ATLANTIC TESTING LABORATORIES, LIMITED

Box 29
Canton, N.Y. 13617
(315) 386-4578
Fax (315) 386-1012

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Cicero, N.Y. 13039
(315) 699-5281

May 20, 1993

U.S. Army Corps of Engineers
New England Division
424 Trapelo Road
Waltham, MA 02254-9149

Attn: Mr. Yuri Yatsevitch

Re: Phase 1C Exploration
Saugus River and Tributaries
Lynn, Massachusetts
Contract No. DACW33-93-D-0004
GED Requisition No. 93-17
Delivery Order No. 0001
ATL Report No. CD0037-1-5-93

Ladies/Gentlemen:

In accordance with Delivery Order No. 0001 dated 93, April 22, enclosed are ~~two~~ one draft copies of our Engineering Report for the subsurface investigation performed at Lynn, Massachusetts.

If you have any questions or comments, please do not hesitate to contact our office.

Respectfully submitted,

Jonathan for
Thomas A. Custeau
Geotechnical Inspector

TAC/dc

Encs.

SECTION 1

PHASE 1C EXPLORATIONS

LYNN, MA

Contract No. DACW33-93-D-0004

Contracting/Ordering Officer:

Michelle A. Kewer

Delivery Order No. 0001

PREPARED FOR: U.S. Army Corps of Engineers
New England Division
424 Trapelo Road
Waltham, MA 02254-9149

PREPARED BY: Atlantic Testing Laboratories, Limited
P.O. Box 29
Canton, NY 13617

ATL REPORT NO. CD0037-1-5-93

MAY 20, 1993

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SCOPE OF INVESTIGATION

a. Delivery Order No. 0001

ORDER FOR SUPPLIES OR SERVICES

(Contractor must submit four copies of Invoice)

Form Approved OMB No. 0704-0187 Expires Aug 31, 1992

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0187), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send your completed form to the procurement official identified in item 6.

1. CONTRACT/PURCH ORDER NO.: DACW33-93-B-0004
2. DELIVERY ORDER NO.: 0001
3. DATE OF ORDER: 04/22/93
4. REQUISITION/PURCH REQUEST NO.: 961316-3106-0016
5. PRIORITY:

6. ISSUED BY — CODE 961316
Dept. of the Army
N. E. Division, Corps of Engrs
424 Trapelo Road
Waltham, MA 02254-9149
Dorothy Moebius S01 / (617)-647-8419

7. ADMINISTERED BY — CODE EMPTY

8. DELIVERY FOB
[X] DEST
[ ] OTHER
(See Schedule)

9. CONTRACTOR Vendor Id: 00001556 — CODE 0SKT9 — FACILITY CODE
NAME AND ADDRESS: ATLANTIC TESTING LAB, LIMITED
P. O. BOX 29
CANTON, NY 13617-

10. DELIVER TO FOB POINT BY 06/02/93

11. MARK IF BUS. IS
[X] SMALL
[ ] SMALL DIS-ADVANTAGED
[ ] WOMEN-OWNED

12. DISCOUNT TERMS 0 % 0 Net 0

13. MAIL INVOICES TO
See Block 15

14. SHIP TO — CODE GEB
Geotechnical Engineering
Division, Engineering
Directorate, at issuing office
DACW33930B004/0001

15. PAYMENT WILL BE MADE BY — CODE FAO
Finance & Accounting Officer
U.S.A. Engr. Div., New England
424 Trapelo Road
Waltham, MA 02254-9149

MARK ALL PACKAGES AND PAPERS WITH CONTRACT OR ORDER NUMBER

16. DELIVERY [X] This delivery order is issued on another Government agency or in accordance with and subject to terms and conditions of above numbered contract.

PURCHASE [ ] Reference your . furnish the following on terms specified herein.

ACCEPTANCE. THE CONTRACTOR HEREBY ACCEPTS THE OFFER REPRESENTED BY THE NUMBERED PURCHASE ORDER AS IT MAY PREVIOUSLY HAVE BEEN OR IS NOW MODIFIED, SUBJECT TO ALL OF THE TERMS AND CONDITIONS SET FORTH, AND AGREES TO PERFORM THE SAME.

NAME OF CONTRACTOR	SIGNATURE	TYPED NAME AND TITLE	DATE SIGNED
Atlantic Testing Laboratories, Limited	M. R. King	Michael R. King, Vice Pres. Finance & Admin.	4/28/93

[ ] If this box is marked, supplier must sign Acceptance and return the following number of copies:

17. ACCOUNTING AND APPROPRIATION DATA/LOCAL USE
96X3121 AF5030551030GR2 (MD) AE 284 $60,775.00

18. ITEM NO.	19. SCHEDULE OF SUPPLIES/SERVICE	20. QUANTITY ORDERED/ACCEPTED*	21. UNIT	22. UNIT PRICE	23. AMOUNT
	Furnish necessary supplies and services to complete Phase 1C Explorations, Saugus River & Tributaries in accordance with attached Scope of Work.				

*If quantity accepted by the Government is same as quantity ordered, indicate by x. If different, enter actual quantity accepted below quantity ordered and encircle.

24. UNITED STATES OF AMERICA
Michelle A. Kewer 4/23/93
BY: MICHELLE A. KEWER a01
CONTRACTING/ORDERING OFFICER

25. TOTAL: 60775.00

29. DIFFERENCES

26. QUANTITY IN COLUMN 20 HAS BEEN
[ ] INSPECTED [ ] RECEIVED [ ] ACCEPTED AND CONFORMS TO THE CONTRACT EXCEPT AS NOTED

DATE — SIGNATURE OF AUTHORIZED GOVERNMENT REP.

27. SHIP. NO.
[ ] PARTIAL
[ ] FINAL

28. D.O. VOUCHER NO.

30. INITIALS

31. PAYMENT
[ ] COMPLETE
[ ] PARTIAL
[ ] FINAL

32. PAID BY

33. AMT VERIFIED CORRECT FOR

34. CHECK NUMBER

35. BILL OF LADING NO.

36. I certify this account is correct and proper for payment

DATE — SIGNATURE AND TITLE OF CERTIFYING OFFICER

37. REC'D AT	38. RECEIVED BY	39. DATE REC'D	40. TOTAL CONT.	41. S/R ACCOUNT NUMBER	42. S/R VOUCHER NO.

Orig: Cat Folder
cc: Tom Wagner
4/26/93
CH.

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02254-9149

REPLY TO
ATTENTION OF

CENED-CT-C

23 April 1993

MEMORANDUM FOR Michelle A. Kewer

SUBJECT: Designation as Contracting Officer

During the temporary absence of Mr. Charles W. Coe for the period 19 through 23 April 1993, you are hereby appointed Contracting Officer on the following contract.

Contract No.	Contractor	Project
DACW33-93-D-0004	[redacted]	Furnish All Necessary Personnel, Equipment, and Supplies to Perform Geotechnical Exploratory Work, Various Locations in New England
DACW33-93-C-0001	Franklin Environmental Services, Inc.	Furnish Necessary Services to Analyze, Transport and Dispose of Approximately 219 Fifty-Five Gallon Drums of Potentially Hazardous Waste, Davis Liquid Waste Superfund Site, Smithfield, Rhode Island

JAMES K. HUGHES
LTC, CE
Acting Commander

Distribution:
Mr. Charles W. Coe
[redacted]
Contract File
F&A Center, Exam
Operations Dir
Regulatory Div
Office of Counsel
Audit Office
Contracting Dir
Contracts Div

ATLANTIC TESTING LAB, LIMITED

ITEM NO.	SCHEDULE OF SUPPLIES/SERVICE	QUANTITY	UNIT	UNIT-PRICE	AMOUNT
0003	GEOTECHNICAL INSPECTOR	90	HR	48.000000	4320.00
0005	PER DIEM - OVERNIGHT STAY	9	DA	55.000000	495.00
0006	MILEAGE FROM WALTHAM, MA AND RETURN	200	MI	0.500000	100.00
000701	50% of $4,320.00 (Line Item 0003) D. O. #0001	1	JB	2160.000000	2160.00
0008	SURVEYING MOBILIZATION AND DEMOBILIZATION	1	JB	450.000000	450.00
0010	MILEAGE FROM/TO CONTRACTOR'S EQUIPMENT STORAGE SITE(S). SITE(S) LOCATED IN MANCHESTER, NEW HAMPSHIRE	200	MI	0.500000	100.00
0011	SURVEY CREW AND EQUIPMENT	10	DA	880.000000	8800.00
0012	OVERNIGHT PER DIEM FOR SURVEY CREW	9	DA	160.000000	1440.00
0015	SAMPLE DELIVERY	1	JB	110.000000	110.00
0016	MOBILIZATION AND DEMOBILIZATION ONE DRILL RIG, CREW AND AUXILIARY EQUIPMENT MOBILIZATION AND DEMOBILIZATION	1	JB	1320.000000	1320.00
0018	MILEAGE FROM/TO CONTRACTOR'S MAIN EQUIPMENT STORAGE SITE. SITE LOCATED IN MANCHESTER, NEW HAMPSHIRE	100	MI	1.650000	165.00
0020	STANDBY TIME/ON SITE MOVES	15	HR	110.000000	1650.00
0029	16 FOOT BOAT	10	DA	132.000000	1320.00

ATLANTIC TESTING LAB, LIMITED

ITEM NO.	SCHEDULE OF SUPPLIES/SERVICE	QUANTITY	UNIT	UNIT-PRICE	AMOUNT
0029 (continued)					
0030	OPERATOR FOR 12 FT. OR 16 FT. BOAT	10	DA	220.000000	2200.00
0038	1500 SQUARE FT. BARGE WITH SPUD ANCHORS	10	DA	2750.000000	27500.00
0051	DRIVE SAMPLE BORING WITHOUT CASING: SAMPLING SPACED AT 5 FEET 0-30 FT. DEPTH	120	LF	14.000000	1680.00
0052	31-50 FT. DEPTH	80	LF	18.000000	1440.00
0062	DRIVING AND PULLING CASING BX, NX SIZE	200	LF	18.000000	3600.00
0082	NWX SIZE AND/OR NWM	25	LF	77.000000	1925.00

CONTRACTOR SHALL COMMENCE WORK EFFECTIVE 4/26/93.

ATTACHMENT NO. 1

GED REQUISITION NO. 93 - 17

SCOPE OF WORK

PROJECT: Borings.

SITE: Saugus River and Tributaries Project (Figures 1 and 2)

1. SCOPE OF INVESTIGATIONS.

A. A minimum of two and a maximum of four test borings drilled to -60 MLW or until 10 feet of rock core has been recovered. Borings are as shown on the attached map. Boring FD-93-A shall be done first. The results will determine if Borings FD-93-B and FD-93-C are necessary. Boring FD-93-D shall be done regardless. SPT's shall be performed in accordance with ASTM D 1586. SPT's shall be executed at the surface and at 5-foot intervals thereafter or as otherwise directed in the field by the Government. Rock coring shall be performed to penetrate any boulders.

B. The Contractor shall provide an experienced geotechnical inspector to log the explorations and prepare a report.

C. A spud barge is required for this work.

D. Survey support shall be provided by the Contractor. Tide gages are required. Communication between the floating plant and shore shall be by radio.

E. The Contractor shall notify the Coast Guard as required.

2. SITE CONDITIONS.

The work is in open water in Saugus River (Figure 1). Water depths for explorations vary from about -10 feet MLW to -12 feet MLW. Tide levels in the area vary between 5.0 feet NGVD at mean high water and -4.5 feet NGVD at low water. Subsurface soils may consist of mixed deposits of silt, sand and clay, Boston Blue Clay, and/or compact glacial till. Previous borings encountered stiff soils and occasional boulders up to 1 foot in dimension.

3. COORDINATION.

Liaison will be maintained for the duration of the delivery order through frequent telephone contacts with NED points of contact Yuri Yatsevitch (617 647-8387) and Paul Schimelfenyg (617 647-8394). Daily telephone contacts and field discussions are required between the Contractor and the NED points of contact during the work.

4. COMPLETION SCHEDULE.

All work under this delivery order shall be completed within the following time limits:

Mobilization to Site	Within 10 days from NTP
Submission of Draft Report	Within 10 days from completion of explorations
Submission of Final Report	Within 5 days from Government review comments

5. GOVERNMENT REVIEW.

The Government review will take approximately ten calendar days from receipt of draft report. Three copies of the final report shall be submitted no later than ten calendar days after your receipt of the Government-reviewed draft report including the action taken on possible comments.

6. QUALITY CONTROL.

Your attention is invited to the Contract General Provisions, "Quality Control and Assurance". You will be held responsible for the quality of the report submitted and for all damages caused to the Government as a result of your negligence in the performance of any services furnished under the contract.

Although submissions required by our contract are technically reviewed by the Government, it is emphasized that your work must be prosecuted using proper internal controls and review procedures. The letter of transmittal for each submission which you make shall include a certification that the submission has been subjected to your own review and coordination procedures to insure (a) completeness for each discipline commensurate with the level of effort required for that submission, (b) professional and the technical accuracy of the submission. Documents which are significantly deficient in any of these areas will be returned to you for correction and/or upgrading prior to completing out review. Contract submission dates will not be extended if a resubmission of draft material is required for this reason.

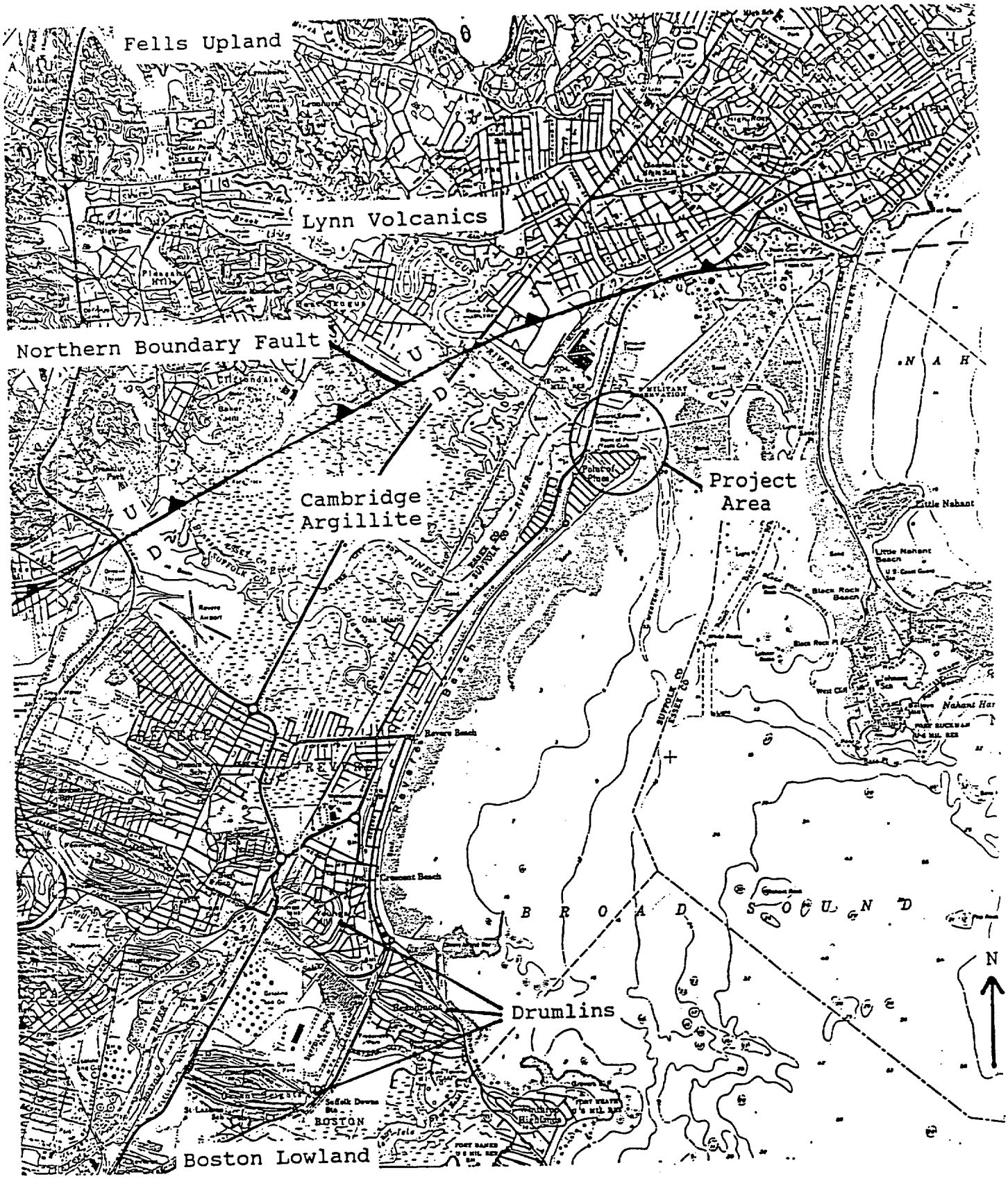


Figure B-1. Topographic Map of Lynn, Saugus, and Revere Area showing Geologic Features in the Saugus Rivers and Tributaries Project Area Geologic Features in the Saugus Rivers and Tributaries Project Area (from U.S.G.S. Boston North, MA and Lynn, MA Quadrangle Maps).

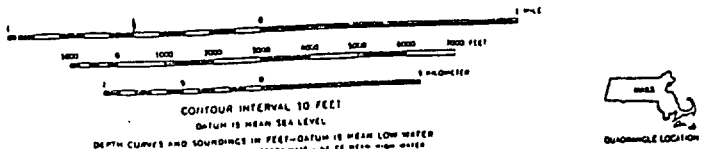


FIG. 1

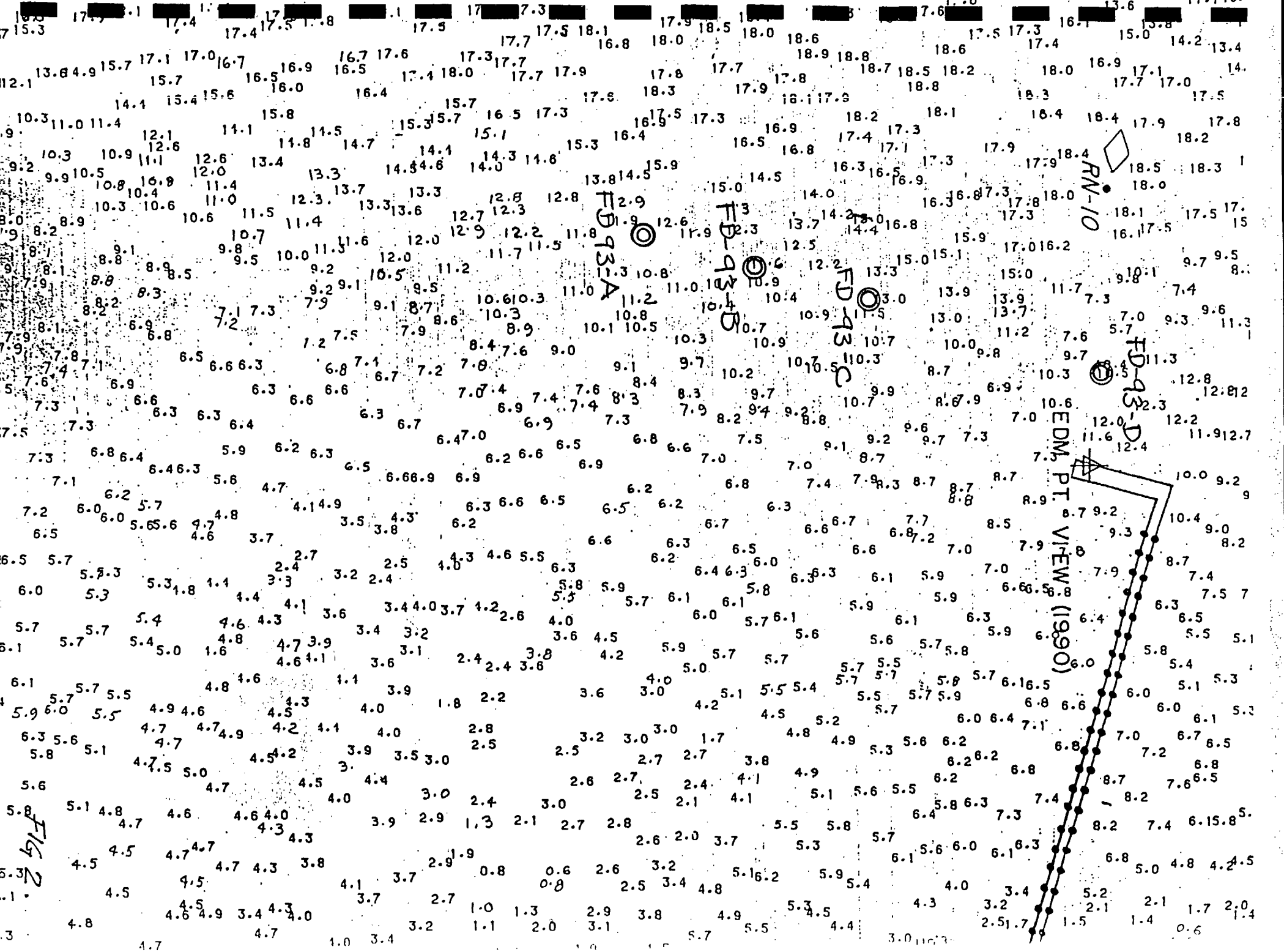
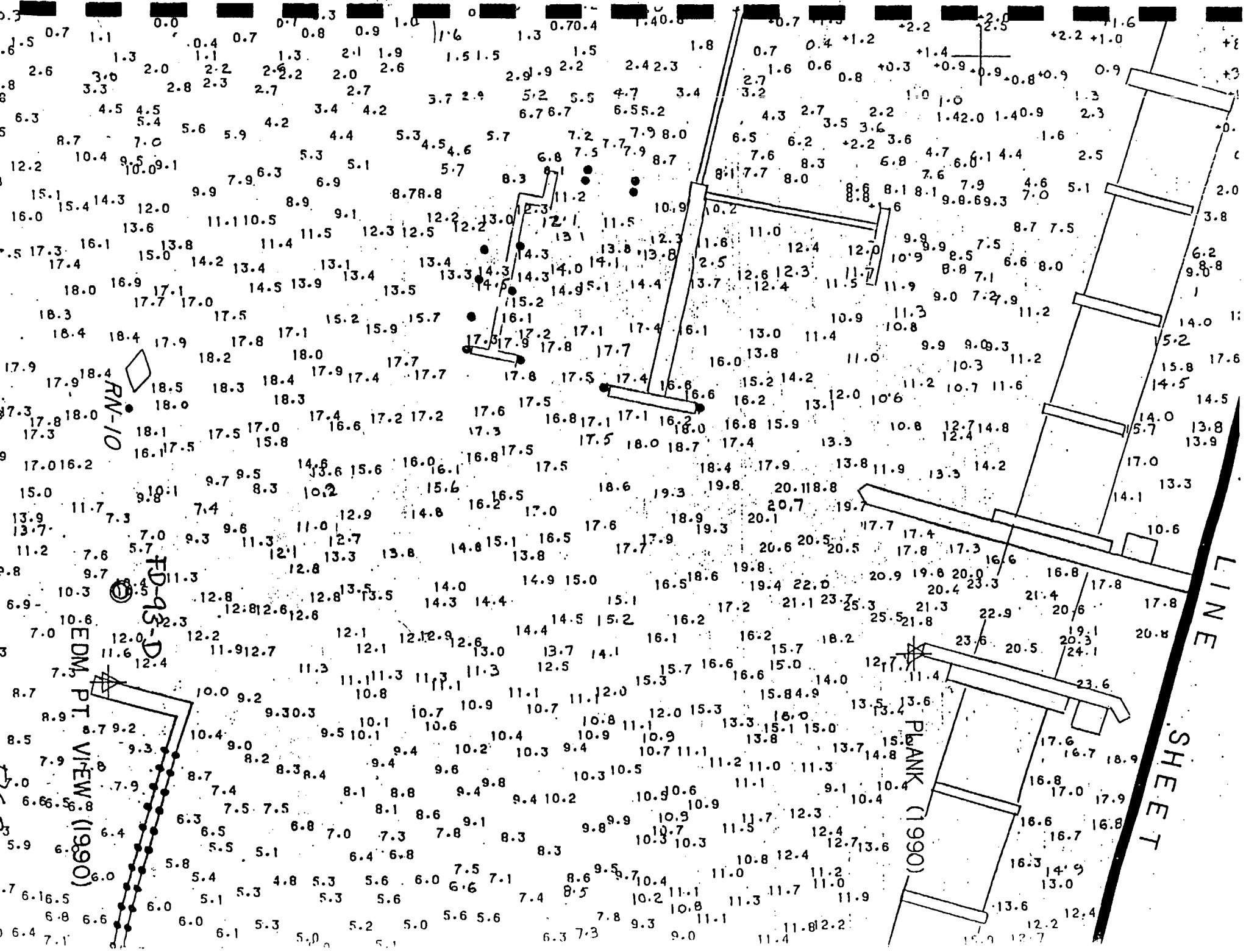


Fig 2


RN-10
FD-93'D
EDM PT VIEW (1990)
PLANK (1990)
LINE
SHEET 1

b. Project Site

The project site is located on the Saugus River in Lynn, Massachusetts. The investigation took place between the General Edwards Bridge and the harbor. The general area of the investigation is shown on Figure 1 of the Delivery Order.

c. Purpose

The purpose of the investigation was to determine the subsurface soil conditions associated with the Saugus River Floodgate Project.

d. Scope of Work

Inspection and exploration instructions were provided by the Army Corps of Engineers, New England Division, in Delivery Order No. 0001 and are included in Section 3a. of this report. General inspection and exploration instructions were provided by the Army Corps of Engineers, New England Division, through the contracted Specifications for Services, and Equipment Necessary for Conducting Geotechnical Exploratory Work Various Locations in New England.

Atlantic Testing Laboratories' surveyors provided locations and elevations for the test borings.

Drilling and sampling were performed by Atlantic Testing Laboratories, Limited's personnel using Atlantic Testing Laboratories' equipment. The test borings were sampled using a 1-3/8" I.D. split spoon sampler advanced with a 140-lb. safety hammer. The borings were advanced using HW, and/or NW casing by spinning and washing. The casing was cleaned with the appropriate size roller bit, when necessary.

The proposed scope of work required four borings drilled from a barge in the Saugus River. The borings were performed from May 3, 1993 to May 7, 1993 using a 30' x 90' spud barge.

SECTION 4

QUALITY CONTROL

a. General Certification Statement

I hereby certify that the records, equipment, and procedures mentioned herein were used to perform the subsurface exploration. I also certify that the work was performed in a professional manner and meets the requirements set forth in the Delivery Order. This report has been subject to my review and is both complete and technically accurate.

CERTIFIED, May 14, 1993

Spencer F. Thew, P.E./L.S.

b. General Statement

The equipment and procedures used to perform the subsurface investigation are summarized below.

c. Records Taken

The "General Project Map", "Site Location Plan", and "Boring Location Plan" are included in Section 8.

Pertinent drilling procedures, sampling operations, and soil classification data were noted on the following forms provided by the Corps of Engineers:

NED 198	Daily Log of Field Explorations
NED 58 and 58a	Field Log of Test Boring

A series of logs for each of the borings is included in Section 8.

A summary of daily activities and a telephone log are Table I and Table II of Section 5, respectively. A chain of custody log is in Section 6. Safety meeting, reports, and NED Form 251 are in Section 7.

d. Equipment Used

All equipment and supplies were provided by Atlantic Testing Laboratories, Limited, with the exception of that provided by subcontractors. A listing of pertinent equipment follows:

1. Survey Equipment:

   - 1 Wild T1000 Electronic Theomat with single and triple reflectors
   - 1 Wild GRE-4 Data Collector/Field Computer
   - Wild Heerbrugg, NAKI automatic level
   - 25-foot, extendable, fiberglass, stadia rod
   - Two-way radios

2. Drilling Equipment:

   - CME-75 truck-mounted drill rig
   - HW and NW size casing with spin shoes
   - Drill rod, NW-threaded in 2-foot, 5-foot and 10-foot lengths used for sampling and advancing a roller bit
   - 140-pound safety hammer was used to advance the 2-foot x 1-3/8-inch split spoon sampler
   - 2-foot x 1-3/8-inch I.D. split spoon samplers
   - Aluminum boat with outboard motor

3. Subcontract Equipment:

   - Tugboat/Operator
   - Barge
   - Crane/Operator

e. Procedures

1. General Statement

   A marine test boring investigation was performed in the Saugus River, Lynn, MA, during the period May 3, 1993 through May 7, 1993.

2. Surveying Procedures

   Atlantic Testing Laboratories' surveyors were on-site throughout the duration of the project to locate the borings, to determine the actual location as drilled, and to provide sample elevations as the drilling program proceeded.

e. Procedures (con't.)

2. Surveying Procedures (con't.)

   a. Horizontal Control

      The coordinates of the proposed borings were determined by scaling from a base map provided by the Corps of Engineers. The position of the borings were determined by turning an angle from the survey baseline (instrument occupying Station "VIEW, Backsight Station "PUMP"), and measuring the distance electronically. Actual coordinates were calculated, and postions with 10-feet of scale were accepted.

   b. Vertical Control

      The elevation of the bottom of the casing was determined and monitored by trignometric levelling using the Wild T1000 electronic theomat, by determining the elevation of the top of casing or drill rod, and subtracting the known length assembled.

3. Boring Location Procedures

   The surveyors determined the relative positon of borings from the Control Point "VIEW" found on the fishing pier. Control Point "PUMP" was used to establish the base line. The surveyors then guided the barge to the site of the proposed boring using two-way radios. When the barge was at the proposed boring location the spuds were set.

4. Sampling and Drilling Procedures

   Sampling techniques involved retrieving material using the Standard Penetration Test. A 1-3/8" I.D. x 2-foot long split spoon sampler was advanced using a 140-lb. safety hammer. Samples were classified in the field in accordance with ASTM D-2488. Representative samples were taken from each soil sampling run and placed in 16-oz. jars with hermetically-sealed lids. Sample jars were labeled using a form similar to ENG Form 1742.

SECTION 5

SUMMARY OF ACTIVITIES
AND
CONVERSATION LOGS

a. Summary of Activities

TABLE I

DATE	ACTIVITY
Monday, April 26, 1993	- Survey crew travelled to Lynn, MA (50 miles). Driller's mobilized drill rig to Gloucester (50 miles).
Tuesday, April 27, 1993	- Survey crew arrived at job site at 6:30 am. Re-established monumentation for stakeout. Recovered stations View, Edwards, and Plank (50 miles). - Drillers load drill rig on barge and prepared for mobilization to the site. - Due to a scheduling conflict, the boat crew is not available until the latter part of the week. - Barge crew will finish securing rig and equipment on barge on Wednesday and Thursday. - Drillers and surveyors departed the site with a scheduled return date of May 3, 1993.
Monday, May 3, 1993	- Survey crew, inspector, and drillers mobilize to Lynn, Massachusetts. - Great Eastern Marine Services (GEMS) mobilized 30′ x 90′ spud barge and CME-75 drill rig using 1,600 hp, 53′ tugboat from Gloucester to Lynn - 6:00 am to Noon. On site Noon - 5:00 pm. - Inspector conducted safety meeting. - Survey crew set up on control point on fishing pier. - Positioned barge at FD-93-1(A) and set-up to drill. Two hours was spent in positioning the barge. - Arranged to moor tugboat at Point of Pines Yacht Club.
Tuesday, May 4, 1993	- Survey crew, inspector, drillers, and boat crew on-site 6:30 am - 7:30 pm. - Drilled FD-93-1(A) using NW casing by spinning and washing to a depth of -64.5 NGVD or -60 MLW. - Mr. Steve Dunbar from U.S.A.C.E. on-site this day and terminated hole FD-93-1(A) at -64.5 NGVD, then left site. - Positioned barge at FD-93-2(B). Began drilling. At a depth of 45′ or -55.8± NGVD spuds slipped, barge moved, casing bent, and tugboat was needed to hold barge in position. Barge-mounted crane was used to assist in removing casing from hole. All casing was recovered. 35′ of NW casing and 20′ of NW rod was destroyed.

a. Summary of Activities (con't.)

TABLE I (con't.)

DATE	ACTIVITY
Tuesday, May 4, 1993 (con't.)	- Repositioned/secured barge for the evening. A total of 4 hours was spent moving and securing the barge. - Returned to Point of Pines Marina.
Wednesday, May 5, 1993	- Survey crew, inspector, drillers, and boat crew on-site 6:30 am to 7:00 pm. - Inspector called Yuri Yatsevitch, spoke to S. Dunbar, and was instructed to reposition barge as close to FD-93-2(B) as possible. Spin and wash casing to 45' or -55.8± NGVD and resume sampling. The barge was repositioned near FD-93-2(B) and drilling commenced. - The drillers spun and washed HW casing to 45', resumed sampling. - Informed S. Dunbar when hole was completed at 53.2 or -64' NGVD. He instructed us to move to FD-93-3(C). - The barge was positioned at FD-93-3(C). It took 2 hours to move barge. Spun and washed, and sampled to a depth of 52.4' or -65±' NGVD. - Removed casing and drill steel. Casing shoe destroyed. - Secured barge for the evening.
Thursday, May 6, 1993	- Survey crew, inspector, drillers, and boat crew on-site 6:30 am - 3:30 pm. - Informed S. Dunbar of the successful completion of FD-93-3(C) and that we were ready to position barge at FD-93-4(D). - Barge had difficulty accessing FD-93-4(D), due to low tide. Barge grounded numerous times. Tugboat grounded on a rock, had to wait approximately 10 minutes for tugboat to lift off rock. Time involved to position barge 2-1/2 hours. - S. Dunbar on-site at barge. Reviewed boring logs for FD-93-1(A), FD-93-2(B), and FD-93-3(C). Instructed inspector to clean out with roller bit if cobbles, gravel is encountered during HW casing advancement. - At 12:15 pm, drillers reported casing would not advance, thought casing was either broken or had spun loose, and as the tide was on its way out, the decision was made to abandon the hole {FD-93-4(D)} at a depth of 29.6'. Barge could not stay on station as boat crew feared damage during low tide. About 2-1/4 hours were spent getting off hole and secured in deeper water.

a. Summary of Activities (con't.)

TABLE I (con't.)

DATE	ACTIVITY
Thursday, May 6, 1993 (con't.)	- Inspector and S. Dunbar returned to the motel where photocopies of the draft field logs were given to S. Dunbar. - Inspector called Y. Yatsevitch informing him of days events. Y. Yatsevitch stated the need for deeper information, arrangements were made to redrill FD-93-4(D).
Friday, May 7, 1993	- Survey crew, inspector, drillers, and boat crew on-site 6:30 am - 4:00 pm. - Sounding charts supplied by Corps was reviewed with boat crew. Based on charts, GEMS positioned barge near FD-93-4(D) (original and redrill coordinates are listed on log). - HW casing was spun and washed to refusal at a depth of 30'±. Tried open hole techniques, however hole would not stay open. NW casing was then telescoped inside HW casing. The roller bit was needed for the successful advancement of the NW casing to a depth of 50'±. - Y. Yatsevitch monitored the days activities from the fishing pier. When the hole was advanced to -55' NGVD., Y. Yatsevitch asked if we could probe to rock. It was explained to Y. Yatsevitch that the HW casing would not advance past a 29.6' depth, and the hole was not staying open, thereby ruling out open hole techniques. - Completed FD-93-4(D). Secured rig, moved barge to secure location. - Returned to Marina, called Tom Wiggins in Canton to report completion. - Attempted to call S. Dunbar, Y. Yatsevitch, and P. Schimelfenyg; all not in. - Survey crew and inspector demobilized from site. - Survey crew and inspector signed over samples to ATL's Manchester office for delivery to Corps of Engineers in Waltham, Mass.
Monday, May 10, 1993	- Sample delivery to Army Corps of Engineers in Waltham, Mass. - Barge and drill rig were demobilized on Monday.

b. List of Telephone Calls

TABLE II

DATE	ACTIVITY
Wednesday, April 7, 1993	- Y. Yatsevitch called T. Wiggins regarding NED contract. Job 1 - Saugus River, proposed flood control for inlet, 2-4 borings to 60', need spud barge, discuss locating systems. Job 2 - Boston Harbor, 5 locations, borings not set yet, also need spud barge. Y. Yatsevitch will FAX information when he gets it together.
Monday, April 12, 1993	- 10:40 am: Y. Yatsevitch called T. Wiggins Saugus River will be first job (2-4 holes) flood gate, need inspector, and surveyor.
Tuesday, April 13, 1993	- 11:50 am: Y. Yatsevitch called T. Wiggins, T. Wiggins told Y. Yatsevitch that ATL is putting together work plan; discussed work order and quantities.
Thursday, April 15, 1993	- 11:45 am.: Y. Yatsevitch called T. Wiggins, regarding 25 lf of NX coring additional; 0013 - add extra day of actual drilling; T. Wiggins requested to work 12-hour days which was o.k. Also, we can prorate decimal equivalents for day rates. 2:32 pm: Y. Yatsevitch called T. Wiggins regarding hydrogeologic engineer/geologist/ geotechnical inspector; T. Wiggins will send geotechnical inspector.
Wednesday, April 21, 1993	- Y. Yatsevitch called T. Wiggins regarding mobilization on Monday and paperwork by end of week.
Thursday, April 22, 1993	- P.Davis confirmed with James Dominick at Great Eastern Marine Services that ATL's drill crew will be in Gloucester late Monday, April 26, 1993 to load rig on barge. J. Dominick said he would check with our office on Monday morning to confirm time.
Monday, April 26, 1993	- 9:12 am: T. Wiggins called and left message for J. Dominick at Great Eastern to confirm that ATL's drill crew was on the road and would be there before noon. - 3:25 am: P. Davis called T. Wiggins: barge needs to be prepared to load drill rig. P. Davis indicated he spoke to J. Dominick about postponing the job to next Monday.

b. List of Telephone Calls (con't.)

TABLE II

DATE	ACTIVITY
Monday, April 26, 1993 (con't.)	- 3:30 pm: J. Dominick called T. Wiggins regarding postponing to next week because crew was committed to other work. However, will prepare barge on Wednesday or Thursday. - 4:35 pm: T. Wiggins left Y. Yatsevitch a message confirming work progress and delay.
Tuesday, April 27, 1993	- Y. Yatsevitch called to discuss rescheding for next Monday. T. Wiggins explained the delay problem.
Wednesday, April 28, 1993	- 3:00 pm: J. Dominick called T. Wiggins and stated 5 hours to Lynn (Saugus River) and he will pickup crew in Point of Pines Marina on Monday, May 3, 1993.
Thursday, April 29, 1993	- 4:30 pm: Kenny Taliadoros of Great Eastern Marine Services called T. Wiggins - barge is prepared and will be on-site Monday, May 3, 1993. - K. Taliadoros will call P. Davis at home Sunday night to confirm go ahead on Monday, May 3, 1993.
Monday, May 3, 1993	- 12:05 pm: J. Dominick called T. Wiggins and stated barge was on-site. Barge will mobilize to drill hole location. - 2:00 pm: T. Custeau called T. Wiggins (ATL) to report drillers on-site and asked how late can we work crew. T. Wiggins indicated that we prefer to work until a hole is finished at day's end. We have Corps approval for days in excess of 10 hours. - T. Custeau stated we were ready to mobilize to the drill hole. Safety meeting was held. - 2:10 pm: T. Custeau called Y. Yatsevitch reported ATL was moving to first location.
Tuesday, May 4, 1993	- T. Custeau called Y. Yatsevitch to report job progress, and results of Boring FD-93-1(A). - T. Custeau called T. Wiggins, then spoke to Spencer Thew (ATL), reported job progress. - T. Custeau called Y. Yatsevitch and received instructions to go to Boring FD-93-2(B). - 2:18 pm: T. Custeau called T. Wiggins to confirm termination depth of 64-1/2' in FD-93-1(A). S. Dunbar, Corps of Engineers' representative, on-site.

b. List of Telephone Calls (con't.)

TABLE II

DATE	ACTIVITY
Wednesday, May 5, 1993	- T. Custeau called Y. Yatsevitch. Y. Yatsevitch not in. T. Custeau spoke to S. Dunbar to report results of FD-93-2(B) - barge shifted on location and casing broke off. - T. Custeau called S. Dunbar, S. Dunbar said return to Boring FD-93-2(B) location and get as close to orginial location as possible (±5'). Spin casing to last sample depth, and resume sampling. - T. Custeau called P. Davis to discuss progress. - T. Custeau called S. Dunbar to report Boring FD-93-2(B) (relocated) completed. Gave him blow counts for -60' to -62' NGVD and -62' to -64' NGVD. S. Dunbar instructed T. Custeau to call S. Dunbar back in 1/2 hour (1:45 pm). - 1:45 pm, T. Custeau called S. Dunbar and was instructed to go to FD-93-3(C) and go to -64.5' NGVD. - T. Custeau called T. Wiggins to report project progress.
Thursday, May 6, 1993	- T. Custeau called S. Dunbar to report Boring FD-93-3(C) was completed, and ATL was moving to FD-93-4(D). S. Dunbar stated he would be on-site today. - T. Custeau called T. Wiggins to report progress and 4-hour working windows for FD-93-4(D), due to tidal conditions. - T. Custeau called Y. Yatsevitch to report progress and 4-hour working windows, and seek direction. Y. Yatsevitch not in, T. Custeau spoke to project geologist, she thought we should go deeper. - Y. Yatsevitch called T. Custeau, T. Custeau gave blow counts and soil description over phone to Y. Yatsevitch. T. Custeau informed Y. Yatsevitch that S. Dunbar had a copy of the logs. T. Custeau gave Y. Yatsevitch progress report, low water, fear of grounding barge, etc. Yuri wants ATL to try again. Drill to -30' NGVD and resume sampling. - T. Custeau called T. Wiggins to report conversation with Y. Yatsevitch. - T. Wiggins called Y. Yatsevitch to confirm drilling. - T. Wiggins called T. Custeau to report his conversation with Y. Yatsevitch. - T. Custeau called J. Dominick (GEMS) to schedule barge crew for May 7, 1993.

b. List of Telephone Calls (con't.)

TABLE II

DATE	ACTIVITY
Friday, May 7, 1993	- T. Custeau called T. Wiggins, to report completion of FD-93-4(D) and discussed moving barge. - T. Custeau called S. Dunbar, Y. Yatsevitch, P. Schimelfenyg; all not in. T. Custeau left message with Marie Wojtas that project was completed, if different, please call T. Wiggins at 315/386-4578. - T. Custeau called T. Wiggins to report conversations. - T. Custeau called J. Dominick (GEMS) to report project completion. T. Custeau spoke to GEMS' secretary as J. Dominick was not in. - 3:45 pm: M. Hawkins called T. Wiggins to verify completion of job. We will demobilize the barge and drill rig on Monday. - 3:55 pm: T. Custeau called T. Wiggins to tell him Y. Yatsevitch on-site today and will not be available in office. - 4:25 pm: T. Wiggins called Y. Yatsevitch's office and left message with secretary that project drilling was completed.
Monday, May 10, 1993	- T. Custeau called Andy O'Sullivan (ATL) with instructions to deliver samples to Waltham, MA.
Thursday, May 13, 1993	- T. Custeau called Y. Yatsevitch regarding routing of report. Y. Yatsevitch said to send draft report to his attention.

SECTION 6

CHAIN OF CUSTODY LOG

00176

CHAIN OF CUSTODY RECORD

ATLANTIC TESTING LABORATORIES, Limited

SCIENCE AND ENGINEERING
P.O. BOX 29
CANTON, NEW YORK 13617
315-386-4578, FAX 315-386-1012

ENVIRONMENTAL LABORATORY
48 LAGRASSE STREET
WADDINGTON, NEW YORK 13694
315-388-4452, FAX 315-388-5510

PROJECT NUMBER: DACW-33-93-D-004

PAGE 1 OF 1

PROJECT CONTACT: YURI YATSCVITCH 617-647-8387 OR STEVE DUNBAR 617-647-8174

QA/QC CODE: ☐ DEC/ASP ☐ NYSDOH ☐ CLP ☐ SW-846 ☒ OTHER

PROJECT NAME: SAUGUS RIVER & TRIBUTARIES

PROJECT LOCATION: LYNN, MASS.

PARAMETERS

REPORT DISTRIBUTION
DATES REQUIRED:
SEND REPORT TO:
FAX RESULTS TO: AT

CUSTODY SEAL 'X' EQUALS INTACT

DATE	TIME	SAMPLE LOCATION	SAMPLE TYPE *	NO. OF CONT.	LABORATORY IDENTIFICATION NUMBER	FIELD NOTES
5/4-		FD93-1	SS	11		SAMPLES FROM ROUTINE
5/7/93		FD93-2	SS	12		BORINGS
		FD93-3	SS	12		
		FD93-4	SS	14		

SAMPLERS NAME: THOMAS A. CUSTEAU DATE: 5/4-5/7
SAMPLERS SIG: Thomas A. Custeau TIME: 6:55

RECEIVED FOR LABORATORY NAME: DATE:
SIG: TIME:
SHIPMENT REC'D INTACT(YES/NO)?

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: THOMAS A. CUSTEAU SIG: Thomas A. Custeau	DATE: 5/7/93 TIME: 6:55 pm	NAME: WENDELL A. SHEDD III SIG: Wendell A. Shedd III	DATE: 5/7/93 TIME: 6:55 pm
NAME: WENDELL A. SHEDD III SIG: Wendell A. Shedd III	DATE: 5/10/93 TIME: 10:30 am	NAME: ANDREW O'SULLIVAN SIG: Andrew O'Sullivan	DATE: 5/10/93 TIME: 10:30 am
NAME: ANDREW O'SULLIVAN SIG: Andrew O'Sullivan	DATE: 5/10/93 TIME: 11:50	NAME: Richard Bergen SIG:	DATE: 5/10/93 TIME: 11:50

* SAMPLE TYPE CODE KEY
B = QA/QC
C = COMPOSITE
G = GRAB
H = HEXANE SURFACE WIPES
ND = NOT DETERMINED BY SAMPLER
O = OIL
S = SOLID OR SLUDGE
W = WATER

DISTRIBUTION: WHITE WITH SAMPLES GREEN TO SCIENCE AND ENGINEERING FILES, GOLD TO CLIENT

LABORATORY STORAGE LOCATION:

LABORATORY REMARKS

THINK QUALITY

SECTION 7

SAFETY REPORTS

WEEKLY SAFETY MEETING

Date held 5/3/93

NEDSO

Time 2:30 pm

THRU: Area Engineer, NED Area

TO: Safety Office, NED

1. Weekly safety meeting was held this date for the following personnel:

Contract No. 001301 Contractor ATL

Conducted By T.A. Custeau Personnel present (Contr) 4 TAC, MH, SC, P.M

(Sub) 3 KT WRTH.

(Govt) None

Subjects discussed (Note, delete, or add):

Individual Protective Equipment - Life Jackets

Prevention of Falls - Be Carfull.

Safe Lifting Techniques - Legs.

Emergency Communications - Land to Barge Atl. Ship

Fire Prevention - Extinguisher on Rig

Sanitation, First Aid - Land Base

Tripping Hazards - trash, hose, nails in lumber - House Keeping

Staging, Ladders, Concrete Forms - N/A

Hand Tools, Portable Power Tools, Woodworking Machinery - Common Sense good work order

Equipment Maintenance (Zero defects) -

Hoisting Equipment - use proper equip

Ropes, Hooks, Chains and Slings - use proper equip.

Electrical Grounding, Temporary Wiring - N/A

Lockouts for safe clearance procedures - electrical, pressure, moving part N/A

Welding - N/A

Excavations - N/A

Loose Rock and Steep Slopes -

Explosives - N/A

Water Safety - Hard hats, vests

Other -

Prepared by Thomas A. Custeau Title R.E. Inspector

2. Forwarded.

Signature Thomas A. Custeau
Resident Engineer

CP: MANHOURS

Contractor 40 min

Sub Contractor 30 min

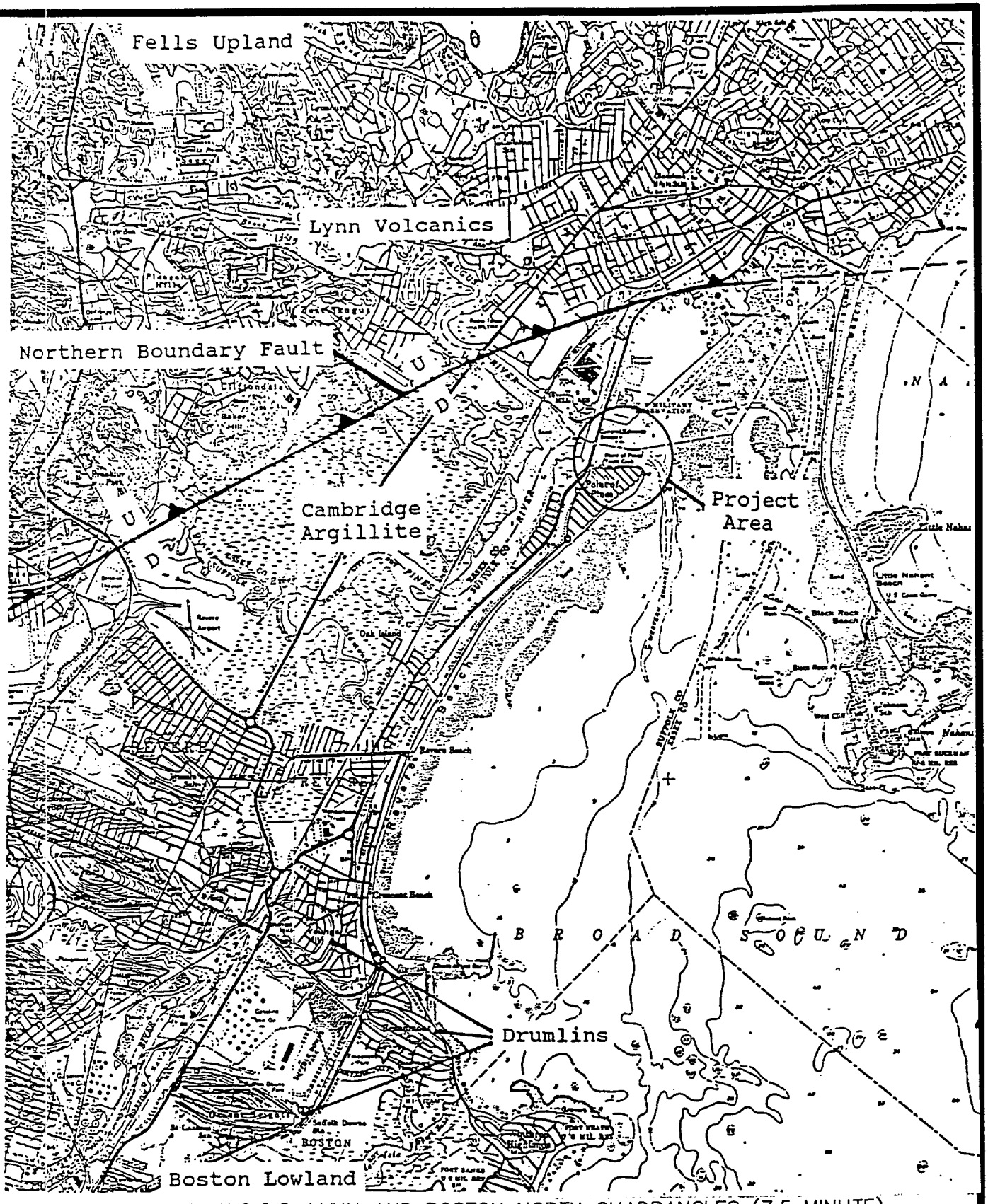
Period Covered 5/3-5/7/93

FIG No. 11

SECTION 8

FIELD INSPECTOR'S LOGS

a. Figure 1 - General Project Map



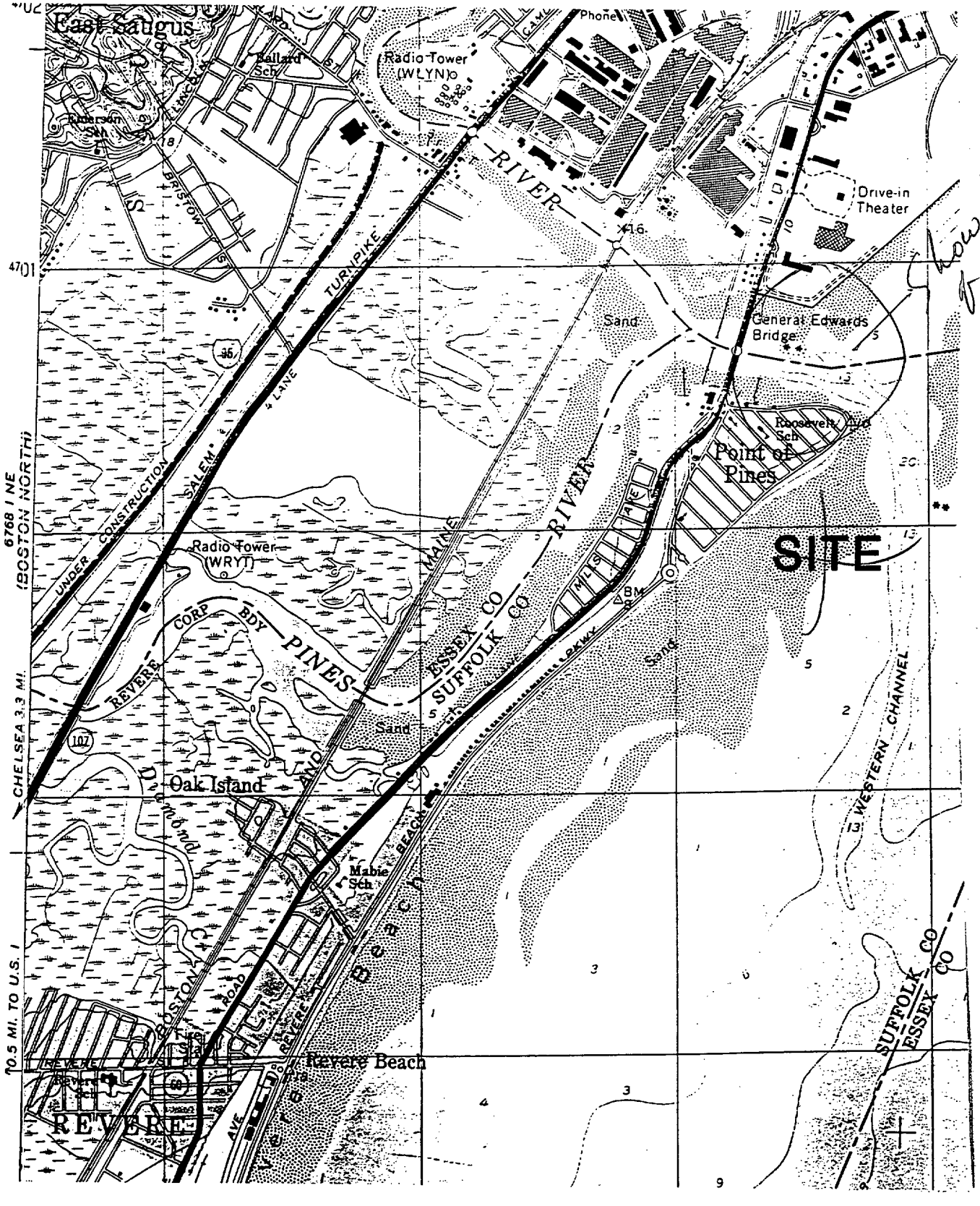
BASE MAPS: U.S.G.S. LYNN AND BOSTON NORTH QUADRANGLES (7.5 MINUTE)

PROJECT LOCATION MAP	DRAWN BY	SCALE	PROJECT No.	DATE
		1" = 100'	CD1301	05-13-93

SAUGUS RIVER FLOODGATE PROJECT
U.S. ARMY CORPS OF ENGINEERS

ATLANTIC TESTING LABORATORIES, Ltd.
CANTON, NY CICERO, NY ENDICOTT, NY
BURLINGTON, VT UTICA, NY MANCHESTER, NH

b. Figure 2 - Site Location Map



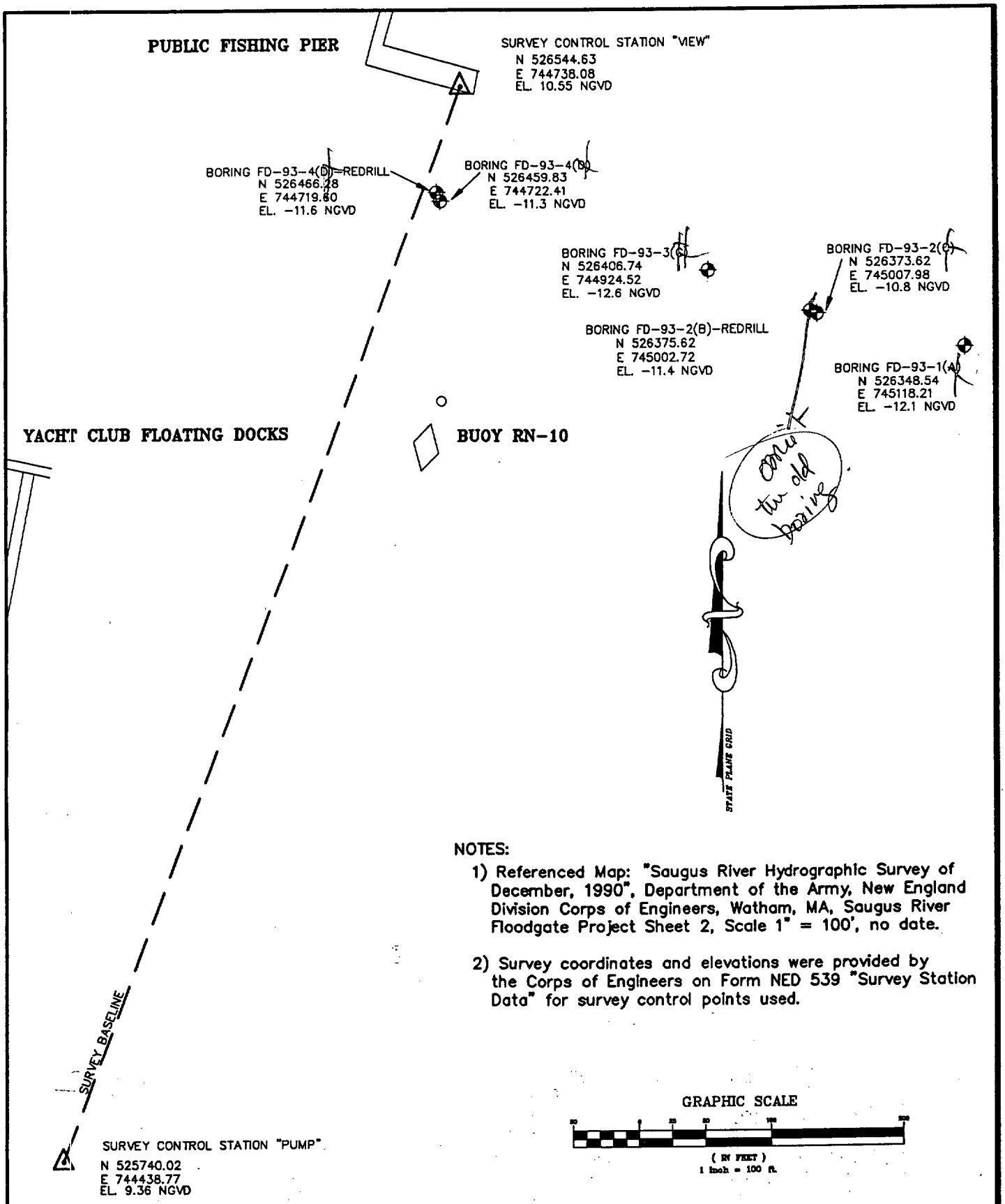
SITE LOCATION MAP	DRAWN BY	SCALE	PROJECT No.	DATE
		1" = 100'	CD1301	05-13-93

SAUGUS RIVER FLOODGATE PROJECT
U.S. ARMY CORPS OF ENGINEERS

ATLANTIC TESTING LABORATORIES, Ltd.

CANTON, NY — CICERO, NY — ENDICOTT, NY
BURLINGTON, VT — UTICA, NY — MANCHESTER, NH

c. Figure 3 - Boring Location Map



NOTES:

1) Referenced Map: "Saugus River Hydrographic Survey of December, 1990", Department of the Army, New England Division Corps of Engineers, Watham, MA, Saugus River Floodgate Project Sheet 2, Scale 1" = 100', no date.

2) Survey coordinates and elevations were provided by the Corps of Engineers on Form NED 539 "Survey Station Data" for survey control points used.

BORING LOCATION PLAN	DRAWN BY	SCALE	PROJECT No.	DATE
	SLC	1" = 100'	CD1301	05-13-93
SAUGUS RIVER FLOODGATE PROJECT U.S. ARMY CORPS OF ENGINEERS	ATLANTIC TESTING LABORATORIES, Ltd. CANTON, NY CICERO, NY ENDICOTT, NY BURLINGTON, VT UTICA, NY MANCHESTER, NH			

d. Figure 4 - Boring Logs

U.S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site: Saugus River and Tributaries Page 1 of 2 pgs.
Boring No. FD-93- Desig. 1(A) Diam. (Casing) 3"
Coordinates: N 526348.5 E 745118.2

Elevation Top of Boring -12.1 NGVD
Total Overburden Drilled 52.4 Feet
Elevation Top of Rock — NGVD
Total Rock Drilled — Feet
Elevation Bottom of Boring -64.5 NGVD
Total Depth of Boring 52.4 Feet
Core Recovered — % No. of Boxes —
Core Recovered — Ft: Diam. — In.
Soil Samples 1 3/8 In. Diam. 11 No.
Soil Samples In. Diam. No.

Hammer Wt. 140 Boring Started 5/4/93
Hammer Drop 30" Boring Comp. 5/4/93
Casing Left 0
Subsurface Water at — feet
Time : Date / /93
Drilled By ATLANTIC TESTING LABS M. HAWKINS
Mfg. Des. Drill CME 75 TRUCK MOUNT
Inspected By ATLANTIC TESTING LAB T.A. CUSTEAU
Classification By T.A. CUSTEAU
Classification By

Depth 1" = 5'	Casing Blows per Foot	Samples NO.	DEPTH RANGE	Blows per 6"	Classification of Materials	Sampling and Coring Operations
		1	0-0.3	WOH-2	BROWN MF SAND; trace SILT (S,NP)	8" RECOVERY
				4-5	GREY-BLACK C-MF SAND; trace SILT (S,NP)	1 3/8" I.D. S.S., AW Rods, 140# HAMMER SPUN N.W. CASING TO 5.0' DRILLING EASY-SMOOTH
5		2	5.0-7.0	5-6	GREY SILT; little CLAY-varved (S,P)	24" RECOVERY 1 3/8" I.D. SS, NW Rods, 140# HAMMER SPUN NW CASING TO 10' DRILLING EASY-SMOOTH
				7-9		
10		3	10.0-12.0	4-4	GREY SILT; some CLAY-varved (S,P)	24" RECOVERY 1 3/8" I.D. SS, NW Rods, 140# HAMMER SPUN NW CASING TO 15' DRILLING SMOOTH-EASY
				5-6		
15		4	15.0-17.0	3-3	GREY SILT; some CLAY (S,P)	24" RECOVERY 1 3/8" I.D. SS, N.W Rods, 140# HAMMER SPUN N.W CASING TO 15' DRILLING SMOOTH EASY.
				4-6		
20		5	20-22	WOH-WOH	GREY SILT; some CLAY (S,P)	24" RECOVERY 1 3/8" I.D. SS, N.W Rods, 140# HAMMER SPUN N.W. CASING TO 20' DRILLING SMOOTH-EASY.
				2-3		

GENERAL REMARKS: Mr STEVE DUNBAR ON SITE mid day
S.S. - Split Spoon
W.O.H - WEIGHT OF HAMMER
W.O.R. - WEIGHT OF Rods
N.W. CASING SHOE - LONGYEAR, RSG, 4NWENG/4 S/N L13291
All CASING SPUN IN 5th gear FULL THROTTLE
WASH WATER SUPPLIED THROUGH MOYNO PUMP MODEL 3L6

Site: Saugus River and Tributaries	Boring No. FD-93-1 (A)	Page 2 of 2

Depth 1" = 5'	Casing Blows per Foot	Samples NO.	DEPTH RANGE	Blows per 6"	Classification of Materials	Sampling and Coring Operations
25		6	25.0-27.0	WOR-WOR 2-4	GREY SILT; and CLAY (S,P)	24" RECOVERY 1 3/8" I.D. SS, NWRod, 140# HAMMER SPUN N.W. CASING TO 30' DRILLING SMOOTH-EASY
30		7	30.5-32.5	WOR-WOR WOR-2	GREY SILT; and CLAY (S,P)	Sampled From -42.6-44.6 N.G.V.D 24" Recovery 1 3/8" I.D. SS, NWRods, 140# HAMMER SPUN N.W. CASING TO 35', DRILLING SMOOTH-EASY
35		8	35-37	WOR-WOR WOR-WOR	GREY CLAY; and SILT (S,P)	24" RECOVERY 1 3/8" I.D SS, NWRod, 140# HAMMER SPUN N.W. CASING TO 40', DRILLING SMOOTH-EASY
40		9	40.6-42.6	3-3 4-5	GREY CLAY; some SILT; trace mf SAND (S,P)	Sampled From -52.7-54.7 N.G.V.D 24" RECOVERY 1 3/8" I.D. SS, NWRod, 140# HAMMER SPUN N.W. CASING TO 45', DRILLING SMOOTH-EASY
45		10	45.4-47.4	WOH-WOH WOR-4	GREY CLAY; some SILT; trace cmf SAND with a 1" LAYER OF GREY cmf SAND; some CLAY; Little SILT; trace mf GRAVEL @ 46.4'	Sampled From -57.4--59.4 N.G.V.D 24" Recovery 1 3/8" I.D, SS, NWRod SPUN N.W. CASING TO 50.4' DRILLING SMOOTH-EASY
50		11	50.4-52.4	1-3 3-4	GREY CLAY; and SILT; some cmf SAND; trace cmf GRAVEL (S,SP)	Sampled from -62.5' N.G.V.D TO -64.5' N.G.V.D
					BOTTOM OF BORING AT -64.5 N.G.V.D PER MR. STEVE DUNBAR	

GENERAL REMARKS: WATER LEVEL IN CASING AT Hole Completion -47.4' N.G.V.D.
20' OF H.W. CASING USED TO STABILIZE NW CASING THROUGH THE WATER

U.S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site: Saugus River and Tributaries Page 1 of 2 pgs.
Boring No. FD-93- Desig. 2 (OB) Diam. (Casing) 3"+4"
Coordinates: N 526374.8 E 745008.6
Redrill 526375.7 745002.8

Elevation Top of Boring -10.77 NGVD
Total Overburden Drilled 54 Feet
Elevation Top of Rock — NGVD
Total Rock Drilled — Feet
Elevation Bottom of Boring -64.8 NGVD
Total Depth of Boring _____ Feet
Core Recovered ___ % No. of Boxes ___
Core Recovered ___ Ft: ___ Diam. ___ In.
Soil Samples 1 3/8" In. Diam. 12 No.
Soil Samples _____ In. Diam. ___ No.

Hammer Wt. 140 Boring Started 5/4/93
Hammer Drop 30" Boring Comp. 5/5/93
Casing Left —
Subsurface Water at — feet
Time : Date / /93
Drilled By ATLANTIC TESTING LABORATORIES M. HAWKINS
Mfg. Des. Drill GME 75 TRUCK MOUNT
Inspected By J.A. CUSTEAU (ATL)
Classification By J.A. CUSTEAU (ATL)
Classification By _____

Depth 1"=5'	Casing Blows per Foot	Samples NO.	DEPTH RANGE	Blows per 6"	Classification of Materials	Sampling and Coring Operations
		1	0-1	1-2 3-4	GREY c-m f SAND; trace SILT; trace SHELL CHANGING TO BLACK c-m f SAND; trace SILT AT 0.7' (S,NP)	20' OF HW USED TO STABILIZE NW CASING THROUGH WATER. 12" RECOVERY 1 3/8" SS N Rod, 140# HAMMER SPUN AND WASH NW CASING 5th GEAR FULL THROTTLE DRILLING SMOOTH-EASY. TO 5'
5		2	5.0-7.0	2-2 3-5	GREY CLAY; and SILT; trace f SAND f SAND PARTING AT 5.7' (S,P)	24" RECOVERY 1 3/8" I.D. SS NWRod, 140# HAMMER SPUN AND WASHED NW CASING 5th GEAR FULL THROTTLE DRILLING SMOOTH-EASY TO 10'
10		3	10-12	2-2 2-3	GREY CLAY; and SILT; trace c-m f SAND (S,P)	18" RECOVERY 1 3/8" I.D. SS, NWRod, 140# HAMMER SPUN AND WASHED NW CASING TO 15' 5th GEAR FULL THROTTLE DRILLING SMOOTH-EASY
15		4	15-17	wh2-2 2-3	GREY CLAY; and SILT; trace c-m f SAND (S,P)	24" RECOVERY 1 3/8" ID SS, NWRod, 140# HAMMER SPUN AND WASHED NW CASING TO 20' 5th GEAR FULL THROTTLE DRILLING SMOOTH-EASY
20		5	20-22	wh2-wh2 1-2	GREY CLAY; and SILT; trace c-m f SAND (S,P)	24" RECOVERY 1 3/8" I.D. SS, NWRod, 140# HAMMER SPUN AND WASHED N.W CASING TO 25', 5th GEAR FULL THROTTLE. DRILLING SMOOTH-EASY

GENERAL REMARKS:

Site: Saugus River and Tributaries	Boring No. FD-93-2	Page 2 of 2

Depth 1" = 5'	Casing Blows per Foot	Samples NO.	DEPTH RANGE	Blows per 6"	Classification of Materials	Sampling and Coring Operations
25		6	25-27	wor-wor 2-3	GREY CLAY; and SILT; trace mf SAND (S,P)	24" RECOVERY 1 3/8" I.D. SS, N rods, 140# HAMMER Ad washed SPUN NW CASING TO 30', 5th GEAR FULL THROTTLE. SMOOTH EASY DRILLING
30		7	30-32	wor-wor 1-2	GREY CLAY; and SILT; trace mf SAND (S,P)	24" RECOVERY 1 3/8" I.D. SS, N rod, 140# HAMMER SPUN, AND WASHED NW CASING TO 35' 5th GEAR FULL THROTTLE, SMOOTH-EASY DRILLING
35		8	35-37	wor-wor 1-3	GREY CLAY; and SILT; trace mf SAND (S,P)	24" RECOVERY 1 3/8" I.D. SS, N rod, 140# HAMMER SPUN AND WASHED NW CASING TO 40' 5th GEAR FULL THROTTLE, SMOOTH-EASY DRILLING
40		9	39-41	wor-wor 1-4	GREY CLAY; and SILT; trace mf SAND (S,P)	24" RECOVERY SAMPLED FROM -49.8'-51.8' N.G.V.D 1 3/8 ID SS, N rod, 140# HAMMER SPUN AND WASHED CASING TO 45' 5th GEAR FULL THROTTLE, 39'-43' SMOOTH EASY DRILLING 43' TO 45' DRILLER REPORTED DENSER MATERIAL.
45		10	45-47	2-8 11-13	GREY CLAY; and SILT; trace cmf SAND; trace cmf GRAVEL, 1 1/2" mf SAND; ~~layer~~ (trace SILT LAYER AT 46'	JUST PRIOR TO DRIVING SPLIT SPOON, THE SPUDS ANCHORING BARGE SLIPPED BARGE MOVED, GREAT DIFFICULTY RECOVERING SAMPLE, TUG WAS NEEDED TO REPOSITION BARGE, 20 TON CRANE ON BARGE ASSISTED IN REMOVING DRILL STEEL FROM HOLE, ALL DRILL STEEL RECOVERED HOLE WAS ABANDON INFORMED STEVE DUNBAR OF SITUATION ON 5/5/93. RECEIVED INSTRUCTIONS TO REPOSITION BARGE AS CLOSE TO ISLAND AS POSSIBLE SPIN AND WASH CASING TO 50' DEPTH THEN RESUME SAMPLING.
					GREY CLAY; and cmf SAND; some cmf GRAVEL; some SILT (S,SP) TILL	
50		11	50-52	7-8 9-10		
		12	52-54	6-9 14-14	GREY CLAY; and cmf SAND; some SILT; little cmf GRAVEL (S,SP) TILL	Redrill - 57.5' N.G.V.D TO 59.0' N.G.V.D Driller Reported DENSER MATERIAL CASING REFUSAL AT 59.0' Roller BIT - 59.0' N.G.V.D TO - 60' N.G.V.D 1 3/8 ID SS, N rod 140# HAMMER
55					BOTTOM OF BORING AT -54' OR -64.8 N.G.V.D.	

GENERAL REMARKS: SAMPLE #10 BLOW COUNTS MAY HAVE BEEN AFFECTED by BARGE MOVING, AND BENDING CASING.
5/5/93 H.W. CASING ADVANCED BY SPINNING AND WASHING TO 50' DEPTH OR -60.8' N.G.V.D. THEN SAMPLED, REDRILL AT 5th GEAR FULL THROTTLE, SMOOTH DRILLING - EASY.
35' OF NW CASING, AND 20' OF N ROD DESTROYED by BARGE MOVEMENT ON 5/4/93

HW CASING SHOE LONGYEAR RSG ECHO 4HWEUG/4 S/N L-12962

U.S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site: Saugus River and Tributaries Page 1 of 2 pgs.
Boring No. FD-93- Desig. 3(4) Diam. (Casing) 4"
Coordinates: N 521406.7 E 744924.5

Elevation Top of Boring -12.6 NGVD
Total Overburden Drilled 53 Feet
Elevation Top of Rock — NGVD
Total Rock Drilled — Feet
Elevation Bottom of Boring -65.6 NGVD
Total Depth of Boring 53 Feet
Core Recovered ___ % No. of Boxes ___
Core Recovered ___ Ft: ___ Diam. ___ In.
Soil Samples 1 3/8 In. Diam. 12 No.
Soil Samples ___ In. Diam. ___ No.

Hammer Wt. 140 Boring Started 5/5/93
Hammer Drop 30" Boring Comp. 5/5/93
Casing Left ___
Subsurface Water at ___ feet
Time : Date / /93
Drilled By ATLANTIC TESTING LABORATORIES (ATL) M. HAWKINS
Mfg. Des. Drill CME 75 TRUCK MOUNT
Inspected By T.A. CUSTEAU (ATL)
Classification By T.A. CUSTEAU (ATL)
Classification By ___

Depth 1"=5'	Casing Blows per Foot	Samples NO.	DEPTH RANGE	Blows per 6"	Classification of Materials	Sampling and Coring Operations
		1	0-0.7	WOR-1	GREY BLACK m f SAND; trace SILT; trace SHELLS (S,NP)	12" RECOVERY 1 3/8" S.S., N.W. Rod, 140# HAMMER SPUN AND WASHED CASING TO 5' FULL THROTTLE, 5th GEAR SMOOTH-EASY DRILLING.
		2	0.7-1.0	3-4		
5		3	5.0-7.0	3-3	GREY CLAY; Little SILT (S,P)	21" RECOVERY 1 3/8" ~~RECOVERY~~ S.S., N.W Rod 140# HAMMER SPUN AND WASHED H.W. CASING TO 10' FULL THROTTLE, 5th GEAR, SMOOTH EASY DRILLING
				5-5		
10		4	10-12	2-3	GREY CLAY; trace SILT (S,P)	24" RECOVERY 1 3/8" SS, N.W. Rods, 140# HAMMER SPUN AND WASHED H.W. CASING TO 15' FULL THROTTLE, 5th GEAR, SMOOTH EASY DRILLING
				3-3		
15		5	15.0-17.0	3-3	GREY CLAY; trace SILT; trace m f SAND (S,P)	24" RECOVERY 1 3/8" SS, N.W. Rod, 140# HAMMER SPUN AND WASHED H.W. CASING TO 20' FULL THROTTLE, 5th GEAR, SMOOTH-EASY DRILLING.
				4-4		
20		6	20.0-22.0	WOR-WOR	GREY CLAY; trace SILT (S,P)	24" RECOVERY 1 3/8" S.S., N.W. Rods, 140# HAMMER SPUN AND WASHED H.W. CASING TO 25' FULL THROTTLE, 5th GEAR, SMOOTH EASY DRILLING.
				WOH-4		

GENERAL REMARKS:
WOR = WEIGHT OF Rods
WOH = WEIGHT OF HAMMER
SS = SPLIT SPOON

H.W. CASING SHOE LONGYEAR, RSG ECONO, 4 HWEUG/4 S/N 12948

Site: Saugus River and Tributaries	Boring No. FD-93-3 (d)	Page 2 of 2

Depth (1" = 5')	Casing Blows per Foot	Samples NO.	Samples DEPTH RANGE	Samples Blows per 6"	Classification of Materials	Sampling and Coring Operations
25		7	25-27	wbc-1	GREY CLAY; trace SILT varved with SILT and f SAND (S,P)	24" RECOVERY 1 3/8" SS, N.W. Rod, 140# HAMMER SPUN HW CASING WASHED TO 30' SMOOTH EASY DRILLING.
				2-2		
30		8	30-32	6-6	No RECOVERY	0" RECOVERY 1 3/8" SS, N.W. Rod, 140# HAMMER SPUN AND WASHED HW CASING TO 35' DRILLER REPORTED DENSER MATERIAL FROM 31.5' TO 33.5' FULL THROTTLE, SMOOTH RELATIVELY EASY DRILLING
				12-9		
35		9	35-37	8-5	GREY c+f GRAVEL; trace c+f SAND; trace SILT (S,NP)	6" RECOVERY 1 3/8" SS, N.W Rod, 140# HAMMER Possible BOULDERS, OR COBBLES BASED ON PERCENTAGE OF FINES, CASING ADVANCING SMOOTHLY TO 40' FULL THROTTLE, 5th GEAR
				6-7		
40		10	40-42.0	14-14	GREY c+f GRAVEL; trace c+f SAND; trace SILT (S,NP)	6" RECOVERY 1 3/8" SS, N.W Rod, 140# HAMMER Possible BOULDERS, OR COBBLES, BASED ON PERCENTAGE OF FINES SPUN AND WASHED CASING TO 45' FULL THROTTLE, 5th GEAR SMOOTH EASY DRILLING
				19-11		
45		11	45-47	14-4	GREY c+f SAND; some CLAY; some c+f GRAVEL; little SILT (S,SP) - Till	12" RECOVERY 1 3/8" SS, N.W Rod, 140# HAMMER SPUN AND WASHED CASING TO 54' SMOOTH EASY DRILLING
				6-9		
50		12	51-53	4-11	GREY c-m f SAND; little CLAY; little m f GRAVEL; trace SILT (S,NP) - Till	24" RECOVERY ~~SS~~, 1 3/8" SS, N.W Rod, 140# HAMMER Sampled from -63' to -65'
				3-3		
					BOTTOM OF BORING AT 53' or -65.6' M.G.V.D.	
55						

GENERAL REMARKS: NOTED H.W. CASING SHOE destroyed WHEN REMOVED FROM Hole

U.S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site: Saugus River and Tributaries — Page 1 of 2 pgs.

Boring No. FD-93- Desig. 4 Diam. (Casing) 4"

Coordinates: N 526459.8 E 744722.4
Redrill 526466.4 744719.3

Elevation Top of Boring -11.3 NGVD
Total Overburden Drilled 54.3 Feet
Elevation Top of Rock — NGVD
Total Rock Drilled — Feet
Elevation Bottom of Boring -65.6 NGVD
Total Depth of Boring 54.3' Feet
Core Recovered ___ % No. of Boxes ___
Core Recovered ___ Ft: ___ Diam. ___ In.
Soil Samples 1 3/8 In. Diam. 14 No.
Soil Samples ___ In. Diam. ___ No.

Hammer Wt. 140 Boring Started 5/6/93
Hammer Drop 30" Boring Comp. 5/7/93
Casing Left ___
Subsurface Water at ___ feet
Time ___ Date ___/___/93
Drilled By M. Hawkins, P. McAloon
Mfg. Des. Drill CME 75
Inspected By T.A. Custeau
Classification By T.A. Custeau
Classification By ___

Depth 1" = 5'	Casing Blows per Foot	Samples NO.	DEPTH RANGE	Blows per 6"	Classification of Materials	Sampling and Coring Operations
-11.3 ~~-8.1~~		1	00-20	W.O.R.-W.O.H 3-3	Black Gray Cmf SAND; trace SILT (S,NP)	1 3/8" S.S. & N.W. Rods, 140# Hammer 7" Recovery Drilling smoothly Spun HW Casing
16.3 ~~-13.1~~	5	2	50-7.0	4-4 5-8	Grey SILT, and Clay (S,P) varved	1 3/8" S.S. N.W. Rods, 140# Hammer 24" Recovery Drilling smoothly Spun HW Casing
-21.3 ~~-18.1~~	10	3	10-12	3-3 5-6	Grey CLAY; and SILT varved (Fine sand layer at 10.5') (S,P)	1 3/8" S.S. N.W. Rods, 140# Hammer 24" Recovery Drilling smoothly N.W. Head to HW Casing had to be heated to get it off Roller Bit used to clean casing 13.5-15.0'
-26.3 ~~-23.1~~	15	4	15-17	4-5 6-15	Grey SILT; Some Clay; trace f. sand Gravel (S,P) varved w/ Fine sand Noted 6" very soft clay in bottom of spoon.	1 3/8" S.S., N.W. Rods, 140# Hammer 24" Recovery, Roller Bit used ahead of casing hole stayed open
-31.3	20	5 5A	20-21 21-21.3	7-12 12-10	Grey CLAY; and SILT; trace ~~trace~~ cmf SAND; trace cmf GRAVEL w/ 4" layer of cmf SAND AND CLAY; trace cmf ~~trace~~ GRAVEL; trace SILT (S,P)	18" Recovery 1 3/8" SS, N.W. Rods, 140 Hammer Roller Bit after sampling; Casing HW was advanced to ~~35.8~~ 35.8' Roller Bit advanced to 36.3'
-36.3						

GENERAL REMARKS: Mr. Steve Dunbar USACE on site 9:30-1:30
W.O.R. = Weight of Rod
W.O.H = Weight of Hammer

Site: Saugus River and Tributaries	Boring No. FD-93-4	Page 2 of 2

Depth 1" = 5'	Casing Blows per Foot	Samples NO.	Samples DEPTH RANGE	Samples Blows per 6"	Classification of Materials	Sampling and Coring Operations
-34.3 25		6A	~~25.5-27.0~~ 25-26.0	4-47	GREY CMF GRAVEL; SOME CMF SAND SOME CLAY; TRACE SILT	1 3/8" S.S. on NW Rods; 140# HAMMER 12" RECOVERY
		6B	~~27.0-27.3~~	4-27	BROWN CMF SAND; AND CMF GRAVEL; LITTLE SILT (S, NP)	ADVANCED N.W. CASING TO 28.0' Refusal at 28.0' ATTEMPT TO ROLLER BIT IN 3rd GEAR ½ THROTTLE TO 30' HOLE WOULDN'T STAY OPEN ATTEMPT TO SPIN N.W. CASING 5th GEAR FULL
-41.6 30		7	29.6-31.6	13-18	GREY CMF GRAVEL; AND CMF SAND; TRACE SILT (S, NP)	DRILLING HARD AT 29.3' ADVANCING Roller BIT TO SAMPLING DEPTH; DRILLER Reported CASING BACK OR UNSCREWED COULD NOT ROLLER BIT PAST 29.6' ATTEMPTED SAMPLING
				12-22		7" RECOVERY; 1 3/8" SS, N Rods, 140# HAMMER
-46.3 35 46.6		8	35.0-37.0	36-21	GREY CMF SAND; AND CMF GRAVEL TRACE SILT; TRACE CLAY (S, NP)	ATTEMPTED TO SPIN NW CASING, Refusal at 29.9 CASING REMOVED FROM HOLE TO SEE IT WAS PLUGGED
				22-30		ENDED OPERATION DUE TO LOW TIDES S. DONBARY I TO CALL YUZI
-51.3 40 -51.6		9	40-42	20-61	GREY CMF SAND; AND SILT; SOME C-MF GRAVEL TRACE CLAY (S, NP) WITH A 4" LENS CMF SAND; SOME CMF GRAVEL; TRACE SILT AT 40.6'	5/6 REPOSITIONED BARGE SPIN NW CASING TO EL. N.G.V.D 0.0-5.0 5th GEAR FULL WASHING
				23-45		SMOOTH EASY DRILLING 5.0-10.0 " " ; 10.0-15.0 " " ; 15.0-20.0 " "
						DENSE MATERIAL SOMEWHAT HARDER DRILLING 20-25.0 " " ; 25-30 " " ; 30-35.0'
-56.3 45 -56.6		10	45-47	18-13	GREY CMF ~~SAND~~ SILT; SOME SILT; LITTLE MF GRAVEL; TRACE CLAY (S, NP)	@ -42.0 N.G.V.D HARD DRILLING ADVANCE TO ROLLER BIT BECAME EASIER AT APPROX -42 N.G.V.D CASING ADVANCING EASILY
				10-9		~~HARD~~ 15 min/6" ATTEMPT TO ROLLER BIT TO -46.6 N.G.V.D. ATTEMPT TO GET CASING TO -46.6, APPROX CASING REFUSAL AT 40.0 ATTEMPT CLEANOUT WITH ROLLER BIT. ADVANCE ROLLER BIT TO 46.6, DRILLER REPORTS INTERMITTENT LOSS OF WATER ATTEMPT TO ADVANCE CASING TO -46.6 N.G.V.D COULD NOT ADVANCE CASING PAST -46.6 N.G.V.D ATTEMPT TO SWITCH TO NW CASING, SPUN AND INSERTED TO -46.6 N.G.V.D ~~ADVANCED~~ SS SAMPLING N.W. Rod 140# Hammer 6" RECOVERY
-61.3 60 -61.6		11	50-52	52-10	~~BLACK~~ GREY BLACK CMF GRAVEL; SOME CMF SAND LITTLE SILT; TRACE CLAY (S, NP)	
				8-8		
-63.6		12	52-54	23-22	GREY CMF SAND; AND SILT; SOME CMF GRAVEL; LITTLE CLAY (S, NP)	
				12-11		
					B.O.B. 54' or -65.6 N.G.V.D	ADVANCED ROLLER BIT (FROM NW CASING TO -51.6 N.G.V.D. HOLE STAYED OPEN DRILLING SMOOTH RELATIVELY EASY 12" RECOVERY 140# HAMMER N.W. Rod.
						ROLLER BIT TO 56.6, WASH FILLED BACK INTO 53.8 N.G.V.D ATTEMPT TO ADVANCE N.W. CASING BY SPINNING AND WASHING CAUSING -46.6 TO -51.6 N.G.V.D 5th gear FULL THROTTLE RELATIVELY SMOOTH -51.6 TO 55 N.G.V.D 4th & 5th gear FULL THROTTLE, SMOOTH. ROLLER BIT TO 56.6' N.G.V.D 6" RECOVERY 140# HAMMER, N.W. Rod
						ROLLER BIT TO -61.6' N.G.V.D. HOLE WOULD NOT STAY OPEN ADVANCED N.W. CASING TO -61.6' N.G.V.D. DRILLING SMOOTH, EASY SS 140# HAMMER, N.W. Rod 6" RECOVERY
						SS 140# Hammer, N.W. Rod. 18" RECOVERY

GENERAL REMARKS: 5/6 BOTTOM ELEV OF -11.6 N.G.V.D CHANGE CASING SHOE PRIOR TO RE-DRILL MR YUZI YATSUITCH ON SITE, ASKED IF WE COULD PROBE FOR ROCK, DRILLER STATED THAT HOLE WOULD NOT STAY OPEN AND GRAVELS, ETC WOULD BIND IN CASING.

WATER IN CASING ~~at completion~~ -19.2' N.G.V.D.

NEW ENGLAND DIVISION
CORPS OF ENGINEERS, U.S. ARMY
WALTHAM, MASSACHUSETTS

FOUNDATIONS & MATERIALS BRANCH

LOG NO. 1 DATE 5/3/93 (MONDAY)

DAILY LOG OF FIELD EXPLORATIONS

PROJECT SAUGUS RIVER AND TRIBUTARIES

TEMPORARY ADDRESS

LOCATION WHERE CAN BE REACHED

PHONE TIME 6:00 pm TEMPERATURE: 47 MAX. MIN.

WEATHER Clear AM Cloudy PM E wind 10-15 mph < 1' waves

DRILLING TODAY

HOLE	AREA	FOOTAGE FROM	FOOTAGE TO	FOOTAGE TODAY	MATERIAL
				NONE	

TEST PITS OR AUGER BORINGS TODAY

HOLE	AREA	DEPTH	MATERIAL

HOLE	AREA	DEPTH	MATERIAL

PERSONNEL

NAME	HOURS
T.A. Cusseau	9½
S. Chateile	11¾
M. Hawkins	8½
P. McAloon	8½
K. Taliadoros	11
W. Benner	11
T. Hubbard	11
Andy O'Sullivan	8½

PLANT USED

ITEM	HOURS	BREAKDOWN HOURS
53' Tug Boat (Michael T)	11	—
30'x90' Spud Barge	11	
CME 75 (Truck Mount)	11	
Chase Truck	5½	
Elec. Survey Equip.	12	
Survey Vehicle	12	
16' Boat	½	

CHIEF OF FIELD PARTY

NED FORM DEC 63 198 REPLACES EDITION OF MAY 62 WHICH MAY BE USED UNTIL EXHAUSTED

(OVER)

NARRATIVE OF DAYS OPERATIONS

Drillers traveled to site Great Eastern Marine Service (GEMS)
Mobilized the barge mounted drill rig and tug from Gloucester to
Lynn Mass.
Survey crew and inspector mobilized to site
- Conducted safety meeting, with ATL and (GEMS) crew
- Positioned barge @ FD-93-1(A)

MAN-HOUR WORK BREAKDOWN

NAME	MOB.	DEMOB.	MOVING	DRILL OVB.	DRILL BEDROCK	PREV. MAINT.	EQUIP. FAILURE	LOST TIME (WEATHER)	INSP. & SUPER.	MISC.	TOTAL
T.A. Custeau	4½								3½	1½	9½
S. Chatelle	6½									5¼	11¾
M. Hawkins	5½		2							1	8½
P. Mc Alonl	5½		2							1	8½
K. Taladoros	6		2							3	11
W. Benner	6		2							3	11
T. Hubbard	6		2							3	11
A. O'Sullivan	2									5¼	7¼

WORK FOR TOMORROW

Drill FD-93-1(A) then call Yuri Yatsevitch @ 617-647-8387

FIELD PURCHASES

ITEM	AMOUNT
Starter	
Out Board oil	

ITEM	AMOUNT

NEW ENGLAND DIVISION
CORPS OF ENGINEERS, U.S. ARMY
WALTHAM, MASSACHUSETTS

FOUNDATIONS & MATERIALS BRANCH

LOG NO. 2 DATE 5/4/93 TUES

DAILY LOG OF FIELD EXPLORATIONS

PROJECT Saugus River and Tributaries

TEMPORARY ADDRESS

LOCATION WHERE CAN BE REACHED

PHONE TIME TEMPERATURE: MAX. 60° MIN. 47

WEATHER Sunny with intermittent fog light east wind waves <1'

DRILLING TODAY

HOLE	AREA	FOOTAGE FROM	FOOTAGE TO	FOOTAGE TODAY	MATERIAL
FD-93-1(A)		-12.1	-64.5	52.4	0-5 sands 5-52.4 Grey silts and clay
FD-93-2(B)		-10.8	-58.8	50	0-5' sand 5-50 " " " "

TEST PITS OR AUGER BORINGS TODAY

HOLE	AREA	DEPTH	MATERIAL

HOLE	AREA	DEPTH	MATERIAL

PERSONNEL

NAME	HOURS
T. Custeau	13
S. Chatelle	12 1/4
M. Hawkins	13
P. McAlood	13
W. Benner	12 1/2
T. Hubbard	12 1/2
A. O'Sullivan	1

PLANT USED

ITEM	HOURS	BREAKDOWN HOURS
53' tug boat	12 1/2	~~12~~
30'x90' spud barge	12 1/2	
CME 75 (truck mount)	12 1/2	
Electronic survey equip	12 1/4	
Manitowoc 20T crane	1 1/2	
Miller welder/gen	1	
Torches	1	
16' Foot boat	1/2	

CHIEF OF FIELD PARTY

NED FORM DEC 63 198 REPLACES EDITION OF MAY 62 WHICH MAY BE USED UNTIL EXHAUSTED

(OVER)

NARRATIVE OF DAYS OPERATIONS

WELDED A 10' N.W. CASING COLLAR TO WORK PLATFORM OF BARGE TO STABILIZE N.W CASING ADVANCEMENT THROUGH WATER. ADVANCED FD 93-1(A) TO EL -64.5 N.G.V.D DRILLING PROGRESSED SMOOTHLY, MR STEVE DUNBAR U.S.A.C.E WAS ON SITE. MR YUSI YATSCVITCH OF U.S.A.C.E WAS PHONED WITH THE RESULTS, MR YATSCVITCH INSTRUCTED ME TO DRILL FD93-2(B) NEXT.

THE BARGE WAS MOVED INTO POSITION (FD 93-2(B)) AND DRILLING PROCEEDED SMOOTHLY TO EL. -55.8± N.G.V.D. AT THIS POINT THE BARGE SHIFTED, BENDING THE CASING. ATTEMPTS TO REPOSITION THE BARGE PROVED FUTILE, N.W. RODS AND CASING BECAME BENT AS SUCH THE HOLE COULD NOT BE ADVANCED, THE HOLE WAS TERMINATED ALL DRILL STEEL WAS RECOVERED USING THE DRILL RIG AND THE BARGE MOUNTED CRANE. 35' OF N.W. CASING, AND 20' OF N.W. ROD WAS DESTROYED.

MAN-HOUR WORK BREAKDOWN

NAME	MOB.	DEMOB.	MOVING	DRILL OVB.	DRILL BEDROCK	PREV. MAINT.	EQUIP. FAILURE	LOST TIME (WEATHER)	INSP. & SUPER.	MISC.	TOTAL
T.A. COSTEAU									12	1	13
S. CHATELLE										12¼	12¼
M HAWKINS			3	9						1	13
P. McALOON			3	9						1	13
W. BENNER										12½	12½
T. HUBLNED										12½	12½
A. O'SULLIVAN										12¼	12¼

WORK FOR TOMORROW

REPORT PROGRESS TO MR YATSCVITCH, THEN EITHER RELOCATE FD 93-2(B) OR MOVE BARGE TO FD93-3(C)

FIELD PURCHASES

ITEM	AMOUNT

ITEM	AMOUNT

NEW ENGLAND DIVISION
CORPS OF ENGINEERS, U.S. ARMY
WALTHAM, MASSACHUSETTS

FOUNDATIONS & MATERIALS BRANCH

LOG NO. 3 DATE 5/5/93 (Wed.)

DAILY LOG OF FIELD EXPLORATIONS

PROJECT Saugus River and its Tributaries

TEMPORARY ADDRESS

LOCATION WHERE CAN BE REACHED

PHONE TIME TEMPERATURE: MAX. 75± MIN. 65±

WEATHER P. Cloudy, Shower early AM, Light ~~wind~~ moderate E.S.E. wind Calm water

DRILLING TODAY

HOLE	AREA	FOOTAGE FROM	FOOTAGE TO	FOOTAGE TODAY	MATERIAL
FD-93-2	(B) relocated	-10.3	-64	53.2'	Sand 0-5, silty clay 5-55' 1' Boulder @ 55' - Till 55-64' (N.V.)
FDS3-3	(C)	-12.6	-65.0	52.4	" " " 5'-35', Gravels 35'-45', Till 45'-53'

TEST PITS OR AUGER BORINGS TODAY

HOLE	AREA	DEPTH	MATERIAL

HOLE	AREA	DEPTH	MATERIAL

PERSONNEL

NAME	HOURS
T.A. Custeau	13
S. Chatelle	11¼
M. Hawkins	12½
P. McAloon	12½
W. Benner	11½
T. Hubbard	11½
A. O'Sullivan	11½

PLANT USED

ITEM	HOURS	BREAKDOWN HOURS
53' Tug Boat	11½	
CME 75 Rig	11½	
30' x 90' Spud Barge	11½	
16' Boat	11½	
Electronic Survey Equip	11¼	

CHIEF OF FIELD PARTY

NED FORM DEC 63 198 REPLACES EDITION OF MAY 62 WHICH MAY BE USED UNTIL EXHAUSTED

(OVER)

NARRATIVE OF DAYS OPERATIONS

Called S. Dunbar Informed Him of Broken Casing, Barge Movement, etc. Mr. Dunbar Instructed us to Get as Close to Original Location (FD93-2(b)) as Possible. Spin and wash Casing to Elev. of the Last Sample and Continue to -64.5' N.G.V.D. We Repositioned Barge Near FD93-2(B) - See Field Boring Log for Exact Coordinates. Spun + Washed H.W. Casing to -59± N.G.V.D Encountered Casing Reversal, Roller Bit to 60' then Sampled to -64 N.G.V.D. Reported Progress to Steve Dunbar, Received Instructions to Move to FD93-3(c) ~~Relocated~~ Moved Barge to FD93-3(c). Advanced H.W. Casing by Spinning and Washing. Performed S.S. Sampling at 5' Intervals to El. -65± N.G.V.D. The Barge and Rig were Secured for the Night.

Sch 10 6"ϕ Pipe used to stabilize HW Casing through water

MAN-HOUR WORK BREAKDOWN

NAME	MOB.	DEMOB.	MOVING	DRILL OVB.	DRILL BEDROCK	PREV. MAINT.	EQUIP. FAILURE	LOST TIME (WEATHER)	INSP. & SUPER.	MISC.	TOTAL
T.A. Costello									12	1	13
S. Chatelle										11¼	11¼
M. Hawkins			½	10½						1½	12½
P. McAloon			½	10½						1½	12½
W. Bernier										11¼	11½
T. Hubbard										11¼	11½
A. O'Sullivan										11¼	11¼

WORK FOR TOMORROW

Call U.S.A.C.E. Then Move Barge to FD93-4(d), Drill FD93-4(d)

FIELD PURCHASES

ITEM	AMOUNT

ITEM	AMOUNT
21' Sch 10 6"ϕ Pipe	

NEW ENGLAND DIVISION
CORPS OF ENGINEERS, U.S. ARMY
WALTHAM, MASSACHUSETTS

FOUNDATIONS & MATERIALS BRANCH

LOG NO. 4 DATE May 6th, 1993 (THURS)

DAILY LOG OF FIELD EXPLORATIONS

PROJECT Saugus River and its Tributaries

TEMPORARY ADDRESS

LOCATION WHERE CAN BE REACHED

PHONE TIME TEMPERATURE: MAX. 75± MIN. 65±

WEATHER P. Cloudy Shower early, Light W/SW Wind calm later

DRILLING TODAY

HOLE	AREA	FOOTAGE FROM	FOOTAGE TO	FOOTAGE TODAY	MATERIAL
FD 93-4(d)		-11.3	-42.9	31.6	0-5' Sand, 5'-25' Gray Silty Clay/Clayey Silt
					25'-31.6' Sandy Gravel/Gravelly Sand

TEST PITS OR AUGER BORINGS TODAY

HOLE	AREA	DEPTH	MATERIAL

HOLE	AREA	DEPTH	MATERIAL

PERSONNEL

NAME	HOURS
T.A. Custeau	9 1/2
S. Chatelle	7 1/4
M. Hawkins	9
P. McAlan	9
W. Benner	8
T. Hubbard	8
A. O'Sullivan	9 1/2

PLANT USED

ITEM	HOURS	BREAKDOWN HOURS
53' Tug Boat	8	
30'x90' Spud Barge	8	
CME 75 Drill	8	
16' Boat	8	
Electronic Survey Equip.	7 1/4	

CHIEF OF FIELD PARTY

NED FORM DEC 63 198 REPLACES EDITION OF MAY 62 WHICH MAY BE USED UNTIL EXHAUSTED

(OVER)

NARRATIVE OF DAYS OPERATIONS

Moved Barge to FD93-4(d) Run Barge and tug aground. Had difficulty accessing Hole. Spun and washed H.W. Casing to refusal at -40.4 N.G.V.D. terminated Hole in Gravels. Gravel was binding between Casing and Roller Bit. Roller Bit advanced ahead of Casing from el. -26.3 N.G.V.D to -40.4 N.G.V.D. Driller thought Casing might have unscrewed or broke. The Casing was then pulled to check it out. And as the tide was going out (Fear of Grounding Barge) the Hole had to be abandoned. Casing shoe was worn out, otherwise Casing is ok. The Barge was moved to deeper water and secured for the night. Mr Dunbar (USACE) was on-site for the day, and kept abreast of the situation. Mr. Dunbar was given a copy of the Field log, per his request, at 6:45pm low tide el. was -4.7' N.G.V.D.

MAN-HOUR WORK BREAKDOWN

NAME	MOB.	DEMOB.	MOVING	DRILL OVB.	DRILL BEDROCK	PREV. MAINT.	EQUIP. FAILURE	LOST TIME (WEATHER)	INSP. & SUPER.	MISC.	TOTAL
T.A. Costeau									7	2½	9½
S. Chatelle										7¼	7¼
M. Hawkins			2½	4¼						2¼	9
P. McAlan			2½	4¼						2¼	9
W. Benoice										8	8
T. Hubbard										8	8
A. O'Sullivan										7¼	7¼

WORK FOR TOMORROW

Set Backup as close to FD53-4(d) as possible, when tide allows advance Casing to -32' or -42 N.G.V.D and resume sampling. Try to get to -64.5' N.G.V.D.

FIELD PURCHASES

ITEM	AMOUNT

ITEM	AMOUNT

NEW ENGLAND DIVISION
CORPS OF ENGINEERS, U.S. ARMY
WALTHAM, MASSACHUSETTS

FOUNDATIONS & MATERIALS BRANCH

LOG NO. 5 DATE May 7 1993 (Fri.)

DAILY LOG OF FIELD EXPLORATIONS

PROJECT Saugus River and Tributaries

TEMPORARY ADDRESS

LOCATION WHERE CAN BE REACHED

PHONE TIME TEMPERATURE: MAX. 65± MIN. 60±

WEATHER Partly Cloudy N.N.E Wind

DRILLING TODAY

HOLE	AREA	FOOTAGE FROM	FOOTAGE TO	FOOTAGE TODAY	MATERIAL
FD93-4		-11.6	-65.6	54.0'	0-5 sand; 5 to 25' - silty clay/clayey silts 25 to 50
					sandy silty gravels

TEST PITS OR AUGER BORINGS TODAY

HOLE	AREA	DEPTH	MATERIAL

HOLE	AREA	DEPTH	MATERIAL

PERSONNEL

NAME	HOURS
T.A. Custeau	14 3/4
S. Chattle	18
M. Hawkins	9 1/2
P. McAloon	9 1/2
W. Benner	9 1/2
T. Hubbard	9 1/2
Andy O'Sullivan	11 1/2

PLANT USED

ITEM	HOURS	BREAKDOWN HOURS
53' Tug Boat	9 1/2	
30x90 Barge w/spuds	9 1/2	
CME 75 Drill	9 1/2	
Electronic Survey Equip	8 1/2	

CHIEF OF FIELD PARTY

NED FORM DEC 63 198 REPLACES EDITION OF MAY 62 WHICH MAY BE USED UNTIL EXHAUSTED

(OVER)

NARRATIVE OF DAYS OPERATIONS

Reviewed Depth Charts with Tug Pilot. Then Positioned Barge at FD 93-4 & located
Advanced HW Casing to 30 & -42± N.G.V.D to Resume Sampling. Casing was advanced
using wash techniques at at times advanced after Roller Bit. HW Casing could not
be advanced by past -42± N.G.V.D (29.6') NW Casing was then advanced thru
the HW Casing to a depth of -61.6 N.G.V.D, again by washing or advancing Roller Bit.
The Hole was sampled from -61.6 to -65.6 N.G.V.D using the 1 7/8 O.D. Split Spoon
Sampler. Drilling steel was then removed

Mr Yuri Yatsevitch was on site today and observed the Drilling operations. He asked
if we could probe for bedrock deeper than -69.5', M. Hawkins said not really as the
Hole at times was not staying open using wet rotary open hole methods. M Hawkins also
feared plugging or jamming augers. Mr Yatsevitch accepted this reasoning

MAN-HOUR WORK BREAKDOWN

NAME	MOB.	DEMOB.	MOVING	DRILL OVB.	DRILL BEDROCK	PREV. MAINT.	EQUIP. FAILURE	LOST TIME (WEATHER)	INSP. & SUPER.	MISC.	TOTAL
T.A. Custeau		4 3/4	1/2						9 1/2	3/4	14 3/4
S. Chatte		8 1/2								9 1/2	18
M Hawkins			1	6 1/4						2 1/4	9 1/2
P McAloon			1	6 1/4						2 1/4	9 1/2
W Benner										9 1/2	9 1/2
T Hubbard										9 1/2	9 1/2
A. O Sullivan		2								9 1/2	11 1/2

WORK FOR TOMORROW

Demob Barge + Rig (CME 75) to Gloucester

FIELD PURCHASES

ITEM	AMOUNT

ITEM	AMOUNT

SECTION 9

OTHER RECORDS TAKEN

a. Survey Notes

Botrity Staked out

U.S. Army Corps of Engineers

Savoy River

CKCD 1301

Weather

Light Breeze, M. Sunny (P.M.) 5/3/93

Light Breeze, Light Fog (AM) 5/4/93

Mostly Cloudy, Breezy (PM)

Light Fog, Light Breeze (AM) 5/5/93

M. Sunny, Light Breeze (PM)

Partly Sunny, Lt. Breeze (AM) 5/6/93

60°

Equipment:

T1000 El. theomat

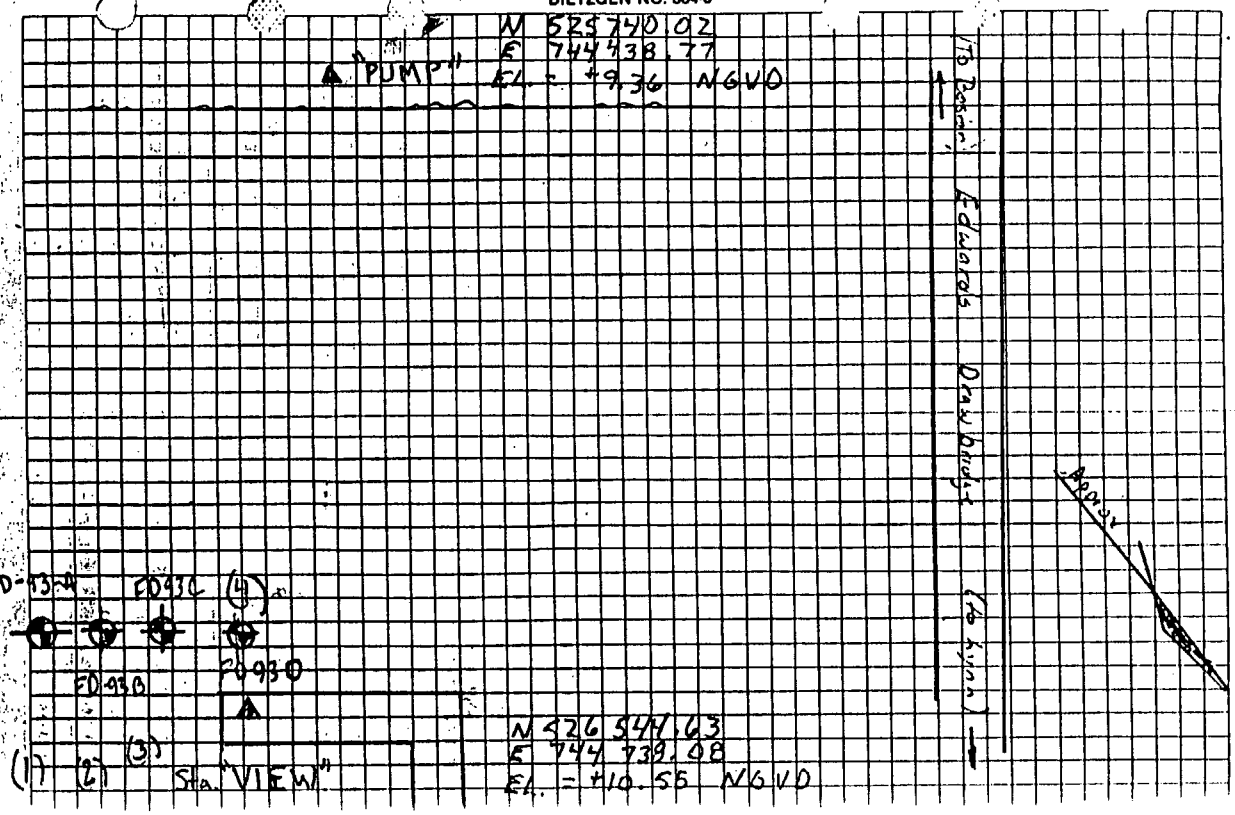
GPS - Gold

DIETZGEN NO. 384-6

Object	Hz Angle	Location	Vert Dist	Rods	NGVD EL.
12:26 PM			-1.12	67.5	-52.72
12:21 PM			-4.46	62.5	(-51.55)
12:05 PM			-1.00	62.5	47.10
12:01 PM	(no sample)		1.33	62.5	(-45.22)
11:54	(no sample - to check)		-1.44	57.5	(-43.04)
11:39 AM			-1.05	57.5	-42.65
11:11 AM			-1.36	52.5	-37.96
10:52 AM			-1.01	47.5	-32.61
10:34 AM			-0.62	42.5	-27.22
10:26 AM			+3.84	42.5	-22.76
10:11 AM			-0.22	37.5	-21.82 -17.11
9:44 AM			-0.51	~~30.5~~ 32.5	~~-15.11~~
9:34 AM		Rods ~~30.5~~	+2.50	30.5	-12.10
9:12 AM top casing	el. bottom =	-12.14	-0.04	28.0' ~~17~~	-12.14 28 rods
BD 93 A (2S)	276 52 56	427.73	to verify position		
π at "VIEW"	HI = 5.35	= 15.90 NGVD			10.55
BS "PUMP"		8.48,49	-1.64 -1.58	4.95	9.34 (-0.02)
		start 5-4-93			
		end 5-3-93			
FD-93-A(2S)	276 58 47	428.35	platform - anchored		
FD-93-A(S)	277 16 12	423.36	stake out notes		
π at "VIEW"	HI = 5.37				10.55
BS "PUMP"		858.49	-1.58 -1.34	5.10	9.36

P. 2 (F. No.) Object	Hor. Ang	Hor Dist	Vert Dist	Casing / Rod	NGVD Elev.
5:42			-11.18	60.5	55.78
5:16			-5.21	60.5	49.91
5:01	go down	0.84	-5.55	55.5	45.15
4:49	to check		-6.39	50.5	
4:37			-6.39	50.5	-40.99
4:23			-6.18	45.5	-35.78
4:14			-6.34	40.5	-30.94
4:01 pm			-6.24	35.5	-25.84
3:50 pm			-6.33	30.5	-20.93
3:39 pm (26)	2814201	319.43	-6.54	25.5	-16.14
3:28			-6.88	20.5	-11.48
Casing 3:21 pm	2814216	319.43	-11.17	15.5	-10.77
1st Location (26)	2815713	319.52			
Planned (6)	2813201	326.32			
	Boring FD-93-B				
	end of boring 'A'				
1:13 PM			-5.96	72.5	-62.56
1:10 PM	No sample		-0.87	72.5	-57.47
12:52 PM			-5.88	67.5	-57.48
			-1.89	67.5	(53.49)
Tot "VIEW"	HI = 5.35 = +15.90 NGVD				
BS 'PUMP'					(57.6)
		5/4/93	continues		

DIETZGEN NO. 384-6



P.1A

5:37			-11.42	67.5	-63.11
5:25			-7.07	67.5	-58.72
5:10			-7.03	62.5	-53.68
4:53			-11.98	52.5	-48.63
4:46			-11.02	52.5	-47.67
4:33			-11.55	50.5	-46.20
4:24			-8.10	50.5	-42.75
4:12 PM			-6.09	50.5	-40.74
3:57			-5.43	45.5	-35.09
3:43			-4.84	40.5	-29.49
3:28			-4.58	35.5	-24.23
3:13 pm			-3.23	30.5	-17.88
2:55 pm			-2.61	25.5	-12.26
As drilled FD-93-C	2860450	231.89	-7.95	20.5	-12.61
2:45 pm					
		Start	BD-93-C		
		End	BD-93-B		
11:41			6.27	81.00	-58.83
11:12 No Sample			-0.62	70.5	-55.27
10:54 AM	2820618	314.06	-0.96	55.5	-40.61
10:00 AM					
Redrill FD-93-B (26)	2820932	314.01	-1.77	25.5	-11.42
Tat "VIEW"	5.30 = 1# = 15.85 NGVD				10.55
BS "PUMP"		858.49	-1.45	5.06	9.34
		(5-5-94)			(-0.02 error)

Coordinates (From GME-4)

Point #	Point	(300000+) North	(700000+) East
1	"VIEW"	25549.326	44738.27
2	"PUMP"	25740.016	44738.7
~~45~~	~~BD-93-A~~	~~26510.983~~	~~45059.2~~
5	BD-93-A (Plan)	26348	45113 (5.23)
25	BD-93-A (As drilled)	26348.54	45118.21
6	BD-93-B (Plan)	26372	45015 (6.97)
26	BD-93-B (Drilled)	26374.84 (2.9)	45008.6 (6.96 to 26)
36	BD (93-B) (Re drilled)	26375.09	45002.7
7	BD-93-C (Plan)	26403	44925 (3.77)
27	BD-93-C (Drilled)	26406.77	44924.5
8	BD-93-D Plan	26463	44722.3 (3.2)
28	BD-93-D (As Drilled)	26459.8	44722.4
38	BD-93-D (Re-drilled)	26466.4	44719.3
		North + 8.6	West 3.1

4.30 NGVD

13

52

DIETZGEN NO. 384-8

P.4

Station	Hz. Angle	Hz. Distance	Vert. Dist.	Rod/Casing	NGVD Elev.
	Terminate Line				
12:41			1.01	58	-41.2
12:15			4.25	61	-40.9
12:09			4.30	61	-40.4
			+5.26	61	-39.9
11:49			1.43	55.5	-39.26
11:32			3.75	56	-36.4
11:15			-1.05	50.5	35.74
10:58			+3.95	51	-31.2
10:41			-1.15	41	-26.34
10:17			-3.20	35.5	-22.9
9:55.			-4.06	30.5	18.75
			~~-4.36~~	~~30.5~~	~~-14.51~~
9:43			+0.18	30.5	~~-14.57~~
9:37			-0.92	25.5	-10.61
9:32	350 0356	86.23	-1.57	-25.5	~~-11.26~~ ~~-8.12~~
PLAN FD-93-D	350 0336	83.01			
Kat VIEW	HI = 5.26	= 15.81			
BS "PUMP"		858.49	-2.72	4.77	+9.32
	(5/6/93)				
end FD-93-C	286 10 19	231.78	-11.47	0	+4.38
top casing					
Kat (VIEW)					
BS					

Object	Hz Angle	Hz Dist	Vert Dist	Rod / Casing	NGVD Elev.
1:47 Water in Casing			-.35	35.0	-19.6
1:13 pm			-0.58	75.5	60.3
12:54			+4.83	77.25	56.63
12:32			+1.19	72.3 (2-25)	55.3
12:28			-0.79	70.5	55.5
12:15 pm			-.09	69.5	-53.8
11:53 Am			+4.99	72.25	-51.5
11:24			-0.25	62.25	-46.7
11:03			1.51	60.5	-43.20
10:58			-3.31	55.5	-43.02
10:16			-0.93	55.5	-40.64
9:54			-5.44	51.0	-40.65
9:58			-5.88	50.5	-40.6
9:33			5.27	51.0	-40.5
9:31			-5.79	50.5	-40.5
8:49			-5.32	50.5	40.0
8:39			-9.71	45.5	-39.4
8:31 Am			-5.18	45.5	-34.9
8:00 Am	Spin casing to previous sample depth				
Redrill FD-93-D	3525152	80.50	-6.92	20.5	11.63 Bottom
Rat Pun	5.24		~~-1.53~~ ~~-0.15~~		10.55
				4.91	9.35 (0.01)

P.S Tide Elevation

Station	BS	HI	FS	EL
"Pump"	1.32	.68		+9.36
low tide	6:53 Am		17.05	-6.37
5-7-93				

b. Corps Supplied Sample Boring Log

U.S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site: Saugus River Page 1 of 2 pgs.

Boring No. FD92-1 Desig. FD-D

Coordinates: N 526433.0 E 744836.0

Elevation Top of Boring -14.2 NGVD
Total Overburden Drilled 32 Feet
Elevation Top of Rock - NGVD
Total Rock Drilled - Feet
Elevation Bottom of Boring - NGVD
Total Depth of Boring 32 Feet
Core Recovered - % No. of Boxes -
Core Recovered - Ft. Diam. - In.
1 3/8" Disturbed Samples 7 No.
3" Undisturbed Samples - No.

* Hammer Wt. 140 lb. Boring Started 12/8/92
Hammer Drop 30 in Boring Comp. 12/10/92
Casing Left 0 ft Casing Type 6 in Flush
Subsurface Water at - Feet
Time - Date -
Drilled By Corps of Eng., Mobile District
Mfg. Des. Drill -
Inspected By Firicano/Wong/Marcotte
Classification By Firicano/Wong/Marcotte
Classification By Firicano/Schmidt 1/6/93 Corrected Field Log (visual)

Depth 1"= 4'	Casing Blows Per Foot	Samples No.	Samples DEPTH RANGE	Samples Blows per 6"	Classification of Materials	Sampling and Coring Operations
		S-1		5, 6, 14	Dark Grey & Black Silty SP SAND w/shell fragments (Tip of Spoon contained Gr. Clay - CL)	Install 17.0 ft of 6.0 in Casing placed to depth of 3.5 ft, 13.5 ft stick-up. Sample w/1 3/8 in dia. split spoon w/140 lb hammer dropping 30 in; 5 in Recovery on S-1. Advance hole to 5.0 ft w/rock bit.
			1.5		Wash Down w/ Rock Bit, No sampling -drill action smooth	
5		S-2	5.0	10, 10, 15	Grey Silty Clay, CL (18 in recovery)	Sample w/1 3/8 in dia. s.s., washed with rock bit to 7.5 ft, encounter hard mat'l & possibly till - end operations for day. Resume sampling @ 7.0 ft next day, no hard mat'l present.
			6.5			
		S-3	7.0	12, 11, 25	Grey Silty Clay, CL w/ 1 piece of Gravel (18 in recovery)	
			8.5		Wash Down w/Rock Bit, No Sampling -drill action smooth	
10					Clayey (10-20) GRAVEL w/ sand (30-40) (GC)	Advance Hole to 12.0 ft w/rock bit, ~20 min required, smooth drill action
		S-4	12.0	63, 5, 56	Grey ~~Silty Clay, CL~~ w/Gravel. (8 in recovery)	Sample spoon advance held back by large piece of gravel for 1st and last 6 in segments - portion of this gravel recovered in spoon.
			13.5		Wash Down w/Rock Bit, No Sampling -drill action smooth	Advance hole to 17.0 ft w/rock bit. Drilling action variable from smooth to rough.
15					m-c SAND w/ gravel (5-15) tr. Clay SP	
		S-5	17.0	50, 60, 80	Grey ~~Silty Clay w/sand, CL~~ (7 in recovered)	Sample w/1 3/8 in dia. s.s. Installed casing @ 23 ft, 17.4 ft stick-up, 5.6 ft embedded length.
			18.5		Wash Down w/Rock Bit, No Sampling	
20						

GENERAL REMARKS: CORE BARREL WAS USED TO CORE BOULDERS at 7'-8' (two boulders), boulders rolled into hole during washing. Based on drill equip. handling, boulders appear to be disbursed throughout soil below ~7' depth

* SPT performed w/ steel cable ∴ blow counts are considered higher than normal SPT

ATTACHMENT 1

U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DIVISION FIELD LOG OF TEST BORING	Boring No. FD92-1 (FD-D)	Page 2 of 2

Depth 1" = 4'	Casing Blows Per Foot	Samples No.	Samples DEPTH RANGE	Samples Blows per 6"	Classification of Materials	Sampling and Coring Operations
20					- drill action smooth	Installed Casing = 28 ft, 22.4 ft stick-up, 5.6 ft embedded length
			22			
		S-6		33 35 73	No Recovery, Wash Gravel only (f. gravel, varying Lithology)	
			23.5		wash Down w/ Rock Bit, no sampling	Installed Casing = 31.0 ft, 25.4 ft stick-up, 5.6 ft embedded Length
25					SAND w/ gravel (10-20)% Clay (5-15) (SP-SC)	
			27.0			
		S-7		27 52 55	Grey ~~Silty Clay w/Gravel, CL~~ (14" recovery)	
			28.5		Wash Down w/Rock Bit, no sampling - drill action rough and consistent	Reach 32.0 ft depth, forced to end drilling operations due to rough water and approaching storm. Bottom of hole @ 32.0 ft depth.
30						
			32.0		Bottom of Hole	
35						

GENERAL REMARKS:

- Rough seas and high winds slowed and eventually ended drilling operations.
- Casing added/removed to keep up with 10.5 ft tide range.

U.S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site: Saugus River

Boring No. FD92-2 Desig. FD-D

Coordinates: N 526441.4 E 744829.9

Elevation Top of Boring -11.5 NGVD
Total Overburden Drilled 56.8 Feet
Elevation Top of Rock ?-68.3 NGVD
Total Rock Drilled - 0 Feet
Elevation Bottom of Boring -68.3 NGVD
Total Depth of Boring 56.8 Feet
Core Recovered - % No. of Boxes -
Core Recovered - Ft. Diam. - In.
1 3/8" Disturbed Samples 6 No.
3" Undisturbed Samples - No.

Hammer Wt. 140 lb. Boring Started 12/16/92
Hammer Drop 30" Boring Comp. 12/17/92
Casing Left 0 Casing Type 6" Flush
Subsurface Water at - Feet
Time - Date -
Drilled By Corps of Eng., Mobile District
Mfg. Des. Drill
Inspected By Wong / Marcotte
Classification By Wong
Classification By Fiscano / Schmidt 1/6/93 Corrected Field Log (visual)

Depth 1" = 4'	Casing Blows Per Foot	Samples No.	Samples DEPTH RANGE	Samples Blows per 6"	Classification of Materials	Sampling and Coring Operations
0					- Wash Down w/rock bit to 31.9 ft, no sampling	- Install 16 ft of 6" Casing, Stick-up = 12.7", embedded length = 3.3 ft
						- drilling action smooth and consistent
5						
10						- Strong winds blowing mud out of mudpan; rig a wind break.
15						
20						

GENERAL REMARKS:
- Add/Subtract casing to keep up w/10.5 foot tide.
- SPT performed w/ steel cable ∴ blow counts are considered higher than Normal SPT
- Based on drill equipment handling and coring, boulders are disbursed throughout GC
Boulders are Rhyolite, Argillite & Granodiorite

U.S. ARMY CORPS OF ENGINEERS
NEW ENGLAND DIVISION
FIELD LOG OF TEST BORING

Boring No. FD92-2 (FD-D)

Depth 1"= 4'	Casing Blows Per Foot	Samples No.	Samples DEPTH RANGE	Samples Blows per 6"	Classification of Materials	Sampling and Coring Operations
20					Wash down w/rock Bit, no sampling until 31.9 ft	-Add 2 ft of casing, 18 ft total, stick up = 14.7 ft, embedded = 3.3 ft
						@24 ft, drilling action becomes rough and slow for ~1.5 ft then smooth again.
25						-Add 2 ft of casing, 20 ft total, stick-up = 16.7 ft, embedded = 3.3 ft
						-Add 2 ft of casing, 22 ft total, stick-up = 18.7 ft, embedded = 3.3 ft
30					GRAVEL w/ clay (5-15) and sand (15-25) GP-GC	
			31.9	77	Grey ~~Clayey Gravel (GC)~~	
		S-1		63		
				102/5"	(50% recovery)	
			33.4		Wash down w/rock Bit	-Add 4 ft of casing, 26 ft total, stick-up = 22.7 ft, embedded = 3.3 ft
35						-Rock Bit gets hung up on casing, add 3 ft of casing, casing slides deeper, Total Casing = 29 ft, stick-up = 22.4 ft, embedded = 6.6 ft
		S-2	36.2	40/3"	Grey Clayey Gravel (GC)	
			36.4		Spoon Bouncing & 40 blows	
					wash down w/rock Bit, lost drilling mud	
			39.3		Grey Clayey Gravel (GC)	
40		S-3		45		
				40	(50% recovery)	
			40.8	46		
					Wash down w/rock bit, no sampling	
						-Removed 2 ft casing, 27 ft total, stick-up = 20.4 ft, embedded = 6.6 ft
45			45.3		Grey Clayey Gravel (GC)	
		S-4		57		
				45	(40% Recovery) [Bad Sample]	
			46.8	52		
					Wash down w/rock bit, no sampling	Lost drilling mud
50						

GENERAL REMARKS:

-Sampling with Split Spoon difficult.

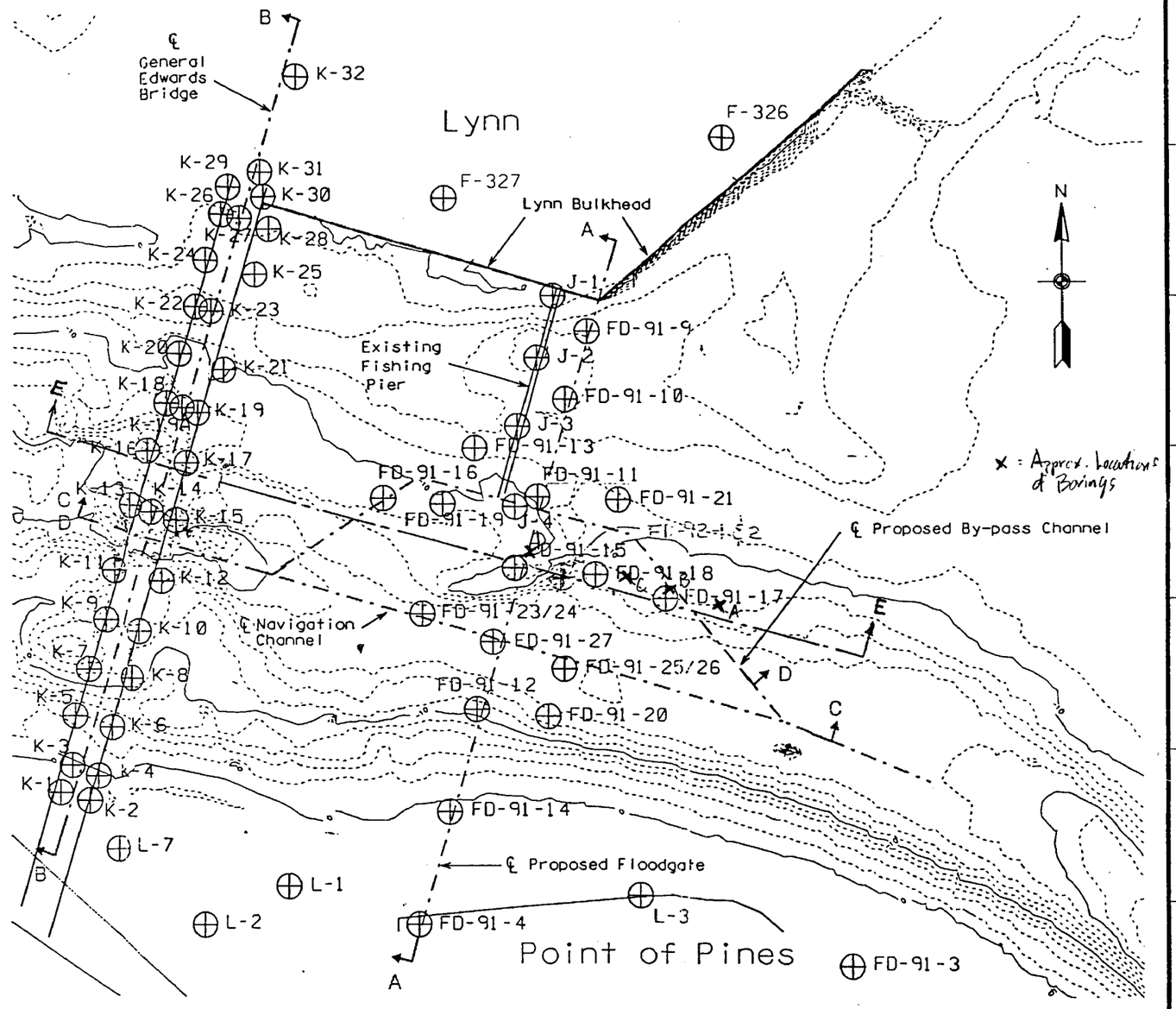
U.S. ARMY CORPS OF ENGINEERS
NEW ENGLAND DIVISION
FIELD LOG OF TEST BORING

Boring No. FD92-2 (FD-D)

Depth 1" = 4'	Casing Blows Per Foot	Samples No.	Samples DEPTH RANGE	Samples Blows per 6"	Classification of Materials	Sampling and Coring Operations
50						
		S-5	50.7 51.3	49 50/0in	Grey Clayey Gravel (GC) (recovery = 80%)	Refusal @ 51.3 ft - Removed 4 ft of casing 23 ft total Stick-up = 16.4 ft embedded = 6.6 ft
					Wash Down w/rock bit, no sampling	
		S-6	54.1 54.6	105/5in	Grey Clayey Gravel (GC)	
55					Wash down w/rock bit, no sampling	- Very hard material, due to time constraint decide to rock bit to bedrock.
			56.8		Bottom of Exploration	- Hit hard rock surface @ 56.8 ft, decide to begin coring. Not able to reach 56.8 ft w/core barrel after 1 day effort and many problems, forced to move off hole.
60						

GENERAL REMARKS:

Not able to obtain rock core sample @ 56.8 ft; not sure if boulder or bedrock encountered @ this depth. Many boulders encountered on the way down to this depth.



NOTES

Hydrographic Survey performed by P.K. O'Brien and Crew, New England Division, Corps of Engineers, between October – November, 1990. Survey Book RNH-4316.

LEGEND FOR ENGINEERING LOGS

Lt.	–	Light	M.	–	Medium	SM	–	Soil symbol, Unified Soil Classification System
Dk.	–	Dark	C.	–	Coarse			
Br.	–	Brown	frags.	–	fragments	(25–35)	–	A range of numbers in parenthesis following a soil component is the estimated limits between which lies the percentage by weight of that component in the soil as determined by visual inspection
Bk.	–	Black	org.	–	organic			
Gr.	–	Gray	LL.	–	Liquid Limit			
Grn.	–	Green /greenish	PL.	–	Plastic Limit			
V.	–	Very	OC	–	Organic Content			
Comp.	–	Compact	w/	–	with	(21)	–	A single number following a soil component represents the percentage by weight of that component as determined by mechanical analysis.
F.	–	Fine	occ.	–	occasional			
arg.	–	argillite	cl.	–	closely			
qtz.	–	quartz	sp.	–	space /spaced /spacing			
mod.	–	moderately	jts.	–	joints	calc.	–	calcareous
sl.	–	slightly	Fe	–	iron	typ.	–	typical/typically
wthd.	–	weathered	sfc.	–	surface	ang.	–	angular
lam.	–	laminated /laminar	sfcs.	–	surfaces	perp.	–	perpendicular
bdg.	–	bedding	diam.	–	diameter	vert.	–	vertical
						B	–	Bottom of Hole
						R	–	Refusal (50 blows with no penetration)

Boring Information

Boring Symbol	Date	Client
F	–	New England Power Corp.
J	1973	Metropolitan District Commision
K	1934	Metropolitan District Commision
L	1982	New England Division
FD	1991	New England Division

GRAPHIC SCALES

1"=100' 100' 0 100' 200'

⊕ Boring w/ Rock Core Recovered

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
BALTIMORE, MASS.

DES. BY S.W.D. DR. BY S.W.D. CK. BY

SUBMITTED

CHIEF, DIVISION OR SECTION

APPROVAL RECOMMENDED

CHIEF, PROJECT MANAGER

CHIEF, PROJECT MANAGEMENT

REVIEWED

DIRECTOR DATE

Saugus River Floodgate Reach
Exploration Plan

SCALE: SPEC. NO.
DRAWING NUMBER

SHEET 3

PLATE 1