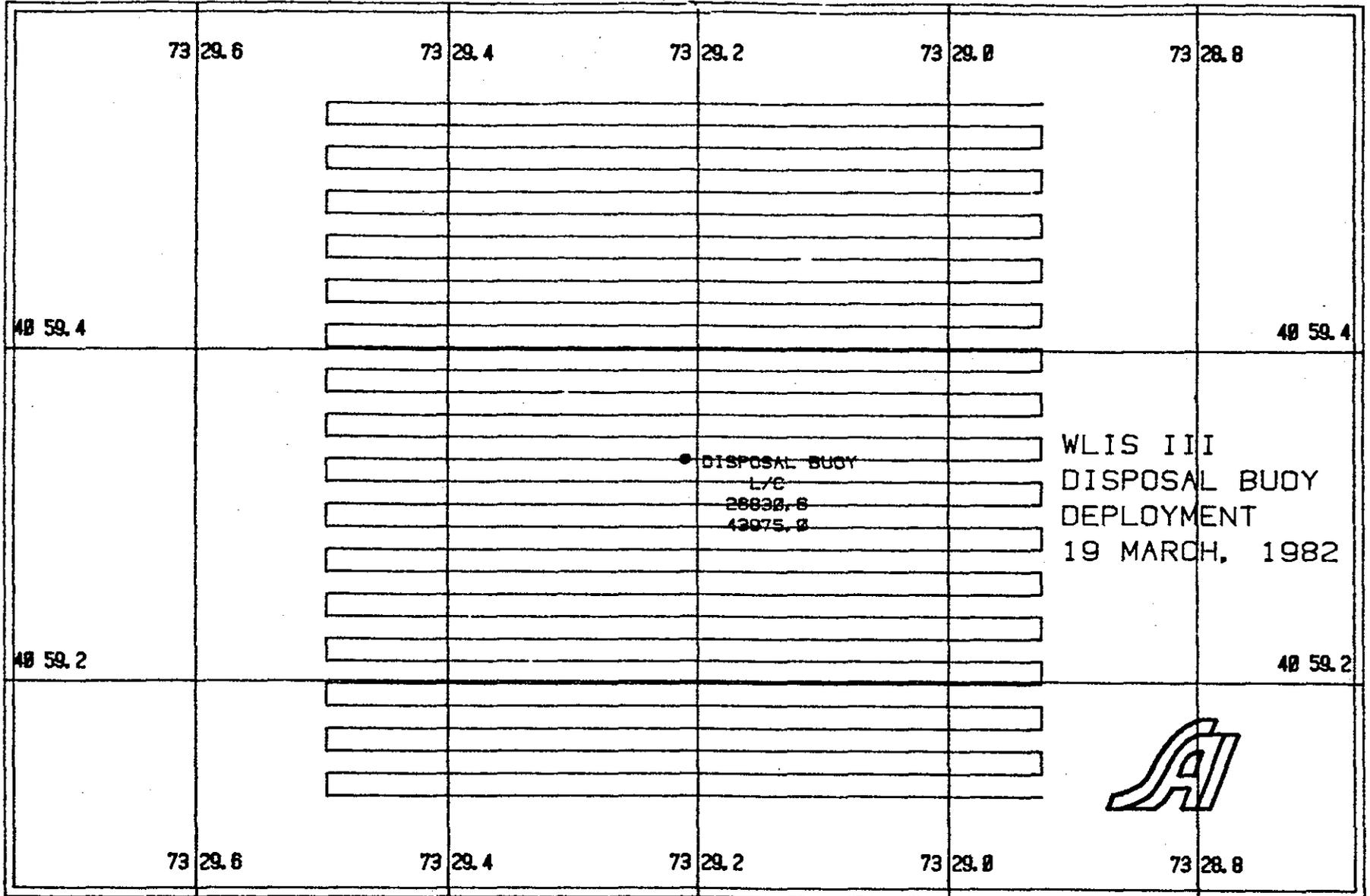


Figure 4.0-3

A visual survey of the area immediately surrounding the disposal point and the intended transit route from buoy "32A" revealed only one lobster pot trawl in the area. This was located slightly more than one half mile ENE of the buoy and should not be affected by the disposal operation. However, the numbers on the marker buoys were recorded and attempts are underway to locate the owner to warn him of potential conflict with scow traffic.

5.0 SUMMARY

The deployment of disposal markers was successfully completed at the designated points in Central and Western Long Island Sound Disposal Sites on 19 March 1982. This entire effort was coordinated with the Aids to Navigation Branch of the Third Coast Guard District in New York. Copies of the application for a private aid to navigation and a letter confirming deployment are included as Appendix I.

At the present time, arrangements are underway to provide sufficient spare parts for replacement of either of these buoys within a one or two day time frame should they be damaged or lost. These arrangements should be complete before April 1, 1982.

APPENDIX I

Communications with U.S. Coast Guard
Third Coast Guard District
Aids to Navigation



March 22, 1982

Commander
Third Coast Guard District
Governors Island, NY 10004

Attn: Lt. Wilhite
Aids to Navigation

Dear Sir,

As discussed in our phone conversation on 16 March, SAI installed two (2) disposal buoys for the US Army Corps of Engineers (contract #DACW33-82-R-0002, in Long Island Sound on 19 March 1982. The buoys were placed in the Central and Western Long Island Sound Disposal Sites at the following locations:

CLIS 41°08.6'N
 72°53.9'W

WLIS 40°59.34'N
 73°29.21'W

Both buoys are marked "DG", have an orange & white superstructure and display a 4 second flashing white light.

The buoys will be maintained by SAI and will remain in place for an indefinite period depending on the disposal operation schedules. SAI will notify the Coast Guard prior to removal of either buoy.

Thank you for your help and cooperation.

Sincerely,



ROBERT W. MORTON
OCEAN SCIENCE & TECHNOLOGY DIVISION

Science Applications, Inc. 202 Thames Street, Newport, RI 02840 (401) 847-4210

Other SAI Offices: Albuquerque, Ann Arbor, Arlington, Atlanta, Boston, Chicago, Huntsville, Los Angeles, McLean, Palo Alto, San Diego, Sunnyvale, and Tucson.

DEPARTMENT OF TRANSPORTATION COAST GUARD 2554 (Rev. 7-76)	PRIVATE AIDS TO NAVIGATION APPLICATION <i>(See attached instructions and copy of Code of Fed. Reg., Title 33, Chap. 1, Part 66)</i>	Form Approved OMB-004-R5681
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PRIVATE AID TO NAVIGATION MAY BE AUTHORIZED UNLESS A COMPLETED APPLICATION FORM HAS BEEN RECEIVED (14 U.S.C. 83; 33 C.F.R. 66.01-8).

ACTION REQUESTED FOR PRIVATE AIDS TO NAVIGATION: A <input checked="" type="checkbox"/> ESTABLISH AND MAINTAIN B <input type="checkbox"/> DISCONTINUE C <input type="checkbox"/> CHANGE D <input type="checkbox"/> TRANSFER OWNERSHIP	2. DATE ACTION TO BE TAKEN 5 April 1982
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AIDS WILL BE OPERATED: A THROUGHOUT YEAR B TEMPORARILY UNTIL _____ C ANNUALLY FROM _____ TO _____

4. NECESSITY FOR AID (Continue in Block 8) See Block 8	5. GENERAL LOCALITY Long Island So	6. CORPS OF ENGINEERS AUTHORIZED THIS STRUCTURE OR BUOY BY <input checked="" type="checkbox"/> PERMIT OR <input type="checkbox"/> LETTER (file and date)
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7. APPLICANT WILL FILL IN APPLICABLE REMAINING COLUMNS

AID LIST NUMBER OR PAGE	NAME OF AID	NO. OR LTR. (7a)	LIGHT			POSITION (7e)	DEPTH OF WATER (7f)	CAN-DLE POWER (7g)	HT. ABOVE WATER (7h)	STRUCTURE TYPE, COLOR, AND HEIGHT ABOVE GROUND (7i)	REMARKS (See Instructions) (7j)
			PER. (7b)	FLASH LGTH. (7c)	COLOR (7d)						
		D	4	0.4	WHT	40°59'20.4"N 73°29'12.6"W	115	89	7		See Attachment international orange, reflective strips, radar reflector
		D	4	0.4	WHT	* SEE BELOW	100	89	7		Same as above

ADDITIONAL COMMENTS
 To mark position for the purpose of accurate disposal of dredge spoil material per order of New England District, U.S. Army Coprs of Engineers. See attachment
 Proposed position is 41°08' 35.2"N 72°53' 57.6"W but will depend on suitability of bottom topography for dredge spoil disposal.

NAME AND ADDRESS OF PERSON IN DIRECT CHARGE OF AID Dr. Robert Morton 202 Thames St. Newport, RI 02840 TELEPHONE NO. 401 847-4210	NAME AND ADDRESS OF PERSON OR CORPORATION AT WHOSE EXPENSE AID IS MAINTAINED Science Applications (for US Army Corps of Engineers), 202 Thames Newport, RI	10b. THE APPLICANT AGREES TO SAVE THE COAST GUARD HARMLESS WITH RESPECT TO ANY CLAIM OR CLAIMS THAT MAY RESULT ARISING FROM THE ALLEGED NEGLIGENCE OF THE MAINTENANCE OR OPERATION OF THE APPROVED AID(S). 10c. DATE 5 April 82
10d. SIGNATURE AND TITLE OF OFFICIAL SIGNING <i>R. Morton</i>		10e. SIGNATURE (By direction) <i>R. Morton</i>
10f. USE BY DISTRICT COMMANDER RECD.	10g. CHART	10h. DATE APPROVED