
REPORT
ADDITIONAL OFF-SITE GROUNDWATER INVESTIGATION
SECOND HYDROSTRATIGRAPHIC ZONE
UNION PACIFIC RAILROAD YARD
SACRAMENTO, CALIFORNIA

 **DAMES & MOORE**

July 1992
PROJECT NO. 00173-072-044



DAMES & MOORE

8801 FOLSOM BOULEVARD, SUITE 200, SACRAMENTO, CALIFORNIA 95826
(916) 387-8800 FAX: (916) 387-0802

July 6, 1992

Mr. Val L. Siebal
Region 1, Department of Toxic Substances Control
California Environmental Protection agency
10151 Croydon Way, Suite 3
Sacramento, CA 95827

Attention: Mr. James L. Tjosvold, P.E., Chief
Sacramento Responsible Party Union
Site Mitigation Branch

Re: Transmittal of Report
Additional Off-Site Groundwater Investigation
Second Hydrostratigraphic Zone
Union Pacific Railroad Yard
Sacramento, California
Project No. 00173-072-044

Dear Mr. Mr. Tjosvold:

Union Pacific Railroad Company (UPRR) has requested that Dames & Moore transmit the enclosed Report. Presented in the Report is a summary of the additional off-site second hydrostratigraphic zone groundwater investigation activities and results. Additionally, recommendations are provided for one to two off-site, second hydrostratigraphic zone groundwater monitoring well installations.

If you have any questions or require further clarification, please contact Tim Parker at (916) 387-7527.

Sincerely,

DAMES & MOORE

Timothy K. Parker
Project Manager

Andrew A. Kopania, R.G.
Senior Hydrogeologist

Enclosure
cc: Distribution List

SAC42.001

DISTRIBUTION LIST:

**UNION PACIFIC RAILROAD YARD
SACRAMENTO, CALIFORNIA
PROJECT NUMBER 00173-072-044**

Mr. Glenn Thomas
Union Pacific Railroad Company
1416 Dodge Street, Room 930
Omaha, NE 68179

Mr. R. L. Eades
Union Pacific Railroad Company
1416 Dodge Street, Room 930
Omaha, NE 68179

Mr. Val W. Siebal, Regional Administrator
Region 1
Department of Toxic Substances Control
California Environmental Protection Agency
10151 Croyden Way, Suite 3
Sacramento, CA 95827-2106
Attn: Mr. James L. Tjosvold, P.E.

Mr. Jose Salcedo, Project Manager
Region 1
Department of Toxic Substances Control
California Environmental Protection Agency
10151 Croyden Way, Suite 3
Sacramento, CA 95827-2106

Ms. Antonia Vorster
Regional Water Quality Control Board
3443 Routier Road
Sacramento, CA 95827-3098

Mr. Mel Knight
County of Sacramento
Hazardous Materials Division
8475 Jackson Road, Suite 230
Sacramento, CA 95826

DISTRIBUTION LIST:

**UNION PACIFIC RAILROAD YARD
SACRAMENTO, CALIFORNIA
PROJECT NUMBER 00173-072-044**

Mr. Joe Serna, Jr.
Councilman, District 5
915 I Street, Room 205
Sacramento, CA 95814
Attn: Sally Hencken, Aid

Mr. Tom Finley, Division Manager
Department of Public Works
City of Sacramento
927 Tenth Street, Room 200
Sacramento, CA 95814

Mr. Reginald Young
Deputy Director Public Works
City of Sacramento
915 I Street, Room 207
Sacramento, CA 95814

Mr. Bob Thomas
Deputy City Manager
915 I Street, Room 101
Sacramento, CA 95814

Ms. Genevieve Shiroma
Sierra Curtis Neighborhood Association
2791 24th Street
Sacramento, CA 95818

Sacramento City College Library
Library Reference Desk
3835 Freeport Boulevard
Sacramento, CA 95822

City Clerk's Office
City of Sacramento
City Hall, Room 304
915 I Street
Sacramento, CA 95814

Belle Cooledge Library
(Lanai Shopping Center)
5681 Freeport Boulevard
Sacramento, CA 95822

SM/up-072/UPSAC.001

DAMES & MOORE

DISTRIBUTION LIST:

**UNION PACIFIC RAILROAD YARD
SACRAMENTO, CALIFORNIA
PROJECT NUMBER 00173-072-044**

Ms. Marty Rozelle
Dames & Moore
Pointe Corporate Centre
7500 North Dreamy Draw Drive, Suite 145
Phoenix, AZ 85020

Mr. Roy Patterson
Dames & Moore
6 Hutton Centre Drive, Suite 700
Santa Ana, CA 92707

Mr. Jeff Asay
Union Pacific Railroad Company
Assistant General Solicitor
5500 Ferguson Drive, Suite J
Los Angeles, CA 90022

Ms. Patricia Mendoza
City of Sacramento
Department of Planning & Development
1231 I Street, Room 300
Sacramento, CA 95814

Mr. Daniel P. Costa
Greve, Clifford, Diepenbrock & Paras
1000 G Street, Suite 400
P.O. Box 2469
Sacramento, CA 95812-2469

REPORT
ADDITIONAL OFF-SITE GROUNDWATER INVESTIGATION
SECOND HYDROSTRATIGRAPHIC ZONE
UNION PACIFIC RAILROAD YARD
SACRAMENTO, CALIFORNIA

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
1.0 <u>INTRODUCTION</u>	1
1.1 <u>PREVIOUS INVESTIGATIONS</u>	1
2.0 <u>PURPOSE AND SCOPE OF INVESTIGATION</u>	2
3.0 <u>CONE PENETRATION TEST (CPT) SYSTEM AND HYDROPUNCH™ (HP)</u> <u>INVESTIGATION</u>	3
3.1 <u>CPT AND HP EXPLORATORY HOLE COMPLETIONS</u>	3
3.2 <u>GROUNDWATER SAMPLING AND ANALYSIS</u>	4
4.0 <u>INVESTIGATIVE RESULTS</u>	6
4.1 <u>STRATIGRAPHY</u>	6
4.2 <u>HP SAMPLING ANALYTICAL RESULTS</u>	6
4.3 <u>INTERPRETATION OF RESULTS - SECOND HYDROSTRATIGRAPHIC</u> <u>ZONE</u>	7
5.0 <u>CONCLUSIONS</u>	9
6.0 <u>RECOMMENDATIONS</u>	10
6.1 <u>ADDITIONAL OFF-SITE SECOND HYDROSTRATIGRAPHIC ZONE</u> <u>GROUNDWATER MONITORING WELL INSTALLATION</u>	10
6.1.1 <u>Monitoring Well Locations and Rationale</u>	10
6.1.2 <u>Monitoring Well Installation</u>	10
6.1.2.1 <u>Drilling Procedures</u>	10
6.1.2.2 <u>Geophysical Logging</u>	11
6.1.2.3 <u>Soil Sampling Procedures</u>	11
6.1.2.4 <u>Monitoring Well Construction</u>	12
6.1.2.5 <u>Monitoring Well Development</u>	13
6.1.2.6 <u>Monitoring Well Sampling</u>	13
7.0 <u>SCHEDULE</u>	14

REPORT
ADDITIONAL OFF-SITE GROUNDWATER INVESTIGATION
SECOND HYDROSTRATIGRAPHIC ZONE
UNION PACIFIC RAILROAD YARD
SACRAMENTO, CALIFORNIA

LIST OF TABLES, FIGURES AND APPENDICES

LIST OF TABLES

- TABLE 1 - SUMMARY GROUNDWATER ANALYTICAL RESULTS - ORGANICS -
DETECTIONS ONLY
TABLE 2 - SUMMARY QUALITY CONTROL SAMPLE RESULTS - SELECTED ORGANICS

LIST OF FIGURES

- FIGURE 1 - CONE PENETRATION TEST AND HYDROPUNCH SAMPLE LOCATIONS
FIGURE 2 - SCHEMATIC SUBSURFACE CROSS SECTIONS

LIST OF APPENDICES

- APPENDIX A - CONE PENETRATION TEST LOGS
APPENDIX B - ANALYTICAL LABORATORY REPORTS AND CHAIN-OF-CUSTODY
RECORDS

REPORT
ADDITIONAL OFF-SITE GROUNDWATER INVESTIGATION
SECOND HYDROSTRATIGRAPHIC ZONE
UNION PACIFIC RAILROAD YARD
SACRAMENTO, CALIFORNIA

1.0 INTRODUCTION

Presented in this report is a summary of the investigative activities and results of the additional off-site, second hydrostratigraphic zone groundwater investigation conducted by Dames & Moore in May and June 1992. Also presented in this report is Dames & Moore's recommended approach for the installation of one to two additional off-site second hydrostratigraphic zone groundwater monitoring wells. Investigative activities were conducted in accordance with the Work Plan - Additional Off-Site Groundwater Investigation Second Hydrostratigraphic Zone (Dames & Moore, 1992b).

1.1 PREVIOUS INVESTIGATIONS

Off-site groundwater investigations have been completed in phases since 1990. Off-site groundwater investigations have been conducted in accordance with the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) approved work plans (Dames & Moore, 1989; Dames & Moore, 1990a, Dames & Moore, 1990c, Dames & Moore, 1991b). Potential off-site groundwater impacts were initially evaluated in early 1990 with the installation of two groundwater monitoring wells in the first hydrostratigraphic zone (MW-29 and MW-30), and one groundwater monitoring well in the second hydrostratigraphic zone (MW-28). Analysis of groundwater collected from these wells indicated the presence of chlorinated solvents in groundwater.

To further evaluate the off-site lateral extent of chlorinated solvents within the first hydrostratigraphic zone, over 60 cone penetration test (CPT) and Hydropunch™ (HP) exploratory holes were completed and seven additional groundwater monitoring wells (MW-31, MW-32, MW-34, MW-35, MW-36 MW-38, and MW-39) were installed during 1990 and 1991. Results of the investigations indicated the presence of chlorinated solvents in the groundwater extending approximately 3,000 feet downgradient (southeast) of the site (Dames & Moore, 1990b and Dames & Moore, 1991a).

Two groundwater monitoring wells (MW-37, installed in November 1991, and MW-40, installed in May 1991) were completed within the second hydrostratigraphic zone (Dames & Moore, 1991d and Dames & Moore, 1992). Analytical results from samples collected from these wells indicate that the second hydrostratigraphic zone has been impacted off-site by chlorinated solvents.

2.0 PURPOSE AND SCOPE OF INVESTIGATION

The purpose of this investigation was to:

- Further assess the extent of off-site second hydrostratigraphic zone groundwater impacted by chlorinated volatile organic compounds;
- Evaluate subsurface stratigraphy, with focus on second hydrostratigraphic zone definition; and
- Develop data which can be utilized for siting additional off-site second hydrostratigraphic zone groundwater monitoring wells, and subsequently, with additional information, in designing a groundwater remedial system.

To further evaluate potential impacts to off-site second hydrostratigraphic zone groundwater and subsurface stratigraphy, Dames & Moore:

- Conducted 20 CPTs beyond the lateral extent of the previously defined first hydrostratigraphic zone;
- Collected 18 HP in-situ groundwater samples downgradient of the impacted groundwater monitoring wells and the previously completed CPT/HP sampling locations;
- Provided 24-hour turn-around analytical results by a DTSC-certified analytical laboratory during the investigation to provide real-time data on the groundwater chemistry, enabling field decisions to be made regarding the necessity and location of additional sampling locations; and
- Prepared this report incorporating results of the previous studies, and recommendations for one to two additional second hydrostratigraphic zone groundwater monitoring wells.

Investigative activities were conducted in accordance with the DTSC-approved work plan (Dames & Moore, 1992b). All CPT/HP and monitoring well sampling activities were conducted in accordance with the Health and Safety Plan for the Off-Site Groundwater Investigation Second Hydrostratigraphic Zone (Dames & Moore, 1990e).

3.0 CONE PENETRATION TEST (CPT) SYSTEM AND HYDROPUNCH™ (HP) INVESTIGATION

3.1 CPT AND HP EXPLORATORY HOLE COMPLETIONS

A total of 20 CPT and 18 HP exploratory holes were completed by Earth Technology Corporation under the direct supervision of Dames & Moore on Sacramento City Property (city streets) and Sacramento Children's Home Property (see Figure 1 for CPT and HP locations). All exploratory holes on City of Sacramento property were completed under excavation permit No. 19920121 issued by the City of Sacramento, Department of Public Works. Permission was obtained for all exploratory holes located in the Sacramento Children's Home property.

Initial second hydrostratigraphic zone exploratory hole locations were chosen based on the extent of the first hydrostratigraphic zone plume. To minimize potential cross contamination between the first and second hydrostratigraphic zones, the exploratory holes were located laterally 50 to 100 feet outside the first hydrostratigraphic zone plume. Additional exploratory hole locations were completed for expanded scope investigations, as warranted. These additional hole locations were utilized to expand the investigation on the basis of detections of selected chemical parameters in HP samples.

Generally, CPT holes were advanced to a depth of approximately 80 to 85 feet below ground surface (bgs), or until refusal was encountered. At CPT-82, refusal was encountered at 17 feet bgs. Upon completion of each CPT, a field log was generated which included a stratigraphic interpretation. The CPT field log was then examined in the field to select the appropriate depth for HP sampling.

At locations where both CPT and HP sampling were conducted, the HP sampling was completed in a separate, adjacent hole, approximately two feet from the CPT hole. The HP holes were generally advanced to several feet above the desired sample depth with the use of a solid cone. The solid cone was extracted from the hole and replaced by the HP, and the HP was then advanced to the sample depth. This process was utilized to minimize potential cross contamination from the first to the second hydrostratigraphic zones.

Upon completion, the CPT and HP exploratory holes were grouted to the surface with volclay grout. The grout was pumped through a tremmie pipe placed at the bottom of each hole. The surface was patched with either asphalt or concrete depending on the existing surface material.

3.2 GROUNDWATER SAMPLING AND ANALYSIS

Groundwater sampling procedures and protocols, QA/QC measures, and analytical testing methods were in accordance with criteria established in the Work Plan (Dames & Moore, 1992b). Details of groundwater sampling procedures and protocols are described in the following text.

Groundwater samples were collected with the HP in-situ groundwater sampler. Once the target depth was reached, an upward pull on the tool opened the inlet section and allowed groundwater to flow into the sample chamber. A Teflon check ball sealed the sample chamber when the inlet was closed, allowing the groundwater sample to remain in the chamber until brought to the surface. The sample was then transferred from the sample chamber through a Teflon tube into 40-milliliter (ml) VOA bottles with Teflon septums. The VOAs were then properly labeled and placed in an ice chest cooled with "Blue" ice and delivered to the DTSC-approved laboratory within the same day.

Groundwater samples were analyzed for purgeable halocarbons (EPA Method 601) by Anlab Analytical Laboratory of Sacramento, California on a 24-hour turn-around basis. In this way, additional sample locations were selected and completed while the CPT system and sampling equipment were still on site. Summary groundwater sample analytical results are presented in Table 1.

To provide a measure of the precision of sampling and analytical methods, the following quality control measures were implemented during this investigation:

- Analysis of two blind duplicate groundwater samples;
- Confirmatory analyses of three duplicate groundwater samples by a separate laboratory; and
- Analysis of a rinsate blank sample.

Summary quality control sample results are presented in Table 2.

Duplicate samples were collected at selected HP locations contemporaneously with primary groundwater samples. Two blind duplicate samples were submitted for analysis by Anlab. The blind duplicate sample analysis serves as a check on both the sampling and analytical procedures.

Three duplicate groundwater samples were submitted for analysis by ENESCO Laboratory of West Sacramento, California. The duplicate groundwater sample analysis provides confirmation of analytical results of the same samples provided by Anlab Laboratory.

A rinsate blank sample was collected by pouring distilled water into a decontaminated HP sampler and sampling the water by the same method groundwater was collected. The rinsate blank represents the quality of decontamination of sampling equipment. The blank may also reflect contamination that may be introduced in the field or that may occur in the laboratory during analytical processing.

4.0 INVESTIGATIVE RESULTS

4.1 STRATIGRAPHY

Interpretation of CPT logs in conjunction with previously developed data indicates a sequence of fluvial materials composed of thickly and thinly bedded sands, silts, and clays which vary laterally across the area of investigation. This interpretation concurs with the previous stratigraphic interpretation of the area (Dames & Moore, 1990b, 1991a, 1991c, 1991d). Groundwater monitoring well and CPT/HP locations are presented in Figure 1. Geologic cross sections interpreted from the data are provided as Figure 2. Copies of CPT logs are provided in Appendix A.

The primary pertinent subsurface hydrogeologic features identified during this and previous investigations are:

- A generally correlatable, permeable saturated sand zone between approximately 30 and 65 feet bgs, designated as the first hydrostratigraphic zone; and
- Silty sand to clayey sand units, between approximately 70 and 84 feet bgs, designed as the second hydrostratigraphic zone.

The focus of the geologic portion of this investigation was to further evaluate the second hydrostratigraphic zone. The sandy units defining the second hydrostratigraphic zone ranged from 2 to 8 feet thick, and were generally present at most CPT locations. However, at several CPT locations (CPT-91, CPT-92, CPT-95, and CPT-96), a sand unit was absent at depth, and the deeper lithology was interpreted to be interbedded silty clay, clayey silt, and clay.

4.2 HP SAMPLING ANALYTICAL RESULTS

HP in-situ groundwater samples were collected from HP-86 through HP-103 sample locations (Figure 1). Groundwater sampling procedures and protocol, field QA/QC measures, and analytical testing methods were in accordance with criteria established in the Work Plan (Dames & Moore, 1992b).

HP in-situ groundwater samples were analyzed by EPA Test Method 601 by Anlab Analytical Laboratory of Sacramento, California. All samples were analyzed on a 24-hour turn-around basis. Summary analytical test results are presented in Table 1. Copies of laboratory analytical reports are presented in Appendix B.

Halogenated volatile organic compounds (VOCs), primarily carbon tetrachloride and chloroform, were detected at relatively low levels in 11 of the 18 groundwater samples. Carbon tetrachloride was detected in eight samples, ranging in concentrations from 0.58 $\mu\text{g}/\ell$ to 3.3 $\mu\text{g}/\ell$. Chloroform was detected in six samples with concentrations ranging from 0.64 $\mu\text{g}/\ell$ to 2.8 $\mu\text{g}/\ell$. 1,2-DCA was detected in one sample at a concentration of 1.2 $\mu\text{g}/\ell$.

4.3 INTERPRETATION OF RESULTS - SECOND HYDROSTRATIGRAPHIC ZONE

The primary constituents of concern previously identified in on-site groundwater are 1,1-DCE, 1,1-DCA, 1,2-DCA, 1,1,1-TCA, and TCE (Dames & Moore, 1991a, 1991d). One of these constituents of concern, 1,2-DCA, was detected at one location (CPT-89/HP-96). There were no other detections of the primary constituents of concern in the second hydrostratigraphic zone.

Carbon tetrachloride was detected at several locations along the west side of the area of investigation. Previous detections of carbon tetrachloride have been limited to off-site CPT/HP and groundwater monitoring well locations. There have not been any detections of carbon tetrachloride on-site.

The furthest upgradient detection of carbon tetrachloride has been measured in groundwater samples collected from monitoring well MW-29. This well is located adjacent to the former location of a gasoline service station (Dames & Moore, 1991c). The service station was present from around 1931 (based on underground gasoline storage tank permits) until the 1950s. Carbon tetrachloride may have been used for degreasing at the service station.

Chloroform distribution in groundwater in the off-site second hydrostratigraphic zone and previous investigations appears ubiquitous. All detections of chloroform were low and well below drinking water MCLs and are not considered problematic.

The results of the investigation suggest that impacts to groundwater in the second hydrostratigraphic zone off site generally do not exceed the lateral extent of impacts to the first hydrostratigraphic zone. While 1,2-DCA was detected outside the previously evaluated lateral extent of impact to the first hydrostratigraphic zone, the detection was very low (1.2 $\mu\text{g}/\ell$). As the nearest drinking water well is over 1 mile away, the low detections are not considered problematic.

Comparison of analytical results of groundwater samples collected from adjacent monitoring wells completed within separate hydrostratigraphic zones (for example, MW-28 and MW-30, MW-32 and MW-40, MW-36 and MW-37) indicate that impacts to groundwater in the second hydrostratigraphic zone are comparable to impacts in the first hydrostratigraphic zone in the area of MW-40 and MW-32. This

may suggest interconnection of the first and second hydrostratigraphic zones in the area of MW-32 and MW-40.

In the area of MW-28 and MW-30, and MW-36 and MW-37 comparison of groundwater analytical results indicates that, while the second hydrostratigraphic zone has been impacted, the impacts are considerably less (nearly an order magnitude). This may suggest minimal interconnection between the first and second hydrostratigraphic zones in the area of MW-28 and MW-30, and MW-36 and MW-37.

5.0 CONCLUSIONS

Conclusions of the off-site second hydrostratigraphic zone groundwater investigation are stated below.

- CPT and HP in-situ groundwater sampling are effective tools for providing stratigraphic and in-situ groundwater samples under the conditions found in the investigation area.
- On the basis of the HP sample data, it appears that groundwater in the second hydrostratigraphic zone has been impacted by carbon tetrachloride, chloroform, and 1,2-DCA at depths of approximately 70 to 84 feet bgs.
- Carbon tetrachloride has not been detected in groundwater on site. The farthest upgradient off-site carbon tetrachloride detection was found in MW-29 within the first hydrostratigraphic zone (see Figure 1 for location of MW-29). MW-29 is located adjacent to a former gas station as referenced in the Remedial Investigation/Feasibility Study report (Dames & Moore, 1991c). Therefore, the source of the carbon tetrachloride detected in the first and second hydrostratigraphic zones off site may be the former gas station.
- Impacts to off-site groundwater in the second hydrostratigraphic zone do not appear to exceed the lateral extent of the first hydrostratigraphic zone, and available data indicate impacts to the second hydrostratigraphic zone off site are much less than impacts to the first hydrostratigraphic zone.

6.0 RECOMMENDATIONS

6.1 ADDITIONAL OFF-SITE SECOND HYDROSTRATIGRAPHIC ZONE GROUNDWATER MONITORING WELL INSTALLATION

Based on the results of this investigation, installation of an additional one to two off-site second hydrostratigraphic zone groundwater monitoring wells are recommended, as discussed in the following sections.

6.1.1 Monitoring Well Locations and Rationale

A total of one to two new off-site groundwater monitoring wells are proposed for installation within the second hydrostratigraphic zone. First, a monitoring well will be installed adjacent to existing well MW-38. Depending on the results of samples collected from this new well, an additional well may be recommended for installation adjacent to well MW-39.

As depicted in Figure 1, proposed well MW-44 will be located adjacent to existing well MW-38. The well will be screened in relatively sandy units of the second hydrostratigraphic zone, which occur between approximately 70 to 90 feet bgs. Based on existing stratigraphic information, well screen length will be five to ten feet.

The purpose of the proposed off-site groundwater monitoring well is to:

- Provide stratigraphic information within the contaminant plume;
- Provide groundwater hydraulic gradient and aquifer characteristic data; and
- Provide groundwater chemical data.

The following sections describe procedures for drilling, well construction, and well development for the proposed monitoring wells.

6.1.2 Monitoring Well Installation

6.1.2.1 Drilling Procedures

Groundwater monitoring wells will be completed using direct mud rotary drilling methods. The drilling fluid will consist of a bentonite-water mixture. Steel conductor casing will be sealed into significant clay zones to minimize the potential for migration of water from the first and second hydrostratigraphic zones during drilling.

The borehole for the monitoring wells will be advanced in two stages. The first stage will be completed in two steps. A 6-inch pilot hole will be advanced to approximately 60 feet bgs. Continuous core will be collected in short runs, for the last 10 feet. Core will be evaluated to locate a competent clay unit immediately underlying the primary sand zone for seating the conductor casing.

The hole will then be reamed about one foot into the top of the clay zone using a 15-3/4 inch roller bit. Conductor casing, 10-3/4 inches in diameter, will be pressed approximately one foot into the clay zone to seal the primary sand zone from lower permeable zones. The annular space between the exterior of the conductor casing and the borehole walls will be grouted using a cement/bentonite slurry. After allowing the grout to cure for a minimum of 24 hours, drilling fluid used to drill this portion of the borehole will be evacuated and disposed of properly. All downhole drilling equipment will be steam cleaned prior to re-entering the borehole. Drilling and continuous sampling will subsequently be resumed to the base of the next sand zone, estimated to be at 80 to 90 feet bgs. The hole will be reamed using a 9-7/8 inch diameter roller bit and the well will then be installed.

6.1.2.2 Geophysical Logging

Geophysical logging will be performed at each borehole. The suite of geophysical parameters will include spontaneous potential (SP), short and normal lateral resistivity, natural gamma, and caliper.

The borehole will be geophysically logged in stages, as follows:

- The first stage will be the 6-inch pilot hole advanced to approximately 60 feet bgs; and
- The second stage will be the 6-inch pilot hole advanced to 80 to 90 feet bgs.

6.1.2.3 Soil Sampling Procedures

Continuous soil sampling will be conducted utilizing a 2 1/2-inch diameter CME five-foot-long split-barrel sampler or comparable core barrel and, as appropriate, an 18-inch driven Dames & Moore U-sampler. Soil cores will be logged according to the Unified Soil Classification System (USCS) and stored in core trays or boxes for future evaluation or testing as necessary.

The five-foot sample barrel fits within the drill rod, extending a few inches in front of the drill bit. Upon advancing the sampler five feet, the sample system will be lifted from within the drill rod and removed from the leading end of the rod assembly. The sampler assembly will then be removed, allowing the split tube to be separated and sample removed, or in the case of a solid-core barrel, extruded from the barrel.

As appropriate, a U-sampler will be used to collect and retain soil samples at intervals between five-foot core runs for potential chemical analyses. The U-sampler will also be used for any interval where core recovery and retention become difficult.

During use, the U-sampler will be driven 18 inches or until refusal into undisturbed soil. The sampler will be driven using a 140-pound hammer dropping 30 inches. Hammer blows required to drive the sampler each 6-inch increment of the 18-inch interval will be recorded on the boring log. The sampler will then be removed from the bore hole, and the tip and waste barrel will be removed, allowing the split barrel to be separated and sample rings to be removed.

The U-sampler will be fitted with a set of three-inch-long stainless steel rings. Sample rings will be separated with a clean soil knife. The exposed ends of the rings will be covered with 2-mil Teflon sheets and secured with tight-fitting plastic end caps. Sample labels will be affixed to the end caps and will contain the following information: boring number; sample location; sample number; sample depth; date of sampling; time of sampling; sample collector's name; soil type (USCS); and project name.

Three rings from the 18-inch U-sampler will be retained from each sample interval. These samples will have the same sample identification numbers except for postscripts "A, B, or C". The lowest ring, Sample "A", will be retained for potential chemical testing; "B" samples may be submitted as duplicates or will be refrigerated for possible future chemical analyses; and the "C" samples will be retained for possible physical testing. Sample rings will be screened with an OVM to evaluate whether chemical analyses are warranted.

6.1.2.4 Monitoring Well Construction

Groundwater monitoring wells will be installed through the 10-3/4-inch steel conductor casing. Monitoring wells will be constructed of 4-inch diameter flush-threaded Schedule 40 PVC blank casing and stainless steel continuous-wrap well screen. Stainless steel continuous-wrap well screen will be used as it is envisaged that the wells will be utilized for the long-term monitoring during remediation. Wells will be assembled without the use of chemical bonding agents.

The screened interval in each well will be filter packed with a prewashed filter sand from total depth to approximately two feet above the top of the screened interval. Both the screen size and filter pack used will be confirmed based upon on-site sieve analyses of the materials found at the interval to be screened. Samples of the filter pack and formation will be forwarded to a laboratory for confirmation of grain-size distribution. Installation of the monitoring well will be delayed pending analysis only if the field geologist is in doubt as to the appropriate screen and filter to use, based on his field assessment.

The filter pack and seal will be placed by using tremmie pipe. The filter pack will be surged gently with a surge block to settle the filter pack material appropriately prior to placing the seal. The wells will have approximately one to two feet of No. 60 silica sand which will be tremmied on top of the filter pack, followed by placement of approximately three feet of a bentonite slurry. The sand will be tamped down using a weighted line or tremmie to reduce the possibility of potential bridges in the sand pack. After addition of the bentonite slurry, the top of the seal will then be measured.

After allowing the bentonite seal to hydrate for a minimum of one hour, the remaining annular space will be backfilled with a three-percent bentonite/cement grout mixture. Bentonite will be weighed in the field and amounts of bentonite, cement and water will be documented in a field log.

Monitoring wells will be completed at ground surface with a water tight, flush mount, 12-inch diameter traffic rated surface vault.

The top of the monitoring well PVC casing, ground surface elevations, and horizontal coordinates will subsequently be surveyed by a licensed land surveyor. The survey reference point on top of the PVC casing will be permanently marked.

6.1.2.5 Monitoring Well Development

After allowing the newly completed monitoring well to stabilize a minimum of 24 hours, the well will be developed by surging with a surge block, followed by either bailing with a bailer or pumping with a submersible pump. Measurements of the pH, specific conductivity, and temperature will be taken at regular intervals during development, and development will proceed until these parameters stabilize and the produced water is relatively free of sediment. Criteria used for stabilization will be three consecutive readings within 0.2 pH units, 10-percent fluctuation in specific conductivity and 0.2 degrees temperature. Water produced during development will be placed in containers with the drilling muds and handled properly.

6.1.2.6 Monitoring Well Sampling

Monitoring well sampling will be conducted according to the procedures and protocol utilized for quarterly groundwater sampling at the site. A minimum of one week stabilization period will pass prior to sampling a new well. Each new well will be sampled and analyzed for chlorinated volatile organic compounds and nickel.

7.0 SCHEDULE

Dames & Moore will commence monitoring well installation subsequent to receipt of written approval by the DTSC. We anticipate one month will be required to obtain written permission from the Sacramento Children's Home for monitoring well installation on their property. Additionally, we anticipate one month will be required to obtain a revocable permit from the City of Sacramento for monitoring well installation on City property, if necessary. We will attempt to accelerate that process by requesting permission from the Sacramento Children's Home and applying for the revocable permit while DTSC is in the process of reviewing this report.

Approximately three weeks will be required for well installation, development, and sampling. A data transmittal will be completed three to four weeks following completion of well sampling.

REFERENCES

- Dames & Moore, 1989, Work Plan, Off-Site Groundwater Investigation, Union Pacific Railroad Yard, Sacramento, California, December 1989.
- Dames & Moore, 1990a, Work Plan, Additional Off-Site Groundwater Investigation, Union Pacific Railroad Yard, Sacramento, California, march 1990.
- Dames & Moore, 1990b, Hydropunch and Groundwater Investigation Report, Union Pacific Railroad Yard, Sacramento, California, July 1990.
- Dames & Moore, 1990c, Work Plan, Supplementary Groundwater Investigation, Union Pacific Railroad Yard, Sacramento, California, July 1990.
- Dames & Moore, 1991a, Supplementary Groundwater Investigation Report, Union Pacific Railroad Yard, Sacramento, California, January 1991.
- Dames & Moore, 1991b, Work Plan, Off-Site Groundwater Monitoring Well Installation, Union Pacific Railroad Yard, Sacramento, California, March 1991.
- Dames & Moore, 1991c, Remedial Investigation/Feasibility Study Report, Union Pacific Railroad Yard, Sacramento, California, May 1991.
- Dames & Moore, 1991d, Addendum Remedial Investigation/Feasibility Study Report, Union Pacific Railroad Yard, Sacramento, California, November 1991.
- Dames & Moore, 1992a, Transmittal of Additional Groundwater Investigation Results and Quarterly Groundwater Monitoring Data, Union Pacific Railroad Yard, Sacramento, California, February 1992.
- Dames & Moore, 1992b, Work Plan, Additional Off-Site Groundwater Investigation Second Hydrostratigraphic Zone, Union Pacific Railroad Yard, Sacramento, California, March 1992.

Tables

TABLE 1
SUMMARY GROUNDWATER ANALYTICAL RESULTS
ORGANICS - DETECTIONS ONLY ($\mu\text{g/l}$)
UNION PACIFIC RAILROAD YARD
SACRAMENTO, CALIFORNIA

Sample ID	Date Sampled	CCl ₄	Chloroform	1,2-DCA
		MCL/AL		
		0.5	100	0.5
HP-86-80.5	5/26/92	1.1	--	--
HP-88-80	5/28/92	--	0.64	--
HP-89-78	5/28/92	--	0.65	--
HP-91-83	5/29/92	--	0.85	--
HP-94-76	6/01/92	2.1	1.0	--
HP-95-74	6/02/92	0.58	2.8	--
HP-96-79	6/02/92	2.8	2.2	1.2
HP-97-78	6/03/92	0.76	--	--
HP-98-70	6/03/92	3.3	--	--
HP-100-80	6/04/92	2.5	--	--
HP-101-75	6/04/92	0.71	--	--

Sample ID *HP* and the first two numbers indicate Hydropunch™ sample location number. Last two numbers indicate sampling depth in feet below ground surface.

CCl₄ Carbon tetrachloride.

1,2-DCA 1,2-Dichloroethane.

MCL Maximum Contaminant Level drinking water standard.

AL Drinking water action level, recommended by DTSC.

-- Not detected.

TABLE 2
SUMMARY QUALITY CONTROL SAMPLE RESULTS
SELECTED ORGANICS ($\mu\text{g}/\ell$)
UNION PACIFIC RAILROAD YARD
SACRAMENTO, CALIFORNIA

Sample ID	Date Sampled	CCL ₄	Chloroform	1,2-DCA
		MCL/AL		
		0.5	100	0.5
HP-90-80 ¹	6/01/92	--	--	--
HP-90A-80 ¹	6/01/92	--	--	--
HP-96-79 ¹	6/02/92	2.8	2.2	1.2
HP-96-79 ² (AA02201)	6/10/92	3.5	2.5	1.5
HP-99-82 ¹	6/04/92	--	--	--
HP-99A-82 ¹	6/04/92	--	--	--
HP-100-80 ¹	6/04/92	2.5	--	--
HP-100-80 ² (AA02658)	6/10/92	2.4	--	--
HP-101-75 ¹	6/05/92	0.71	--	--
HP-101-75 ² (AA02737)	6/10/92	1.2	--	--
HP-RB-1 ³	6/05/92	--	--	--

Sample ID *HP* and the first two numbers indicate Hydropunch™ sample location number. Last two numbers indicate sampling depth in feet below ground surface.

CCl₄ Carbon tetrachloride.

1,2-DCA 1,2-Dichloroethane.

MCL Maximum Contaminant Level drinking water standard.

AL Drinking water action level, recommended by DTSC.

-- Not detected.

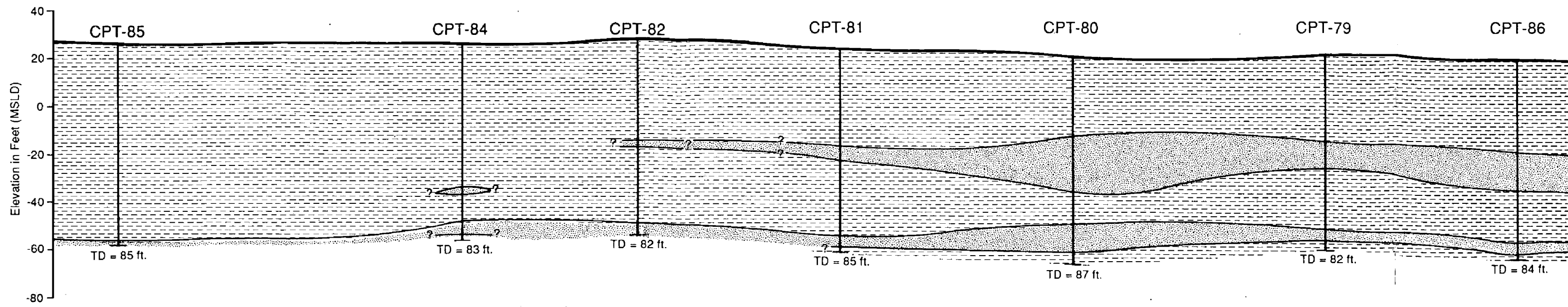
1 Analyzed by Anlab Laboratory.

2 Analyzed by ENSECO Laboratory.

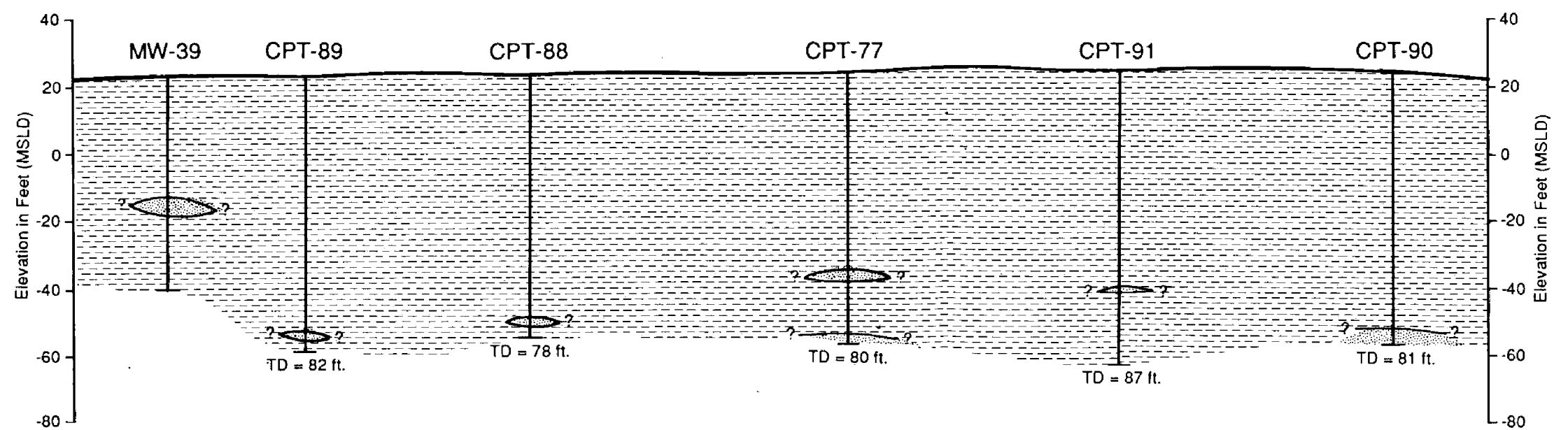
3 Rinsate blank sample analyzed by Anlab.

FIGURES

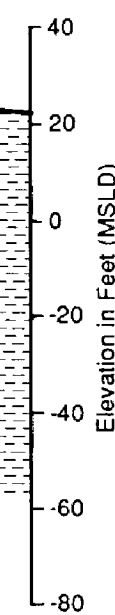
A
SOUTHEAST



B
SOUTHEAST



B'
NORTHWEST



Appendix A

APPENDIX A
CONE PENETRATION TEST LOGS

DATE: 06/09/1992

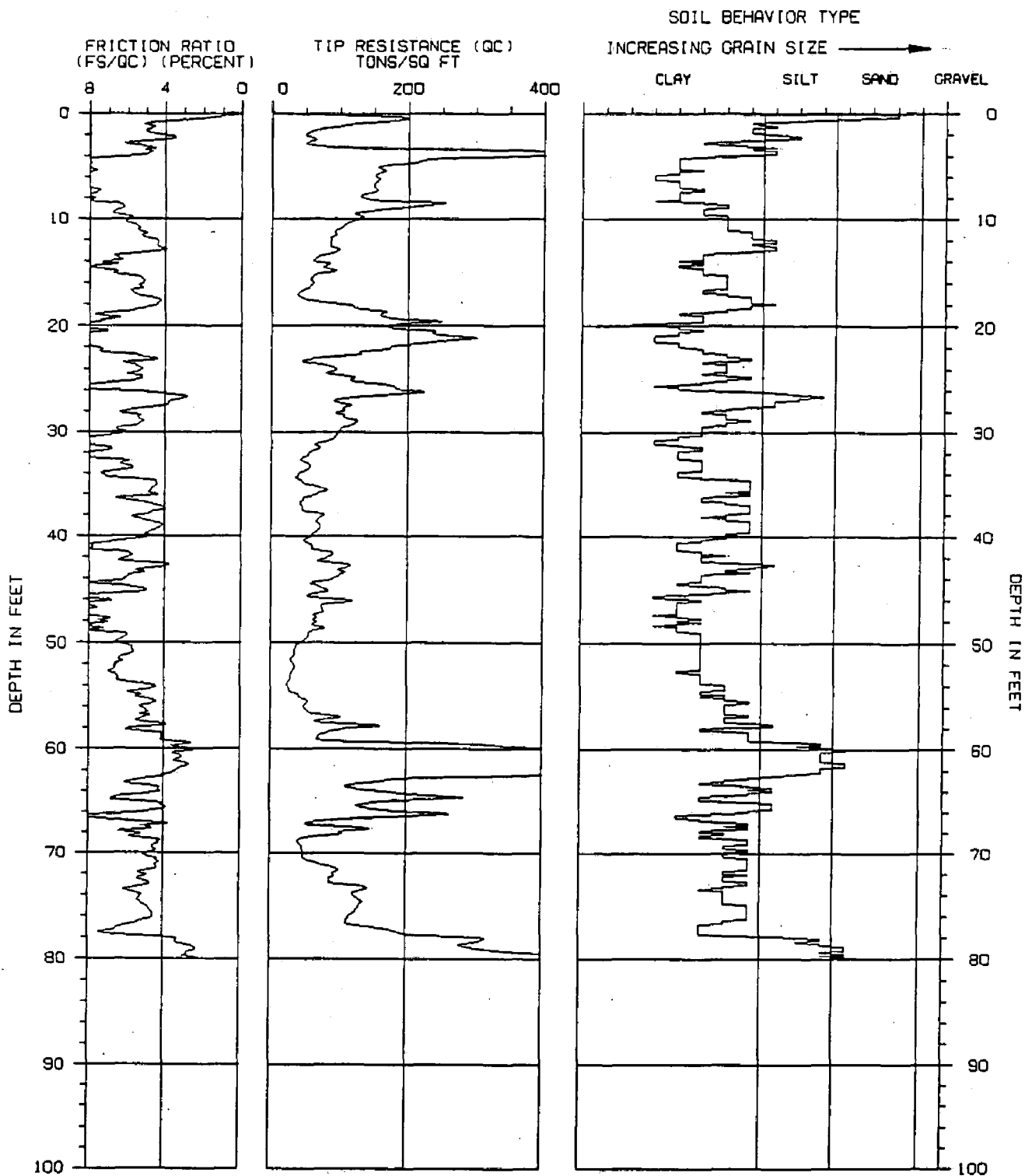
SUMMARY OF CONE PENETRATION TESTING

PROJECT NAME : D&M/UPRR-II
PROJECT NUMBER : 92-381-01110

LOCATION : SACRAMENTO CA
NO. OF SOUNDINGS: 22

TEST DATE	SOUNDING NO.	DEPTH (ft.)	TYPE OF TEST	REASON FOR TERMINATION
05-26-1992	CPT-77	80	STANDARD	REACHED REQUIRED DEPTH
05-27-1992	CPT-78	83	STANDARD	REACHED REQUIRED DEPTH
05-27-1992	CPT-79	81	STANDARD	HIGH PENETRATION RESISTANCE
05-27-1992	CPT-80	87	STANDARD	HIGH PENETRATION RESISTANCE
05-28-1992	CPT-81	85	STANDARD	REACHED REQUIRED DEPTH
05-28-1992	CPT-82	23	STANDARD	HIGH PENETRATION RESISTANCE
05-28-1992	CPT-82A	81	STANDARD	REACHED REQUIRED DEPTH
05-28-1992	CPT-83	17	STANDARD	HIGH PENETRATION RESISTANCE
05-28-1992	CPT-83A	18	STANDARD	HIGH PENETRATION RESISTANCE
05-29-1992	CPT-84	82	STANDARD	REACHED REQUIRED DEPTH
05-29-1992	CPT-85	85	STANDARD	REACHED REQUIRED DEPTH
06-01-1992	CPT-86	83	STANDARD	REACHED REQUIRED DEPTH
06-01-1992	CPT-87	83	STANDARD	REACHED REQUIRED DEPTH
06-02-1992	CPT-88	77	STANDARD	EXCESSIVE ROD BUCKLING
06-02-1992	CPT-89	82	STANDARD	REACHED REQUIRED DEPTH
06-03-1992	CPT-90	81	STANDARD	REACHED REQUIRED DEPTH
06-03-1992	CPT-91	87	STANDARD	HIGH PENETRATION RESISTANCE
06-04-1992	CPT-92	83	STANDARD	HIGH PENETRATION RESISTANCE
06-04-1992	CPT-93	81	STANDARD	EXCESSIVE ROD BUCKLING
06-04-1992	CPT-94	83	STANDARD	EXCESSIVE ROD BUCKLING
06-05-1992	CPT-95	86	STANDARD	REACHED REQUIRED DEPTH
06-05-1992	CPT-96	79	STANDARD	HIGH PENETRATION RESISTANCE

TOTAL FOOTAGE - 1627



ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

CONE PENETRATION TEST

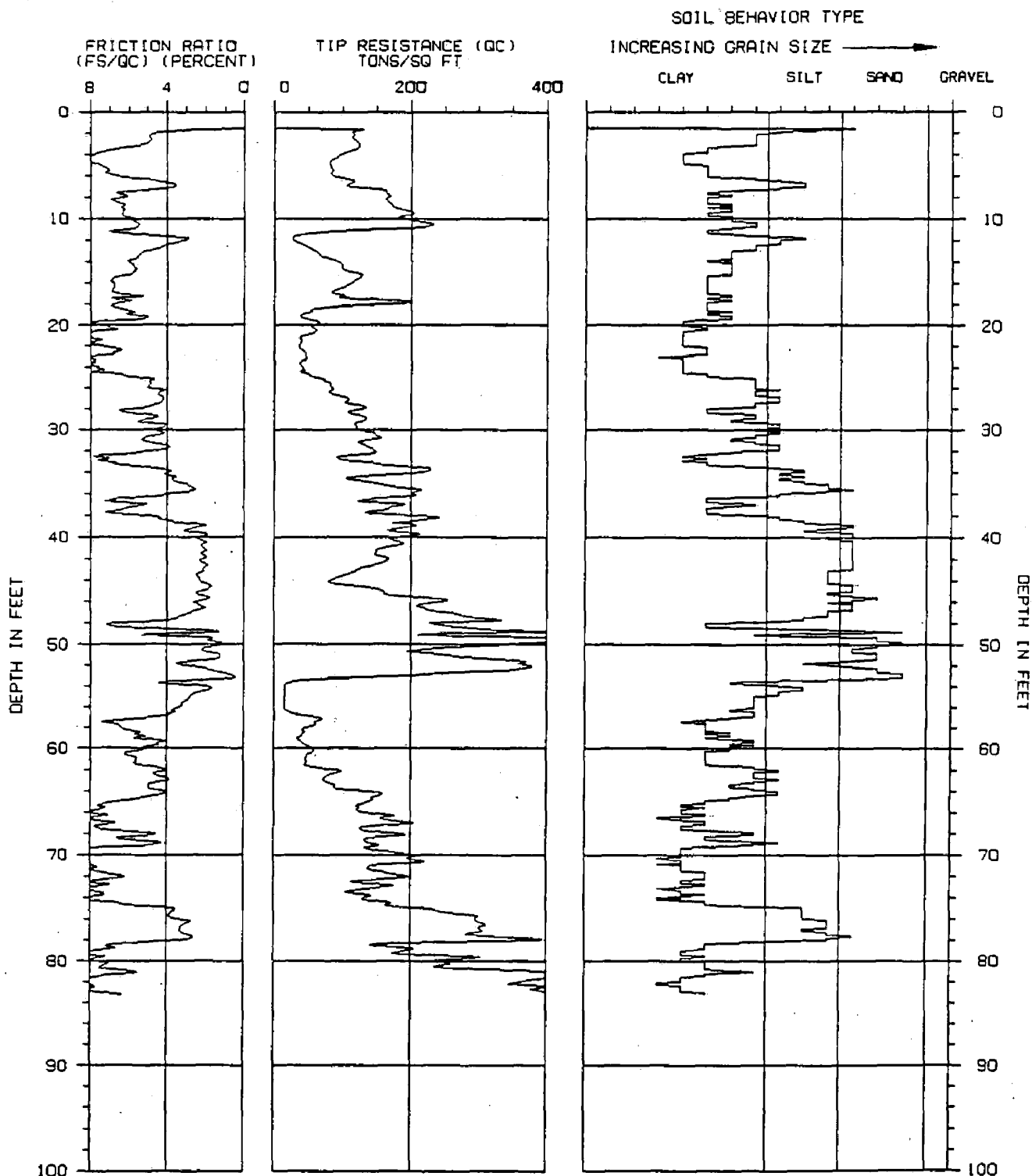
SOUNDING NUMBER: CPT-77

PROJECT NAME : D&M/UPRR-11
PROJECT NUMBER : 92-381-01110

LOCATION : SACRAMENTO CA
DATE : 05-26-1992



THE EARTH TECHNOLOGY
CORPORATION



TOP 1.5 FT IS DISTURBED SOIL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

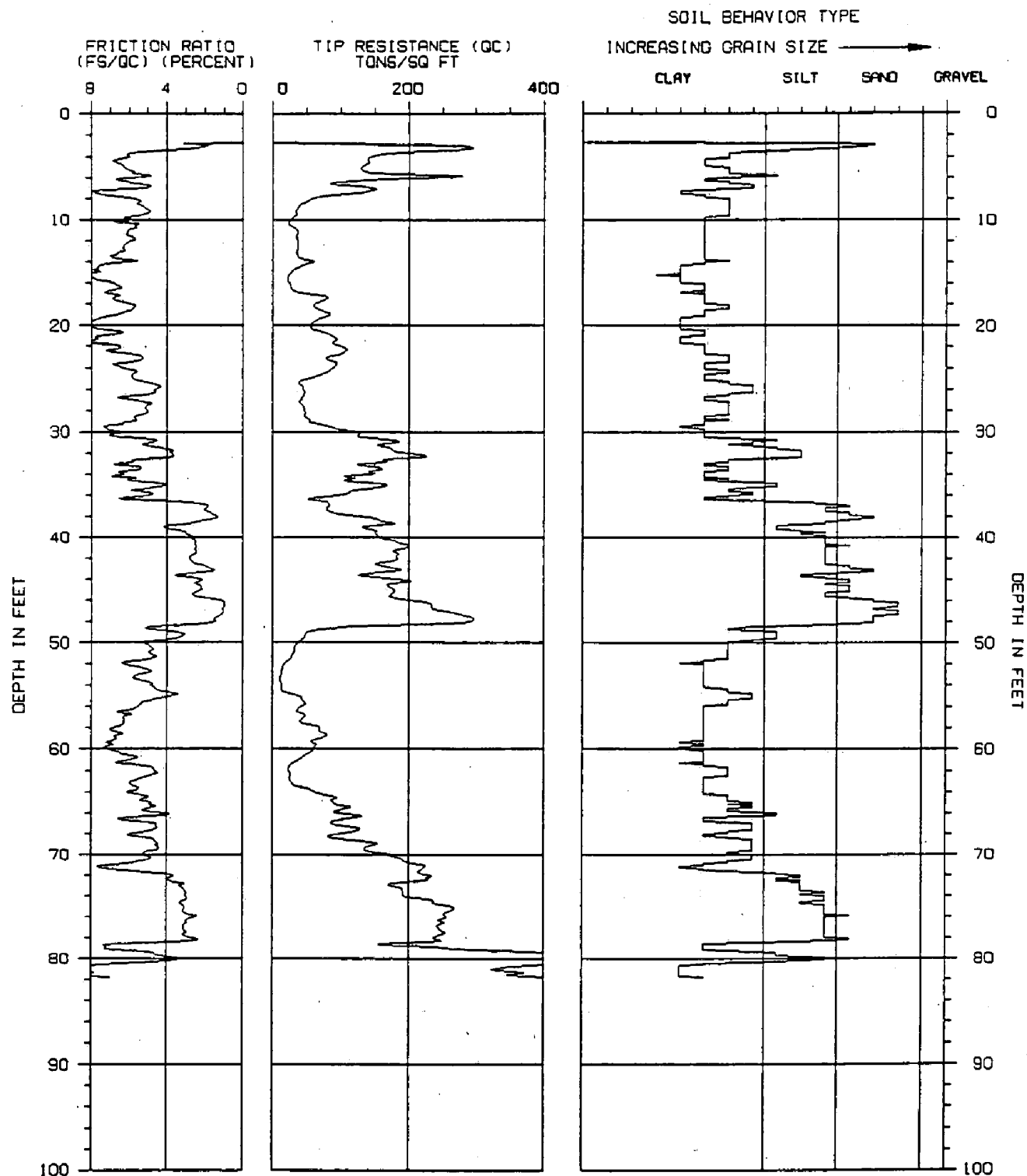
CONE PENETRATION TEST

SOUNDING NUMBER: CPT-78

PROJECT NAME : D&M/UPRR-11
PROJECT NUMBER : 92-381-01110

LOCATION : SACRAMENTO CA
DATE : 05-27-1992

 THE EARTH TECHNOLOGY CORPORATION



TOP 2.7 FT IS DISTURBED SOIL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

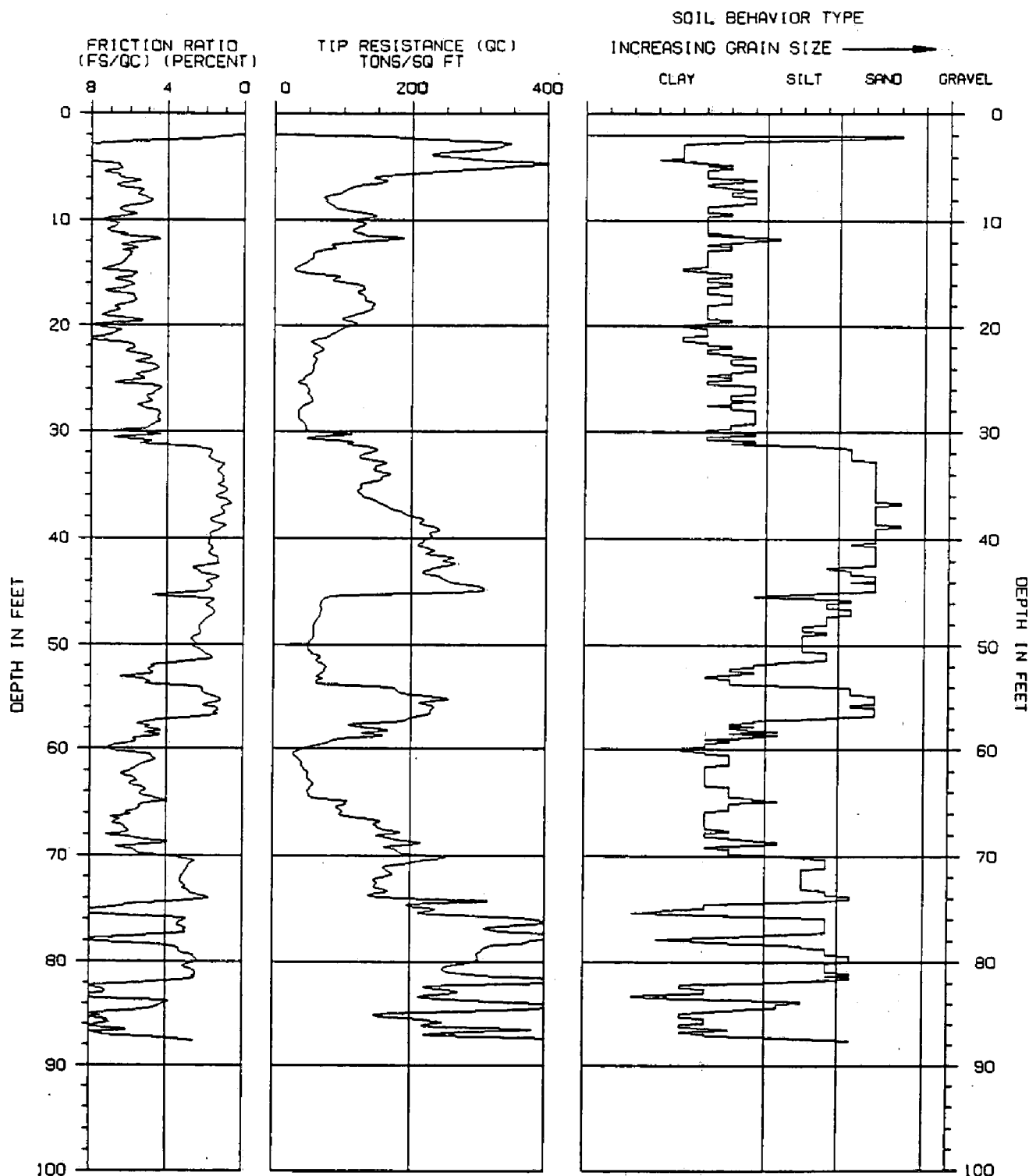
CONE PENETRATION TEST

SOUNDING NUMBER: CPT-79

PROJECT NAME : D&M/UPRR-II
PROJECT NUMBER : 92-381-01110

LOCATION : SACRAMENTO CA
DATE : 05-27-1992

 THE EARTH TECHNOLOGY CORPORATION



TOP 2.0 FT IS DISTURBED SOIL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

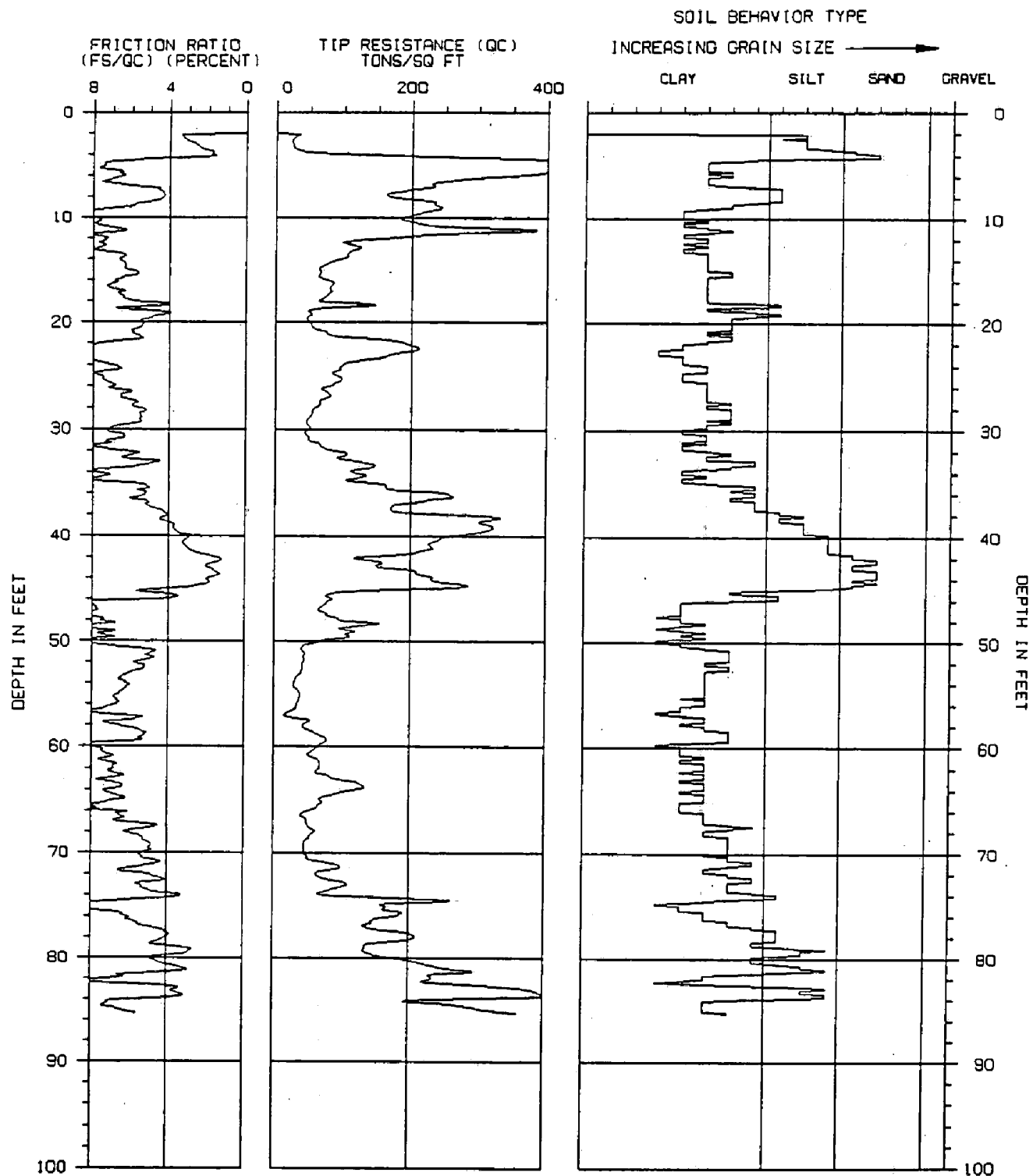
CONE PENETRATION TEST

SOUNDING NUMBER: CPT-80

PROJECT NAME : D&M/UPRR-11
PROJECT NUMBER : 92-381-01110

LOCATION : SACRAMENTO CA
DATE : 05-27-1992

 THE EARTH TECHNOLOGY
CORPORATION



ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

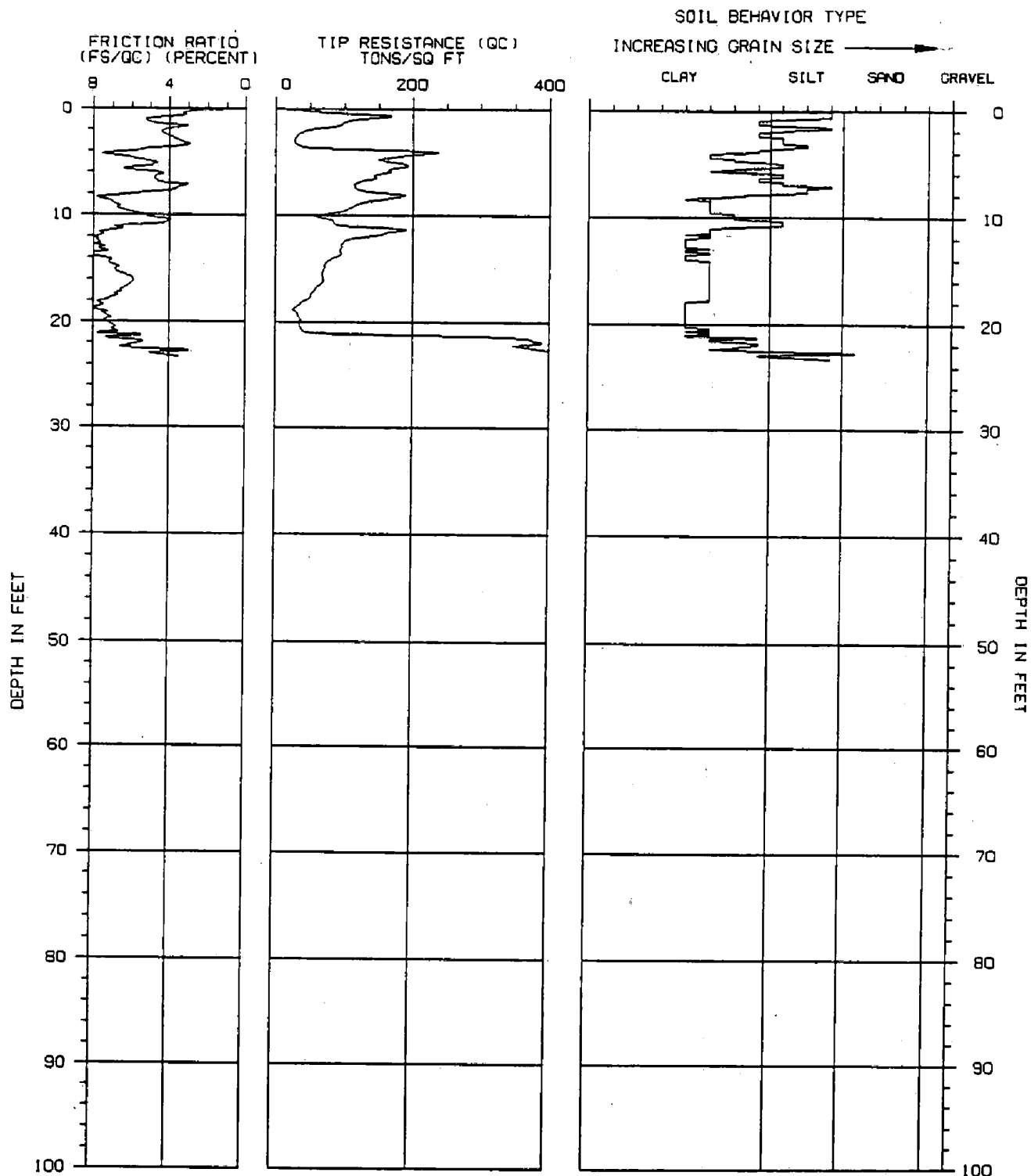
CONE PENETRATION TEST

SOUNDING NUMBER: CPT-81

PROJECT NAME : D&M/UPRR-[]
PROJECT NUMBER : 92-381-01110

LOCATION : SACRAMENTO CA
DATE : 05-28-1992

 THE EARTH TECHNOLOGY
CORPORATION



ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

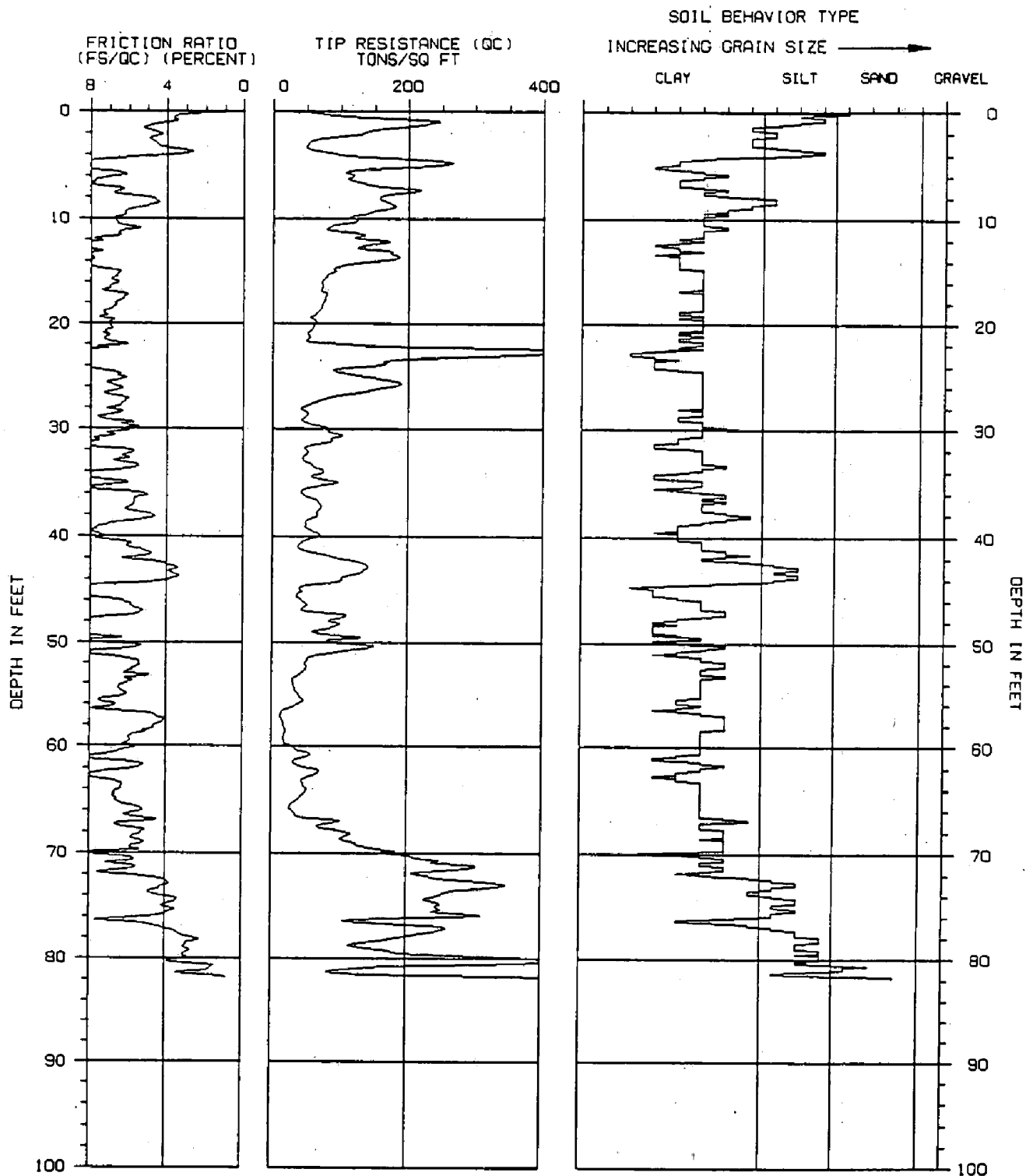
CONE PENETRATION TEST

SOUNDING NUMBER: CPT-82

PROJECT NAME : D&M/UPRR-11
PROJECT NUMBER : 92-381-01110

LOCATION : SACRAMENTO CA
DATE : 05-28-1992

 THE EARTH TECHNOLOGY CORPORATION



ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

CONE PENETRATION TEST

SOUNDING NUMBER: CPT-82A

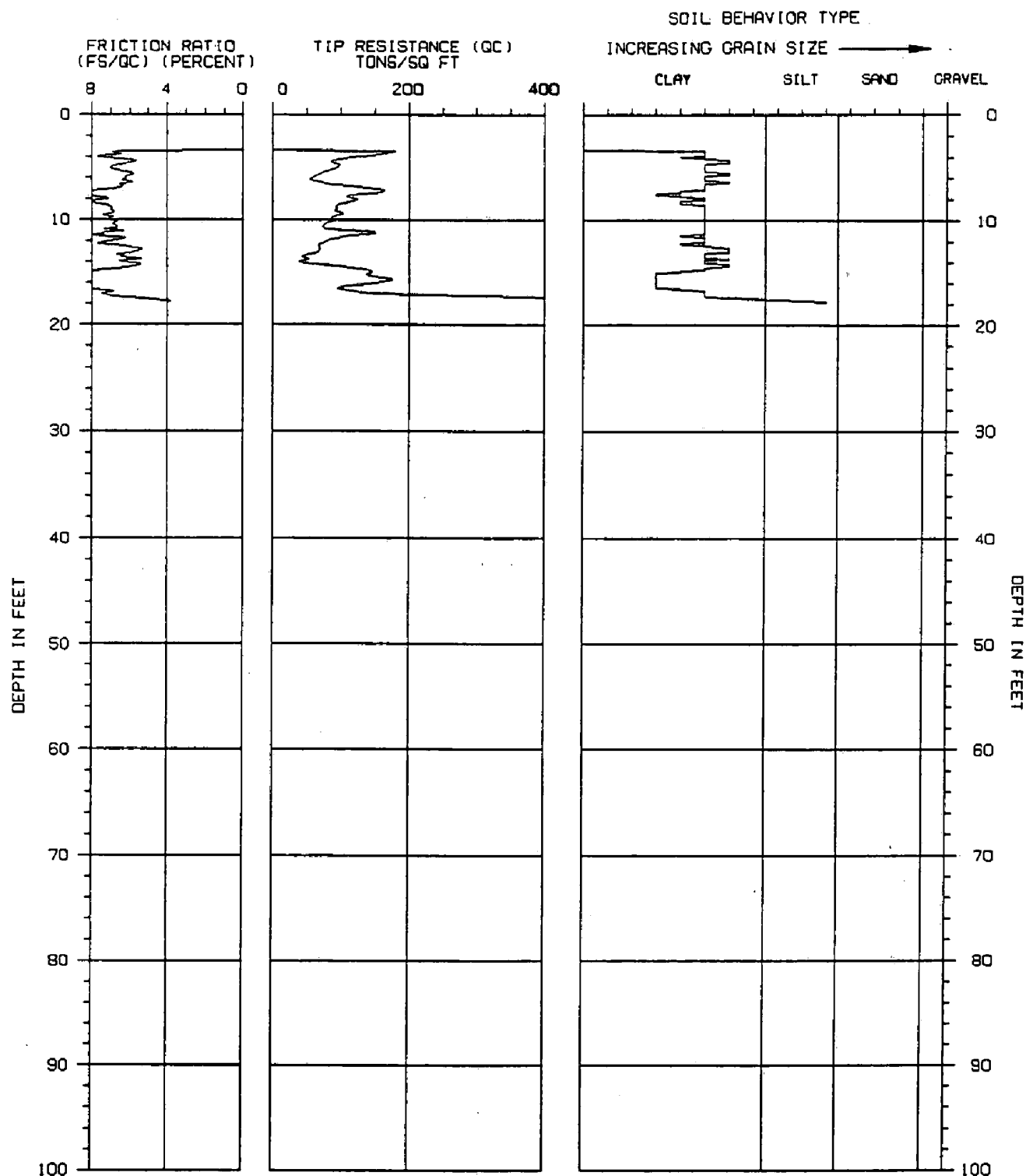
PROJECT NAME : D&M/UPRR-[1]

LOCATION : SACRAMENTO CA

PROJECT NUMBER : 92-381-01110

DATE : 05-28-1992

 THE EARTH TECHNOLOGY CORPORATION



TOP 3.3 FT IS DISTURBED SOIL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

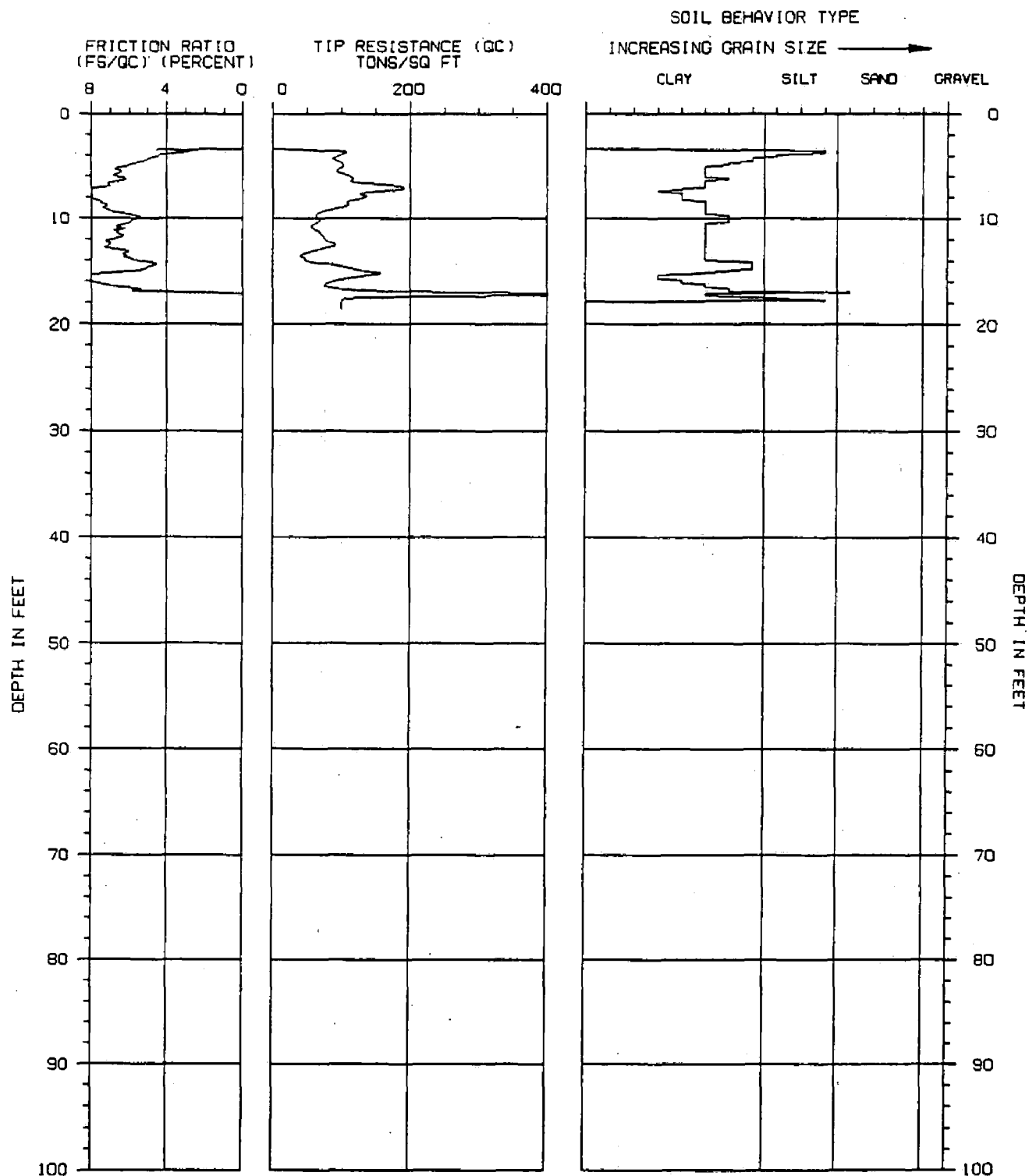
CONE PENETRATION TEST

SOUNDING NUMBER: CPT-83

PROJECT NAME : D&M/UPRR-II
PROJECT NUMBER : 92-381-01110

LOCATION : SACRAMENTO CA
DATE : 05-28-1992

 THE EARTH TECHNOLOGY CORPORATION



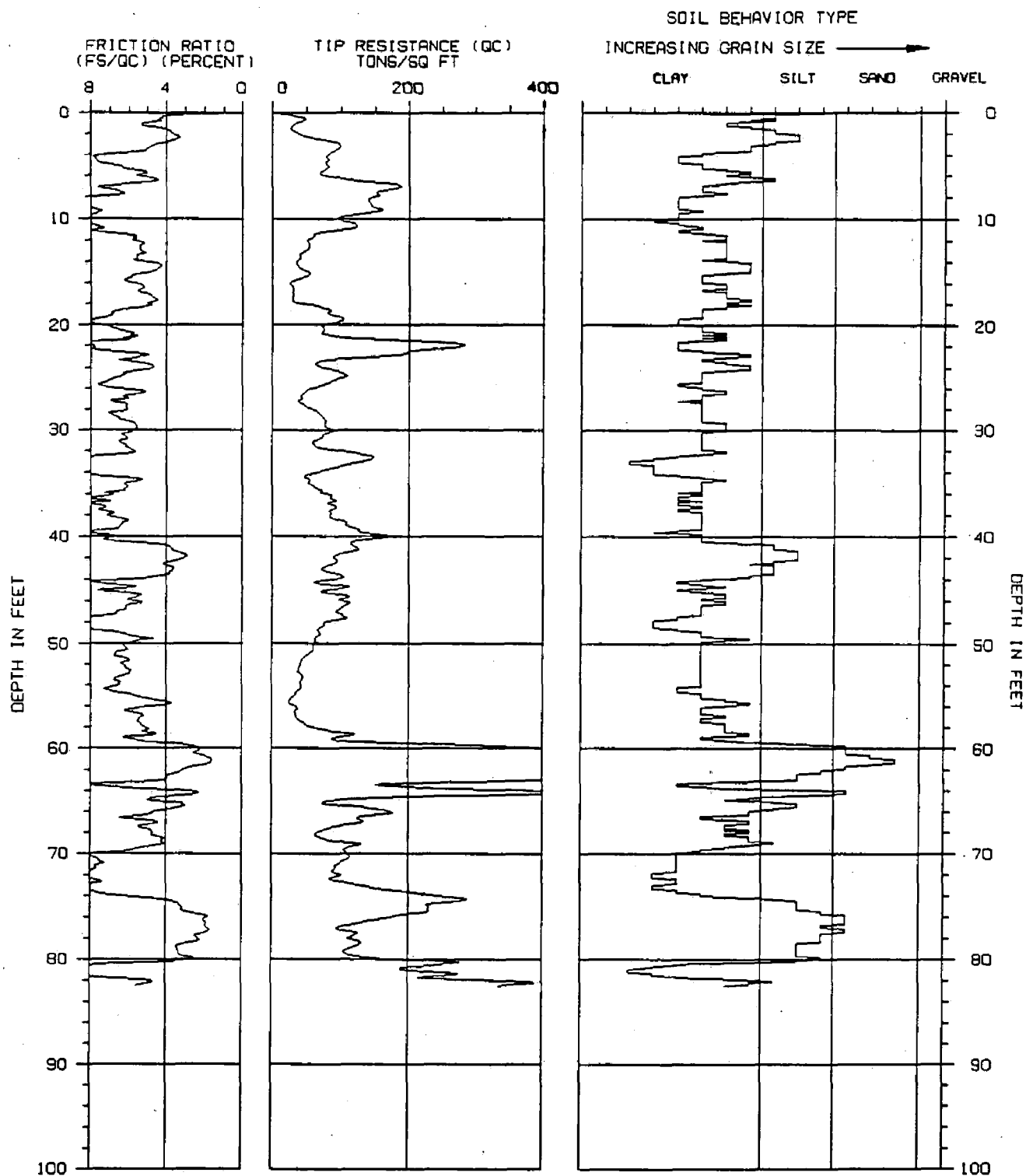
CONE PENETRATION TEST

SOUNDING NUMBER: CPT-83A

PROJECT NAME : D&M/UPRR-11
PROJECT NUMBER : 92-381-01110

LOCATION : SACRAMENTO CA
DATE : 05-28-1992

THE EARTH TECHNOLOGY CORPORATION



ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

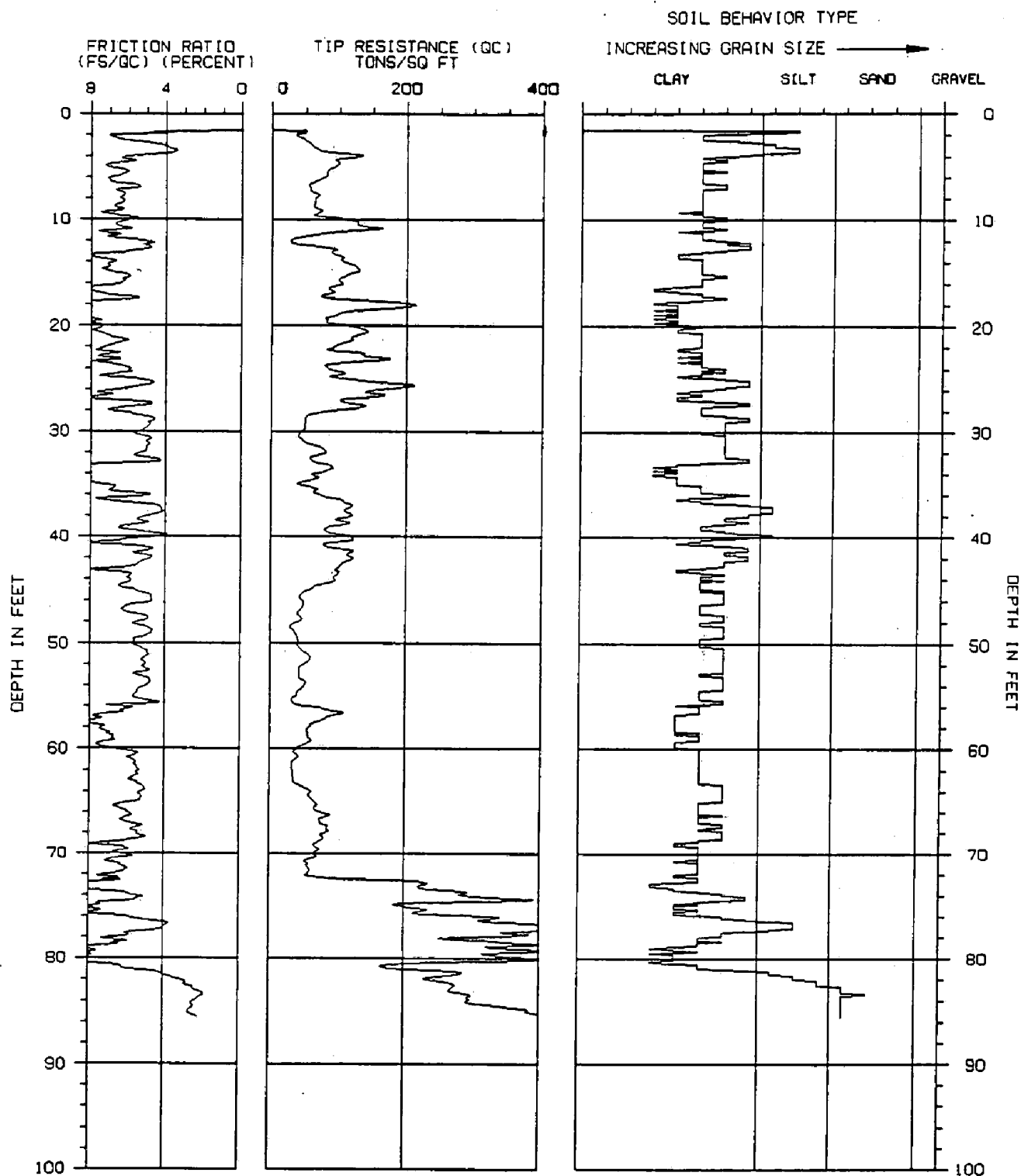
CONE PENETRATION TEST

SOUNDING NUMBER: CPT-84

PROJECT NAME : D&M/UPRR-II
PROJECT NUMBER : 92-381-01110

LOCATION : SACRAMENTO CA
DATE : 05-29-1992

 THE EARTH TECHNOLOGY CORPORATION



ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

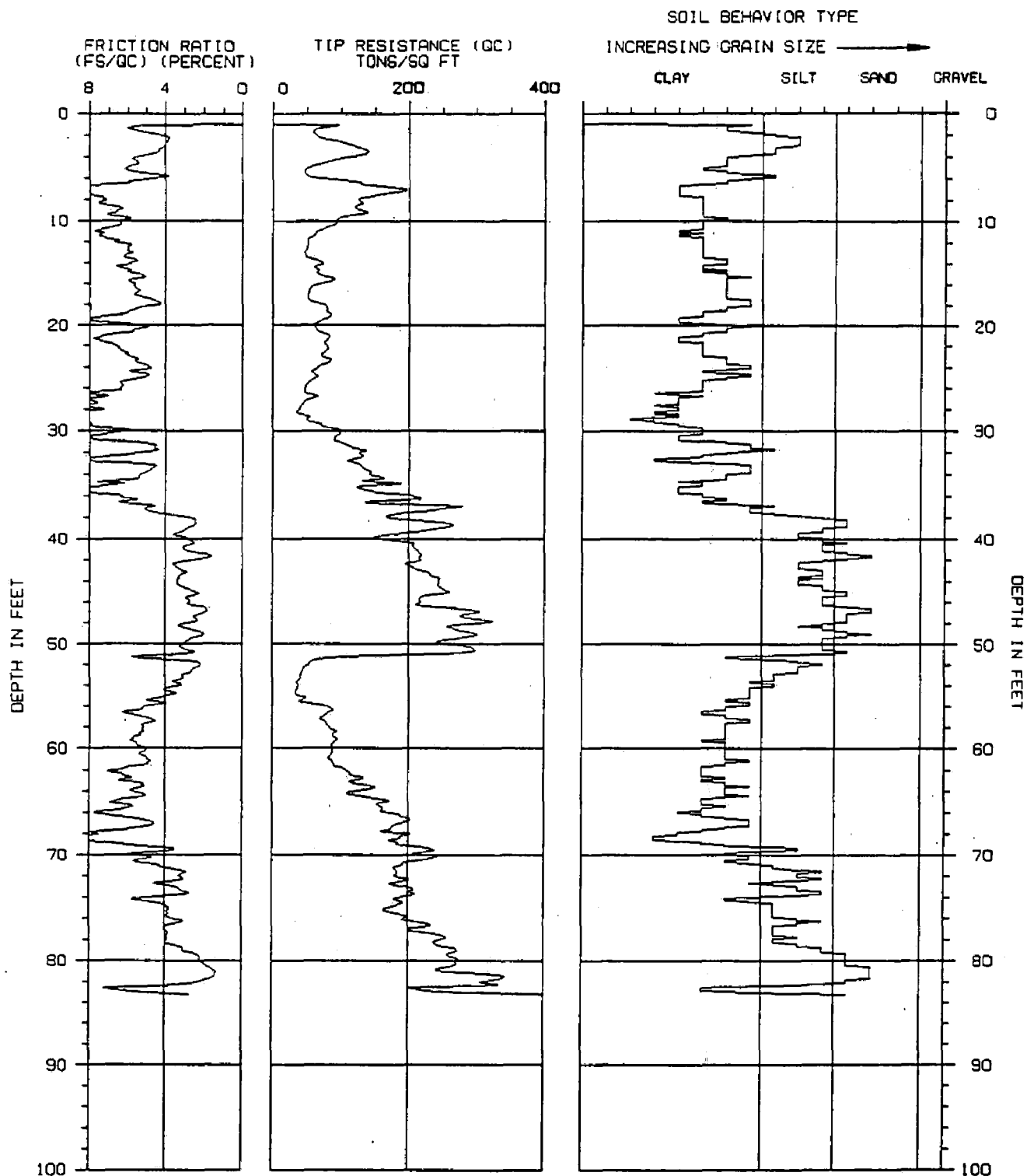
CONE PENETRATION TEST

SOUNDING NUMBER: CPT-85

PROJECT NAME : D&M/UPRR-II
PROJECT NUMBER : 92-381-01110

LOCATION : SACRAMENTO CA
DATE : 05-29-1992

 THE EARTH TECHNOLOGY CORPORATION



TOP 1.0 FT IS DISTURBED SOIL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

CONE PENETRATION TEST

SOUNDING NUMBER: CPT-86

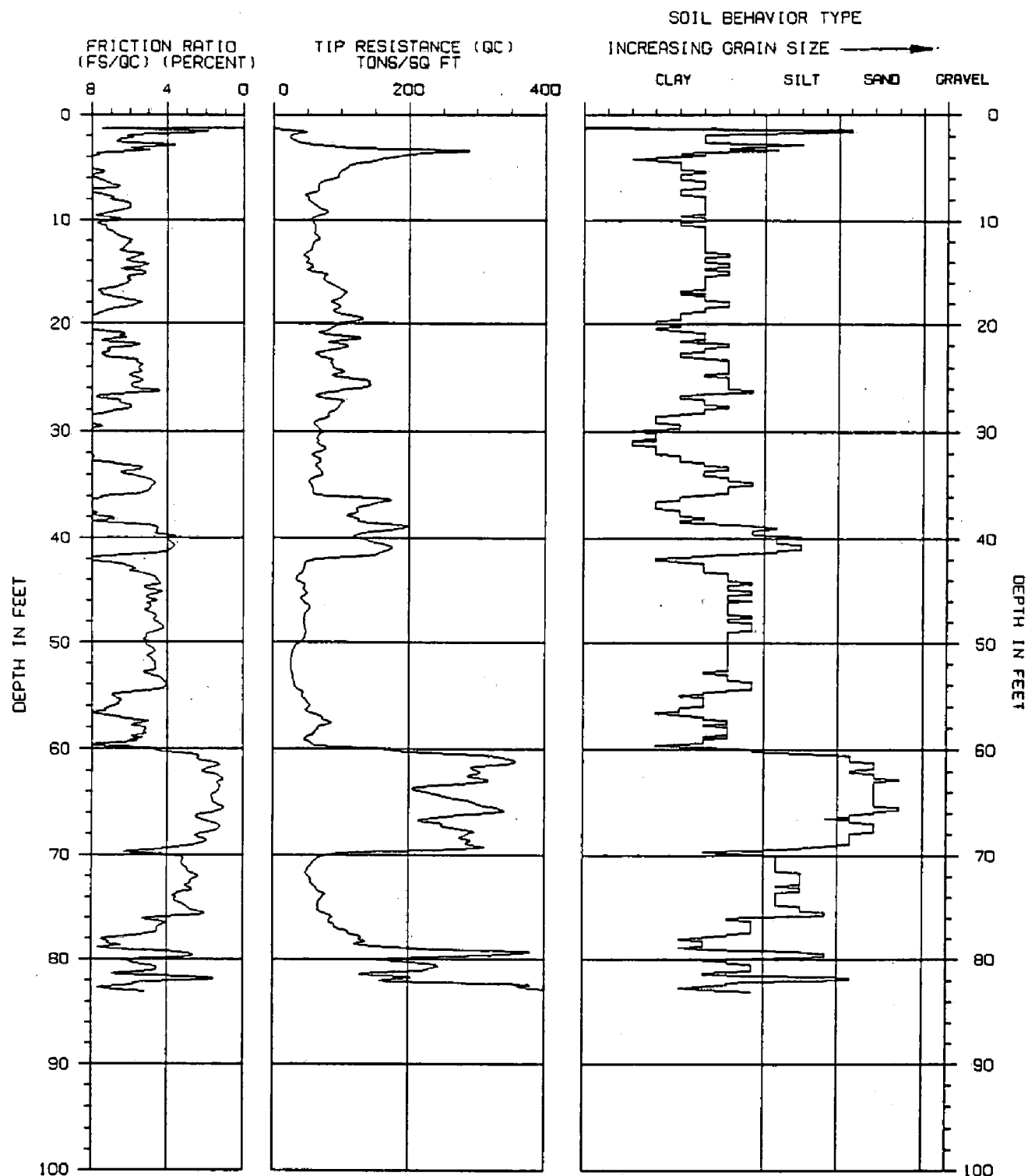
PROJECT NAME : D&M/UPRR-II

LOCATION : SACRAMENTO CA

PROJECT NUMBER : 92-381-01110

DATE : 06-01-1992

THE EARTH TECHNOLOGY CORPORATION



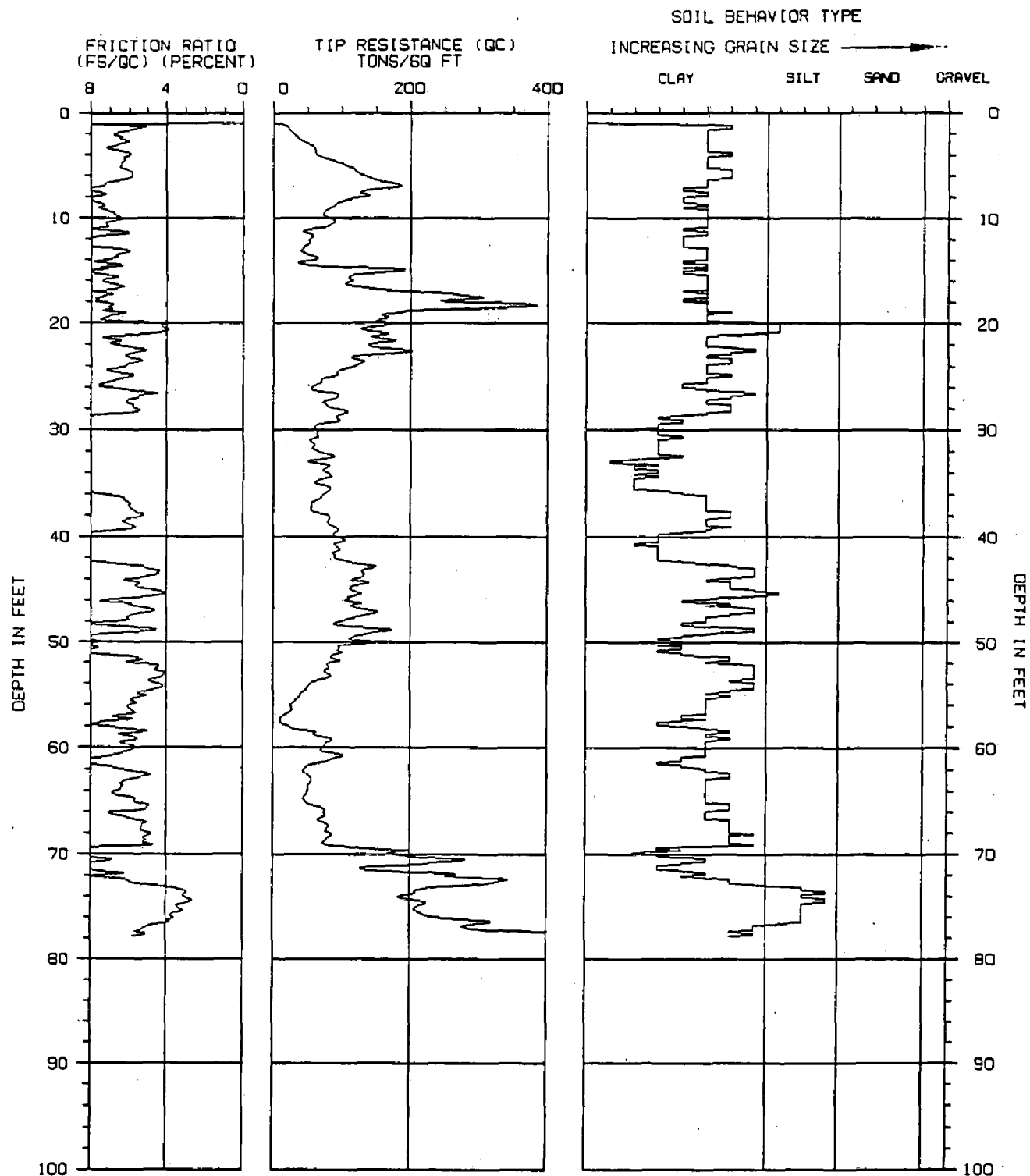
CONE PENETRATION TEST

SOUNDING NUMBER: CPT-87

PROJECT NAME : D&M/UPRR-11
PROJECT NUMBER : 92-381-01110

LOCATION : SACRAMENTO CA
DATE : 06-01-1992

 THE EARTH TECHNOLOGY CORPORATION



TOP 1.0 FT IS DISTURBED SOIL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

CONE PENETRATION TEST

SOUNDING NUMBER: CPT-88

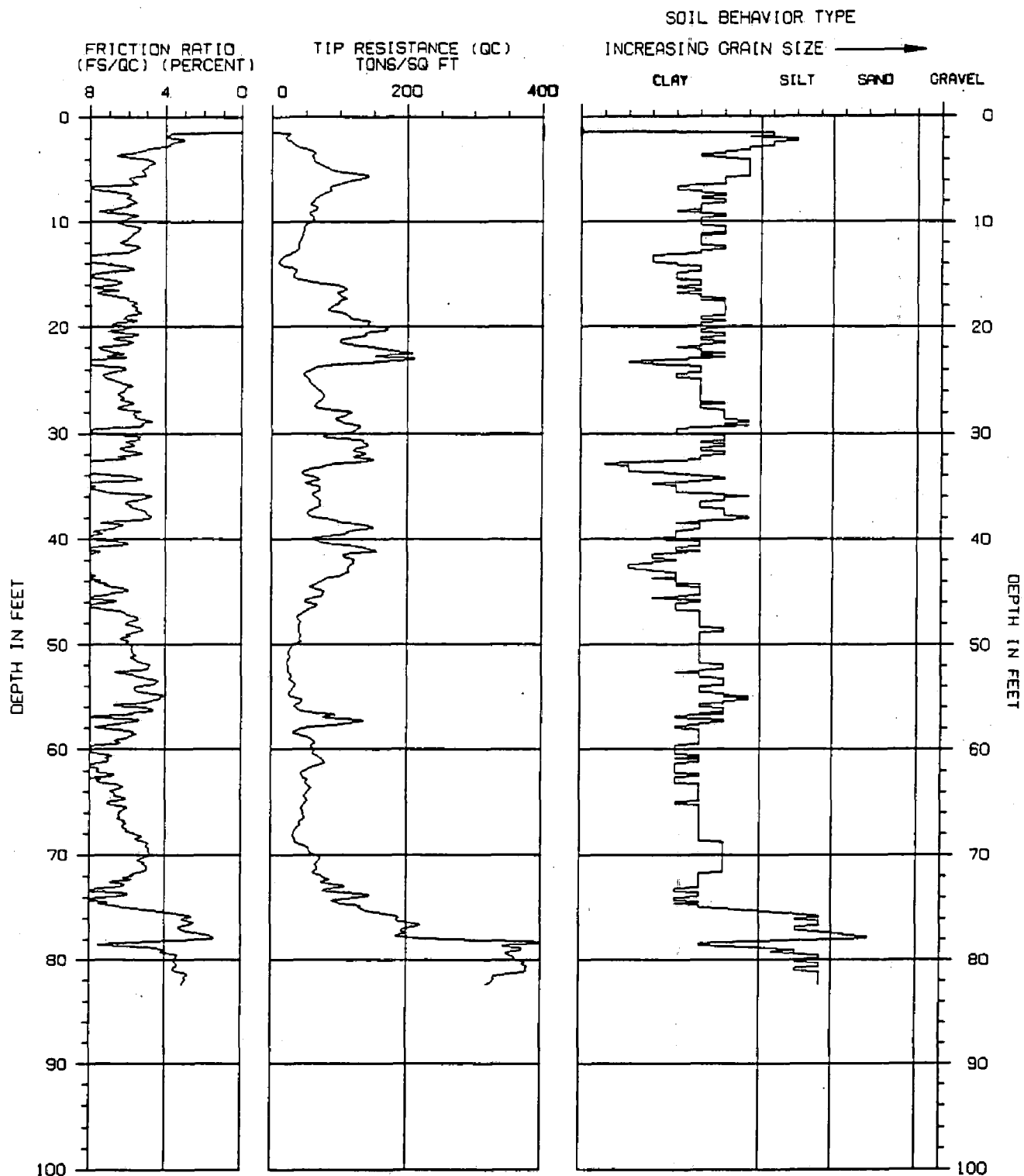
PROJECT NAME : D&M/UPRR-II

LOCATION : SACRAMENTO CA

PROJECT NUMBER : 92-381-01110

DATE : 06-02-1992

THE EARTH TECHNOLOGY CORPORATION



TOP 1.4 FT IS DISTURBED SOIL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

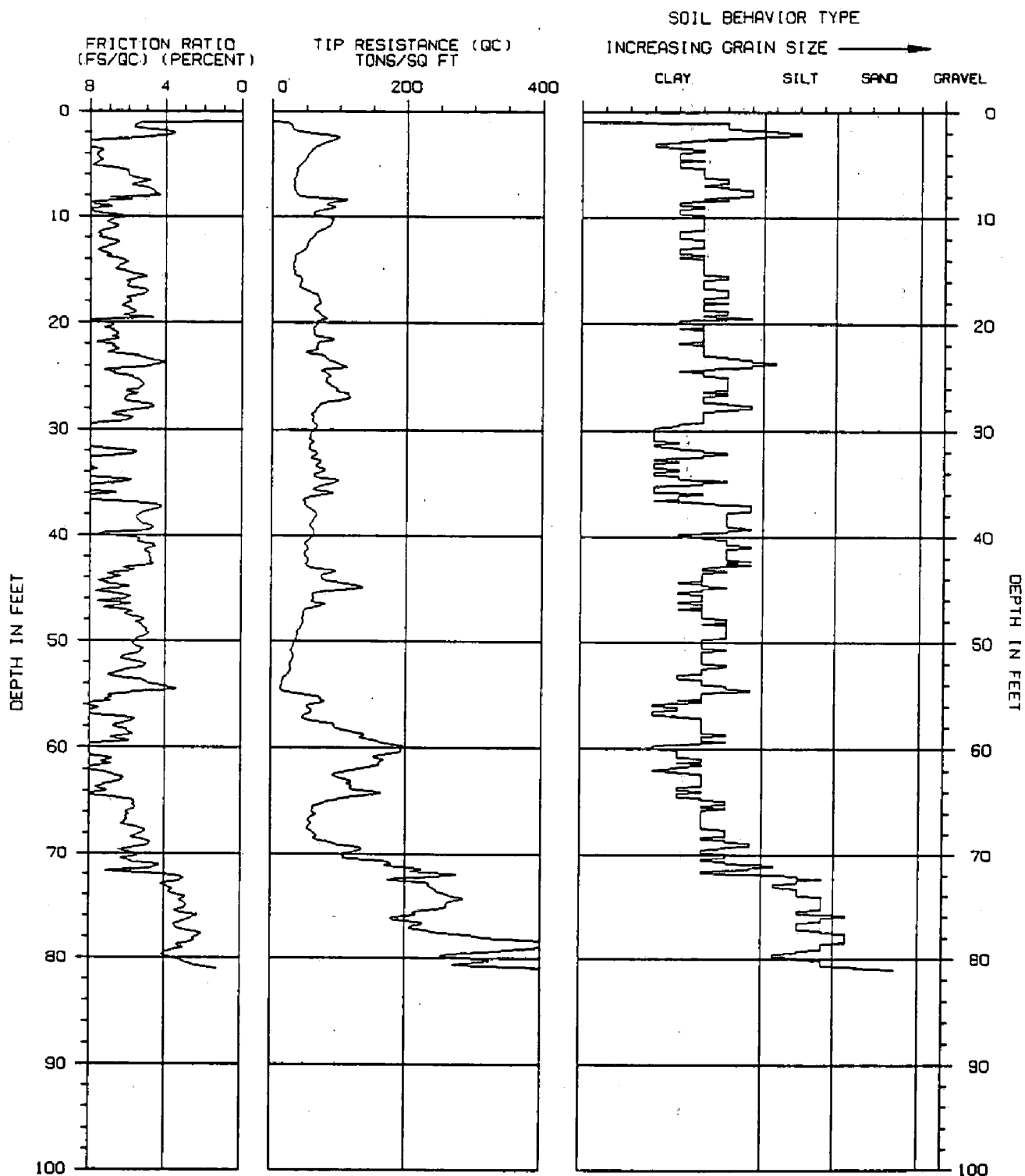
CONE PENETRATION TEST

SOUNDING NUMBER: CPT-89

PROJECT NAME : D&M/UPRR-II
PROJECT NUMBER : 92-381-01110

LOCATION : SACRAMENTO CA
DATE : 06-02-1992

 THE EARTH TECHNOLOGY CORPORATION



TOP 1.0 FT IS DISTURBED SOIL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 36.0 FT

CONE PENETRATION TEST

SOUNDING NUMBER: CPT-90

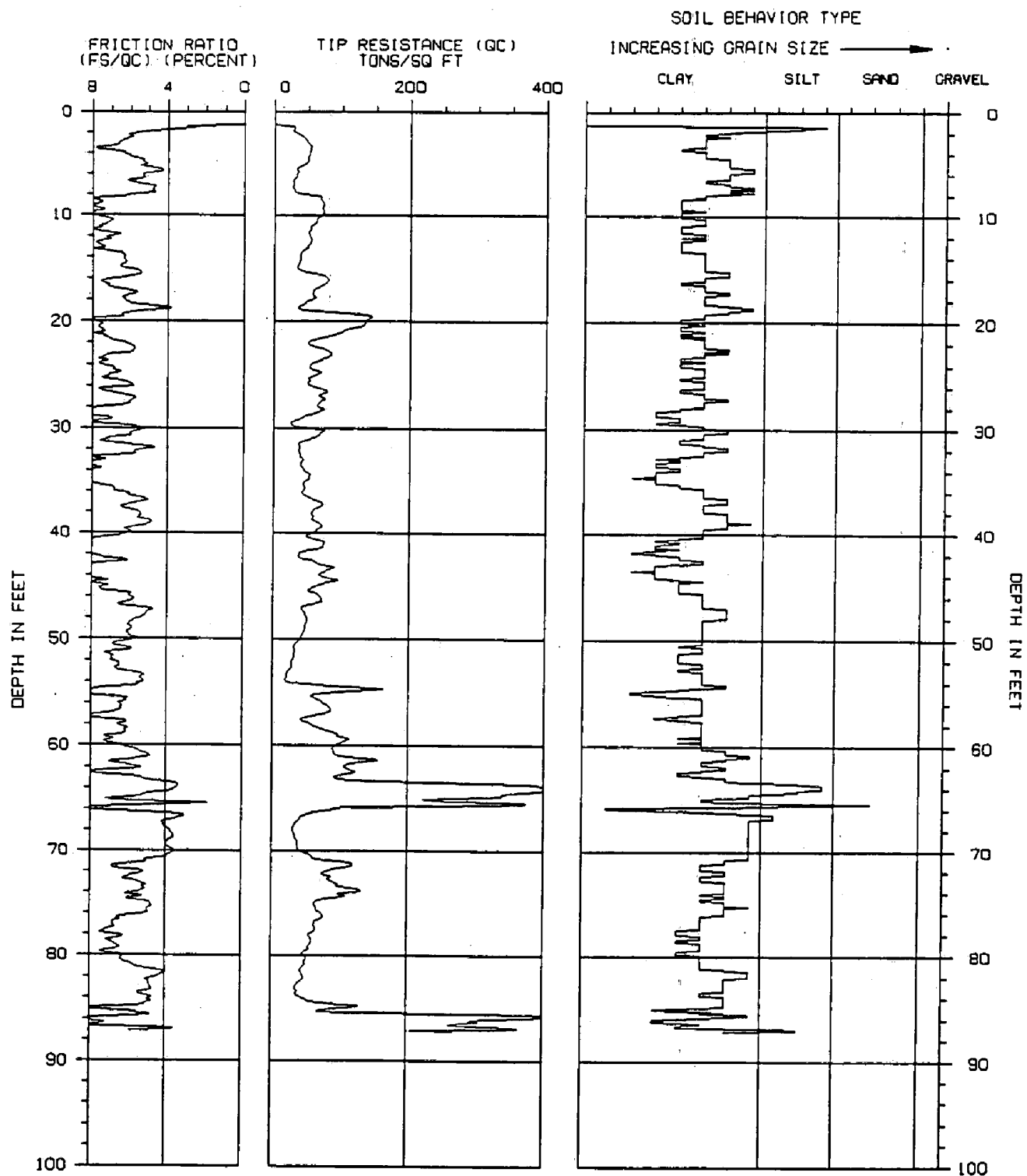
PROJECT NAME : D&M/UPRR-II

LOCATION : SACRAMENTO CA

PROJECT NUMBER : 92-381-01110

DATE : 06-03-1992

 THE EARTH TECHNOLOGY CORPORATION



TOP 1.2 FT IS DISTURBED SOIL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 36.0 FT

CONE PENETRATION TEST

SOUNDING NUMBER: CPT-91

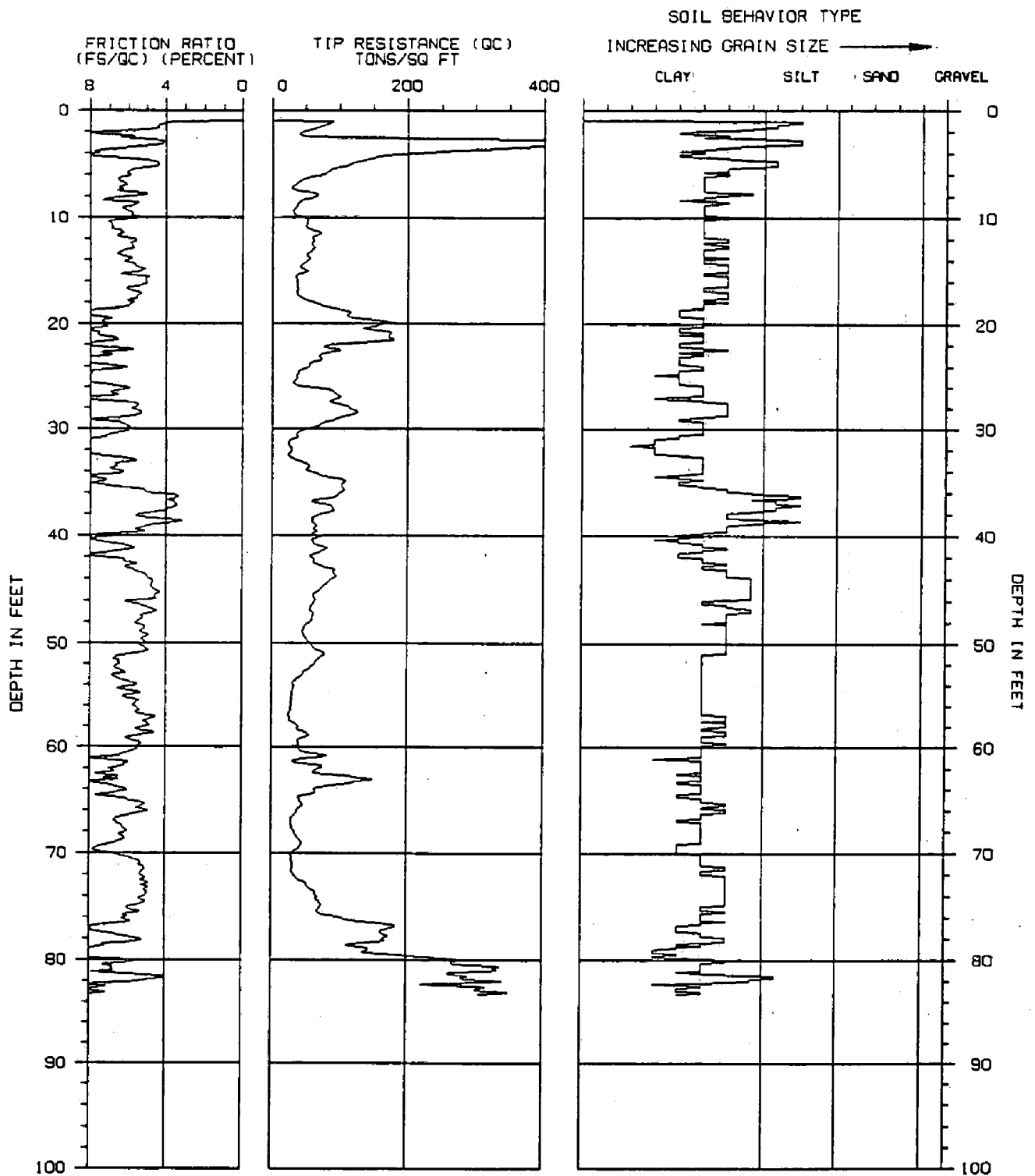
PROJECT NAME : D&M/UPRR-II

LOCATION : SACRAMENTO CA

PROJECT NUMBER : 92-381-01110

DATE : 06-03-1992

 THE EARTH TECHNOLOGY CORPORATION



ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

CONE PENETRATION TEST

SOUNDING NUMBER: CPT-92

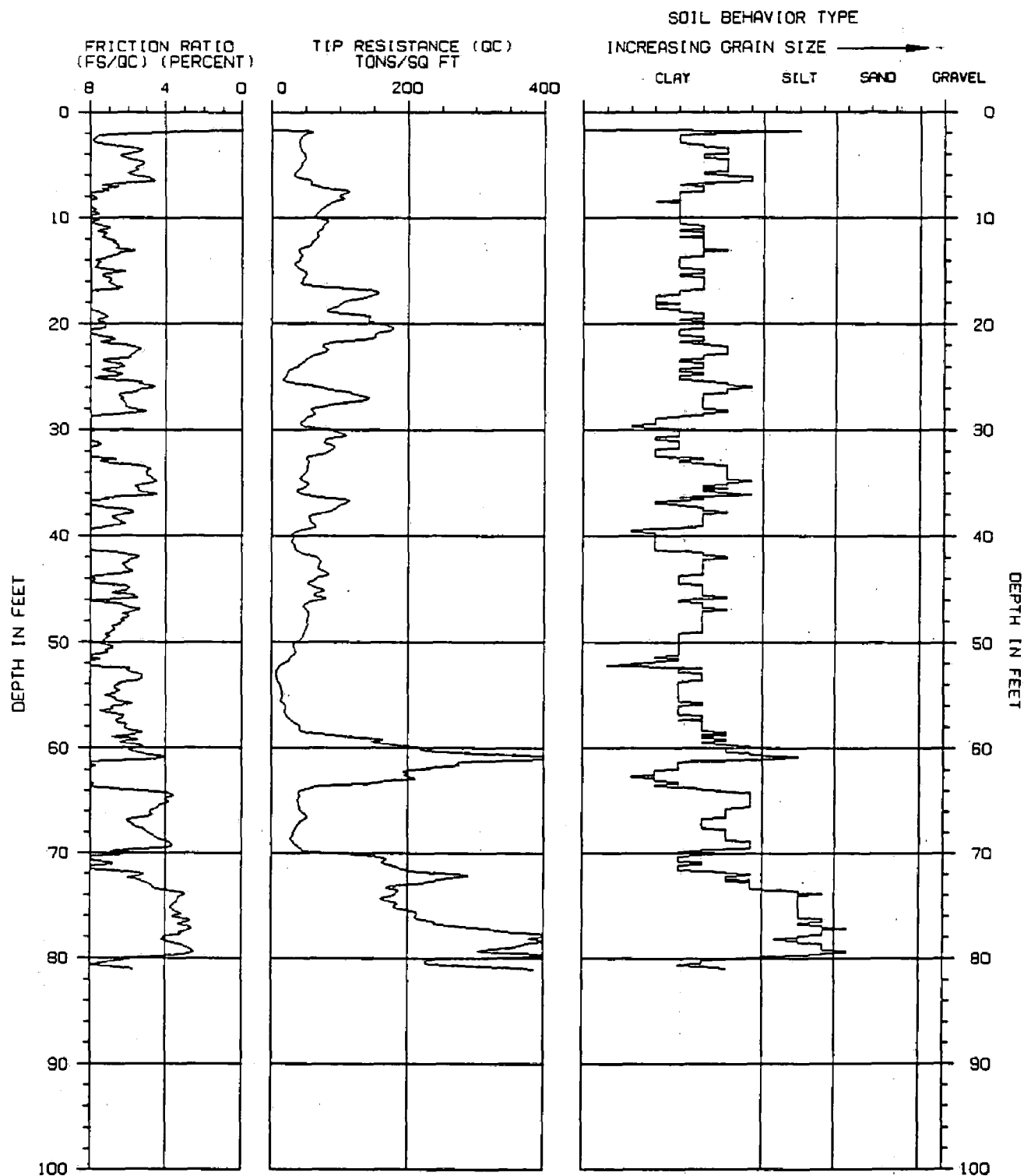
PROJECT NAME : D&M/UPRR-11

LOCATION : SACRAMENTO CA

PROJECT NUMBER : 92-381-01110

DATE : 06-04-1992

 THE EARTH TECHNOLOGY CORPORATION



TOP 1.7 FT IS DISTURBED SOIL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

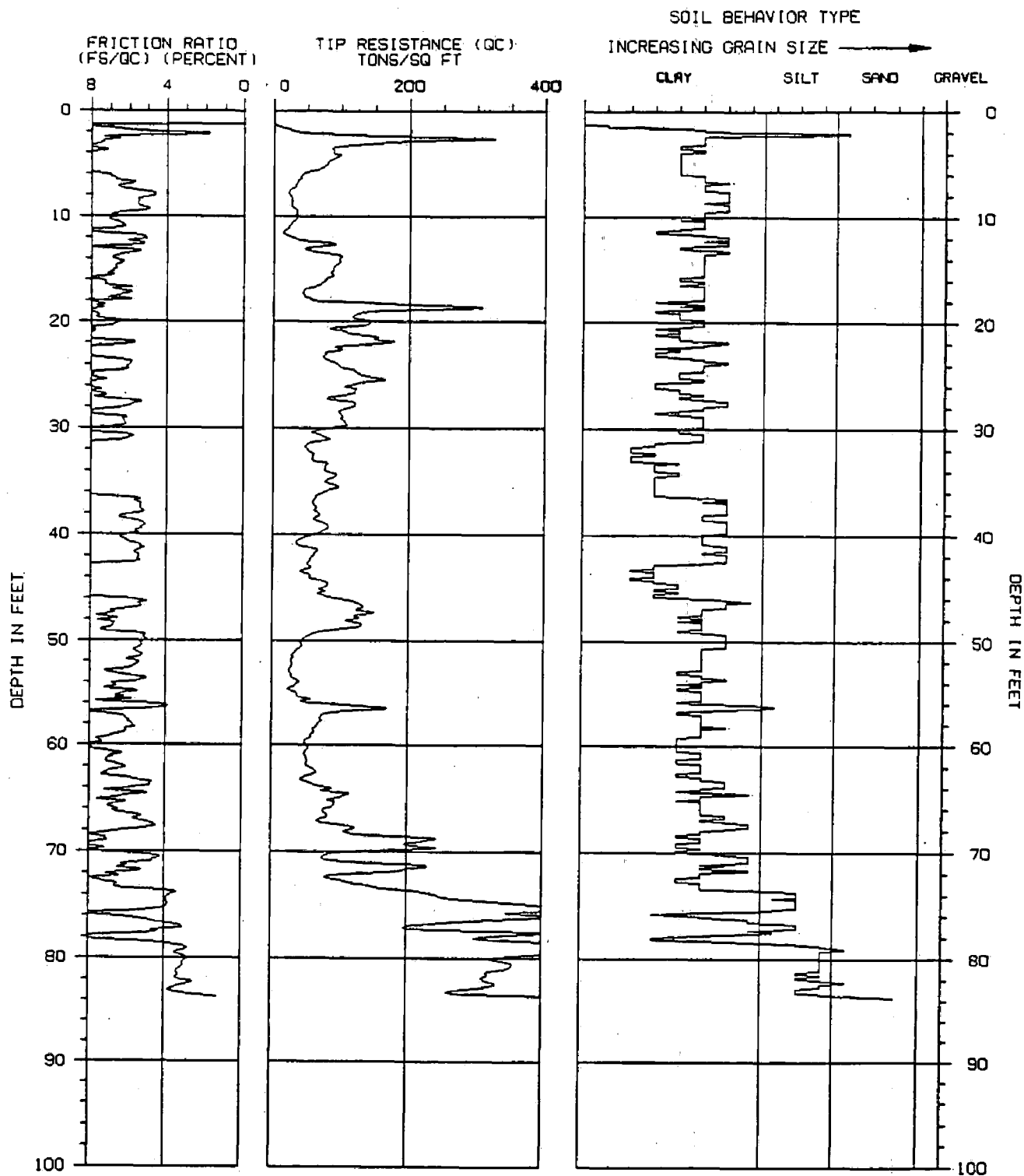
CONE PENETRATION TEST

SOUNDING NUMBER: CPT-93

PROJECT NAME : O&M/UPRR-II
PROJECT NUMBER : 92-381-01110

LOCATION : SACRAMENTO CA
DATE : 06-04-1992

 THE EARTH TECHNOLOGY CORPORATION



TOP 1.2 FT IS DISTURBED SOIL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

CONE PENETRATION TEST

SOUNDING NUMBER: CPT-94

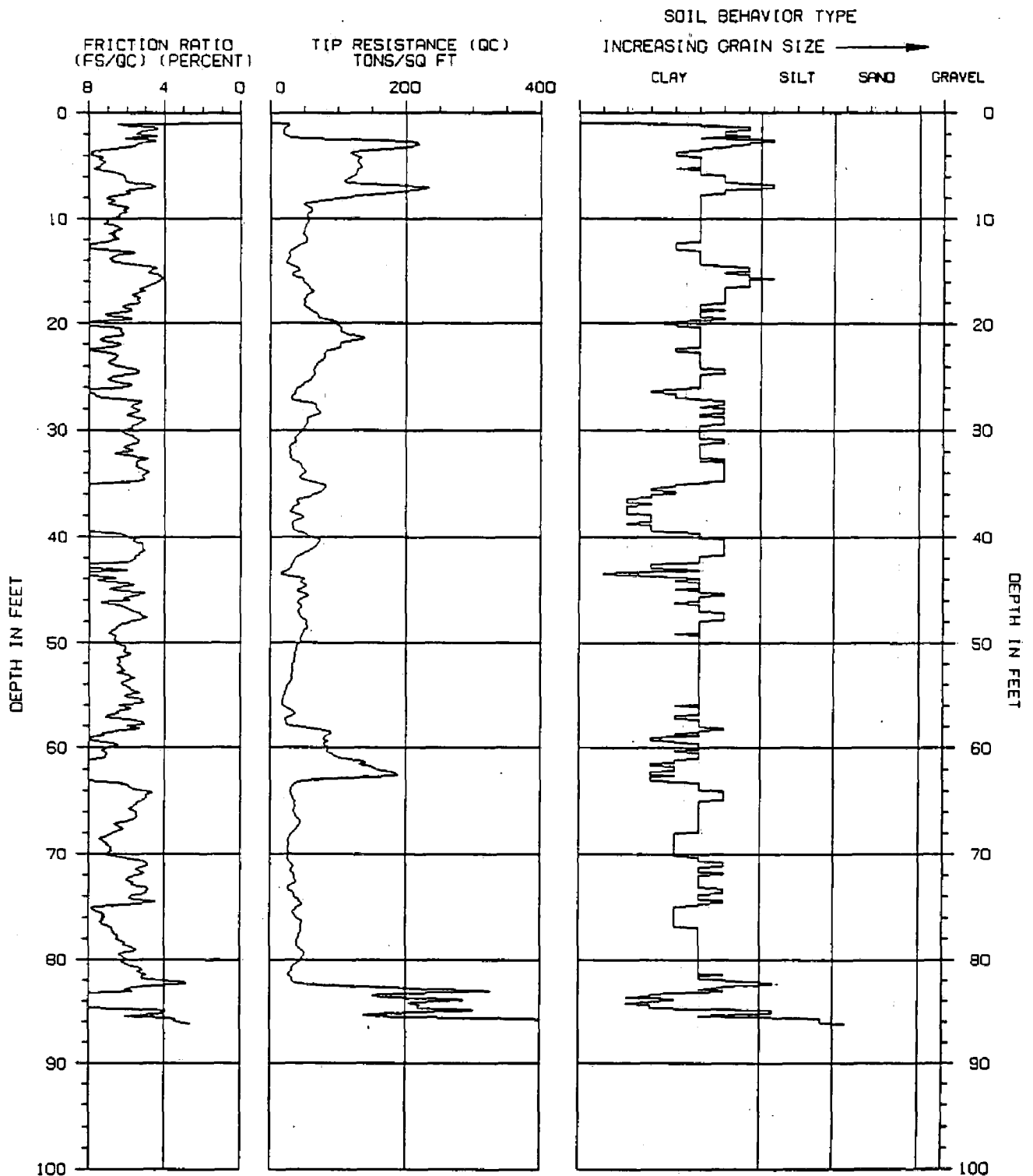
PROJECT NAME : D&M/UPRR-11

LOCATION : SACRAMENTO CA

PROJECT NUMBER : 92-381-01110

DATE : 06-04-1992

 THE EARTH TECHNOLOGY CORPORATION



TOP 1.0 FT IS DISTURBED SOIL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

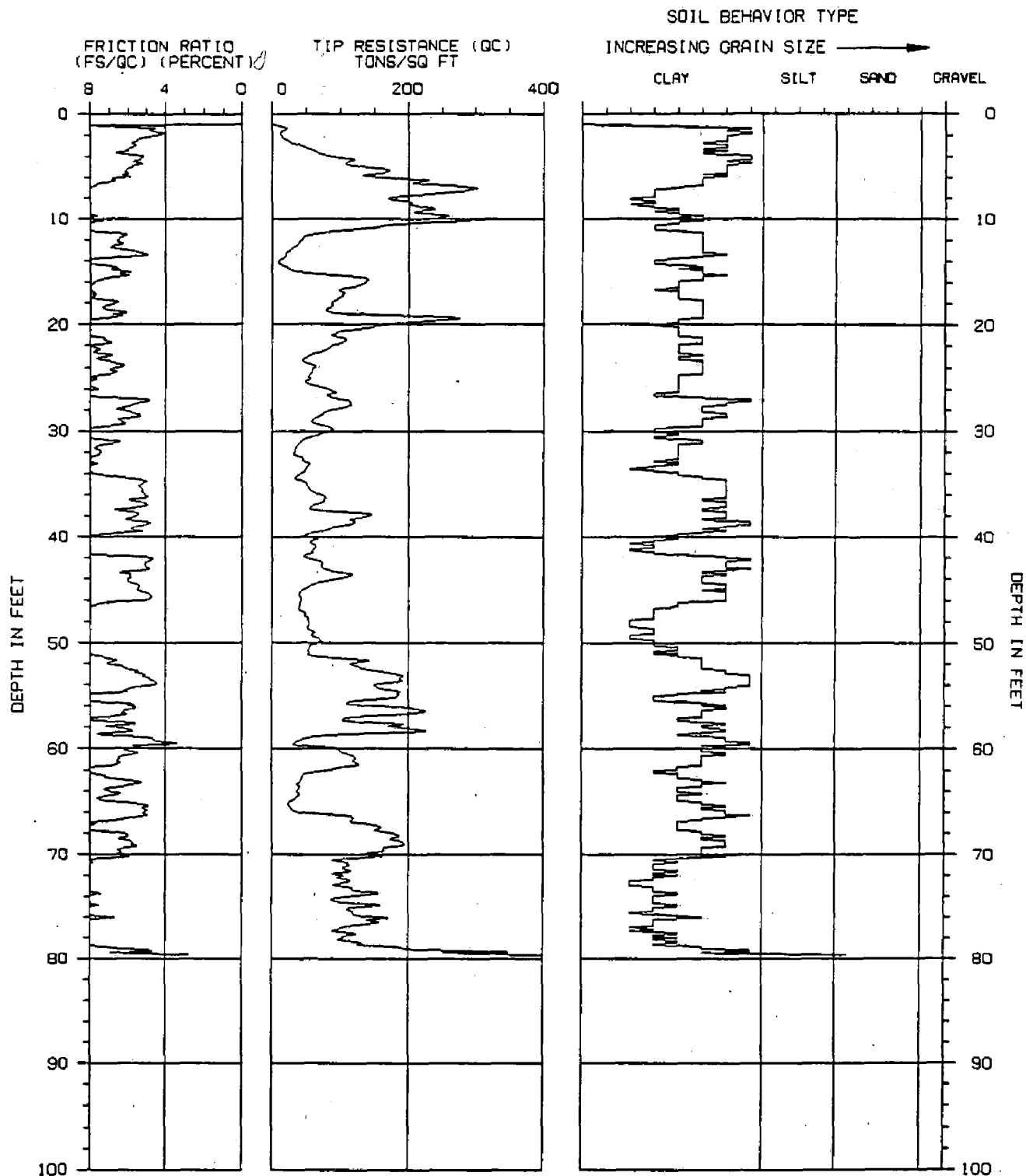
CONE PENETRATION TEST

SOUNDING NUMBER: CPT-95

PROJECT NAME : D&M/UPRR-11
PROJECT NUMBER : 92-381-01110

LOCATION : SACRAMENTO CA
DATE : 06-05-1992

 THE EARTH TECHNOLOGY
CORPORATION



TOP 1.0 FT IS DISTURBED SOIL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

CONE PENETRATION TEST

SOUNDING NUMBER: CPT-96

PROJECT NAME : O&M/UPRR-II

LOCATION : SACRAMENTO CA

PROJECT NUMBER : 92-381-01110

DATE : 06-05-1992



THE EARTH TECHNOLOGY
CORPORATION

```
*****  
*                                     *  
*               CONE PENETRATION TEST                *  
*                                     *  
* SOUNDING   : CPT-77                      PROJECT NO : 92-381-01110 *  
* PROJECT    : D&M/UPRR-II                 INSTRUMENT  : F15CKE095  *  
* LOCATION   : SACRAMENTO CA              SYSTEM      : T-1       *  
* DATE       : 05-26-1992                OPERATOR     : MR/DH      *  
*                                     *  
*****
```

DEPTH	TIP RESISTANCE	NORMALIZED	FRICTION	CONE PORE	SOIL BEHAVIOR TYPE
(ft)	(tsf)	TIP RESISTANCE (tsf)	RATIO (%)	PRESSURE (tsf)	
.0	.0	.0	.00	NA	
.5	199.0	509.6	2.26	NA	*SAND to SILTY SAND
1.0	124.1	280.3	5.19	NA	*HEAVILY O.C./CEMENT. MAT.
1.5	67.4	140.4	4.96	NA	*SANDY CLAY to SILTY CLAY
2.0	47.7	93.4	4.09	NA	*CLAYEY SAND to SANDY CLAY
2.5	63.7	118.6	4.30	NA	*CLAYEY SAND to SANDY CLAY
3.0	57.3	102.1	5.43	NA	*SANDY CLAY to SILTY CLAY
3.5	521.9	895.3	4.70	NA	*HEAVILY O.C./CEMENT. MAT.
4.0	357.7	593.0	6.24	NA	*HEAVILY O.C./CEMENT. MAT.
4.5	217.5	349.4	8.17	NA	*HEAVILY O.C./CEMENT. MAT.
5.0	153.9	240.1	8.85	NA	*HEAVILY O.C./CEMENT. MAT.
5.5	160.9	244.5	8.10	NA	*HEAVILY O.C./CEMENT. MAT.
6.0	152.7	226.3	9.06	NA	*HEAVILY O.C./CEMENT. MAT.
6.5	154.2	223.1	8.44	NA	*HEAVILY O.C./CEMENT. MAT.
7.0	151.1	213.7	8.03	NA	*HEAVILY O.C./CEMENT. MAT.
7.5	144.2	199.6	7.67	NA	*HEAVILY O.C./CEMENT. MAT.
8.0	133.9	181.7	7.71	NA	*HEAVILY O.C./CEMENT. MAT.
8.5	252.9	336.5	6.59	NA	*HEAVILY O.C./CEMENT. MAT.
9.0	165.6	216.2	6.42	NA	*HEAVILY O.C./CEMENT. MAT.
9.5	120.8	154.8	6.69	NA	*SANDY CLAY to SILTY CLAY
10.0	128.3	161.7	5.97	NA	*SANDY CLAY to SILTY CLAY
10.5	109.3	135.4	5.65	NA	*SANDY CLAY to SILTY CLAY
11.0	94.3	114.8	5.49	NA	*SANDY CLAY to SILTY CLAY
11.5	93.3	111.8	5.27	NA	*SANDY CLAY to SILTY CLAY
12.0	87.0	102.7	4.41	NA	*CLAYEY SAND to SANDY CLAY
12.5	84.7	98.5	4.43	NA	*CLAYEY SAND to SANDY CLAY
13.0	95.0	108.8	4.55	NA	*SANDY CLAY to SILTY CLAY
13.5	69.6	78.6	6.67	NA	*SANDY CLAY to SILTY CLAY
14.0	59.5	66.2	7.32	NA	*SANDY CLAY to SILTY CLAY
14.5	75.3	82.7	8.02	NA	*SANDY CLAY to SILTY CLAY
15.0	80.4	87.1	6.73	NA	*SANDY CLAY to SILTY CLAY
15.5	59.6	63.8	5.23	NA	*SANDY CLAY to SILTY CLAY
16.0	61.0	64.3	5.13	NA	*SANDY CLAY to SILTY CLAY
16.5	50.0	52.1	5.50	NA	*SANDY CLAY to SILTY CLAY
17.0	38.3	39.4	5.56	NA	*SANDY CLAY to SILTY CLAY
17.5	49.7	50.6	4.32	NA	*SANDY CLAY to SILTY CLAY
18.0	101.7	102.2	4.40	NA	*CLAYEY SAND to SANDY CLAY
18.5	152.9	151.8	5.67	NA	*SANDY CLAY to SILTY CLAY
19.0	158.5	155.5	7.32	NA	*SANDY CLAY to SILTY CLAY
19.5	235.8	228.7	7.26	NA	*HEAVILY O.C./CEMENT. MAT.
20.0	167.1	160.2	9.56	NA	*HEAVILY O.C./CEMENT. MAT.

The Earth Technology Corporation

SOUNDING : CPT-77

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
20.5	240.4	227.8	7.73	NA	*HEAVILY O.C./CEMENT. MAT.
21.0	290.5	272.4	9.64	NA	*HEAVILY O.C./CEMENT. MAT.
21.5	234.0	216.9	9.49	NA	*HEAVILY O.C./CEMENT. MAT.
22.0	175.0	160.5	7.72	NA	*HEAVILY O.C./CEMENT. MAT.
22.5	130.5	118.4	6.53	NA	*SANDY CLAY to SILTY CLAY
23.0	65.0	58.4	4.62	NA	*SANDY CLAY to SILTY CLAY
23.5	59.2	52.6	6.01	NA	*SANDY CLAY to SILTY CLAY
24.0	96.0	84.4	5.18	NA	*SANDY CLAY to SILTY CLAY
24.5	85.1	74.1	6.02	NA	*SANDY CLAY to SILTY CLAY
25.0	116.0	100.0	5.48	NA	*SANDY CLAY to SILTY CLAY
25.5	161.4	137.7	7.92	NA	*SANDY CLAY to SILTY CLAY
26.0	194.6	164.4	7.21	NA	*SANDY CLAY to SILTY CLAY
26.5	160.3	134.1	3.19	NA	*CLAYEY SAND to SANDY CLAY
27.0	92.1	76.3	3.59	NA	*CLAYEY SAND to SANDY CLAY
27.5	118.0	96.8	3.96	NA	*CLAYEY SAND to SANDY CLAY
28.0	106.2	86.3	6.14	NA	*SANDY CLAY to SILTY CLAY
28.5	106.1	85.4	5.45	NA	*SANDY CLAY to SILTY CLAY
29.0	125.9	100.3	5.15	NA	*SANDY CLAY to SILTY CLAY
29.5	111.4	87.9	5.98	NA	*SANDY CLAY to SILTY CLAY
30.0	98.3	76.9	6.16	NA	*SANDY CLAY to SILTY CLAY
30.5	93.2	72.3	7.91	NA	*SANDY CLAY to SILTY CLAY
31.0	75.6	58.1	8.68	NA	*SANDY CLAY to SILTY CLAY
31.5	70.7	53.8	6.86	NA	*SANDY CLAY to SILTY CLAY
32.0	54.2	40.9	8.26	NA	*SANDY CLAY to SILTY CLAY
32.5	45.4	33.9	8.10	NA	*SANDY CLAY to SILTY CLAY
33.0	51.0	37.8	6.28	NA	*SANDY CLAY to SILTY CLAY
33.5	54.3	39.9	5.75	NA	*SANDY CLAY to SILTY CLAY
34.0	39.4	28.7	7.38	NA	*SANDY CLAY to SILTY CLAY
34.5	35.7	25.7	6.10	NA	*SANDY CLAY to SILTY CLAY
35.0	46.6	33.4	4.44	NA	CLAYEY SILT to SILTY CLAY
35.5	79.9	56.9	4.73	NA	*SANDY CLAY to SILTY CLAY
36.0	66.7	47.3	4.50	NA	*SANDY CLAY to SILTY CLAY
36.5	47.1	33.4	6.31	NA	*SANDY CLAY to SILTY CLAY
37.0	42.8	30.2	4.74	NA	CLAYEY SILT to SILTY CLAY
37.5	45.0	31.6	4.13	NA	CLAYEY SILT to SILTY CLAY
38.0	78.2	54.7	5.31	NA	*SANDY CLAY to SILTY CLAY
38.5	67.3	46.9	5.10	NA	*SANDY CLAY to SILTY CLAY
39.0	72.2	50.1	4.12	NA	*SANDY CLAY to SILTY CLAY
39.5	67.2	46.5	4.70	NA	*SANDY CLAY to SILTY CLAY
40.0	59.3	40.9	4.75	NA	*SANDY CLAY to SILTY CLAY
40.5	48.2	33.1	6.64	NA	*SANDY CLAY to SILTY CLAY
41.0	61.0	41.8	7.79	NA	*SANDY CLAY to SILTY CLAY
41.5	87.7	59.8	5.97	NA	*SANDY CLAY to SILTY CLAY
42.0	82.6	56.1	5.98	NA	*SANDY CLAY to SILTY CLAY
42.5	78.5	53.2	5.19	NA	*SANDY CLAY to SILTY CLAY
43.0	106.9	72.1	4.82	NA	*SANDY CLAY to SILTY CLAY
43.5	104.3	70.1	5.40	NA	*SANDY CLAY to SILTY CLAY
44.0	91.1	61.0	6.13	NA	*SANDY CLAY to SILTY CLAY
44.5	57.1	38.1	8.15	NA	*SANDY CLAY to SILTY CLAY
45.0	80.4	53.5	4.97	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-77

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
45.5	56.0	37.1	8.03	NA	*SANDY CLAY to SILTY CLAY
46.0	102.1	67.4	6.86	NA	*SANDY CLAY to SILTY CLAY
46.5	74.7	49.1	8.44	NA	*SANDY CLAY to SILTY CLAY
47.0	76.5	50.2	8.02	NA	*SANDY CLAY to SILTY CLAY
47.5	62.4	40.8	7.84	NA	*SANDY CLAY to SILTY CLAY
48.0	63.5	41.3	7.33	NA	*SANDY CLAY to SILTY CLAY
48.5	67.5	43.8	8.06	NA	*SANDY CLAY to SILTY CLAY
49.0	55.8	36.1	6.67	NA	*SANDY CLAY to SILTY CLAY
49.5	53.6	34.5	6.19	NA	*SANDY CLAY to SILTY CLAY
50.0	43.5	27.9	6.37	NA	*SANDY CLAY to SILTY CLAY
50.5	35.3	22.6	5.77	NA	SILTY CLAY to CLAY
51.0	34.8	22.2	5.82	NA	SILTY CLAY to CLAY
51.5	29.1	18.5	6.45	NA	SILTY CLAY to CLAY
52.0	34.1	21.6	6.52	NA	*SANDY CLAY to SILTY CLAY
52.5	32.4	20.4	6.89	NA	*SANDY CLAY to SILTY CLAY
53.0	29.1	18.3	6.55	NA	SILTY CLAY to CLAY
53.5	27.4	17.1	6.46	NA	SILTY CLAY to CLAY
54.0	24.2	15.1	4.54	NA	CLAYEY SILT to SILTY CLAY
54.5	27.9	17.3	5.97	NA	SILTY CLAY to CLAY
55.0	40.7	25.2	5.56	NA	SILTY CLAY to CLAY
55.5	53.8	33.2	4.45	NA	CLAYEY SILT to SILTY CLAY
56.0	48.2	29.6	5.30	NA	*SANDY CLAY to SILTY CLAY
56.5	56.9	34.9	5.04	NA	*SANDY CLAY to SILTY CLAY
57.0	100.2	61.2	5.12	NA	*SANDY CLAY to SILTY CLAY
57.5	79.9	48.6	4.53	NA	*SANDY CLAY to SILTY CLAY
58.0	113.8	69.1	5.90	NA	*SANDY CLAY to SILTY CLAY
58.5	77.4	46.8	4.02	NA	CLAYEY SILT to SILTY CLAY
59.0	66.9	40.3	4.01	NA	CLAYEY SILT to SILTY CLAY
59.5	300.5	180.5	2.74	NA	*SILTY SAND to CLAYEY SAND
60.0	485.6	290.7	2.47	NA	*SILTY SAND to CLAYEY SAND
60.5	537.0	320.3	3.16	NA	*SILTY SAND to CLAYEY SAND
61.0	521.0	309.7	3.45	NA	*SILTY SAND to CLAYEY SAND
61.5	510.5	302.4	2.68	NA	*SILTY SAND to CLAYEY SAND
62.0	521.0	307.7	3.35	NA	*SILTY SAND to CLAYEY SAND
62.5	365.6	215.1	4.18	NA	*CLAYEY SAND to SANDY CLAY
63.0	166.7	97.8	5.59	NA	*SANDY CLAY to SILTY CLAY
63.5	112.5	65.7	4.87	NA	*SANDY CLAY to SILTY CLAY
64.0	166.4	96.9	4.17	NA	*CLAYEY SAND to SANDY CLAY
64.5	264.7	153.7	6.41	NA	*SANDY CLAY to SILTY CLAY
65.0	165.4	95.7	5.30	NA	*SANDY CLAY to SILTY CLAY
65.5	127.8	73.7	3.98	NA	*CLAYEY SAND to SANDY CLAY
66.0	214.0	123.0	5.13	NA	*SANDY CLAY to SILTY CLAY
66.5	168.9	96.7	8.52	NA	*SANDY CLAY to SILTY CLAY
67.0	58.8	33.6	5.17	NA	*SANDY CLAY to SILTY CLAY
67.5	113.3	64.5	4.77	NA	*SANDY CLAY to SILTY CLAY
68.0	101.8	57.7	5.75	NA	*SANDY CLAY to SILTY CLAY
68.5	50.9	28.8	5.54	NA	*SANDY CLAY to SILTY CLAY
69.0	40.7	22.9	4.38	NA	CLAYEY SILT to SILTY CLAY
69.5	46.7	26.2	4.61	NA	CLAYEY SILT to SILTY CLAY
70.0	49.1	27.5	4.85	NA	CLAYEY SILT to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-77

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
70.5	49.6	27.7	4.46	NA	CLAYEY SILT to SILTY CLAY
71.0	67.3	37.4	4.26	NA	CLAYEY SILT to SILTY CLAY
71.5	100.5	55.7	4.49	NA	*SANDY CLAY to SILTY CLAY
72.0	91.8	50.7	5.10	NA	*SANDY CLAY to SILTY CLAY
72.5	86.5	47.6	5.39	NA	*SANDY CLAY to SILTY CLAY
73.0	98.4	53.9	4.68	NA	*SANDY CLAY to SILTY CLAY
73.5	137.2	75.0	6.07	NA	*SANDY CLAY to SILTY CLAY
74.0	123.1	67.1	5.15	NA	*SANDY CLAY to SILTY CLAY
74.5	132.7	72.0	5.37	NA	*SANDY CLAY to SILTY CLAY
75.0	131.7	71.3	5.00	NA	*SANDY CLAY to SILTY CLAY
75.5	125.9	67.9	4.64	NA	*SANDY CLAY to SILTY CLAY
76.0	116.5	62.6	4.55	NA	*SANDY CLAY to SILTY CLAY
76.5	112.8	60.4	5.34	NA	*SANDY CLAY to SILTY CLAY
77.0	142.3	76.0	6.31	NA	*SANDY CLAY to SILTY CLAY
77.5	191.9	102.1	7.39	NA	*SANDY CLAY to SILTY CLAY
78.0	305.1	161.8	3.62	NA	*CLAYEY SAND to SANDY CLAY
78.5	298.8	158.0	3.33	NA	*CLAYEY SAND to SANDY CLAY
79.0	301.9	159.1	2.28	NA	SILTY SAND to SANDY SILT
79.5	406.1	213.3	2.73	NA	*SILTY SAND to CLAYEY SAND
80.0	596.8	312.4	2.16	NA	*SAND to SILTY SAND

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

```
*****  
*                                     *  
*          CONE PENETRATION TEST          *  
*                                     *  
* SOUNDING : CPT-78                     PROJECT NO : 92-381-01110 *  
* PROJECT   : D&M/UPRR-II                INSTRUMENT  : F15CKE095 *  
* LOCATION  : SACRAMENTO CA              SYSTEM      : T-1       *  
* DATE      : 05-27-1992                 OPERATOR    : MR/DH      *  
*                                     *  
*****
```

DEPTH	TIP RESISTANCE	NORMALIZED	FRICTION	CONE PORE	SOIL BEHAVIOR TYPE
(ft)	(tsf)	TIP RESISTANCE	RATIO	PRESSURE	
		(tsf)	(%)	(tsf)	
.0	.0	.0	.00	NA	
.5	.0	.0	.00	NA	
1.0	.0	.0	.00	NA	
1.5	.0	.0	.00	NA	
2.0	114.7	224.7	4.70	NA	*CLAYEY SAND to SANDY CLAY
2.5	113.8	211.8	4.84	NA	*SANDY CLAY to SILTY CLAY
3.0	123.7	220.5	5.11	NA	*SANDY CLAY to SILTY CLAY
3.5	116.3	199.5	6.87	NA	*HEAVILY O.C./CEMENT. MAT.
4.0	96.9	160.5	7.84	NA	*HEAVILY O.C./CEMENT. MAT.
4.5	85.0	136.5	8.44	NA	*SANDY CLAY to SILTY CLAY
5.0	81.6	127.3	7.47	NA	*SANDY CLAY to SILTY CLAY
5.5	84.5	128.4	7.02	NA	*SANDY CLAY to SILTY CLAY
6.0	85.4	126.5	6.67	NA	*SANDY CLAY to SILTY CLAY
6.5	116.2	168.2	4.52	NA	*CLAYEY SAND to SANDY CLAY
7.0	112.8	159.6	3.75	NA	*CLAYEY SAND to SANDY CLAY
7.5	163.3	226.1	6.62	NA	*HEAVILY O.C./CEMENT. MAT.
8.0	165.8	225.0	6.29	NA	*HEAVILY O.C./CEMENT. MAT.
8.5	167.2	222.4	6.59	NA	*HEAVILY O.C./CEMENT. MAT.
9.0	181.2	236.5	6.27	NA	*HEAVILY O.C./CEMENT. MAT.
9.5	202.6	259.7	6.34	NA	*HEAVILY O.C./CEMENT. MAT.
10.0	191.4	241.1	5.86	NA	*HEAVILY O.C./CEMENT. MAT.
10.5	233.4	289.1	5.49	NA	*HEAVILY O.C./CEMENT. MAT.
11.0	121.9	148.6	6.58	NA	*SANDY CLAY to SILTY CLAY
11.5	32.7	39.2	4.82	NA	*SANDY CLAY to SILTY CLAY
12.0	27.0	31.9	3.20	NA	SANDY SILT to CLAYEY SILT
12.5	44.0	51.1	4.15	NA	*SANDY CLAY to SILTY CLAY
13.0	60.4	69.2	5.18	NA	*SANDY CLAY to SILTY CLAY
13.5	69.0	77.9	5.56	NA	*SANDY CLAY to SILTY CLAY
14.0	91.6	102.0	6.04	NA	*SANDY CLAY to SILTY CLAY
14.5	98.3	107.9	5.73	NA	*SANDY CLAY to SILTY CLAY
15.0	117.1	126.9	5.79	NA	*SANDY CLAY to SILTY CLAY
15.5	125.0	133.7	6.82	NA	*SANDY CLAY to SILTY CLAY
16.0	113.6	119.9	6.76	NA	*SANDY CLAY to SILTY CLAY
16.5	94.6	98.6	6.82	NA	*SANDY CLAY to SILTY CLAY
17.0	90.2	92.8	6.30	NA	*SANDY CLAY to SILTY CLAY
17.5	125.6	127.6	6.57	NA	*SANDY CLAY to SILTY CLAY
18.0	162.4	163.1	6.78	NA	*SANDY CLAY to SILTY CLAY
18.5	53.4	53.0	6.18	NA	*SANDY CLAY to SILTY CLAY
19.0	38.3	37.5	5.89	NA	*SANDY CLAY to SILTY CLAY
19.5	51.8	50.2	6.04	NA	*SANDY CLAY to SILTY CLAY
20.0	58.7	56.3	7.55	NA	*SANDY CLAY to SILTY CLAY

The Earth Technology Corporation

SOUNDING : CPT-78

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
20.5	59.5	56.4	7.67	NA	*SANDY CLAY to SILTY CLAY
21.0	41.2	38.6	8.26	NA	*SANDY CLAY to SILTY CLAY
21.5	39.4	36.5	7.64	NA	*SANDY CLAY to SILTY CLAY
22.0	35.7	32.8	7.44	NA	*SANDY CLAY to SILTY CLAY
22.5	42.9	38.9	6.69	NA	*SANDY CLAY to SILTY CLAY
23.0	46.2	41.5	8.30	NA	*SANDY CLAY to SILTY CLAY
23.5	39.2	34.9	7.84	NA	*SANDY CLAY to SILTY CLAY
24.0	40.5	35.6	7.55	NA	*SANDY CLAY to SILTY CLAY
24.5	37.5	32.6	7.95	NA	*SANDY CLAY to SILTY CLAY
25.0	54.2	46.7	5.92	NA	*SANDY CLAY to SILTY CLAY
25.5	73.9	63.0	4.99	NA	*SANDY CLAY to SILTY CLAY
26.0	83.0	70.1	5.05	NA	*SANDY CLAY to SILTY CLAY
26.5	80.2	67.1	4.42	NA	*SANDY CLAY to SILTY CLAY
27.0	105.1	87.1	4.24	NA	*CLAYEY SAND to SANDY CLAY
27.5	103.3	84.7	4.37	NA	*SANDY CLAY to SILTY CLAY
28.0	127.9	103.9	6.04	NA	*SANDY CLAY to SILTY CLAY
28.5	113.5	91.4	5.37	NA	*SANDY CLAY to SILTY CLAY
29.0	133.2	106.2	4.95	NA	*SANDY CLAY to SILTY CLAY
29.5	115.6	91.3	4.29	NA	*CLAYEY SAND to SANDY CLAY
30.0	122.0	95.5	4.74	NA	*SANDY CLAY to SILTY CLAY
30.5	147.0	113.9	4.50	NA	*CLAYEY SAND to SANDY CLAY
31.0	136.6	104.9	5.34	NA	*SANDY CLAY to SILTY CLAY
31.5	132.6	100.9	4.12	NA	*CLAYEY SAND to SANDY CLAY
32.0	145.9	110.1	5.05	NA	*SANDY CLAY to SILTY CLAY
32.5	97.8	73.1	7.82	NA	*SANDY CLAY to SILTY CLAY
33.0	115.8	85.8	7.49	NA	*SANDY CLAY to SILTY CLAY
33.5	204.1	150.0	5.13	NA	*SANDY CLAY to SILTY CLAY
34.0	214.4	156.1	3.90	NA	*CLAYEY SAND to SANDY CLAY
34.5	110.6	79.8	3.55	NA	*CLAYEY SAND to SANDY CLAY
35.0	141.1	101.0	3.41	NA	*CLAYEY SAND to SANDY CLAY
35.5	202.1	144.0	2.59	NA	SILTY SAND to SANDY SILT
36.0	202.6	143.9	4.04	NA	*CLAYEY SAND to SANDY CLAY
36.5	143.3	101.4	6.81	NA	*SANDY CLAY to SILTY CLAY
37.0	191.9	135.3	5.09	NA	*SANDY CLAY to SILTY CLAY
37.5	157.5	110.6	6.50	NA	*SANDY CLAY to SILTY CLAY
38.0	209.6	146.6	5.13	NA	*SANDY CLAY to SILTY CLAY
38.5	205.6	143.3	3.76	NA	*CLAYEY SAND to SANDY CLAY
39.0	206.1	143.2	2.01	NA	SILTY SAND to SANDY SILT
39.5	185.6	128.4	2.70	NA	SILTY SAND to SANDY SILT
40.0	178.9	123.4	2.34	NA	SILTY SAND to SANDY SILT
40.5	187.6	128.9	1.95	NA	SILTY SAND to SANDY SILT
41.0	156.6	107.2	2.10	NA	SILTY SAND to SANDY SILT
41.5	147.1	100.3	2.25	NA	SILTY SAND to SANDY SILT
42.0	167.2	113.6	2.13	NA	SILTY SAND to SANDY SILT
42.5	150.1	101.6	1.95	NA	SILTY SAND to SANDY SILT
43.0	119.3	80.5	2.13	NA	SILTY SAND to SANDY SILT
43.5	102.0	68.5	2.47	NA	SILTY SAND to SANDY SILT
44.0	82.4	55.2	2.29	NA	SILTY SAND to SANDY SILT
44.5	108.8	72.6	1.73	NA	SILTY SAND to SANDY SILT
45.0	160.4	106.7	2.28	NA	SILTY SAND to SANDY SILT

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-78

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
45.5	190.9	126.5	1.94	NA	SILTY SAND to SANDY SILT
46.0	246.0	162.4	2.47	NA	SILTY SAND to SANDY SILT
46.5	211.4	139.1	2.17	NA	SILTY SAND to SANDY SILT
47.0	257.4	168.7	2.79	NA	*SILTY SAND to CLAYEY SAND
47.5	298.2	194.7	3.48	NA	*CLAYEY SAND to SANDY CLAY
48.0	227.7	148.2	6.74	NA	*SANDY CLAY to SILTY CLAY
48.5	286.0	185.5	5.09	NA	*SANDY CLAY to SILTY CLAY
49.0	221.7	143.2	4.99	NA	*SANDY CLAY to SILTY CLAY
49.5	515.4	331.9	1.68	NA	SAND to SILTY SAND
50.0	343.8	220.6	1.17	NA	SAND to SILTY SAND
50.5	210.0	134.3	2.21	NA	SILTY SAND to SANDY SILT
51.0	254.5	162.1	1.22	NA	SAND to SILTY SAND
51.5	352.4	223.7	2.11	NA	SILTY SAND to SANDY SILT
52.0	376.3	238.1	3.06	NA	*SILTY SAND to CLAYEY SAND
52.5	303.9	191.6	1.52	NA	SAND to SILTY SAND
53.0	168.2	105.7	.51	NA	SAND to SILTY SAND
53.5	30.8	19.3	3.53	NA	CLAYEY SILT to SILTY CLAY
54.0	15.4	9.6	2.00	NA	SANDY SILT to CLAYEY SILT
54.5	16.2	10.1	2.34	NA	SANDY SILT to CLAYEY SILT
55.0	15.2	9.4	2.79	NA	SILTY CLAY to CLAY
55.5	15.2	9.4	3.13	NA	SILTY CLAY to CLAY
56.0	15.6	9.6	3.31	NA	SILTY CLAY to CLAY
56.5	24.8	15.2	3.69	NA	CLAYEY SILT to SILTY CLAY
57.0	63.4	38.8	4.87	NA	*SANDY CLAY to SILTY CLAY
57.5	58.1	35.4	7.43	NA	*SANDY CLAY to SILTY CLAY
58.0	46.7	28.3	6.39	NA	*SANDY CLAY to SILTY CLAY
58.5	41.9	25.4	5.56	NA	SILTY CLAY to CLAY
59.0	33.5	20.2	5.78	NA	SILTY CLAY to CLAY
59.5	42.0	25.3	4.52	NA	CLAYEY SILT to SILTY CLAY
60.0	56.3	33.7	5.21	NA	*SANDY CLAY to SILTY CLAY
60.5	51.8	30.9	6.19	NA	*SANDY CLAY to SILTY CLAY
61.0	46.1	27.4	5.60	NA	*SANDY CLAY to SILTY CLAY
61.5	45.1	26.7	5.66	NA	*SANDY CLAY to SILTY CLAY
62.0	90.1	53.2	4.08	NA	*CLAYEY SAND to SANDY CLAY
62.5	79.3	46.7	4.63	NA	*SANDY CLAY to SILTY CLAY
63.0	72.4	42.5	3.92	NA	SANDY SILT to CLAYEY SILT
63.5	90.1	52.7	4.95	NA	*SANDY CLAY to SILTY CLAY
64.0	137.9	80.3	3.96	NA	*CLAYEY SAND to SANDY CLAY
64.5	149.3	86.7	4.98	NA	*SANDY CLAY to SILTY CLAY
65.0	138.2	80.0	6.68	NA	*SANDY CLAY to SILTY CLAY
65.5	122.4	70.5	7.44	NA	*SANDY CLAY to SILTY CLAY
66.0	131.1	75.3	8.14	NA	*SANDY CLAY to SILTY CLAY
66.5	156.8	89.8	8.78	NA	*SANDY CLAY to SILTY CLAY
67.0	204.7	116.8	6.71	NA	*SANDY CLAY to SILTY CLAY
67.5	127.1	72.3	7.65	NA	*SANDY CLAY to SILTY CLAY
68.0	188.7	107.0	4.57	NA	*SANDY CLAY to SILTY CLAY
68.5	133.7	75.6	6.48	NA	*SANDY CLAY to SILTY CLAY
69.0	147.5	83.1	4.47	NA	*SANDY CLAY to SILTY CLAY
69.5	144.9	81.3	8.26	NA	*SANDY CLAY to SILTY CLAY
70.0	207.6	116.1	8.41	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
70.5	213.8	119.2	8.58	NA	*SANDY CLAY to SILTY CLAY
71.0	143.5	79.7	8.30	NA	*SANDY CLAY to SILTY CLAY
71.5	156.1	86.5	7.56	NA	*SANDY CLAY to SILTY CLAY
72.0	197.2	108.9	6.20	NA	*SANDY CLAY to SILTY CLAY
72.5	113.9	62.7	8.49	NA	*SANDY CLAY to SILTY CLAY
73.0	163.4	89.6	7.97	NA	*SANDY CLAY to SILTY CLAY
73.5	108.4	59.2	7.29	NA	*SANDY CLAY to SILTY CLAY
74.0	130.8	71.2	8.61	NA	*SANDY CLAY to SILTY CLAY
74.5	172.0	93.4	6.55	NA	*SANDY CLAY to SILTY CLAY
75.0	209.2	113.2	3.73	NA	*CLAYEY SAND to SANDY CLAY
75.5	272.0	146.7	3.84	NA	*CLAYEY SAND to SANDY CLAY
76.0	294.2	158.1	3.51	NA	*CLAYEY SAND to SANDY CLAY
76.5	310.8	166.5	3.03	NA	*SILTY SAND to CLAYEY SAND
77.0	303.8	162.2	3.33	NA	*CLAYEY SAND to SANDY CLAY
77.5	288.6	153.6	2.77	NA	*SILTY SAND to CLAYEY SAND
78.0	389.2	206.4	3.30	NA	*SILTY SAND to CLAYEY SAND
78.5	141.3	74.7	7.05	NA	*SANDY CLAY to SILTY CLAY
79.0	189.1	99.7	8.01	NA	*SANDY CLAY to SILTY CLAY
79.5	283.4	148.9	7.20	NA	*SANDY CLAY to SILTY CLAY
80.0	232.7	121.8	7.66	NA	*SANDY CLAY to SILTY CLAY
80.5	234.4	122.3	7.46	NA	*SANDY CLAY to SILTY CLAY
81.0	453.7	236.0	5.54	NA	*HEAVILY O.C./CEMENT. MAT.
81.5	446.9	231.6	7.74	NA	*HEAVILY O.C./CEMENT. MAT.
82.0	362.5	187.3	8.24	NA	*HEAVILY O.C./CEMENT. MAT.
82.5	415.6	214.0	7.74	NA	*HEAVILY O.C./CEMENT. MAT.
83.0	442.9	227.3	7.21	NA	*HEAVILY O.C./CEMENT. MAT.

NA = NOT APPLICABLE.

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

```

*****
*
*               CONE PENETRATION TEST
*
*
*   SOUNDING   : CPT-79                PROJECT NO   : 92-381-01110
*   PROJECT    : D&M/UPRR-II           INSTRUMENT  : F15CKE095
*   LOCATION   : SACRAMENTO CA         SYSTEM      : T-1
*   DATE       : 05-27-1992           OPERATOR    : MR/DH
*
*****
                                           PAGE 1 of 4

```

NA = NOT APPLICABLE
TOP 2.7 FT IS DISTURBED SOIL
*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL
ASSUMED TOTAL UNIT WT = 110 PCF
ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-79

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
20.5	66.9	63.4	6.60	NA	*SANDY CLAY to SILTY CLAY
21.0	86.7	81.2	7.66	NA	*SANDY CLAY to SILTY CLAY
21.5	90.8	84.2	8.15	NA	*SANDY CLAY to SILTY CLAY
22.0	98.3	90.2	6.53	NA	*SANDY CLAY to SILTY CLAY
22.5	103.9	94.3	6.93	NA	*SANDY CLAY to SILTY CLAY
23.0	80.9	72.6	5.36	NA	*SANDY CLAY to SILTY CLAY
23.5	91.5	81.3	5.87	NA	*SANDY CLAY to SILTY CLAY
24.0	88.5	77.9	6.38	NA	*SANDY CLAY to SILTY CLAY
24.5	75.1	65.4	5.70	NA	*SANDY CLAY to SILTY CLAY
25.0	53.7	46.3	5.82	NA	*SANDY CLAY to SILTY CLAY
25.5	37.7	32.1	4.88	NA	*SANDY CLAY to SILTY CLAY
26.0	44.2	37.4	4.65	NA	*SANDY CLAY to SILTY CLAY
26.5	44.6	37.3	5.07	NA	*SANDY CLAY to SILTY CLAY
27.0	42.1	34.9	5.95	NA	*SANDY CLAY to SILTY CLAY
27.5	41.5	34.1	4.95	NA	*SANDY CLAY to SILTY CLAY
28.0	45.9	37.3	5.01	NA	*SANDY CLAY to SILTY CLAY
28.5	46.1	37.1	5.63	NA	*SANDY CLAY to SILTY CLAY
29.0	53.4	42.6	5.68	NA	*SANDY CLAY to SILTY CLAY
29.5	75.8	59.9	7.38	NA	*SANDY CLAY to SILTY CLAY
30.0	124.3	97.3	6.34	NA	*SANDY CLAY to SILTY CLAY
30.5	130.6	101.3	6.29	NA	*SANDY CLAY to SILTY CLAY
31.0	181.7	139.6	4.82	NA	*SANDY CLAY to SILTY CLAY
31.5	169.9	129.3	4.46	NA	*CLAYEY SAND to SANDY CLAY
32.0	200.1	151.0	3.75	NA	*CLAYEY SAND to SANDY CLAY
32.5	186.8	139.7	4.55	NA	*CLAYEY SAND to SANDY CLAY
33.0	143.2	106.1	6.27	NA	*SANDY CLAY to SILTY CLAY
33.5	160.5	117.9	5.44	NA	*SANDY CLAY to SILTY CLAY
34.0	144.0	104.9	6.28	NA	*SANDY CLAY to SILTY CLAY
34.5	111.6	80.5	6.06	NA	*SANDY CLAY to SILTY CLAY
35.0	165.4	118.3	3.99	NA	*CLAYEY SAND to SANDY CLAY
35.5	117.5	83.8	5.90	NA	*SANDY CLAY to SILTY CLAY
36.0	93.3	66.3	5.07	NA	*SANDY CLAY to SILTY CLAY
36.5	62.7	44.3	4.67	NA	*SANDY CLAY to SILTY CLAY
37.0	83.5	58.9	1.85	NA	SILTY SAND to SANDY SILT
37.5	82.7	58.1	1.90	NA	SILTY SAND to SANDY SILT
38.0	126.8	88.7	1.35	NA	SAND to SILTY SAND
38.5	160.1	111.6	2.37	NA	SILTY SAND to SANDY SILT
39.0	134.0	93.1	4.14	NA	*CLAYEY SAND to SANDY CLAY
39.5	150.8	104.4	2.98	NA	*SILTY SAND to CLAYEY SAND
40.0	154.8	106.7	2.73	NA	SILTY SAND to SANDY SILT
40.5	182.9	125.7	2.51	NA	SILTY SAND to SANDY SILT
41.0	193.4	132.4	2.51	NA	SILTY SAND to SANDY SILT
41.5	184.3	125.7	2.49	NA	SILTY SAND to SANDY SILT
42.0	183.7	124.9	2.79	NA	*SILTY SAND to CLAYEY SAND
42.5	151.6	102.6	2.56	NA	SILTY SAND to SANDY SILT
43.0	188.8	127.4	1.62	NA	SAND to SILTY SAND
43.5	133.5	89.7	3.20	NA	*CLAYEY SAND to SANDY CLAY
44.0	180.4	120.8	2.21	NA	SILTY SAND to SANDY SILT
44.5	168.0	112.1	2.48	NA	SILTY SAND to SANDY SILT
45.0	179.5	119.4	2.24	NA	SILTY SAND to SANDY SILT

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-79

DEPTH	TIP RESISTANCE	NORMALIZED	FRICTION	CONE PORE	SOIL BEHAVIOR TYPE
(ft)	(tsf)	TIP RESISTANCE (tsf)	RATIO (%)	PRESSURE (tsf)	
45.5	172.2	114.1	2.63	NA	SILTY SAND to SANDY SILT
46.0	200.7	132.5	1.24	NA	SAND to SILTY SAND
46.5	234.1	154.0	1.00	NA	SAND to SILTY SAND
47.0	255.9	167.7	1.04	NA	SAND to SILTY SAND
47.5	289.5	189.1	1.30	NA	SAND to SILTY SAND
48.0	290.6	189.1	1.46	NA	SAND to SILTY SAND
48.5	116.3	75.4	4.86	NA	*SANDY CLAY to SILTY CLAY
49.0	49.8	32.2	3.47	NA	SANDY SILT to CLAYEY SILT
49.5	46.0	29.6	3.33	NA	SANDY SILT to CLAYEY SILT
50.0	37.5	24.0	5.30	NA	CLAYEY SILT to SILTY CLAY
50.5	32.2	20.6	4.76	NA	CLAYEY SILT to SILTY CLAY
51.0	29.8	19.0	4.92	NA	CLAYEY SILT to SILTY CLAY
51.5	26.2	16.6	4.92	NA	CLAYEY SILT to SILTY CLAY
52.0	17.5	11.1	6.29	NA	SILTY CLAY TO CLAY
52.5	13.6	8.6	4.99	NA	SILTY CLAY TO CLAY
53.0	12.1	7.6	5.60	NA	SILTY CLAY TO CLAY
53.5	10.5	6.6	5.51	NA	SILTY CLAY TO CLAY
54.0	12.3	7.7	4.90	NA	SILTY CLAY TO CLAY
54.5	13.8	8.6	4.23	NA	CLAYEY SILT to SILTY CLAY
55.0	39.0	24.2	3.93	NA	CLAYEY SILT to SILTY CLAY
55.5	45.4	28.0	5.14	NA	CLAYEY SILT to SILTY CLAY
56.0	41.7	25.6	5.52	NA	*SANDY CLAY to SILTY CLAY
56.5	37.4	23.0	6.61	NA	*SANDY CLAY to SILTY CLAY
57.0	45.6	27.9	6.35	NA	*SANDY CLAY to SILTY CLAY
57.5	41.2	25.1	6.27	NA	*SANDY CLAY to SILTY CLAY
58.0	68.9	41.8	6.80	NA	*SANDY CLAY to SILTY CLAY
58.5	78.0	47.2	6.33	NA	*SANDY CLAY to SILTY CLAY
59.0	68.6	41.3	6.69	NA	*SANDY CLAY to SILTY CLAY
59.5	61.1	36.7	7.01	NA	*SANDY CLAY to SILTY CLAY
60.0	58.9	35.3	7.20	NA	*SANDY CLAY to SILTY CLAY
60.5	47.5	28.3	6.31	NA	*SANDY CLAY to SILTY CLAY
61.0	38.6	22.9	6.00	NA	SILTY CLAY TO CLAY
61.5	26.0	15.4	5.62	NA	SILTY CLAY TO CLAY
62.0	23.5	13.9	4.70	NA	CLAYEY SILT to SILTY CLAY
62.5	25.5	15.0	5.00	NA	CLAYEY SILT to SILTY CLAY
63.0	26.5	15.6	5.82	NA	SILTY CLAY TO CLAY
63.5	34.1	19.9	5.79	NA	SILTY CLAY TO CLAY
64.0	62.1	36.2	6.16	NA	*SANDY CLAY to SILTY CLAY
64.5	93.3	54.2	4.96	NA	*SANDY CLAY to SILTY CLAY
65.0	89.4	51.7	4.84	NA	*SANDY CLAY to SILTY CLAY
65.5	114.4	66.0	4.75	NA	*SANDY CLAY to SILTY CLAY
66.0	95.8	55.1	4.06	NA	*CLAYEY SAND to SANDY CLAY
66.5	109.8	62.9	6.57	NA	*SANDY CLAY to SILTY CLAY
67.0	85.5	48.8	4.65	NA	*SANDY CLAY to SILTY CLAY
67.5	127.6	72.6	4.54	NA	*SANDY CLAY to SILTY CLAY
68.0	93.9	53.2	5.99	NA	*SANDY CLAY to SILTY CLAY
68.5	102.1	57.7	4.69	NA	*SANDY CLAY to SILTY CLAY
69.0	153.9	86.7	4.48	NA	*SANDY CLAY to SILTY CLAY
69.5	135.5	76.0	4.50	NA	*SANDY CLAY to SILTY CLAY
70.0	172.7	96.6	5.12	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-79

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
70.5	191.1	106.6	5.04	NA	*SANDY CLAY to SILTY CLAY
71.0	217.3	120.7	6.70	NA	*SANDY CLAY to SILTY CLAY
71.5	218.8	121.2	6.30	NA	*SANDY CLAY to SILTY CLAY
72.0	233.3	128.8	3.67	NA	*CLAYEY SAND to SANDY CLAY
72.5	226.0	124.3	3.84	NA	*CLAYEY SAND to SANDY CLAY
73.0	170.7	93.6	3.26	NA	*CLAYEY SAND to SANDY CLAY
73.5	191.3	104.6	3.05	NA	*CLAYEY SAND to SANDY CLAY
74.0	192.8	105.0	2.99	NA	*SILTY SAND to CLAYEY SAND
74.5	237.4	128.9	3.14	NA	*CLAYEY SAND to SANDY CLAY
75.0	259.5	140.4	3.11	NA	*SILTY SAND to CLAYEY SAND
75.5	256.3	138.2	3.11	NA	*SILTY SAND to CLAYEY SAND
76.0	256.6	137.9	2.52	NA	SILTY SAND to SANDY SILT
76.5	250.8	134.3	2.95	NA	*SILTY SAND to CLAYEY SAND
77.0	243.1	129.8	3.11	NA	*SILTY SAND to CLAYEY SAND
77.5	255.0	135.7	3.00	NA	*SILTY SAND to CLAYEY SAND
78.0	236.0	125.2	2.63	NA	SILTY SAND to SANDY SILT
78.5	188.6	99.7	5.05	NA	*SANDY CLAY to SILTY CLAY
79.0	267.4	140.9	7.28	NA	*SANDY CLAY to SILTY CLAY
79.5	423.3	222.3	4.67	NA	*CLAYEY SAND to SANDY CLAY
80.0	505.7	264.7	3.26	NA	*SILTY SAND to CLAYEY SAND
80.5	524.9	273.9	6.46	NA	*HEAVILY O.C./CEMENT. MAT.
81.0	323.4	168.2	8.52	NA	*HEAVILY O.C./CEMENT. MAT.
81.5	346.7	179.7	8.73	NA	*HEAVILY O.C./CEMENT. MAT.

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

```
*****  
*                                     *  
*                                CONE PENETRATION TEST                               *  
*                                     *  
* SOUNDING : CPT-80                      PROJECT NO : 92-381-01110          *  
* PROJECT   : D&M/UPRR-II                INSTRUMENT : F15CCKE095         *  
* LOCATION  : SACRAMENTO CA              SYSTEM      : T-1                 *  
* DATE      : 05-27-1992                 OPERATOR    : MR/DH                  *  
*                                     *  
*****
```

NA = NOT APPLICABLE
TOP 2.0 FT IS DISTURBED SOIL
*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL
ASSUMED TOTAL UNIT WT = 110 PCF
ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-80

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
20.5	91.5	86.7	6.60	NA	*SANDY CLAY to SILTY CLAY
21.0	79.0	74.1	7.43	NA	*SANDY CLAY to SILTY CLAY
21.5	53.9	50.0	7.47	NA	*SANDY CLAY to SILTY CLAY
22.0	63.8	58.5	5.74	NA	*SANDY CLAY to SILTY CLAY
22.5	65.5	59.5	6.19	NA	*SANDY CLAY to SILTY CLAY
23.0	56.3	50.5	4.84	NA	*SANDY CLAY to SILTY CLAY
23.5	59.2	52.6	5.70	NA	*SANDY CLAY to SILTY CLAY
24.0	56.4	49.6	4.51	NA	*SANDY CLAY to SILTY CLAY
24.5	54.0	47.0	5.26	NA	*SANDY CLAY to SILTY CLAY
25.0	42.8	36.9	5.27	NA	*SANDY CLAY to SILTY CLAY
25.5	33.4	28.5	6.77	NA	*SANDY CLAY to SILTY CLAY
26.0	49.2	41.6	4.37	NA	*SANDY CLAY to SILTY CLAY
26.5	48.8	40.9	4.77	NA	*SANDY CLAY to SILTY CLAY
27.0	54.8	45.4	5.03	NA	*SANDY CLAY to SILTY CLAY
27.5	47.8	39.2	5.42	NA	*SANDY CLAY to SILTY CLAY
28.0	35.3	28.7	4.57	NA	CLAYEY SILT to SILTY CLAY
28.5	35.1	28.3	4.48	NA	CLAYEY SILT to SILTY CLAY
29.0	38.4	30.6	4.40	NA	CLAYEY SILT to SILTY CLAY
29.5	44.9	35.4	4.87	NA	*SANDY CLAY to SILTY CLAY
30.0	52.0	40.7	6.64	NA	*SANDY CLAY to SILTY CLAY
30.5	66.7	51.7	6.34	NA	*SANDY CLAY to SILTY CLAY
31.0	109.3	84.0	4.86	NA	*SANDY CLAY to SILTY CLAY
31.5	134.7	102.5	2.55	NA	SILTY SAND to SANDY SILT
32.0	140.1	105.7	1.65	NA	SILTY SAND to SANDY SILT
32.5	123.6	92.4	1.80	NA	SILTY SAND to SANDY SILT
33.0	162.7	120.6	1.29	NA	SAND to SILTY SAND
33.5	146.6	107.7	1.26	NA	SAND to SILTY SAND
34.0	168.7	122.9	1.19	NA	SAND to SILTY SAND
34.5	157.2	113.4	1.10	NA	SAND to SILTY SAND
35.0	126.3	90.4	1.32	NA	SAND to SILTY SAND
35.5	122.6	87.4	.85	NA	SAND to SILTY SAND
36.0	127.4	90.5	1.42	NA	SAND to SILTY SAND
36.5	145.5	103.0	.87	NA	SAND to SILTY SAND
37.0	161.0	113.5	.95	NA	SAND to SILTY SAND
37.5	183.5	128.9	1.04	NA	SAND to SILTY SAND
38.0	200.9	140.6	1.47	NA	SAND to SILTY SAND
38.5	214.7	149.7	1.64	NA	SAND to SILTY SAND
39.0	232.1	161.2	1.01	NA	SAND to SILTY SAND
39.5	227.0	157.1	1.76	NA	SAND to SILTY SAND
40.0	226.3	156.0	1.80	NA	SAND to SILTY SAND
40.5	213.8	146.9	1.85	NA	SILTY SAND to SANDY SILT
41.0	230.6	157.8	1.67	NA	SAND to SILTY SAND
41.5	229.2	156.3	1.70	NA	SAND to SILTY SAND
42.0	248.5	168.9	1.37	NA	SAND to SILTY SAND
42.5	259.4	175.6	1.80	NA	SAND to SILTY SAND
43.0	219.4	148.0	2.31	NA	SILTY SAND to SANDY SILT
43.5	239.7	161.1	1.33	NA	SAND to SILTY SAND
44.0	254.0	170.1	1.94	NA	SILTY SAND to SANDY SILT
44.5	297.4	198.5	1.66	NA	SAND to SILTY SAND
45.0	260.6	173.3	2.68	NA	*SILTY SAND to CLAYEY SAND

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-80

DEPTH	TIP RESISTANCE	NORMALIZED	FRICTION	CONE PORE	SOIL BEHAVIOR TYPE
(ft)	(tsf)	TIP RESISTANCE (tsf)	RATIO (%)	PRESSURE (tsf)	
45.5	75.8	50.2	3.02	NA	SANDY SILT to CLAYEY SILT
46.0	68.2	45.0	1.70	NA	SILTY SAND to SANDY SILT
46.5	67.9	44.7	1.77	NA	SILTY SAND to SANDY SILT
47.0	67.6	44.3	1.56	NA	SILTY SAND to SANDY SILT
47.5	63.4	41.4	1.91	NA	SILTY SAND to SANDY SILT
48.0	59.0	38.4	2.19	NA	SILTY SAND to SANDY SILT
48.5	56.9	36.9	2.30	NA	SANDY SILT to CLAYEY SILT
49.0	57.7	37.3	2.33	NA	SANDY SILT to CLAYEY SILT
49.5	53.6	34.5	2.74	NA	SANDY SILT to CLAYEY SILT
50.0	49.5	31.8	2.54	NA	SANDY SILT to CLAYEY SILT
50.5	51.6	33.0	2.18	NA	SANDY SILT to CLAYEY SILT
51.0	66.0	42.0	1.74	NA	SILTY SAND to SANDY SILT
51.5	61.1	38.8	2.86	NA	SANDY SILT to CLAYEY SILT
52.0	74.8	47.3	4.81	NA	*SANDY CLAY to SILTY CLAY
52.5	72.3	45.6	4.76	NA	*SANDY CLAY to SILTY CLAY
53.0	61.8	38.8	6.44	NA	*SANDY CLAY to SILTY CLAY
53.5	61.4	38.5	4.90	NA	*SANDY CLAY to SILTY CLAY
54.0	144.9	90.4	2.58	NA	SILTY SAND to SANDY SILT
54.5	183.3	113.9	2.12	NA	SILTY SAND to SANDY SILT
55.0	239.5	148.4	1.41	NA	SAND to SILTY SAND
55.5	215.2	132.9	1.44	NA	SAND to SILTY SAND
56.0	235.0	144.6	1.57	NA	SAND to SILTY SAND
56.5	229.7	140.9	1.58	NA	SAND to SILTY SAND
57.0	199.2	121.8	3.06	NA	*SILTY SAND to CLAYEY SAND
57.5	140.7	85.7	5.45	NA	*SANDY CLAY to SILTY CLAY
58.0	139.2	84.5	5.17	NA	*SANDY CLAY to SILTY CLAY
58.5	136.3	82.4	4.76	NA	*SANDY CLAY to SILTY CLAY
59.0	96.7	58.3	5.81	NA	*SANDY CLAY to SILTY CLAY
59.5	73.1	43.9	6.22	NA	*SANDY CLAY to SILTY CLAY
60.0	41.8	25.0	7.05	NA	*SANDY CLAY to SILTY CLAY
60.5	29.5	17.6	4.85	NA	CLAYEY SILT to SILTY CLAY
61.0	37.2	22.1	4.61	NA	CLAYEY SILT to SILTY CLAY
61.5	40.2	23.8	5.38	NA	CLAYEY SILT to SILTY CLAY
62.0	47.4	28.0	5.92	NA	*SANDY CLAY to SILTY CLAY
62.5	49.2	28.9	6.26	NA	*SANDY CLAY to SILTY CLAY
63.0	53.5	31.4	5.55	NA	*SANDY CLAY to SILTY CLAY
63.5	55.8	32.6	5.67	NA	*SANDY CLAY to SILTY CLAY
64.0	49.9	29.1	5.32	NA	*SANDY CLAY to SILTY CLAY
64.5	53.5	31.1	4.87	NA	CLAYEY SILT to SILTY CLAY
65.0	105.7	61.2	4.55	NA	*SANDY CLAY to SILTY CLAY
65.5	90.9	52.4	5.42	NA	*SANDY CLAY to SILTY CLAY
66.0	97.2	55.9	6.14	NA	*SANDY CLAY to SILTY CLAY
66.5	127.9	73.3	6.71	NA	*SANDY CLAY to SILTY CLAY
67.0	146.5	83.6	6.81	NA	*SANDY CLAY to SILTY CLAY
67.5	155.0	88.2	6.20	NA	*SANDY CLAY to SILTY CLAY
68.0	154.5	87.6	7.16	NA	*SANDY CLAY to SILTY CLAY
68.5	179.5	101.4	5.13	NA	*SANDY CLAY to SILTY CLAY
69.0	197.5	111.2	5.17	NA	*SANDY CLAY to SILTY CLAY
69.5	181.8	102.0	5.62	NA	*SANDY CLAY to SILTY CLAY
70.0	235.2	131.6	4.16	NA	*CLAYEY SAND to SANDY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-80

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
70.5	212.8	118.6	2.53	NA	SILTY SAND to SANDY SILT
71.0	165.1	91.8	2.85	NA	SILTY SAND to SANDY SILT
71.5	169.4	93.8	3.03	NA	SANDY SILT to CLAYEY SILT
72.0	159.0	87.7	3.22	NA	*CLAYEY SAND to SANDY CLAY
72.5	150.6	82.8	3.26	NA	SANDY SILT to CLAYEY SILT
73.0	146.9	80.6	3.06	NA	SANDY SILT to CLAYEY SILT
73.5	152.0	83.0	2.72	NA	SILTY SAND to SANDY SILT
74.0	186.6	101.6	1.76	NA	SILTY SAND to SANDY SILT
74.5	231.9	125.9	5.29	NA	*SANDY CLAY to SILTY CLAY
75.0	228.4	123.6	7.32	NA	*SANDY CLAY to SILTY CLAY
75.5	233.9	126.1	8.50	NA	*SANDY CLAY to SILTY CLAY
76.0	380.0	204.3	2.93	NA	*SILTY SAND to CLAYEY SAND
76.5	385.0	206.2	3.35	NA	*SILTY SAND to CLAYEY SAND
77.0	314.7	168.0	3.09	NA	*SILTY SAND to CLAYEY SAND
77.5	566.8	301.7	5.29	NA	*HEAVILY O.C./CEMENT. MAT.
78.0	381.2	202.2	8.51	NA	*HEAVILY O.C./CEMENT. MAT.
78.5	316.9	167.5	3.95	NA	*CLAYEY SAND to SANDY CLAY
79.0	304.8	160.6	3.30	NA	*CLAYEY SAND to SANDY CLAY
79.5	300.7	157.9	2.57	NA	*SILTY SAND to CLAYEY SAND
80.0	293.6	153.7	2.41	NA	SILTY SAND to SANDY SILT
80.5	252.3	131.6	3.09	NA	*SILTY SAND to CLAYEY SAND
81.0	261.0	135.7	2.46	NA	SILTY SAND to SANDY SILT
81.5	392.7	203.5	2.51	NA	*SILTY SAND to CLAYEY SAND
82.0	483.1	249.6	5.51	NA	*HEAVILY O.C./CEMENT. MAT.
82.5	225.5	116.1	7.58	NA	*SANDY CLAY to SILTY CLAY
83.0	254.0	130.3	7.93	NA	*SANDY CLAY to SILTY CLAY
83.5	236.6	121.1	7.55	NA	*SANDY CLAY to SILTY CLAY
84.0	393.9	200.8	4.18	NA	*CLAYEY SAND to SANDY CLAY
84.5	391.6	199.0	4.98	NA	*SANDY CLAY to SILTY CLAY
85.0	150.3	76.1	7.71	NA	*SANDY CLAY to SILTY CLAY
85.5	217.6	109.9	7.03	NA	*SANDY CLAY to SILTY CLAY
86.0	225.5	113.5	7.67	NA	*SANDY CLAY to SILTY CLAY
86.5	380.8	191.0	6.06	NA	*SANDY CLAY to SILTY CLAY
87.0	221.5	110.7	7.27	NA	*SANDY CLAY to SILTY CLAY
87.5	523.3	260.8	3.06	NA	*SILTY SAND to CLAYEY SAND

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

CONE PENETRATION TEST

* SOUNDING : CPT-81	PROJECT NO : 92-381-01110
* PROJECT : D&M/UPRR-II	INSTRUMENT : F15CKE095
* LOCATION : SACRAMENTO CA	SYSTEM : T-1
* DATE : 05-28-1992	OPERATOR : MR/DH

PAGE 1 of 4

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
0.0	0.0	0.0	0.00	NA	
0.5	0.0	0.0	0.00	NA	
1.0	0.0	0.0	0.00	NA	
1.5	0.0	0.0	0.00	NA	
2.0	0.0	0.0	0.00	NA	
2.5	24.4	45.5	3.26	NA	SANDY SILT to CLAYEY SILT
3.0	23.8	42.4	2.65	NA	SANDY SILT to CLAYEY SILT
3.5	31.0	53.3	2.15	NA	SILTY SAND to SANDY SILT
4.0	129.2	214.1	1.67	NA	SAND to SILTY SAND
4.5	448.8	721.0	5.65	NA	*HEAVILY O.C./CEMENT. MAT.
5.0	466.9	728.7	7.38	NA	*HEAVILY O.C./CEMENT. MAT.
5.5	457.7	695.3	6.60	NA	*HEAVILY O.C./CEMENT. MAT.
6.0	345.5	511.9	6.43	NA	*HEAVILY O.C./CEMENT. MAT.
6.5	253.4	366.6	7.32	NA	*HEAVILY O.C./CEMENT. MAT.
7.0	232.7	329.2	5.38	NA	*HEAVILY O.C./CEMENT. MAT.
7.5	181.1	250.8	4.35	NA	*CLAYEY SAND to SANDY CLAY
8.0	166.9	226.4	4.31	NA	*CLAYEY SAND to SANDY CLAY
8.5	236.1	314.1	5.12	NA	*HEAVILY O.C./CEMENT. MAT.
9.0	244.6	319.3	6.69	NA	*HEAVILY O.C./CEMENT. MAT.
9.5	215.1	275.7	8.46	NA	*HEAVILY O.C./CEMENT. MAT.
10.0	187.1	235.7	8.02	NA	*HEAVILY O.C./CEMENT. MAT.
10.5	205.5	254.5	7.83	NA	*HEAVILY O.C./CEMENT. MAT.
11.0	340.7	415.0	6.76	NA	*HEAVILY O.C./CEMENT. MAT.
11.5	249.8	299.5	7.76	NA	*HEAVILY O.C./CEMENT. MAT.
12.0	156.8	185.1	7.26	NA	*HEAVILY O.C./CEMENT. MAT.
12.5	102.7	119.4	7.56	NA	*SANDY CLAY to SILTY CLAY
13.0	119.6	137.0	7.88	NA	*SANDY CLAY to SILTY CLAY
13.5	104.6	118.1	6.47	NA	*SANDY CLAY to SILTY CLAY
14.0	93.6	104.3	6.68	NA	*SANDY CLAY to SILTY CLAY
14.5	72.1	79.2	6.29	NA	*SANDY CLAY to SILTY CLAY
15.0	63.5	68.9	6.16	NA	*SANDY CLAY to SILTY CLAY
15.5	63.6	68.0	5.75	NA	*SANDY CLAY to SILTY CLAY
16.0	73.4	77.5	6.87	NA	*SANDY CLAY to SILTY CLAY
16.5	80.3	83.7	7.30	NA	*SANDY CLAY to SILTY CLAY
17.0	81.4	83.8	6.32	NA	*SANDY CLAY to SILTY CLAY
17.5	73.8	75.0	6.38	NA	*SANDY CLAY to SILTY CLAY
18.0	61.9	62.2	5.99	NA	*SANDY CLAY to SILTY CLAY
18.5	94.6	93.8	6.07	NA	*SANDY CLAY to SILTY CLAY
19.0	47.8	46.9	4.18	NA	*SANDY CLAY to SILTY CLAY
19.5	46.4	45.0	4.91	NA	*SANDY CLAY to SILTY CLAY
20.0	49.8	47.7	5.42	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE
 TOP 2.0 FT IS DISTURBED SOIL
 *INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL
 ASSUMED TOTAL UNIT WT = 110 PCF
 ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-81

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
20.5	54.8	51.9	5.60	NA	*SANDY CLAY to SILTY CLAY
21.0	74.1	69.5	5.96	NA	*SANDY CLAY to SILTY CLAY
21.5	122.4	113.5	5.39	NA	*SANDY CLAY to SILTY CLAY
22.0	190.2	174.5	7.63	NA	*HEAVILY O.C./CEMENT. MAT.
22.5	210.5	191.0	9.12	NA	*HEAVILY O.C./CEMENT. MAT.
23.0	170.4	153.0	8.92	NA	*HEAVILY O.C./CEMENT. MAT.
23.5	137.5	122.1	8.36	NA	*SANDY CLAY to SILTY CLAY
24.0	98.0	86.2	7.09	NA	*SANDY CLAY to SILTY CLAY
24.5	93.8	81.6	6.81	NA	*SANDY CLAY to SILTY CLAY
25.0	87.5	75.4	7.72	NA	*SANDY CLAY to SILTY CLAY
25.5	96.0	81.9	7.45	NA	*SANDY CLAY to SILTY CLAY
26.0	77.7	65.6	6.88	NA	*SANDY CLAY to SILTY CLAY
26.5	73.7	61.6	5.99	NA	*SANDY CLAY to SILTY CLAY
27.0	79.5	65.8	6.50	NA	*SANDY CLAY to SILTY CLAY
27.5	64.9	53.3	5.67	NA	*SANDY CLAY to SILTY CLAY
28.0	57.5	46.7	5.55	NA	*SANDY CLAY to SILTY CLAY
28.5	53.7	43.2	5.60	NA	*SANDY CLAY to SILTY CLAY
29.0	47.5	37.9	5.53	NA	*SANDY CLAY to SILTY CLAY
29.5	45.5	35.9	5.76	NA	*SANDY CLAY to SILTY CLAY
30.0	49.5	38.7	7.19	NA	*SANDY CLAY to SILTY CLAY
30.5	44.8	34.7	6.36	NA	*SANDY CLAY to SILTY CLAY
31.0	47.9	36.8	6.98	NA	*SANDY CLAY to SILTY CLAY
31.5	65.2	49.6	7.89	NA	*SANDY CLAY to SILTY CLAY
32.0	86.9	65.6	6.51	NA	*SANDY CLAY to SILTY CLAY
32.5	101.0	75.5	6.26	NA	*SANDY CLAY to SILTY CLAY
33.0	119.1	88.3	4.51	NA	*SANDY CLAY to SILTY CLAY
33.5	144.4	106.1	5.98	NA	*SANDY CLAY to SILTY CLAY
34.0	113.0	82.3	7.92	NA	*SANDY CLAY to SILTY CLAY
34.5	126.0	90.9	7.64	NA	*SANDY CLAY to SILTY CLAY
35.0	124.5	89.1	7.03	NA	*SANDY CLAY to SILTY CLAY
35.5	163.6	116.6	5.03	NA	*SANDY CLAY to SILTY CLAY
36.0	255.1	181.2	5.27	NA	*SANDY CLAY to SILTY CLAY
36.5	239.8	169.7	6.07	NA	*SANDY CLAY to SILTY CLAY
37.0	192.5	135.7	5.06	NA	*SANDY CLAY to SILTY CLAY
37.5	171.0	120.1	4.54	NA	*SANDY CLAY to SILTY CLAY
38.0	268.0	187.6	4.01	NA	*CLAYEY SAND to SANDY CLAY
38.5	315.6	220.0	4.49	NA	*CLAYEY SAND to SANDY CLAY
39.0	316.6	219.9	3.70	NA	*CLAYEY SAND to SANDY CLAY
39.5	310.3	214.8	3.63	NA	*CLAYEY SAND to SANDY CLAY
40.0	254.0	175.1	2.86	NA	*SILTY SAND to CLAYEY SAND
40.5	238.0	163.5	3.18	NA	*SILTY SAND to CLAYEY SAND
41.0	232.9	159.4	3.07	NA	*SILTY SAND to CLAYEY SAND
41.5	209.6	143.0	2.64	NA	*SILTY SAND to CLAYEY SAND
42.0	119.3	81.0	1.57	NA	SILTY SAND to SANDY SILT
42.5	156.9	106.3	1.58	NA	SAND to SILTY SAND
43.0	167.5	113.0	1.83	NA	SILTY SAND to SANDY SILT
43.5	208.3	140.0	1.35	NA	SAND to SILTY SAND
44.0	233.3	156.3	2.01	NA	SILTY SAND to SANDY SILT
44.5	266.6	177.9	1.95	NA	SILTY SAND to SANDY SILT
45.0	176.3	117.2	4.85	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-81

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
45.5	78.7	52.1	3.94	NA	*CLAYEY SAND to SANDY CLAY
46.0	85.7	56.6	4.61	NA	*SANDY CLAY to SILTY CLAY
46.5	75.5	49.7	7.99	NA	*SANDY CLAY to SILTY CLAY
47.0	64.6	42.4	7.66	NA	*SANDY CLAY to SILTY CLAY
47.5	75.2	49.1	8.80	NA	*SANDY CLAY to SILTY CLAY
48.0	93.6	60.9	7.47	NA	*SANDY CLAY to SILTY CLAY
48.5	128.3	83.2	8.52	NA	*SANDY CLAY to SILTY CLAY
49.0	119.6	77.3	6.78	NA	*SANDY CLAY to SILTY CLAY
49.5	110.5	71.2	7.12	NA	*SANDY CLAY to SILTY CLAY
50.0	66.0	42.4	9.20	NA	*SANDY CLAY to SILTY CLAY
50.5	40.3	25.8	6.44	NA	*SANDY CLAY to SILTY CLAY
51.0	43.7	27.8	4.78	NA	CLAYEY SILT to SILTY CLAY
51.5	42.9	27.3	4.76	NA	CLAYEY SILT to SILTY CLAY
52.0	42.2	26.7	5.82	NA	*SANDY CLAY to SILTY CLAY
52.5	40.2	25.4	5.34	NA	CLAYEY SILT to SILTY CLAY
53.0	38.7	24.3	6.00	NA	*SANDY CLAY to SILTY CLAY
53.5	31.3	19.6	6.52	NA	SILTY CLAY TO CLAY
54.0	28.8	18.0	6.32	NA	SILTY CLAY TO CLAY
54.5	33.2	20.7	6.28	NA	SILTY CLAY TO CLAY
55.0	38.4	23.8	6.54	NA	*SANDY CLAY to SILTY CLAY
55.5	36.5	22.6	6.68	NA	*SANDY CLAY to SILTY CLAY
56.0	33.1	20.4	6.67	NA	SILTY CLAY TO CLAY
56.5	27.4	16.8	7.95	NA	SILTY CLAY TO CLAY
57.0	14.2	8.7	6.59	NA	SILTY CLAY TO CLAY
57.5	52.8	32.2	5.92	NA	*SANDY CLAY to SILTY CLAY
58.0	42.2	25.6	6.66	NA	*SANDY CLAY to SILTY CLAY
58.5	55.4	33.5	5.47	NA	*SANDY CLAY to SILTY CLAY
59.0	70.6	42.6	5.30	NA	*SANDY CLAY to SILTY CLAY
59.5	75.8	45.5	6.09	NA	*SANDY CLAY to SILTY CLAY
60.0	65.4	39.1	7.93	NA	*SANDY CLAY to SILTY CLAY
60.5	53.4	31.8	7.38	NA	*SANDY CLAY to SILTY CLAY
61.0	57.8	34.3	7.01	NA	*SANDY CLAY to SILTY CLAY
61.5	67.2	39.8	7.05	NA	*SANDY CLAY to SILTY CLAY
62.0	67.5	39.8	6.80	NA	*SANDY CLAY to SILTY CLAY
62.5	66.0	38.8	6.78	NA	*SANDY CLAY to SILTY CLAY
63.0	87.2	51.2	7.37	NA	*SANDY CLAY to SILTY CLAY
63.5	124.9	73.0	6.60	NA	*SANDY CLAY to SILTY CLAY
64.0	116.9	68.1	7.33	NA	*SANDY CLAY to SILTY CLAY
64.5	85.2	49.5	6.78	NA	*SANDY CLAY to SILTY CLAY
65.0	67.1	38.8	6.67	NA	*SANDY CLAY to SILTY CLAY
65.5	64.8	37.4	8.16	NA	*SANDY CLAY to SILTY CLAY
66.0	50.3	28.9	7.10	NA	*SANDY CLAY to SILTY CLAY
66.5	39.9	22.9	6.49	NA	*SANDY CLAY to SILTY CLAY
67.0	48.5	27.7	6.80	NA	*SANDY CLAY to SILTY CLAY
67.5	50.6	28.8	4.50	NA	CLAYEY SILT to SILTY CLAY
68.0	60.5	34.3	6.30	NA	*SANDY CLAY to SILTY CLAY
68.5	52.8	29.8	5.42	NA	*SANDY CLAY to SILTY CLAY
69.0	45.4	25.6	5.08	NA	CLAYEY SILT to SILTY CLAY
69.5	44.6	25.0	5.03	NA	CLAYEY SILT to SILTY CLAY
70.0	46.5	26.0	5.29	NA	CLAYEY SILT to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-81

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
70.5	48.9	27.3	5.41	NA	*SANDY CLAY to SILTY CLAY
71.0	79.5	44.2	4.50	NA	*SANDY CLAY to SILTY CLAY
71.5	91.7	50.8	6.36	NA	*SANDY CLAY to SILTY CLAY
72.0	63.3	34.9	4.95	NA	*SANDY CLAY to SILTY CLAY
72.5	76.3	42.0	4.22	NA	CLAYEY SILT to SILTY CLAY
73.0	109.2	59.9	5.67	NA	*SANDY CLAY to SILTY CLAY
73.5	82.5	45.1	5.04	NA	*SANDY CLAY to SILTY CLAY
74.0	70.7	38.5	3.24	NA	SANDY SILT to CLAYEY SILT
74.5	263.1	142.8	6.18	NA	*SANDY CLAY to SILTY CLAY
75.0	159.5	86.3	8.63	NA	*SANDY CLAY to SILTY CLAY
75.5	180.0	97.1	7.17	NA	*SANDY CLAY to SILTY CLAY
76.0	180.4	97.0	6.13	NA	*SANDY CLAY to SILTY CLAY
76.5	142.0	76.1	5.79	NA	*SANDY CLAY to SILTY CLAY
77.0	133.7	71.4	5.06	NA	*SANDY CLAY to SILTY CLAY
77.5	192.4	102.4	4.10	NA	*CLAYEY SAND to SANDY CLAY
78.0	211.1	112.0	4.08	NA	*CLAYEY SAND to SANDY CLAY
78.5	162.3	85.8	4.75	NA	*SANDY CLAY to SILTY CLAY
79.0	135.6	71.5	2.99	NA	SANDY SILT to CLAYEY SILT
79.5	139.6	73.3	2.94	NA	SANDY SILT to CLAYEY SILT
80.0	173.4	90.8	4.93	NA	*SANDY CLAY to SILTY CLAY
80.5	217.0	113.2	4.32	NA	*CLAYEY SAND to SANDY CLAY
81.0	257.2	133.8	2.93	NA	*SILTY SAND to CLAYEY SAND
81.5	245.2	127.1	5.73	NA	*SANDY CLAY to SILTY CLAY
82.0	235.9	121.9	7.21	NA	*SANDY CLAY to SILTY CLAY
82.5	253.0	130.3	6.65	NA	*SANDY CLAY to SILTY CLAY
83.0	374.1	192.0	3.59	NA	*CLAYEY SAND to SANDY CLAY
83.5	399.3	204.3	3.18	NA	*SILTY SAND to CLAYEY SAND
84.0	236.2	120.4	5.98	NA	*SANDY CLAY to SILTY CLAY
84.5	262.7	133.5	7.32	NA	*SANDY CLAY to SILTY CLAY
85.0	313.8	158.9	6.43	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

```
*****  
*                                     *  
*               CONE PENETRATION TEST                *  
*                                     *  
* SOUNDING   : CPT-82                      PROJECT NO : 92-381-01110 *  
* PROJECT    : D&M/UPRR-II                 INSTRUMENT  : F15CKE095  *  
* LOCATION   : SACRAMENTO CA              SYSTEM      : T-1       *  
* DATE       : 05-28-1992                 OPERATOR     : MR/DH      *  
*                                     *  
*****
```

NA = NOT APPLICABLE
*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL
ASSUMED TOTAL UNIT WT = 110 PCF
ASSUMED DEPTH OF WATER TABLE = 35.0 FT

DEPTH	TIP RESISTANCE	NORMALIZED	FRICTION	CONE PORE	SOIL BEHAVIOR TYPE
(ft)	(tsf)	TIP RESISTANCE	RATIO	PRESSURE	
		(tsf)	(%)	(tsf)	
20.5	37.3	35.4	6.92	NA	*SANDY CLAY to SILTY CLAY
21.0	53.7	50.4	7.64	NA	*SANDY CLAY to SILTY CLAY
21.5	363.8	337.4	7.34	NA	*HEAVILY O.C./CEMENT. MAT.
22.0	385.1	353.2	5.52	NA	*HEAVILY O.C./CEMENT. MAT.
22.5	385.3	349.6	5.66	NA	*HEAVILY O.C./CEMENT. MAT.
23.0	446.5	400.9	5.01	NA	*HEAVILY O.C./CEMENT. MAT.

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

```
*****  
*                                     *  
*          CONE PENETRATION TEST      *  
*                                     *  
* SOUNDING : CPT-82A                 PROJECT NO : 92-381-01110 *  
* PROJECT   : D&M/UPRR-II            INSTRUMENT  : F15CKE095  *  
* LOCATION  : SACRAMENTO CA          SYSTEM      : T-1        *  
* DATE      : 05-28-1992             OPERATOR    : MR/DH     *  
*                                     *  
*****
```

DEPTH	TIP RESISTANCE	NORMALIZED	FRICTION	CONE PORE	SOIL BEHAVIOR TYPE
(ft)	(tsf)	TIP RESISTANCE	RATIO	PRESSURE	
		(tsf)	(%)	(tsf)	
.0	.0	.0	.00	NA	
.5	108.0	276.6	3.61	NA	*CLAYEY SAND to SANDY CLAY
1.0	246.5	557.1	3.92	NA	*HEAVILY O.C./CEMENT. MAT.
1.5	177.7	370.2	5.27	NA	*HEAVILY O.C./CEMENT. MAT.
2.0	134.4	263.2	4.36	NA	*CLAYEY SAND to SANDY CLAY
2.5	75.1	139.9	4.95	NA	*SANDY CLAY to SILTY CLAY
3.0	51.0	90.9	4.54	NA	*SANDY CLAY to SILTY CLAY
3.5	55.1	94.5	3.16	NA	*CLAYEY SAND to SANDY CLAY
4.0	97.4	161.4	3.98	NA	*CLAYEY SAND to SANDY CLAY
4.5	224.7	360.9	7.73	NA	*HEAVILY O.C./CEMENT. MAT.
5.0	234.0	365.2	9.06	NA	*HEAVILY O.C./CEMENT. MAT.
5.5	112.1	170.3	7.15	NA	*HEAVILY O.C./CEMENT. MAT.
6.0	117.8	174.5	6.71	NA	*SANDY CLAY to SILTY CLAY
6.5	118.0	170.7	7.70	NA	*HEAVILY O.C./CEMENT. MAT.
7.0	162.2	229.4	7.03	NA	*HEAVILY O.C./CEMENT. MAT.
7.5	204.1	282.6	6.73	NA	*HEAVILY O.C./CEMENT. MAT.
8.0	158.2	214.5	5.06	NA	*SANDY CLAY to SILTY CLAY
8.5	169.6	225.6	4.44	NA	*CLAYEY SAND to SANDY CLAY
9.0	171.7	224.1	5.83	NA	*HEAVILY O.C./CEMENT. MAT.
9.5	140.5	180.1	6.18	NA	*SANDY CLAY to SILTY CLAY
10.0	120.2	151.4	6.73	NA	*SANDY CLAY to SILTY CLAY
10.5	105.2	130.3	6.59	NA	*SANDY CLAY to SILTY CLAY
11.0	77.8	94.8	6.11	NA	*SANDY CLAY to SILTY CLAY
11.5	135.1	162.0	6.46	NA	*SANDY CLAY to SILTY CLAY
12.0	146.3	172.7	7.56	NA	*HEAVILY O.C./CEMENT. MAT.
12.5	138.7	161.2	9.07	NA	*HEAVILY O.C./CEMENT. MAT.
13.0	169.9	194.6	7.39	NA	*HEAVILY O.C./CEMENT. MAT.
13.5	186.2	210.3	8.22	NA	*HEAVILY O.C./CEMENT. MAT.
14.0	150.7	167.8	8.27	NA	*HEAVILY O.C./CEMENT. MAT.
14.5	95.1	104.4	7.89	NA	*SANDY CLAY to SILTY CLAY
15.0	88.9	96.3	6.50	NA	*SANDY CLAY to SILTY CLAY
15.5	79.4	84.9	6.70	NA	*SANDY CLAY to SILTY CLAY
16.0	71.7	75.7	6.56	NA	*SANDY CLAY to SILTY CLAY
16.5	71.8	74.9	7.01	NA	*SANDY CLAY to SILTY CLAY
17.0	78.7	81.0	6.39	NA	*SANDY CLAY to SILTY CLAY
17.5	76.1	77.4	6.31	NA	*SANDY CLAY to SILTY CLAY
18.0	73.6	73.9	6.80	NA	*SANDY CLAY to SILTY CLAY
18.5	70.1	69.5	6.92	NA	*SANDY CLAY to SILTY CLAY
19.0	63.5	62.3	7.30	NA	*SANDY CLAY to SILTY CLAY
19.5	56.9	55.2	7.10	NA	*SANDY CLAY to SILTY CLAY
20.0	64.3	61.7	6.82	NA	*SANDY CLAY to SILTY CLAY

The Earth Technology Corporation

SOUNDING : CPT-82A

DEPTH	TIP RESISTANCE	NORMALIZED	FRICTION	CONE PORE	SOIL BEHAVIOR TYPE
(ft)	(tsf)	TIP RESISTANCE (tsf)	RATIO (%)	PRESSURE (tsf)	
20.5	57.6	54.6	7.02	NA	*SANDY CLAY to SILTY CLAY
21.0	51.4	48.1	7.17	NA	*SANDY CLAY to SILTY CLAY
21.5	51.6	47.8	7.29	NA	*SANDY CLAY to SILTY CLAY
22.0	107.6	98.7	6.06	NA	*SANDY CLAY to SILTY CLAY
22.5	421.3	382.3	8.99	NA	*HEAVILY O.C./CEMENT. MAT.
23.0	359.9	323.1	10.49	NA	*HEAVILY O.C./CEMENT. MAT.
23.5	179.8	159.8	9.36	NA	*HEAVILY O.C./CEMENT. MAT.
24.0	149.3	131.3	9.84	NA	*SANDY CLAY to SILTY CLAY
24.5	88.9	77.4	7.19	NA	*SANDY CLAY to SILTY CLAY
25.0	124.9	107.6	6.59	NA	*SANDY CLAY to SILTY CLAY
25.5	174.1	148.5	6.78	NA	*SANDY CLAY to SILTY CLAY
26.0	173.5	146.6	6.57	NA	*SANDY CLAY to SILTY CLAY
26.5	136.9	114.5	6.95	NA	*SANDY CLAY to SILTY CLAY
27.0	88.6	73.4	6.52	NA	*SANDY CLAY to SILTY CLAY
27.5	64.9	53.2	6.20	NA	*SANDY CLAY to SILTY CLAY
28.0	42.6	34.6	6.88	NA	*SANDY CLAY to SILTY CLAY
28.5	51.8	41.7	6.50	NA	*SANDY CLAY to SILTY CLAY
29.0	47.4	37.8	7.59	NA	*SANDY CLAY to SILTY CLAY
29.5	49.3	38.9	5.76	NA	*SANDY CLAY to SILTY CLAY
30.0	78.8	61.6	6.28	NA	*SANDY CLAY to SILTY CLAY
30.5	94.3	73.1	6.87	NA	*SANDY CLAY to SILTY CLAY
31.0	85.3	65.5	7.72	NA	*SANDY CLAY to SILTY CLAY
31.5	65.4	49.8	8.94	NA	*SANDY CLAY to SILTY CLAY
32.0	50.2	37.9	5.87	NA	*SANDY CLAY to SILTY CLAY
32.5	47.6	35.6	6.35	NA	*SANDY CLAY to SILTY CLAY
33.0	45.0	33.4	6.82	NA	*SANDY CLAY to SILTY CLAY
33.5	59.4	43.6	5.48	NA	*SANDY CLAY to SILTY CLAY
34.0	75.1	54.7	7.67	NA	*SANDY CLAY to SILTY CLAY
34.5	57.3	41.4	9.32	NA	*SANDY CLAY to SILTY CLAY
35.0	95.1	68.1	6.15	NA	*SANDY CLAY to SILTY CLAY
35.5	51.6	36.8	8.62	NA	*SANDY CLAY to SILTY CLAY
36.0	42.7	30.3	5.27	NA	*SANDY CLAY to SILTY CLAY
36.5	58.2	41.2	5.66	NA	*SANDY CLAY to SILTY CLAY
37.0	68.9	48.5	5.76	NA	*SANDY CLAY to SILTY CLAY
37.5	69.2	48.6	6.20	NA	*SANDY CLAY to SILTY CLAY
38.0	66.2	46.3	4.79	NA	*SANDY CLAY to SILTY CLAY
38.5	52.9	36.9	5.50	NA	*SANDY CLAY to SILTY CLAY
39.0	49.6	34.5	7.13	NA	*SANDY CLAY to SILTY CLAY
39.5	58.2	40.3	8.66	NA	*SANDY CLAY to SILTY CLAY
40.0	68.7	47.3	7.18	NA	*SANDY CLAY to SILTY CLAY
40.5	44.2	30.4	6.29	NA	*SANDY CLAY to SILTY CLAY
41.0	37.1	25.4	5.95	NA	*SANDY CLAY to SILTY CLAY
41.5	61.5	41.9	4.82	NA	*SANDY CLAY to SILTY CLAY
42.0	92.9	63.1	6.34	NA	*SANDY CLAY to SILTY CLAY
42.5	131.1	88.7	4.19	NA	*CLAYEY SAND to SANDY CLAY
43.0	138.9	93.7	3.61	NA	*CLAYEY SAND to SANDY CLAY
43.5	121.4	81.6	3.51	NA	*CLAYEY SAND to SANDY CLAY
44.0	102.5	68.7	3.87	NA	*CLAYEY SAND to SANDY CLAY
44.5	66.4	44.3	7.30	NA	*SANDY CLAY to SILTY CLAY
45.0	42.6	28.3	8.55	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
45.5	36.0	23.8	8.59	NA	*SANDY CLAY to SILTY CLAY
46.0	44.2	29.2	6.32	NA	*SANDY CLAY to SILTY CLAY
46.5	50.5	33.2	5.92	NA	*SANDY CLAY to SILTY CLAY
47.0	54.1	35.5	5.34	NA	*SANDY CLAY to SILTY CLAY
47.5	108.9	71.1	6.92	NA	*SANDY CLAY to SILTY CLAY
48.0	83.3	54.2	8.87	NA	*SANDY CLAY to SILTY CLAY
48.5	91.6	59.4	9.57	NA	*SANDY CLAY to SILTY CLAY
49.0	59.4	38.4	8.48	NA	*SANDY CLAY to SILTY CLAY
49.5	131.2	84.5	6.32	NA	*SANDY CLAY to SILTY CLAY
50.0	87.9	56.4	7.81	NA	*SANDY CLAY to SILTY CLAY
50.5	137.8	88.1	6.00	NA	*SANDY CLAY to SILTY CLAY
51.0	86.0	54.8	8.57	NA	*SANDY CLAY to SILTY CLAY
51.5	52.2	33.1	6.27	NA	*SANDY CLAY to SILTY CLAY
52.0	48.5	30.7	5.45	NA	*SANDY CLAY to SILTY CLAY
52.5	49.8	31.4	5.88	NA	*SANDY CLAY to SILTY CLAY
53.0	42.7	26.8	6.23	NA	*SANDY CLAY to SILTY CLAY
53.5	31.0	19.4	6.22	NA	SILTY CLAY TO CLAY
54.0	32.0	19.9	6.07	NA	SILTY CLAY TO CLAY
54.5	33.3	20.7	6.48	NA	SILTY CLAY TO CLAY
55.0	39.3	24.4	6.11	NA	*SANDY CLAY to SILTY CLAY
55.5	44.6	27.5	7.50	NA	*SANDY CLAY to SILTY CLAY
56.0	38.5	23.7	6.66	NA	*SANDY CLAY to SILTY CLAY
56.5	17.9	11.0	7.53	NA	SILTY CLAY TO CLAY
57.0	13.3	8.2	4.61	NA	CLAYEY SILT to SILTY CLAY
57.5	15.3	9.3	4.10	NA	CLAYEY SILT to SILTY CLAY
58.0	17.9	10.8	4.65	NA	CLAYEY SILT to SILTY CLAY
58.5	20.3	12.3	5.27	NA	SILTY CLAY TO CLAY
59.0	18.2	10.9	5.89	NA	SILTY CLAY TO CLAY
59.5	18.1	10.9	5.91	NA	SILTY CLAY TO CLAY
60.0	30.7	18.4	5.56	NA	SILTY CLAY TO CLAY
60.5	49.6	29.6	6.56	NA	*SANDY CLAY to SILTY CLAY
61.0	48.6	28.9	8.38	NA	*SANDY CLAY to SILTY CLAY
61.5	31.4	18.6	5.82	NA	SILTY CLAY TO CLAY
62.0	57.7	34.1	5.70	NA	*SANDY CLAY to SILTY CLAY
62.5	66.7	39.2	7.77	NA	*SANDY CLAY to SILTY CLAY
63.0	49.0	28.7	7.76	NA	*SANDY CLAY to SILTY CLAY
63.5	46.1	26.9	6.43	NA	*SANDY CLAY to SILTY CLAY
64.0	52.1	30.4	6.39	NA	*SANDY CLAY to SILTY CLAY
64.5	47.3	27.5	6.69	NA	*SANDY CLAY to SILTY CLAY
65.0	39.3	22.8	6.59	NA	*SANDY CLAY to SILTY CLAY
65.5	28.5	16.4	6.27	NA	SILTY CLAY TO CLAY
66.0	30.0	17.3	5.20	NA	SILTY CLAY TO CLAY
66.5	35.3	20.2	6.14	NA	SILTY CLAY TO CLAY
67.0	100.7	57.5	4.66	NA	*SANDY CLAY to SILTY CLAY
67.5	67.5	38.4	6.51	NA	*SANDY CLAY to SILTY CLAY
68.0	106.4	60.3	5.34	NA	*SANDY CLAY to SILTY CLAY
68.5	107.3	60.6	5.77	NA	*SANDY CLAY to SILTY CLAY
69.0	117.4	66.1	5.14	NA	*SANDY CLAY to SILTY CLAY
69.5	146.9	82.5	5.86	NA	*SANDY CLAY to SILTY CLAY
70.0	154.1	86.2	10.38	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-82A

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
70.5	213.6	119.1	5.68	NA	*SANDY CLAY to SILTY CLAY
71.0	248.6	138.2	7.13	NA	*SANDY CLAY to SILTY CLAY
71.5	269.8	149.4	6.14	NA	*SANDY CLAY to SILTY CLAY
72.0	216.8	119.7	6.44	NA	*SANDY CLAY to SILTY CLAY
72.5	264.9	145.7	4.14	NA	*CLAYEY SAND to SANDY CLAY
73.0	348.4	191.0	3.96	NA	*CLAYEY SAND to SANDY CLAY
73.5	264.8	144.7	4.89	NA	*SANDY CLAY to SILTY CLAY
74.0	246.2	134.1	4.29	NA	*CLAYEY SAND to SANDY CLAY
74.5	233.8	126.9	3.44	NA	*CLAYEY SAND to SANDY CLAY
75.0	244.7	132.4	4.23	NA	*CLAYEY SAND to SANDY CLAY
75.5	237.1	127.9	3.87	NA	*CLAYEY SAND to SANDY CLAY
76.0	270.2	145.2	5.05	NA	*SANDY CLAY to SILTY CLAY
76.5	109.9	58.9	6.58	NA	*SANDY CLAY to SILTY CLAY
77.0	255.7	136.5	4.34	NA	*CLAYEY SAND to SANDY CLAY
77.5	233.9	124.5	3.35	NA	*CLAYEY SAND to SANDY CLAY
78.0	186.7	99.0	2.66	NA	SILTY SAND to SANDY SILT
78.5	136.9	72.4	2.88	NA	SANDY SILT to CLAYEY SILT
79.0	141.7	74.7	2.94	NA	SANDY SILT to CLAYEY SILT
79.5	190.8	100.2	3.03	NA	*CLAYEY SAND to SANDY CLAY
80.0	391.0	204.7	3.14	NA	*SILTY SAND to CLAYEY SAND
80.5	361.6	188.6	3.02	NA	*SILTY SAND to CLAYEY SAND
81.0	108.8	56.6	1.70	NA	SILTY SAND to SANDY SILT
81.5	136.0	70.5	2.77	NA	SANDY SILT to CLAYEY SILT

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

 *
 * **CONE PENETRATION TEST** *
 *
 * SOUNDING : CPT-87 PROJECT NO : 92-381-01110 *
 * PROJECT : D&M/UPRR-II INSTRUMENT : F15CKE095 *
 * LOCATION : SACRAMENTO CA SYSTEM : T-1 *
 * DATE : 06-01-1992 OPERATOR : MR/DH *
 *

PAGE 1 of 4

DEPTH	TIP RESISTANCE	NORMALIZED	FRICTION	CONE PORE	SOIL BEHAVIOR TYPE
(ft)	(tsf)	TIP RESISTANCE	RATIO	PRESSURE	
-----	-----	(tsf)	(%)	(tsf)	-----
.0	.0	.0	.00	NA	
.5	.0	.0	.00	NA	
1.0	.0	.0	.00	NA	
1.5	38.5	80.2	1.88	NA	SILTY SAND to SANDY SILT
2.0	24.1	47.2	6.18	NA	*SANDY CLAY to SILTY CLAY
2.5	31.5	58.6	6.61	NA	*SANDY CLAY to SILTY CLAY
3.0	81.8	145.8	4.23	NA	*CLAYEY SAND to SANDY CLAY
3.5	250.4	429.7	6.96	NA	*HEAVILY O.C./CEMENT. MAT.
4.0	175.9	291.6	9.51	NA	*HEAVILY O.C./CEMENT. MAT.
4.5	137.1	220.2	8.68	NA	*HEAVILY O.C./CEMENT. MAT.
5.0	108.3	169.1	8.32	NA	*HEAVILY O.C./CEMENT. MAT.
5.5	97.2	147.7	7.46	NA	*SANDY CLAY to SILTY CLAY
6.0	92.4	136.8	7.76	NA	*SANDY CLAY to SILTY CLAY
6.5	67.1	97.0	7.16	NA	*SANDY CLAY to SILTY CLAY
7.0	66.3	93.8	7.89	NA	*SANDY CLAY to SILTY CLAY
7.5	48.3	66.9	7.60	NA	*SANDY CLAY to SILTY CLAY
8.0	50.0	67.8	7.09	NA	*SANDY CLAY to SILTY CLAY
8.5	59.7	79.4	5.98	NA	*SANDY CLAY to SILTY CLAY
9.0	76.2	99.5	6.50	NA	*SANDY CLAY to SILTY CLAY
9.5	67.3	86.2	7.82	NA	*SANDY CLAY to SILTY CLAY
10.0	57.4	72.2	6.41	NA	*SANDY CLAY to SILTY CLAY
10.5	61.3	75.9	7.43	NA	*SANDY CLAY to SILTY CLAY
11.0	61.4	74.8	7.06	NA	*SANDY CLAY to SILTY CLAY
11.5	64.3	77.1	6.59	NA	*SANDY CLAY to SILTY CLAY
12.0	61.6	72.7	6.02	NA	*SANDY CLAY to SILTY CLAY
12.5	57.0	66.2	6.25	NA	*SANDY CLAY to SILTY CLAY
13.0	51.2	58.7	6.46	NA	*SANDY CLAY to SILTY CLAY
13.5	45.9	51.9	5.53	NA	*SANDY CLAY to SILTY CLAY
14.0	49.4	55.0	6.09	NA	*SANDY CLAY to SILTY CLAY
14.5	58.5	64.2	5.50	NA	*SANDY CLAY to SILTY CLAY
15.0	57.6	62.4	5.26	NA	*SANDY CLAY to SILTY CLAY
15.5	74.1	79.2	6.21	NA	*SANDY CLAY to SILTY CLAY
16.0	77.3	81.6	6.09	NA	*SANDY CLAY to SILTY CLAY
16.5	94.5	98.5	6.77	NA	*SANDY CLAY to SILTY CLAY
17.0	106.7	109.8	7.50	NA	*SANDY CLAY to SILTY CLAY
17.5	100.2	101.9	6.86	NA	*SANDY CLAY to SILTY CLAY
18.0	85.2	85.6	5.38	NA	*SANDY CLAY to SILTY CLAY
18.5	95.8	95.1	6.75	NA	*SANDY CLAY to SILTY CLAY
19.0	95.1	93.3	7.66	NA	*SANDY CLAY to SILTY CLAY
19.5	132.6	128.6	8.28	NA	*SANDY CLAY to SILTY CLAY
20.0	101.9	97.7	8.95	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE
 TOP 1.2 FT IS DISTURBED SOIL
 *INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL
 ASSUMED TOTAL UNIT WT = 110 PCF
 ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-87

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
20.5	84.3	79.9	8.73	NA	*SANDY CLAY to SILTY CLAY
21.0	78.2	73.3	6.27	NA	*SANDY CLAY to SILTY CLAY
21.5	117.7	109.1	7.26	NA	*SANDY CLAY to SILTY CLAY
22.0	103.8	95.2	5.51	NA	*SANDY CLAY to SILTY CLAY
22.5	81.3	73.8	7.07	NA	*SANDY CLAY to SILTY CLAY
23.0	65.8	59.1	7.31	NA	*SANDY CLAY to SILTY CLAY
23.5	87.1	77.4	5.59	NA	*SANDY CLAY to SILTY CLAY
24.0	87.0	76.5	5.47	NA	*SANDY CLAY to SILTY CLAY
24.5	104.2	90.7	5.40	NA	*SANDY CLAY to SILTY CLAY
25.0	96.0	82.7	5.82	NA	*SANDY CLAY to SILTY CLAY
25.5	142.2	121.3	5.49	NA	*SANDY CLAY to SILTY CLAY
26.0	124.6	105.2	5.75	NA	*SANDY CLAY to SILTY CLAY
26.5	72.1	60.3	6.06	NA	*SANDY CLAY to SILTY CLAY
27.0	77.1	63.9	7.49	NA	*SANDY CLAY to SILTY CLAY
27.5	99.5	81.6	6.39	NA	*SANDY CLAY to SILTY CLAY
28.0	92.2	74.9	6.57	NA	*SANDY CLAY to SILTY CLAY
28.5	80.5	64.8	8.01	NA	*SANDY CLAY to SILTY CLAY
29.0	67.4	53.8	9.73	NA	*SANDY CLAY to SILTY CLAY
29.5	62.0	49.0	7.63	NA	*SANDY CLAY to SILTY CLAY
30.0	71.5	55.9	10.10	NA	*SANDY CLAY to SILTY CLAY
30.5	65.5	50.8	9.01	NA	*SANDY CLAY to SILTY CLAY
31.0	66.1	50.8	10.13	NA	*SANDY CLAY to SILTY CLAY
31.5	76.3	58.1	9.51	NA	*SANDY CLAY to SILTY CLAY
32.0	59.7	45.0	9.18	NA	*SANDY CLAY to SILTY CLAY
32.5	67.3	50.3	8.02	NA	*SANDY CLAY to SILTY CLAY
33.0	66.1	49.0	6.86	NA	*SANDY CLAY to SILTY CLAY
33.5	68.4	50.3	5.44	NA	*SANDY CLAY to SILTY CLAY
34.0	73.0	53.1	5.98	NA	*SANDY CLAY to SILTY CLAY
34.5	53.4	38.5	4.89	NA	*SANDY CLAY to SILTY CLAY
35.0	57.0	40.8	4.75	NA	*SANDY CLAY to SILTY CLAY
35.5	58.9	42.0	5.15	NA	*SANDY CLAY to SILTY CLAY
36.0	82.5	58.6	7.41	NA	*SANDY CLAY to SILTY CLAY
36.5	168.7	119.3	9.42	NA	*SANDY CLAY to SILTY CLAY
37.0	134.5	94.8	9.46	NA	*SANDY CLAY to SILTY CLAY
37.5	124.8	87.7	7.82	NA	*SANDY CLAY to SILTY CLAY
38.0	115.3	80.6	7.16	NA	*SANDY CLAY to SILTY CLAY
38.5	130.3	90.8	7.60	NA	*SANDY CLAY to SILTY CLAY
39.0	199.1	138.3	4.57	NA	*CLAYEY SAND to SANDY CLAY
39.5	132.9	91.9	4.72	NA	*SANDY CLAY to SILTY CLAY
40.0	121.7	83.9	4.03	NA	*CLAYEY SAND to SANDY CLAY
40.5	150.1	103.1	3.79	NA	*CLAYEY SAND to SANDY CLAY
41.0	174.3	119.3	3.80	NA	*CLAYEY SAND to SANDY CLAY
41.5	154.6	105.4	5.52	NA	*SANDY CLAY to SILTY CLAY
42.0	66.7	45.3	9.54	NA	*SANDY CLAY to SILTY CLAY
42.5	46.8	31.7	6.53	NA	*SANDY CLAY to SILTY CLAY
43.0	44.2	29.8	5.98	NA	*SANDY CLAY to SILTY CLAY
43.5	38.2	25.7	5.04	NA	CLAYEY SILT to SILTY CLAY
44.0	34.0	22.8	4.66	NA	CLAYEY SILT to SILTY CLAY
44.5	46.8	31.3	4.66	NA	CLAYEY SILT to SILTY CLAY
45.0	46.4	30.9	4.42	NA	CLAYEY SILT to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-87

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
45.5	46.0	30.5	5.00	NA	*SANDY CLAY to SILTY CLAY
46.0	44.4	29.3	4.53	NA	CLAYEY SILT to SILTY CLAY
46.5	52.3	34.4	4.85	NA	*SANDY CLAY to SILTY CLAY
47.0	49.5	32.5	5.09	NA	*SANDY CLAY to SILTY CLAY
47.5	46.3	30.2	4.60	NA	CLAYEY SILT to SILTY CLAY
48.0	45.9	29.8	4.67	NA	CLAYEY SILT to SILTY CLAY
48.5	46.9	30.4	4.21	NA	CLAYEY SILT to SILTY CLAY
49.0	48.0	31.0	4.83	NA	CLAYEY SILT to SILTY CLAY
49.5	46.2	29.8	5.05	NA	*SANDY CLAY to SILTY CLAY
50.0	40.1	25.7	5.12	NA	CLAYEY SILT to SILTY CLAY
50.5	30.7	19.6	4.76	NA	CLAYEY SILT to SILTY CLAY
51.0	28.2	18.0	4.79	NA	CLAYEY SILT to SILTY CLAY
51.5	26.7	17.0	4.88	NA	CLAYEY SILT to SILTY CLAY
52.0	26.6	16.8	4.64	NA	CLAYEY SILT to SILTY CLAY
52.5	26.3	16.6	4.58	NA	CLAYEY SILT to SILTY CLAY
53.0	28.9	18.2	4.97	NA	CLAYEY SILT to SILTY CLAY
53.5	29.7	18.6	4.29	NA	CLAYEY SILT to SILTY CLAY
54.0	30.8	19.2	4.07	NA	CLAYEY SILT to SILTY CLAY
54.5	40.0	24.9	5.13	NA	CLAYEY SILT to SILTY CLAY
55.0	41.6	25.8	6.96	NA	*SANDY CLAY to SILTY CLAY
55.5	48.9	30.2	6.44	NA	*SANDY CLAY to SILTY CLAY
56.0	53.9	33.2	6.89	NA	*SANDY CLAY to SILTY CLAY
56.5	50.5	31.0	8.49	NA	*SANDY CLAY to SILTY CLAY
57.0	72.6	44.4	6.55	NA	*SANDY CLAY to SILTY CLAY
57.5	86.9	52.9	5.23	NA	*SANDY CLAY to SILTY CLAY
58.0	66.4	40.3	5.17	NA	*SANDY CLAY to SILTY CLAY
58.5	61.1	36.9	5.15	NA	*SANDY CLAY to SILTY CLAY
59.0	46.2	27.9	5.65	NA	*SANDY CLAY to SILTY CLAY
59.5	57.8	34.7	7.61	NA	*SANDY CLAY to SILTY CLAY
60.0	165.7	99.2	4.77	NA	*SANDY CLAY to SILTY CLAY
60.5	302.4	180.4	2.48	NA	*SILTY SAND to CLAYEY SAND
61.0	352.8	209.8	2.35	NA	*SILTY SAND to CLAYEY SAND
61.5	324.0	191.9	1.25	NA	SAND to SILTY SAND
62.0	301.9	178.3	2.21	NA	SILTY SAND to SANDY SILT
62.5	285.5	168.0	1.27	NA	SAND to SILTY SAND
63.0	316.8	185.8	1.25	NA	SAND to SILTY SAND
63.5	234.1	136.8	1.25	NA	SAND to SILTY SAND
64.0	222.1	129.4	1.38	NA	SAND to SILTY SAND
64.5	252.6	146.6	1.69	NA	SAND to SILTY SAND
65.0	291.8	168.8	1.61	NA	SAND to SILTY SAND
65.5	320.1	184.6	1.05	NA	SAND to SILTY SAND
66.0	319.2	183.4	1.72	NA	SAND to SILTY SAND
66.5	236.9	135.7	2.49	NA	SILTY SAND to SANDY SILT
67.0	242.9	138.7	1.56	NA	SAND to SILTY SAND
67.5	263.3	149.8	1.27	NA	SAND to SILTY SAND
68.0	286.0	162.1	2.36	NA	SILTY SAND to SANDY SILT
68.5	281.2	158.9	2.07	NA	SILTY SAND to SANDY SILT
69.0	284.4	160.2	2.48	NA	SILTY SAND to SANDY SILT
69.5	237.6	133.4	4.92	NA	*SANDY CLAY to SILTY CLAY
70.0	77.0	43.0	3.85	NA	SANDY SILT to CLAYEY SILT

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-87

DEPTH	TIP RESISTANCE	NORMALIZED	FRICTION	CONE PORE	SOIL BEHAVIOR TYPE
(ft)	(tsf)	TIP RESISTANCE	RATIO	PRESSURE	
		(tsf)	(%)	(tsf)	
70.5	61.8	34.4	3.19	NA	SANDY SILT to CLAYEY SILT
71.0	55.4	30.8	3.17	NA	SANDY SILT to CLAYEY SILT
71.5	49.3	27.3	2.90	NA	SANDY SILT to CLAYEY SILT
72.0	53.2	29.4	2.38	NA	SANDY SILT to CLAYEY SILT
72.5	55.4	30.5	2.77	NA	SANDY SILT to CLAYEY SILT
73.0	61.0	33.4	3.04	NA	SANDY SILT to CLAYEY SILT
73.5	71.1	38.9	3.50	NA	SANDY SILT to CLAYEY SILT
74.0	73.2	39.9	3.51	NA	SANDY SILT to CLAYEY SILT
74.5	67.2	36.5	3.47	NA	SANDY SILT to CLAYEY SILT
75.0	66.9	36.2	2.92	NA	SANDY SILT to CLAYEY SILT
75.5	74.7	40.3	2.04	NA	SILTY SAND to SANDY SILT
76.0	87.1	46.8	4.95	NA	*SANDY CLAY to SILTY CLAY
76.5	83.7	44.8	4.14	NA	CLAYEY SILT to SILTY CLAY
77.0	92.2	49.2	4.54	NA	*SANDY CLAY to SILTY CLAY
77.5	111.4	59.3	5.16	NA	*SANDY CLAY to SILTY CLAY
78.0	126.0	66.8	7.49	NA	*SANDY CLAY to SILTY CLAY
78.5	120.7	63.8	7.21	NA	*SANDY CLAY to SILTY CLAY
79.0	227.7	120.0	6.86	NA	*SANDY CLAY to SILTY CLAY
79.5	340.6	178.9	2.71	NA	*SILTY SAND to CLAYEY SAND
80.0	152.6	79.9	6.19	NA	*SANDY CLAY to SILTY CLAY
80.5	241.2	125.9	5.31	NA	*SANDY CLAY to SILTY CLAY
81.0	219.1	114.0	4.83	NA	*SANDY CLAY to SILTY CLAY
81.5	155.8	80.7	4.84	NA	*SANDY CLAY to SILTY CLAY
82.0	157.5	81.4	3.32	NA	*CLAYEY SAND to SANDY CLAY
82.5	378.6	194.9	6.43	NA	*HEAVILY O.C./CEMENT. MAT.
83.0	553.2	283.9	5.16	NA	*HEAVILY O.C./CEMENT. MAT.

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

 *
 * **CONE PENETRATION TEST** *
 *
 * SOUNDING : CPT-88 PROJECT NO : 92-381-01110 *
 * PROJECT : D&M/UPRR-II INSTRUMENT : F15CKE095 *
 * LOCATION : SACRAMENTO CA SYSTEM : T-1 *
 * DATE : 06-02-1992 OPERATOR : MR/DH *
 *

PAGE 1 of 4

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
.0	.0	.0	.00	NA	
.5	.0	.0	.00	NA	
1.0	.0	.0	.00	NA	
1.5	21.8	45.5	5.67	NA	*SANDY CLAY to SILTY CLAY
2.0	28.3	55.4	6.71	NA	*SANDY CLAY to SILTY CLAY
2.5	36.5	67.9	6.51	NA	*SANDY CLAY to SILTY CLAY
3.0	50.5	90.1	6.56	NA	*SANDY CLAY to SILTY CLAY
3.5	61.1	104.8	6.79	NA	*SANDY CLAY to SILTY CLAY
4.0	63.0	104.5	5.98	NA	*SANDY CLAY to SILTY CLAY
4.5	83.7	134.4	6.19	NA	*SANDY CLAY to SILTY CLAY
5.0	106.4	166.1	6.39	NA	*SANDY CLAY to SILTY CLAY
5.5	118.6	180.2	6.04	NA	*SANDY CLAY to SILTY CLAY
6.0	133.3	197.5	5.80	NA	*SANDY CLAY to SILTY CLAY
6.5	152.9	221.3	6.62	NA	*HEAVILY O.C./CEMENT. MAT.
7.0	180.2	254.9	7.62	NA	*HEAVILY O.C./CEMENT. MAT.
7.5	126.8	175.6	7.60	NA	*HEAVILY O.C./CEMENT. MAT.
8.0	128.1	173.7	8.17	NA	*HEAVILY O.C./CEMENT. MAT.
8.5	96.9	128.9	7.82	NA	*SANDY CLAY to SILTY CLAY
9.0	81.1	105.8	7.62	NA	*SANDY CLAY to SILTY CLAY
9.5	73.5	94.2	6.77	NA	*SANDY CLAY to SILTY CLAY
10.0	80.3	101.2	6.50	NA	*SANDY CLAY to SILTY CLAY
10.5	86.0	106.5	7.28	NA	*SANDY CLAY to SILTY CLAY
11.0	53.0	64.6	7.94	NA	*SANDY CLAY to SILTY CLAY
11.5	53.9	64.7	6.30	NA	*SANDY CLAY to SILTY CLAY
12.0	52.7	62.2	8.19	NA	*SANDY CLAY to SILTY CLAY
12.5	50.4	58.6	8.26	NA	*SANDY CLAY to SILTY CLAY
13.0	40.6	46.5	6.23	NA	*SANDY CLAY to SILTY CLAY
13.5	50.5	57.0	6.65	NA	*SANDY CLAY to SILTY CLAY
14.0	60.7	67.6	7.14	NA	*SANDY CLAY to SILTY CLAY
14.5	53.9	59.2	6.34	NA	*SANDY CLAY to SILTY CLAY
15.0	185.3	200.8	8.44	NA	*HEAVILY O.C./CEMENT. MAT.
15.5	113.5	121.4	7.03	NA	*SANDY CLAY to SILTY CLAY
16.0	116.7	123.2	7.34	NA	*SANDY CLAY to SILTY CLAY
16.5	121.3	126.4	6.31	NA	*SANDY CLAY to SILTY CLAY
17.0	196.3	202.0	7.90	NA	*HEAVILY O.C./CEMENT. MAT.
17.5	298.2	303.1	7.31	NA	*HEAVILY O.C./CEMENT. MAT.
18.0	250.8	251.9	7.77	NA	*HEAVILY O.C./CEMENT. MAT.
18.5	323.2	320.7	7.02	NA	*HEAVILY O.C./CEMENT. MAT.
19.0	186.4	182.8	6.17	NA	*SANDY CLAY to SILTY CLAY
19.5	168.4	163.3	7.26	NA	*SANDY CLAY to SILTY CLAY
20.0	168.6	161.6	4.59	NA	*CLAYEY SAND to SANDY CLAY

NA = NOT APPLICABLE
 TOP 1.0 FT IS DISTURBED SOIL
 *INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL
 ASSUMED TOTAL UNIT WT = 110 PCF
 ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-88

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
20.5	126.9	120.3	3.88	NA	*CLAYEY SAND to SANDY CLAY
21.0	168.0	157.5	5.08	NA	*SANDY CLAY to SILTY CLAY
21.5	162.4	150.5	7.00	NA	*SANDY CLAY to SILTY CLAY
22.0	139.8	128.2	6.81	NA	*SANDY CLAY to SILTY CLAY
22.5	199.5	181.0	5.05	NA	*SANDY CLAY to SILTY CLAY
23.0	133.3	119.7	6.21	NA	*SANDY CLAY to SILTY CLAY
23.5	126.5	112.4	5.32	NA	*SANDY CLAY to SILTY CLAY
24.0	119.7	105.3	6.17	NA	*SANDY CLAY to SILTY CLAY
24.5	93.5	81.4	6.95	NA	*SANDY CLAY to SILTY CLAY
25.0	86.8	74.8	5.90	NA	*SANDY CLAY to SILTY CLAY
25.5	69.1	59.0	7.03	NA	*SANDY CLAY to SILTY CLAY
26.0	56.1	47.4	7.16	NA	*SANDY CLAY to SILTY CLAY
26.5	81.2	67.9	4.88	NA	*SANDY CLAY to SILTY CLAY
27.0	92.3	76.4	5.49	NA	*SANDY CLAY to SILTY CLAY
27.5	71.6	58.7	6.21	NA	*SANDY CLAY to SILTY CLAY
28.0	90.6	73.6	5.63	NA	*SANDY CLAY to SILTY CLAY
28.5	101.8	81.9	6.66	NA	*SANDY CLAY to SILTY CLAY
29.0	94.1	75.0	8.77	NA	*SANDY CLAY to SILTY CLAY
29.5	68.8	54.3	8.69	NA	*SANDY CLAY to SILTY CLAY
30.0	62.4	48.8	9.99	NA	*SANDY CLAY to SILTY CLAY
30.5	64.2	49.7	9.09	NA	*SANDY CLAY to SILTY CLAY
31.0	53.3	40.9	8.80	NA	*SANDY CLAY to SILTY CLAY
31.5	60.1	45.8	8.51	NA	*SANDY CLAY to SILTY CLAY
32.0	64.3	48.5	9.23	NA	*SANDY CLAY to SILTY CLAY
32.5	90.2	67.4	8.22	NA	*SANDY CLAY to SILTY CLAY
33.0	49.2	36.5	13.73	NA	*SANDY CLAY to SILTY CLAY
33.5	77.9	57.2	10.52	NA	*SANDY CLAY to SILTY CLAY
34.0	80.7	58.8	9.86	NA	*SANDY CLAY to SILTY CLAY
34.5	77.1	55.6	10.68	NA	*SANDY CLAY to SILTY CLAY
35.0	59.5	42.6	10.89	NA	*SANDY CLAY to SILTY CLAY
35.5	83.7	59.7	10.36	NA	*SANDY CLAY to SILTY CLAY
36.0	73.6	52.2	7.39	NA	*SANDY CLAY to SILTY CLAY
36.5	65.9	46.6	6.33	NA	*SANDY CLAY to SILTY CLAY
37.0	55.3	39.0	5.93	NA	*SANDY CLAY to SILTY CLAY
37.5	55.7	39.1	5.68	NA	*SANDY CLAY to SILTY CLAY
38.0	81.3	56.9	5.23	NA	*SANDY CLAY to SILTY CLAY
38.5	80.7	56.2	6.21	NA	*SANDY CLAY to SILTY CLAY
39.0	83.7	58.1	5.80	NA	*SANDY CLAY to SILTY CLAY
39.5	92.0	63.6	7.75	NA	*SANDY CLAY to SILTY CLAY
40.0	89.1	61.5	9.65	NA	*SANDY CLAY to SILTY CLAY
40.5	98.2	67.4	9.82	NA	*SANDY CLAY to SILTY CLAY
41.0	95.3	65.2	9.68	NA	*SANDY CLAY to SILTY CLAY
41.5	85.5	58.3	9.49	NA	*SANDY CLAY to SILTY CLAY
42.0	89.0	60.5	9.32	NA	*SANDY CLAY to SILTY CLAY
42.5	117.6	79.6	6.94	NA	*SANDY CLAY to SILTY CLAY
43.0	134.9	91.0	4.93	NA	*SANDY CLAY to SILTY CLAY
43.5	134.0	90.1	4.39	NA	*CLAYEY SAND to SANDY CLAY
44.0	114.0	76.4	6.08	NA	*SANDY CLAY to SILTY CLAY
44.5	128.9	86.0	5.49	NA	*SANDY CLAY to SILTY CLAY
45.0	116.2	77.3	4.61	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
45.5	119.2	79.0	4.59	NA	*SANDY CLAY to SILTY CLAY
46.0	104.2	68.8	7.36	NA	*SANDY CLAY to SILTY CLAY
46.5	113.2	74.5	5.98	NA	*SANDY CLAY to SILTY CLAY
47.0	150.3	98.5	4.67	NA	*SANDY CLAY to SILTY CLAY
47.5	127.1	83.0	6.00	NA	*SANDY CLAY to SILTY CLAY
48.0	98.6	64.2	6.88	NA	*SANDY CLAY to SILTY CLAY
48.5	111.7	72.5	6.31	NA	*SANDY CLAY to SILTY CLAY
49.0	147.5	95.3	5.86	NA	*SANDY CLAY to SILTY CLAY
49.5	116.1	74.8	8.43	NA	*SANDY CLAY to SILTY CLAY
50.0	148.7	95.4	7.44	NA	*SANDY CLAY to SILTY CLAY
50.5	96.3	61.6	7.57	NA	*SANDY CLAY to SILTY CLAY
51.0	101.3	64.6	8.19	NA	*SANDY CLAY to SILTY CLAY
51.5	83.7	53.1	5.62	NA	*SANDY CLAY to SILTY CLAY
52.0	82.8	52.4	6.09	NA	*SANDY CLAY to SILTY CLAY
52.5	80.7	50.9	4.52	NA	*SANDY CLAY to SILTY CLAY
53.0	79.3	49.8	4.11	NA	*SANDY CLAY to SILTY CLAY
53.5	74.8	46.8	4.66	NA	*SANDY CLAY to SILTY CLAY
54.0	53.9	33.7	4.46	NA	CLAYEY SILT to SILTY CLAY
54.5	47.9	29.8	4.67	NA	CLAYEY SILT to SILTY CLAY
55.0	38.7	24.0	5.30	NA	CLAYEY SILT to SILTY CLAY
55.5	32.3	19.9	5.94	NA	SILTY CLAY to CLAY
56.0	25.2	15.5	6.01	NA	SILTY CLAY to CLAY
56.5	25.8	15.8	5.87	NA	SILTY CLAY to CLAY
57.0	13.4	8.2	6.82	NA	SILTY CLAY to CLAY
57.5	9.6	5.8	7.05	NA	SILTY CLAY to CLAY
58.0	22.7	13.8	7.18	NA	SILTY CLAY to CLAY
58.5	62.9	38.0	5.46	NA	*SANDY CLAY to SILTY CLAY
59.0	76.9	46.3	5.65	NA	*SANDY CLAY to SILTY CLAY
59.5	78.0	46.8	6.51	NA	*SANDY CLAY to SILTY CLAY
60.0	73.5	44.0	5.72	NA	*SANDY CLAY to SILTY CLAY
60.5	94.1	56.1	6.42	NA	*SANDY CLAY to SILTY CLAY
61.0	86.4	51.4	8.10	NA	*SANDY CLAY to SILTY CLAY
61.5	60.2	35.7	8.51	NA	*SANDY CLAY to SILTY CLAY
62.0	45.2	26.7	6.33	NA	*SANDY CLAY to SILTY CLAY
62.5	51.2	30.1	4.87	NA	CLAYEY SILT to SILTY CLAY
63.0	55.8	32.7	6.01	NA	*SANDY CLAY to SILTY CLAY
63.5	51.3	30.0	6.41	NA	*SANDY CLAY to SILTY CLAY
64.0	50.3	29.3	6.70	NA	*SANDY CLAY to SILTY CLAY
64.5	45.9	26.6	6.46	NA	*SANDY CLAY to SILTY CLAY
65.0	47.2	27.3	5.75	NA	*SANDY CLAY to SILTY CLAY
65.5	61.2	35.3	4.90	NA	*SANDY CLAY to SILTY CLAY
66.0	73.0	41.9	6.86	NA	*SANDY CLAY to SILTY CLAY
66.5	73.6	42.2	6.16	NA	*SANDY CLAY to SILTY CLAY
67.0	70.4	40.2	5.08	NA	*SANDY CLAY to SILTY CLAY
67.5	80.0	45.5	5.33	NA	*SANDY CLAY to SILTY CLAY
68.0	83.8	47.5	4.90	NA	*SANDY CLAY to SILTY CLAY
68.5	79.4	44.9	5.21	NA	*SANDY CLAY to SILTY CLAY
69.0	72.9	41.1	5.20	NA	*SANDY CLAY to SILTY CLAY
69.5	149.8	84.1	9.72	NA	*SANDY CLAY to SILTY CLAY
70.0	178.9	100.1	9.92	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-88

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
70.5	281.3	156.9	6.90	NA	*SANDY CLAY to SILTY CLAY
71.0	213.5	118.6	8.43	NA	*SANDY CLAY to SILTY CLAY
71.5	139.9	77.5	7.72	NA	*SANDY CLAY to SILTY CLAY
72.0	253.8	140.1	7.64	NA	*SANDY CLAY to SILTY CLAY
72.5	336.6	185.2	6.06	NA	*SANDY CLAY to SILTY CLAY
73.0	278.0	152.4	4.68	NA	*SANDY CLAY to SILTY CLAY
73.5	208.2	113.8	2.96	NA	*SILTY SAND to CLAYEY SAND
74.0	182.0	99.1	3.10	NA	*CLAYEY SAND to SANDY CLAY
74.5	222.2	120.6	2.71	NA	SILTY SAND to SANDY SILT
75.0	212.1	114.8	3.41	NA	*CLAYEY SAND to SANDY CLAY
75.5	215.7	116.3	3.47	NA	*CLAYEY SAND to SANDY CLAY
76.0	240.6	129.3	3.58	NA	*CLAYEY SAND to SANDY CLAY
76.5	317.2	169.9	3.87	NA	*CLAYEY SAND to SANDY CLAY
77.0	278.4	148.6	5.08	NA	*SANDY CLAY to SILTY CLAY
77.5	497.4	264.7	5.12	NA	*HEAVILY O.C./CEMENT. MAT.

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

CONE PENETRATION TEST

* SOUNDING : CPT-89	* PROJECT NO : 92-381-01110
* PROJECT : D&M/UPRR-II	* INSTRUMENT : F15CKE095
* LOCATION : SACRAMENTO CA	* SYSTEM : T-1
* DATE : 06-02-1992	* OPERATOR : MR/DH

PAGE 1 of 4

DEPTH	TIP RESISTANCE	NORMALIZED	FRICTION	CONE PORE	SOIL BEHAVIOR TYPE
(ft)	(tsf)	TIP RESISTANCE	RATIO	PRESSURE	
		(tsf)	(%)	(tsf)	
.0	.0	.0	.00	NA	
.5	.0	.0	.00	NA	
1.0	.0	.0	.00	NA	
1.5	24.8	51.7	3.57	NA	SANDY SILT to CLAYEY SILT
2.0	19.8	38.8	3.54	NA	SANDY SILT to CLAYEY SILT
2.5	30.2	56.2	3.68	NA	SANDY SILT to CLAYEY SILT
3.0	48.1	85.8	4.92	NA	*SANDY CLAY to SILTY CLAY
3.5	60.0	103.0	6.44	NA	*SANDY CLAY to SILTY CLAY
4.0	61.2	101.4	5.03	NA	*SANDY CLAY to SILTY CLAY
4.5	70.2	112.7	4.80	NA	*SANDY CLAY to SILTY CLAY
5.0	88.6	138.2	5.26	NA	*SANDY CLAY to SILTY CLAY
5.5	141.5	215.1	5.09	NA	*SANDY CLAY to SILTY CLAY
6.0	119.6	177.2	5.88	NA	*SANDY CLAY to SILTY CLAY
6.5	92.4	133.7	6.15	NA	*SANDY CLAY to SILTY CLAY
7.0	87.0	123.0	7.15	NA	*SANDY CLAY to SILTY CLAY
7.5	69.3	95.9	5.86	NA	*SANDY CLAY to SILTY CLAY
8.0	60.9	82.6	5.77	NA	*SANDY CLAY to SILTY CLAY
8.5	61.6	81.9	5.95	NA	*SANDY CLAY to SILTY CLAY
9.0	55.2	72.0	7.56	NA	*SANDY CLAY to SILTY CLAY
9.5	59.7	76.5	5.69	NA	*SANDY CLAY to SILTY CLAY
10.0	57.7	72.7	6.49	NA	*SANDY CLAY to SILTY CLAY
10.5	46.7	57.8	5.71	NA	*SANDY CLAY to SILTY CLAY
11.0	45.1	54.9	5.67	NA	*SANDY CLAY to SILTY CLAY
11.5	43.9	52.7	5.91	NA	*SANDY CLAY to SILTY CLAY
12.0	39.7	46.9	6.45	NA	*SANDY CLAY to SILTY CLAY
12.5	38.9	45.2	5.41	NA	*SANDY CLAY to SILTY CLAY
13.0	28.8	33.0	6.61	NA	*SANDY CLAY to SILTY CLAY
13.5	14.6	16.5	8.81	NA	CLAY TO ORGANIC CLAY
14.0	10.5	11.6	7.48	NA	SILTY CLAY TO CLAY
14.5	34.5	37.9	5.72	NA	*SANDY CLAY to SILTY CLAY
15.0	32.2	34.9	7.87	NA	*SANDY CLAY to SILTY CLAY
15.5	39.9	42.7	7.15	NA	*SANDY CLAY to SILTY CLAY
16.0	87.1	91.9	6.69	NA	*SANDY CLAY to SILTY CLAY
16.5	107.2	111.8	6.53	NA	*SANDY CLAY to SILTY CLAY
17.0	101.1	104.1	7.00	NA	*SANDY CLAY to SILTY CLAY
17.5	100.6	102.3	6.05	NA	*SANDY CLAY to SILTY CLAY
18.0	91.5	91.9	5.89	NA	*SANDY CLAY to SILTY CLAY
18.5	89.8	89.2	5.53	NA	*SANDY CLAY to SILTY CLAY
19.0	114.3	112.1	6.12	NA	*SANDY CLAY to SILTY CLAY
19.5	144.5	140.1	5.79	NA	*SANDY CLAY to SILTY CLAY
20.0	148.7	142.5	6.29	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

TOP 1.4 FT IS DISTURBED SOIL

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-89

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
20.5	139.0	131.7	6.68	NA	*SANDY CLAY to SILTY CLAY
21.0	121.1	113.5	6.48	NA	*SANDY CLAY to SILTY CLAY
21.5	100.6	93.3	5.75	NA	*SANDY CLAY to SILTY CLAY
22.0	149.2	136.8	7.56	NA	*SANDY CLAY to SILTY CLAY
22.5	207.3	188.1	6.24	NA	*SANDY CLAY to SILTY CLAY
23.0	211.2	189.6	6.35	NA	*SANDY CLAY to SILTY CLAY
23.5	119.1	105.8	9.57	NA	*SANDY CLAY to SILTY CLAY
24.0	58.2	51.2	6.16	NA	*SANDY CLAY to SILTY CLAY
24.5	47.2	41.1	7.36	NA	*SANDY CLAY to SILTY CLAY
25.0	54.9	47.3	6.81	NA	*SANDY CLAY to SILTY CLAY
25.5	60.3	51.4	6.00	NA	*SANDY CLAY to SILTY CLAY
26.0	71.4	60.4	6.21	NA	*SANDY CLAY to SILTY CLAY
26.5	76.8	64.2	6.38	NA	*SANDY CLAY to SILTY CLAY
27.0	69.9	57.9	6.09	NA	*SANDY CLAY to SILTY CLAY
27.5	62.5	51.3	6.35	NA	*SANDY CLAY to SILTY CLAY
28.0	117.0	95.1	5.58	NA	*SANDY CLAY to SILTY CLAY
28.5	96.6	77.7	5.65	NA	*SANDY CLAY to SILTY CLAY
29.0	104.4	83.3	4.96	NA	*SANDY CLAY to SILTY CLAY
29.5	129.6	102.3	6.22	NA	*SANDY CLAY to SILTY CLAY
30.0	96.9	75.8	7.62	NA	*SANDY CLAY to SILTY CLAY
30.5	104.7	81.2	5.45	NA	*SANDY CLAY to SILTY CLAY
31.0	137.9	105.9	5.81	NA	*SANDY CLAY to SILTY CLAY
31.5	122.0	92.9	6.44	NA	*SANDY CLAY to SILTY CLAY
32.0	137.1	103.4	5.57	NA	*SANDY CLAY to SILTY CLAY
32.5	150.3	112.4	6.53	NA	*SANDY CLAY to SILTY CLAY
33.0	82.9	61.4	12.25	NA	*SANDY CLAY to SILTY CLAY
33.5	49.5	36.4	10.34	NA	*SANDY CLAY to SILTY CLAY
34.0	51.6	37.6	6.56	NA	*SANDY CLAY to SILTY CLAY
34.5	65.8	47.5	5.75	NA	*SANDY CLAY to SILTY CLAY
35.0	62.8	45.0	8.20	NA	*SANDY CLAY to SILTY CLAY
35.5	68.1	48.6	7.21	NA	*SANDY CLAY to SILTY CLAY
36.0	62.9	44.7	4.74	NA	*SANDY CLAY to SILTY CLAY
36.5	69.9	49.5	6.01	NA	*SANDY CLAY to SILTY CLAY
37.0	68.5	48.3	5.91	NA	*SANDY CLAY to SILTY CLAY
37.5	52.9	37.2	5.05	NA	*SANDY CLAY to SILTY CLAY
38.0	68.7	48.1	4.79	NA	*SANDY CLAY to SILTY CLAY
38.5	106.6	74.3	7.48	NA	*SANDY CLAY to SILTY CLAY
39.0	150.7	104.7	6.64	NA	*SANDY CLAY to SILTY CLAY
39.5	108.8	75.3	7.38	NA	*SANDY CLAY to SILTY CLAY
40.0	60.3	41.6	8.43	NA	*SANDY CLAY to SILTY CLAY
40.5	95.4	65.5	5.97	NA	*SANDY CLAY to SILTY CLAY
41.0	148.7	101.8	8.02	NA	*SANDY CLAY to SILTY CLAY
41.5	104.7	71.4	8.96	NA	*SANDY CLAY to SILTY CLAY
42.0	122.5	83.2	8.30	NA	*SANDY CLAY to SILTY CLAY
42.5	114.9	77.8	10.32	NA	*SANDY CLAY to SILTY CLAY
43.0	112.9	76.1	9.06	NA	*SANDY CLAY to SILTY CLAY
43.5	97.9	65.8	7.74	NA	*SANDY CLAY to SILTY CLAY
44.0	71.5	47.9	7.74	NA	*SANDY CLAY to SILTY CLAY
44.5	55.5	37.1	7.17	NA	*SANDY CLAY to SILTY CLAY
45.0	76.2	50.6	6.53	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-89

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
45.5	64.9	43.0	8.29	NA	*SANDY CLAY to SILTY CLAY
46.0	49.1	32.4	6.81	NA	*SANDY CLAY to SILTY CLAY
46.5	62.9	41.4	7.91	NA	*SANDY CLAY to SILTY CLAY
47.0	44.8	29.3	6.13	NA	*SANDY CLAY to SILTY CLAY
47.5	37.7	24.6	5.46	NA	SILTY CLAY TO CLAY
48.0	40.9	26.6	6.03	NA	*SANDY CLAY to SILTY CLAY
48.5	41.0	26.6	5.30	NA	CLAYEY SILT to SILTY CLAY
49.0	41.5	26.8	6.06	NA	*SANDY CLAY to SILTY CLAY
49.5	40.8	26.3	6.40	NA	*SANDY CLAY to SILTY CLAY
50.0	33.5	21.5	5.97	NA	SILTY CLAY TO CLAY
50.5	26.6	17.0	5.78	NA	SILTY CLAY TO CLAY
51.0	28.2	18.0	5.54	NA	SILTY CLAY TO CLAY
51.5	24.0	15.3	5.53	NA	SILTY CLAY TO CLAY
52.0	24.1	15.3	4.80	NA	CLAYEY SILT to SILTY CLAY
52.5	25.0	15.8	6.47	NA	SILTY CLAY TO CLAY
53.0	28.4	17.9	5.58	NA	SILTY CLAY TO CLAY
53.5	29.7	18.6	4.40	NA	CLAYEY SILT to SILTY CLAY
54.0	33.1	20.6	5.41	NA	SILTY CLAY TO CLAY
54.5	26.0	16.2	5.40	NA	SILTY CLAY TO CLAY
55.0	31.2	19.3	4.26	NA	CLAYEY SILT to SILTY CLAY
55.5	43.9	27.1	4.90	NA	CLAYEY SILT to SILTY CLAY
56.0	35.0	21.5	5.83	NA	SILTY CLAY TO CLAY
56.5	68.8	42.2	5.92	NA	*SANDY CLAY to SILTY CLAY
57.0	80.2	49.0	7.41	NA	*SANDY CLAY to SILTY CLAY
57.5	112.4	68.5	6.23	NA	*SANDY CLAY to SILTY CLAY
58.0	45.9	27.9	7.45	NA	*SANDY CLAY to SILTY CLAY
58.5	36.4	22.0	5.53	NA	SILTY CLAY TO CLAY
59.0	57.9	34.9	6.41	NA	*SANDY CLAY to SILTY CLAY
59.5	62.1	37.3	6.68	NA	*SANDY CLAY to SILTY CLAY
60.0	62.8	37.6	8.08	NA	*SANDY CLAY to SILTY CLAY
60.5	65.4	39.0	7.02	NA	*SANDY CLAY to SILTY CLAY
61.0	75.7	45.0	7.01	NA	*SANDY CLAY to SILTY CLAY
61.5	68.5	40.6	8.11	NA	*SANDY CLAY to SILTY CLAY
62.0	47.7	28.2	7.62	NA	*SANDY CLAY to SILTY CLAY
62.5	46.5	27.4	6.85	NA	*SANDY CLAY to SILTY CLAY
63.0	50.5	29.6	7.64	NA	*SANDY CLAY to SILTY CLAY
63.5	55.5	32.4	6.41	NA	*SANDY CLAY to SILTY CLAY
64.0	52.9	30.8	6.86	NA	*SANDY CLAY to SILTY CLAY
64.5	49.2	28.6	6.51	NA	*SANDY CLAY to SILTY CLAY
65.0	50.1	29.0	7.04	NA	*SANDY CLAY to SILTY CLAY
65.5	44.5	25.7	6.09	NA	*SANDY CLAY to SILTY CLAY
66.0	47.4	27.3	6.42	NA	*SANDY CLAY to SILTY CLAY
66.5	48.2	27.6	6.47	NA	*SANDY CLAY to SILTY CLAY
67.0	40.8	23.3	6.18	NA	*SANDY CLAY to SILTY CLAY
67.5	36.8	20.9	6.22	NA	SILTY CLAY TO CLAY
68.0	32.4	18.4	5.66	NA	SILTY CLAY TO CLAY
68.5	34.2	19.3	5.58	NA	SILTY CLAY TO CLAY
69.0	42.2	23.7	4.91	NA	CLAYEY SILT to SILTY CLAY
69.5	56.0	31.4	4.86	NA	CLAYEY SILT to SILTY CLAY
70.0	65.3	36.5	4.79	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-89

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
70.5	70.5	39.3	5.43	NA	*SANDY CLAY to SILTY CLAY
71.0	65.6	36.4	5.11	NA	*SANDY CLAY to SILTY CLAY
71.5	62.9	34.8	5.11	NA	*SANDY CLAY to SILTY CLAY
72.0	75.6	41.7	5.77	NA	*SANDY CLAY to SILTY CLAY
72.5	73.8	40.6	6.79	NA	*SANDY CLAY to SILTY CLAY
73.0	109.2	59.9	6.34	NA	*SANDY CLAY to SILTY CLAY
73.5	108.7	59.4	6.49	NA	*SANDY CLAY to SILTY CLAY
74.0	124.0	67.6	7.50	NA	*SANDY CLAY to SILTY CLAY
74.5	97.7	53.1	7.04	NA	*SANDY CLAY to SILTY CLAY
75.0	129.3	70.0	6.16	NA	*SANDY CLAY to SILTY CLAY
75.5	167.1	90.1	3.49	NA	*CLAYEY SAND to SANDY CLAY
76.0	187.0	100.5	3.07	NA	*CLAYEY SAND to SANDY CLAY
76.5	214.4	114.8	2.55	NA	SILTY SAND to SANDY SILT
77.0	194.5	103.9	3.25	NA	*CLAYEY SAND to SANDY CLAY
77.5	187.9	100.0	1.96	NA	SILTY SAND to SANDY SILT
78.0	260.6	138.2	2.07	NA	SILTY SAND to SANDY SILT
78.5	362.7	191.7	7.57	NA	*HEAVILY O.C./CEMENT. MAT.
79.0	369.7	194.8	4.05	NA	*CLAYEY SAND to SANDY CLAY
79.5	352.6	185.2	3.33	NA	*SILTY SAND to CLAYEY SAND
80.0	360.8	188.8	3.52	NA	*CLAYEY SAND to SANDY CLAY
80.5	374.0	195.1	3.36	NA	*SILTY SAND to CLAYEY SAND
81.0	379.2	197.2	3.51	NA	*CLAYEY SAND to SANDY CLAY
81.5	332.3	172.3	2.84	NA	*SILTY SAND to CLAYEY SAND
82.0	329.1	170.0	2.94	NA	*SILTY SAND to CLAYEY SAND

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

```

*****
*
*                               CONE PENETRATION TEST                               *
*
* SOUNDING : CPT-90                PROJECT NO : 92-381-01110                *
* PROJECT  : D&M/UPRR-II           INSTRUMENT : F15CKE095                *
* LOCATION : SACRAMENTO CA         SYSTEM    : T-1                      *
* DATE     : 06-03-1992           OPERATOR   : MR/DH                     *
*
*****

```

PAGE 1 of 4

DEPTH	TIP RESISTANCE	NORMALIZED	FRICTION	CONE PORE	SOIL BEHAVIOR TYPE
(ft)	(tsf)	TIP RESISTANCE	RATIO	PRESSURE	
		(tsf)	(%)	(tsf)	
0.0	0.0	0.0	0.00	NA	
0.5	0.0	0.0	0.00	NA	
1.0	0.0	0.0	0.00	NA	
1.5	28.9	60.2	5.71	NA	*SANDY CLAY to SILTY CLAY
2.0	48.5	95.1	3.60	NA	*CLAYEY SAND to SANDY CLAY
2.5	98.9	184.1	5.43	NA	*SANDY CLAY to SILTY CLAY
3.0	75.9	135.3	8.88	NA	*SANDY CLAY to SILTY CLAY
3.5	59.7	102.4	7.41	NA	*SANDY CLAY to SILTY CLAY
4.0	52.3	86.7	7.58	NA	*SANDY CLAY to SILTY CLAY
4.5	48.8	78.4	7.44	NA	*SANDY CLAY to SILTY CLAY
5.0	41.1	64.2	7.78	NA	*SANDY CLAY to SILTY CLAY
5.5	35.7	54.2	6.31	NA	*SANDY CLAY to SILTY CLAY
6.0	34.9	51.8	6.00	NA	*SANDY CLAY to SILTY CLAY
6.5	30.8	44.6	5.10	NA	*SANDY CLAY to SILTY CLAY
7.0	30.8	43.5	5.82	NA	*SANDY CLAY to SILTY CLAY
7.5	32.9	45.6	4.71	NA	*SANDY CLAY to SILTY CLAY
8.0	37.1	50.4	4.33	NA	*SANDY CLAY to SILTY CLAY
8.5	109.3	145.4	6.62	NA	*SANDY CLAY to SILTY CLAY
9.0	91.0	118.8	6.89	NA	*SANDY CLAY to SILTY CLAY
9.5	64.1	82.2	7.88	NA	*SANDY CLAY to SILTY CLAY
10.0	76.0	95.7	6.14	NA	*SANDY CLAY to SILTY CLAY
10.5	87.6	108.4	7.13	NA	*SANDY CLAY to SILTY CLAY
11.0	80.3	97.9	6.71	NA	*SANDY CLAY to SILTY CLAY
11.5	64.7	77.5	7.58	NA	*SANDY CLAY to SILTY CLAY
12.0	58.7	69.3	7.52	NA	*SANDY CLAY to SILTY CLAY
12.5	51.3	59.6	6.57	NA	*SANDY CLAY to SILTY CLAY
13.0	47.6	54.6	7.45	NA	*SANDY CLAY to SILTY CLAY
13.5	36.2	40.9	7.01	NA	*SANDY CLAY to SILTY CLAY
14.0	33.2	37.0	6.41	NA	*SANDY CLAY to SILTY CLAY
14.5	30.6	33.6	6.41	NA	*SANDY CLAY to SILTY CLAY
15.0	31.1	33.7	6.62	NA	*SANDY CLAY to SILTY CLAY
15.5	33.1	35.4	5.34	NA	*SANDY CLAY to SILTY CLAY
16.0	42.3	44.7	5.82	NA	*SANDY CLAY to SILTY CLAY
16.5	39.6	41.3	6.08	NA	*SANDY CLAY to SILTY CLAY
17.0	52.1	53.6	4.94	NA	*SANDY CLAY to SILTY CLAY
17.5	68.1	69.2	5.73	NA	*SANDY CLAY to SILTY CLAY
18.0	69.7	70.0	5.90	NA	*SANDY CLAY to SILTY CLAY
18.5	62.3	61.9	6.02	NA	*SANDY CLAY to SILTY CLAY
19.0	68.7	67.3	5.60	NA	*SANDY CLAY to SILTY CLAY
19.5	78.0	75.6	4.71	NA	*SANDY CLAY to SILTY CLAY
20.0	66.7	63.9	7.41	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE
 TOP 1.0 FT IS DISTURBED SOIL
 *INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL
 ASSUMED TOTAL UNIT WT = 110 PCF
 ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-90

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
20.5	59.6	56.5	7.15	NA	*SANDY CLAY to SILTY CLAY
21.0	60.8	57.0	6.56	NA	*SANDY CLAY to SILTY CLAY
21.5	89.8	83.3	6.50	NA	*SANDY CLAY to SILTY CLAY
22.0	68.0	62.4	6.86	NA	*SANDY CLAY to SILTY CLAY
22.5	63.7	57.8	6.68	NA	*SANDY CLAY to SILTY CLAY
23.0	72.1	64.8	5.98	NA	*SANDY CLAY to SILTY CLAY
23.5	83.2	74.0	4.82	NA	*SANDY CLAY to SILTY CLAY
24.0	107.5	94.6	4.88	NA	*SANDY CLAY to SILTY CLAY
24.5	73.1	63.7	7.17	NA	*SANDY CLAY to SILTY CLAY
25.0	86.7	74.7	5.86	NA	*SANDY CLAY to SILTY CLAY
25.5	79.3	67.6	5.35	NA	*SANDY CLAY to SILTY CLAY
26.0	93.2	78.7	5.37	NA	*SANDY CLAY to SILTY CLAY
26.5	103.3	86.4	5.88	NA	*SANDY CLAY to SILTY CLAY
27.0	116.2	96.3	6.08	NA	*SANDY CLAY to SILTY CLAY
27.5	78.4	64.3	5.67	NA	*SANDY CLAY to SILTY CLAY
28.0	65.2	52.9	5.05	NA	*SANDY CLAY to SILTY CLAY
28.5	59.1	47.6	6.75	NA	*SANDY CLAY to SILTY CLAY
29.0	60.3	48.1	5.85	NA	*SANDY CLAY to SILTY CLAY
29.5	63.5	50.2	7.78	NA	*SANDY CLAY to SILTY CLAY
30.0	63.1	49.4	9.51	NA	*SANDY CLAY to SILTY CLAY
30.5	55.8	43.3	9.15	NA	*SANDY CLAY to SILTY CLAY
31.0	56.6	43.5	8.71	NA	*SANDY CLAY to SILTY CLAY
31.5	55.3	42.1	8.53	NA	*SANDY CLAY to SILTY CLAY
32.0	61.9	46.7	5.77	NA	*SANDY CLAY to SILTY CLAY
32.5	61.8	46.2	6.99	NA	*SANDY CLAY to SILTY CLAY
33.0	72.2	53.5	8.22	NA	*SANDY CLAY to SILTY CLAY
33.5	65.6	48.2	8.60	NA	*SANDY CLAY to SILTY CLAY
34.0	73.4	53.5	8.54	NA	*SANDY CLAY to SILTY CLAY
34.5	64.3	46.4	8.43	NA	*SANDY CLAY to SILTY CLAY
35.0	92.8	66.4	6.45	NA	*SANDY CLAY to SILTY CLAY
35.5	61.4	43.7	9.47	NA	*SANDY CLAY to SILTY CLAY
36.0	89.4	63.5	6.67	NA	*SANDY CLAY to SILTY CLAY
36.5	49.9	35.3	8.28	NA	*SANDY CLAY to SILTY CLAY
37.0	48.3	34.0	5.16	NA	*SANDY CLAY to SILTY CLAY
37.5	58.2	40.9	4.53	NA	*SANDY CLAY to SILTY CLAY
38.0	65.7	46.0	5.39	NA	*SANDY CLAY to SILTY CLAY
38.5	61.0	42.5	5.48	NA	*SANDY CLAY to SILTY CLAY
39.0	55.4	38.5	5.12	NA	*SANDY CLAY to SILTY CLAY
39.5	62.1	43.0	4.92	NA	*SANDY CLAY to SILTY CLAY
40.0	61.2	42.2	7.02	NA	*SANDY CLAY to SILTY CLAY
40.5	52.8	36.2	5.42	NA	*SANDY CLAY to SILTY CLAY
41.0	52.1	35.6	4.56	NA	CLAYEY SILT to SILTY CLAY
41.5	48.7	33.2	5.06	NA	*SANDY CLAY to SILTY CLAY
42.0	51.6	35.1	4.85	NA	*SANDY CLAY to SILTY CLAY
42.5	52.1	35.3	4.86	NA	*SANDY CLAY to SILTY CLAY
43.0	58.3	39.3	6.25	NA	*SANDY CLAY to SILTY CLAY
43.5	88.7	59.6	6.68	NA	*SANDY CLAY to SILTY CLAY
44.0	75.1	50.3	6.65	NA	*SANDY CLAY to SILTY CLAY
44.5	101.4	67.7	7.03	NA	*SANDY CLAY to SILTY CLAY
45.0	119.7	79.6	6.76	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
45.5	60.2	39.9	6.60	NA	*SANDY CLAY to SILTY CLAY
46.0	61.4	40.5	6.06	NA	*SANDY CLAY to SILTY CLAY
46.5	78.9	51.9	5.85	NA	*SANDY CLAY to SILTY CLAY
47.0	47.6	31.2	6.24	NA	*SANDY CLAY to SILTY CLAY
47.5	47.1	30.8	6.07	NA	*SANDY CLAY to SILTY CLAY
48.0	45.6	29.7	5.15	NA	*SANDY CLAY to SILTY CLAY
48.5	43.5	28.2	5.22	NA	*SANDY CLAY to SILTY CLAY
49.0	37.8	24.4	5.09	NA	CLAYEY SILT to SILTY CLAY
49.5	36.8	23.7	5.08	NA	CLAYEY SILT to SILTY CLAY
50.0	34.3	22.0	5.54	NA	SILTY CLAY to CLAY
50.5	31.1	19.9	5.49	NA	SILTY CLAY to CLAY
51.0	30.5	19.5	5.34	NA	SILTY CLAY to CLAY
51.5	31.9	20.3	6.28	NA	SILTY CLAY to CLAY
52.0	28.2	17.9	5.41	NA	SILTY CLAY to CLAY
52.5	28.3	17.9	5.63	NA	SILTY CLAY to CLAY
53.0	25.0	15.7	6.70	NA	SILTY CLAY to CLAY
53.5	16.8	10.5	6.04	NA	SILTY CLAY to CLAY
54.0	15.6	9.7	4.90	NA	SILTY CLAY to CLAY
54.5	14.3	8.9	3.50	NA	SILTY CLAY to CLAY
55.0	51.3	31.8	6.97	NA	*SANDY CLAY to SILTY CLAY
55.5	73.6	45.4	7.14	NA	*SANDY CLAY to SILTY CLAY
56.0	52.7	32.4	8.58	NA	*SANDY CLAY to SILTY CLAY
56.5	59.0	36.2	9.09	NA	*SANDY CLAY to SILTY CLAY
57.0	46.1	28.2	6.99	NA	*SANDY CLAY to SILTY CLAY
57.5	65.0	39.6	5.86	NA	*SANDY CLAY to SILTY CLAY
58.0	92.5	56.2	6.78	NA	*SANDY CLAY to SILTY CLAY
58.5	123.6	74.7	5.98	NA	*SANDY CLAY to SILTY CLAY
59.0	131.1	79.0	6.91	NA	*SANDY CLAY to SILTY CLAY
59.5	163.0	97.9	6.72	NA	*SANDY CLAY to SILTY CLAY
60.0	194.1	116.2	8.93	NA	*SANDY CLAY to SILTY CLAY
60.5	176.5	105.3	8.26	NA	*SANDY CLAY to SILTY CLAY
61.0	162.6	96.7	6.83	NA	*SANDY CLAY to SILTY CLAY
61.5	162.1	96.0	6.90	NA	*SANDY CLAY to SILTY CLAY
62.0	118.5	69.9	8.60	NA	*SANDY CLAY to SILTY CLAY
62.5	91.5	53.8	6.79	NA	*SANDY CLAY to SILTY CLAY
63.0	116.7	68.4	6.30	NA	*SANDY CLAY to SILTY CLAY
63.5	119.4	69.8	7.26	NA	*SANDY CLAY to SILTY CLAY
64.0	146.7	85.4	7.17	NA	*SANDY CLAY to SILTY CLAY
64.5	123.4	71.6	7.41	NA	*SANDY CLAY to SILTY CLAY
65.0	82.6	47.8	5.69	NA	*SANDY CLAY to SILTY CLAY
65.5	62.2	35.8	5.59	NA	*SANDY CLAY to SILTY CLAY
66.0	62.2	35.7	6.10	NA	*SANDY CLAY to SILTY CLAY
66.5	56.7	32.5	6.10	NA	*SANDY CLAY to SILTY CLAY
67.0	58.2	33.2	6.11	NA	*SANDY CLAY to SILTY CLAY
67.5	52.9	30.1	5.52	NA	*SANDY CLAY to SILTY CLAY
68.0	64.1	36.4	5.26	NA	*SANDY CLAY to SILTY CLAY
68.5	62.2	35.2	5.64	NA	*SANDY CLAY to SILTY CLAY
69.0	91.2	51.3	4.77	NA	*SANDY CLAY to SILTY CLAY
69.5	135.4	76.0	6.07	NA	*SANDY CLAY to SILTY CLAY
70.0	104.9	58.7	5.57	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-90

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
70.5	119.5	66.6	6.34	NA	*SANDY CLAY to SILTY CLAY
71.0	179.9	99.9	4.80	NA	*SANDY CLAY to SILTY CLAY
71.5	226.0	125.2	5.63	NA	*SANDY CLAY to SILTY CLAY
72.0	276.5	152.6	4.20	NA	*CLAYEY SAND to SANDY CLAY
72.5	173.6	95.5	3.06	NA	SANDY SILT to CLAYEY SILT
73.0	237.1	130.0	4.20	NA	*CLAYEY SAND to SANDY CLAY
73.5	246.1	134.5	3.65	NA	*CLAYEY SAND to SANDY CLAY
74.0	263.7	143.6	3.24	NA	*CLAYEY SAND to SANDY CLAY
74.5	277.4	150.6	3.21	NA	*SILTY SAND to CLAYEY SAND
75.0	262.0	141.7	2.84	NA	*SILTY SAND to CLAYEY SAND
75.5	219.1	118.2	3.48	NA	*CLAYEY SAND to SANDY CLAY
76.0	202.5	108.8	2.31	NA	SILTY SAND to SANDY SILT
76.5	198.8	106.5	2.99	NA	*SILTY SAND to CLAYEY SAND
77.0	209.5	111.9	3.43	NA	*CLAYEY SAND to SANDY CLAY
77.5	240.7	128.1	2.48	NA	SILTY SAND to SANDY SILT
78.0	306.9	162.8	2.36	NA	SILTY SAND to SANDY SILT
78.5	434.0	229.4	2.63	NA	*SILTY SAND to CLAYEY SAND
79.0	390.6	205.8	2.97	NA	*SILTY SAND to CLAYEY SAND
79.5	289.6	152.1	4.04	NA	*CLAYEY SAND to SANDY CLAY
80.0	288.2	150.8	3.63	NA	*CLAYEY SAND to SANDY CLAY
80.5	289.9	151.2	2.84	NA	*SILTY SAND to CLAYEY SAND
81.0	570.1	296.5	1.25	NA	SAND to SILTY SAND

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

 *
 * **CONE PENETRATION TEST** *
 *
 * SOUNDING : CPT-91 PROJECT NO : 92-381-01110 *
 * PROJECT : D&M/UPRR-II INSTRUMENT : F15CKE095 *
 * LOCATION : SACRAMENTO CA SYSTEM : T-1 *
 * DATE : 06-03-1992 OPERATOR : MR/DH *
 *

PAGE 1 of 4

DEPTH	TIP RESISTANCE	NORMALIZED	FRICTION	CONE PORE	SOIL BEHAVIOR TYPE
(ft)	(tsf)	TIP RESISTANCE	RATIO	PRESSURE	
		(tsf)	(%)	(tsf)	
.0	.0	.0	.00	NA	
.5	.0	.0	.00	NA	
1.0	.0	.0	.00	NA	
1.5	28.8	60.1	2.77	NA	SANDY SILT to CLAYEY SILT
2.0	30.1	58.9	5.61	NA	*SANDY CLAY to SILTY CLAY
2.5	42.1	78.4	6.02	NA	*SANDY CLAY to SILTY CLAY
3.0	48.5	86.5	6.61	NA	*SANDY CLAY to SILTY CLAY
3.5	53.3	91.4	7.86	NA	*SANDY CLAY to SILTY CLAY
4.0	50.6	83.9	6.35	NA	*SANDY CLAY to SILTY CLAY
4.5	48.7	78.2	5.72	NA	*SANDY CLAY to SILTY CLAY
5.0	45.8	71.5	5.14	NA	*SANDY CLAY to SILTY CLAY
5.5	31.5	47.9	4.50	NA	*SANDY CLAY to SILTY CLAY
6.0	32.6	48.3	5.35	NA	*SANDY CLAY to SILTY CLAY
6.5	28.8	41.6	5.47	NA	*SANDY CLAY to SILTY CLAY
7.0	26.8	37.9	5.22	NA	*SANDY CLAY to SILTY CLAY
7.5	28.3	39.1	4.74	NA	*SANDY CLAY to SILTY CLAY
8.0	41.6	56.4	6.06	NA	*SANDY CLAY to SILTY CLAY
8.5	66.9	89.0	8.05	NA	*SANDY CLAY to SILTY CLAY
9.0	71.7	93.6	8.02	NA	*SANDY CLAY to SILTY CLAY
9.5	71.8	92.1	7.40	NA	*SANDY CLAY to SILTY CLAY
10.0	69.9	88.1	8.09	NA	*SANDY CLAY to SILTY CLAY
10.5	60.9	75.4	6.91	NA	*SANDY CLAY to SILTY CLAY
11.0	52.1	63.4	7.67	NA	*SANDY CLAY to SILTY CLAY
11.5	51.0	61.1	7.80	NA	*SANDY CLAY to SILTY CLAY
12.0	51.2	60.4	7.05	NA	*SANDY CLAY to SILTY CLAY
12.5	53.1	61.7	7.69	NA	*SANDY CLAY to SILTY CLAY
13.0	48.8	55.9	7.34	NA	*SANDY CLAY to SILTY CLAY
13.5	39.1	44.2	7.05	NA	*SANDY CLAY to SILTY CLAY
14.0	38.1	42.4	6.36	NA	*SANDY CLAY to SILTY CLAY
14.5	36.1	39.6	6.22	NA	*SANDY CLAY to SILTY CLAY
15.0	33.5	36.3	6.35	NA	*SANDY CLAY to SILTY CLAY
15.5	57.3	61.2	5.43	NA	*SANDY CLAY to SILTY CLAY
16.0	78.0	82.4	6.75	NA	*SANDY CLAY to SILTY CLAY
16.5	73.2	76.3	7.15	NA	*SANDY CLAY to SILTY CLAY
17.0	58.9	60.6	6.31	NA	*SANDY CLAY to SILTY CLAY
17.5	56.3	57.2	6.03	NA	*SANDY CLAY to SILTY CLAY
18.0	53.1	53.4	6.32	NA	*SANDY CLAY to SILTY CLAY
18.5	37.6	37.3	4.77	NA	*SANDY CLAY to SILTY CLAY
19.0	59.1	58.0	5.49	NA	*SANDY CLAY to SILTY CLAY
19.5	141.1	136.8	6.33	NA	*SANDY CLAY to SILTY CLAY
20.0	134.4	128.8	8.02	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE
 TOP 1.2 FT IS DISTURBED SOIL
 *INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL
 ASSUMED TOTAL UNIT WT = 110 PCF
 ASSUMED DEPTH OF WATER TABLE = 35.0 FT

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
20.5	119.8	113.5	7.66	NA	*SANDY CLAY to SILTY CLAY
21.0	97.0	91.0	7.57	NA	*SANDY CLAY to SILTY CLAY
21.5	70.4	65.3	7.23	NA	*SANDY CLAY to SILTY CLAY
22.0	49.0	45.0	6.31	NA	*SANDY CLAY to SILTY CLAY
22.5	71.7	65.1	5.76	NA	*SANDY CLAY to SILTY CLAY
23.0	83.5	75.0	6.88	NA	*SANDY CLAY to SILTY CLAY
23.5	69.5	61.7	7.65	NA	*SANDY CLAY to SILTY CLAY
24.0	52.7	46.4	7.55	NA	*SANDY CLAY to SILTY CLAY
24.5	57.3	49.9	6.95	NA	*SANDY CLAY to SILTY CLAY
25.0	61.3	52.8	7.14	NA	*SANDY CLAY to SILTY CLAY
25.5	52.4	44.7	6.88	NA	*SANDY CLAY to SILTY CLAY
26.0	56.2	47.5	5.80	NA	*SANDY CLAY to SILTY CLAY
26.5	77.3	64.7	7.46	NA	*SANDY CLAY to SILTY CLAY
27.0	66.2	54.9	6.00	NA	*SANDY CLAY to SILTY CLAY
27.5	69.0	56.6	6.03	NA	*SANDY CLAY to SILTY CLAY
28.0	65.2	53.0	7.64	NA	*SANDY CLAY to SILTY CLAY
28.5	62.7	50.5	9.63	NA	*SANDY CLAY to SILTY CLAY
29.0	42.3	33.7	7.27	NA	*SANDY CLAY to SILTY CLAY
29.5	24.9	19.7	9.58	NA	*SANDY CLAY to SILTY CLAY
30.0	54.6	42.7	5.32	NA	*SANDY CLAY to SILTY CLAY
30.5	68.1	52.8	6.01	NA	*SANDY CLAY to SILTY CLAY
31.0	55.6	42.7	7.18	NA	*SANDY CLAY to SILTY CLAY
31.5	36.1	27.5	6.55	NA	*SANDY CLAY to SILTY CLAY
32.0	36.2	27.3	5.36	NA	*SANDY CLAY to SILTY CLAY
32.5	38.9	29.1	5.99	NA	*SANDY CLAY to SILTY CLAY
33.0	43.3	32.1	7.33	NA	*SANDY CLAY to SILTY CLAY
33.5	39.9	29.3	8.91	NA	*SANDY CLAY to SILTY CLAY
34.0	44.6	32.4	8.38	NA	*SANDY CLAY to SILTY CLAY
34.5	53.0	38.3	9.51	NA	*SANDY CLAY to SILTY CLAY
35.0	47.7	34.1	9.36	NA	*SANDY CLAY to SILTY CLAY
35.5	44.6	31.8	7.12	NA	*SANDY CLAY to SILTY CLAY
36.0	42.2	29.9	6.85	NA	*SANDY CLAY to SILTY CLAY
36.5	47.6	33.7	5.89	NA	*SANDY CLAY to SILTY CLAY
37.0	65.3	46.1	5.24	NA	*SANDY CLAY to SILTY CLAY
37.5	66.9	47.0	6.52	NA	*SANDY CLAY to SILTY CLAY
38.0	57.1	39.9	5.49	NA	*SANDY CLAY to SILTY CLAY
38.5	57.9	40.4	5.57	NA	*SANDY CLAY to SILTY CLAY
39.0	63.3	43.9	4.79	NA	*SANDY CLAY to SILTY CLAY
39.5	68.4	47.3	6.05	NA	*SANDY CLAY to SILTY CLAY
40.0	57.5	39.7	6.09	NA	*SANDY CLAY to SILTY CLAY
40.5	53.8	37.0	7.74	NA	*SANDY CLAY to SILTY CLAY
41.0	73.7	50.5	8.52	NA	*SANDY CLAY to SILTY CLAY
41.5	62.7	42.8	8.62	NA	*SANDY CLAY to SILTY CLAY
42.0	37.7	25.6	8.54	NA	*SANDY CLAY to SILTY CLAY
42.5	47.3	32.0	6.58	NA	*SANDY CLAY to SILTY CLAY
43.0	72.3	48.8	8.96	NA	*SANDY CLAY to SILTY CLAY
43.5	77.6	52.1	10.25	NA	*SANDY CLAY to SILTY CLAY
44.0	67.1	45.0	9.30	NA	*SANDY CLAY to SILTY CLAY
44.5	95.3	63.6	7.17	NA	*SANDY CLAY to SILTY CLAY
45.0	61.2	40.7	7.22	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-91

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
45.5	51.6	34.2	7.05	NA	*SANDY CLAY to SILTY CLAY
46.0	68.6	45.3	5.99	NA	*SANDY CLAY to SILTY CLAY
46.5	71.4	47.0	5.96	NA	*SANDY CLAY to SILTY CLAY
47.0	41.6	27.3	5.21	NA	CLAYEY SILT to SILTY CLAY
47.5	46.1	30.1	5.06	NA	*SANDY CLAY to SILTY CLAY
48.0	49.9	32.5	5.36	NA	*SANDY CLAY to SILTY CLAY
48.5	48.3	31.3	5.97	NA	*SANDY CLAY to SILTY CLAY
49.0	46.5	30.0	5.87	NA	*SANDY CLAY to SILTY CLAY
49.5	43.8	28.2	6.05	NA	*SANDY CLAY to SILTY CLAY
50.0	39.5	25.3	5.69	NA	*SANDY CLAY to SILTY CLAY
50.5	32.0	20.5	6.86	NA	*SANDY CLAY to SILTY CLAY
51.0	31.7	20.2	6.05	NA	SILTY CLAY TO CLAY
51.5	30.8	19.6	6.98	NA	SILTY CLAY TO CLAY
52.0	27.9	17.6	6.99	NA	SILTY CLAY TO CLAY
52.5	27.3	17.2	6.49	NA	SILTY CLAY TO CLAY
53.0	21.9	13.8	6.01	NA	SILTY CLAY TO CLAY
53.5	20.3	12.7	5.38	NA	SILTY CLAY TO CLAY
54.0	19.9	12.4	5.21	NA	SILTY CLAY TO CLAY
54.5	144.9	90.1	7.42	NA	*SANDY CLAY to SILTY CLAY
55.0	78.4	48.6	10.46	NA	*SANDY CLAY to SILTY CLAY
55.5	62.2	38.4	6.06	NA	*SANDY CLAY to SILTY CLAY
56.0	73.7	45.3	6.57	NA	*SANDY CLAY to SILTY CLAY
56.5	85.4	52.4	6.40	NA	*SANDY CLAY to SILTY CLAY
57.0	68.7	42.0	7.73	NA	*SANDY CLAY to SILTY CLAY
57.5	40.9	24.9	7.04	NA	*SANDY CLAY to SILTY CLAY
58.0	56.6	34.4	6.61	NA	*SANDY CLAY to SILTY CLAY
58.5	79.4	48.0	6.25	NA	*SANDY CLAY to SILTY CLAY
59.0	96.9	58.4	6.88	NA	*SANDY CLAY to SILTY CLAY
59.5	110.1	66.1	7.08	NA	*SANDY CLAY to SILTY CLAY
60.0	92.3	55.2	6.48	NA	*SANDY CLAY to SILTY CLAY
60.5	90.6	54.1	5.44	NA	*SANDY CLAY to SILTY CLAY
61.0	100.3	59.6	4.85	NA	*SANDY CLAY to SILTY CLAY
61.5	144.5	85.6	6.85	NA	*SANDY CLAY to SILTY CLAY
62.0	105.9	62.5	5.38	NA	*SANDY CLAY to SILTY CLAY
62.5	121.4	71.5	7.99	NA	*SANDY CLAY to SILTY CLAY
63.0	91.3	53.5	5.41	NA	*SANDY CLAY to SILTY CLAY
63.5	230.8	134.9	3.89	NA	*CLAYEY SAND to SANDY CLAY
64.0	436.2	254.1	3.50	NA	*SILTY SAND to CLAYEY SAND
64.5	350.5	203.5	4.93	NA	*SANDY CLAY to SILTY CLAY
65.0	267.9	155.0	6.50	NA	*SANDY CLAY to SILTY CLAY
65.5	373.8	215.6	1.84	NA	SAND to SILTY SAND
66.0	94.4	54.2	10.08	NA	*SANDY CLAY to SILTY CLAY
66.5	52.4	30.0	3.35	NA	SANDY SILT to CLAYEY SILT
67.0	40.5	23.1	3.59	NA	CLAYEY SILT to SILTY CLAY
67.5	33.8	19.2	4.14	NA	CLAYEY SILT to SILTY CLAY
68.0	30.5	17.3	3.79	NA	CLAYEY SILT to SILTY CLAY
68.5	33.5	18.9	3.59	NA	CLAYEY SILT to SILTY CLAY
69.0	36.0	20.3	3.84	NA	CLAYEY SILT to SILTY CLAY
69.5	37.1	20.8	3.96	NA	CLAYEY SILT to SILTY CLAY
70.0	41.2	23.1	3.57	NA	CLAYEY SILT to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT.

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
70.5	58.3	32.5	3.88	NA	CLAYEY SILT to SILTY CLAY
71.0	80.1	44.5	5.14	NA	*SANDY CLAY to SILTY CLAY
71.5	114.9	63.6	6.90	NA	*SANDY CLAY to SILTY CLAY
72.0	81.0	44.7	5.25	NA	*SANDY CLAY to SILTY CLAY
72.5	85.2	46.8	5.93	NA	*SANDY CLAY to SILTY CLAY
73.0	87.8	48.1	5.57	NA	*SANDY CLAY to SILTY CLAY
73.5	99.1	54.2	5.29	NA	*SANDY CLAY to SILTY CLAY
74.0	121.5	66.2	5.52	NA	*SANDY CLAY to SILTY CLAY
74.5	102.5	55.6	5.52	NA	*SANDY CLAY to SILTY CLAY
75.0	64.7	35.0	4.84	NA	*SANDY CLAY to SILTY CLAY
75.5	66.0	35.6	4.96	NA	*SANDY CLAY to SILTY CLAY
76.0	72.8	39.1	5.03	NA	*SANDY CLAY to SILTY CLAY
76.5	74.8	40.1	6.54	NA	*SANDY CLAY to SILTY CLAY
77.0	62.5	33.4	6.78	NA	*SANDY CLAY to SILTY CLAY
77.5	63.9	34.0	7.13	NA	*SANDY CLAY to SILTY CLAY
78.0	55.5	29.4	7.01	NA	*SANDY CLAY to SILTY CLAY
78.5	59.1	31.2	6.99	NA	*SANDY CLAY to SILTY CLAY
79.0	56.0	29.5	6.63	NA	*SANDY CLAY to SILTY CLAY
79.5	52.9	27.8	7.13	NA	*SANDY CLAY to SILTY CLAY
80.0	50.2	26.3	6.24	NA	*SANDY CLAY to SILTY CLAY
80.5	50.0	26.1	6.24	NA	*SANDY CLAY to SILTY CLAY
81.0	47.3	24.6	5.60	NA	SILTY CLAY to CLAY
81.5	43.7	22.7	3.96	NA	CLAYEY SILT to SILTY CLAY
82.0	47.0	24.3	4.42	NA	CLAYEY SILT to SILTY CLAY
82.5	41.9	21.6	4.85	NA	CLAYEY SILT to SILTY CLAY
83.0	34.8	17.9	4.80	NA	CLAYEY SILT to SILTY CLAY
83.5	36.7	18.7	5.47	NA	SILTY CLAY to CLAY
84.0	43.6	22.2	4.72	NA	CLAYEY SILT to SILTY CLAY
84.5	69.6	35.4	5.05	NA	*SANDY CLAY to SILTY CLAY
85.0	87.5	44.3	8.60	NA	*SANDY CLAY to SILTY CLAY
85.5	278.6	140.7	5.11	NA	*SANDY CLAY to SILTY CLAY
86.0	318.1	160.1	9.55	NA	*HEAVILY O.C./CEMENT. MAT.
86.5	262.7	131.8	7.59	NA	*SANDY CLAY to SILTY CLAY
87.0	332.7	166.4	3.74	NA	*CLAYEY SAND to SANDY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

* * * * * * * * * *		CONE PENETRATION TEST	* * * * * * * * * *	
SOUNDING :	CPT-92	PROJECT NO :	92-381-01110	
PROJECT :	D&M/UPRR-II	INSTRUMENT :	F15CKE095	
LOCATION :	SACRAMENTO CA	SYSTEM :	T-1	
DATE :	06-04-1992	OPERATOR :	MR	

PAGE 1 of 4

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
.0	.0	.0	.00	NA	
.5	.0	.0	.00	NA	
1.0	.0	.0	.00	NA	
1.5	71.6	149.1	4.43	NA	*CLAYEY SAND to SANDY CLAY
2.0	47.4	92.8	6.91	NA	*SANDY CLAY to SILTY CLAY
2.5	52.0	96.9	5.69	NA	*SANDY CLAY to SILTY CLAY
3.0	633.6	*****	4.10	NA	*HEAVILY O.C./CEMENT. MAT.
3.5	334.7	574.2	6.30	NA	*HEAVILY O.C./CEMENT. MAT.
4.0	214.4	355.3	7.59	NA	*HEAVILY O.C./CEMENT. MAT.
4.5	148.2	238.1	6.24	NA	*HEAVILY O.C./CEMENT. MAT.
5.0	116.5	181.7	4.40	NA	*CLAYEY SAND to SANDY CLAY
5.5	86.9	132.0	5.83	NA	*SANDY CLAY to SILTY CLAY
6.0	75.6	112.0	5.91	NA	*SANDY CLAY to SILTY CLAY
6.5	44.5	64.4	6.52	NA	*SANDY CLAY to SILTY CLAY
7.0	31.1	44.1	6.30	NA	*SANDY CLAY to SILTY CLAY
7.5	37.5	51.9	6.62	NA	*SANDY CLAY to SILTY CLAY
8.0	66.2	89.8	5.90	NA	*SANDY CLAY to SILTY CLAY
8.5	41.4	55.1	6.37	NA	*SANDY CLAY to SILTY CLAY
9.0	35.1	45.8	6.30	NA	*SANDY CLAY to SILTY CLAY
9.5	32.1	41.1	5.75	NA	*SANDY CLAY to SILTY CLAY
10.0	45.9	57.8	5.40	NA	*SANDY CLAY to SILTY CLAY
10.5	50.9	63.1	6.97	NA	*SANDY CLAY to SILTY CLAY
11.0	52.0	63.4	6.92	NA	*SANDY CLAY to SILTY CLAY
11.5	71.9	86.3	6.34	NA	*SANDY CLAY to SILTY CLAY
12.0	59.5	70.2	5.70	NA	*SANDY CLAY to SILTY CLAY
12.5	58.9	68.5	5.87	NA	*SANDY CLAY to SILTY CLAY
13.0	58.9	67.4	6.20	NA	*SANDY CLAY to SILTY CLAY
13.5	50.8	57.4	6.41	NA	*SANDY CLAY to SILTY CLAY
14.0	54.0	60.1	6.01	NA	*SANDY CLAY to SILTY CLAY
14.5	42.6	46.7	5.61	NA	*SANDY CLAY to SILTY CLAY
15.0	53.0	57.4	5.36	NA	*SANDY CLAY to SILTY CLAY
15.5	34.9	37.3	5.21	NA	*SANDY CLAY to SILTY CLAY
16.0	36.9	39.0	5.05	NA	*SANDY CLAY to SILTY CLAY
16.5	37.0	38.5	5.99	NA	*SANDY CLAY to SILTY CLAY
17.0	36.3	37.4	5.53	NA	*SANDY CLAY to SILTY CLAY
17.5	41.0	41.7	5.56	NA	*SANDY CLAY to SILTY CLAY
18.0	60.6	60.8	5.73	NA	*SANDY CLAY to SILTY CLAY
18.5	90.8	90.1	6.94	NA	*SANDY CLAY to SILTY CLAY
19.0	115.2	113.0	8.37	NA	*SANDY CLAY to SILTY CLAY
19.5	124.7	120.9	6.90	NA	*SANDY CLAY to SILTY CLAY
20.0	167.1	160.2	7.50	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE
 TOP 1.0 FT IS DISTURBED SOIL
 *INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL
 ASSUMED TOTAL UNIT WT = 110 PCF
 ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-92

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
20.5	140.7	133.3	8.16	NA	*SANDY CLAY to SILTY CLAY
21.0	174.4	163.5	7.64	NA	*HEAVILY O.C./CEMENT. MAT.
21.5	179.7	166.7	6.58	NA	*SANDY CLAY to SILTY CLAY
22.0	87.3	80.0	8.46	NA	*SANDY CLAY to SILTY CLAY
22.5	100.5	91.2	6.28	NA	*SANDY CLAY to SILTY CLAY
23.0	69.9	62.7	6.97	NA	*SANDY CLAY to SILTY CLAY
23.5	71.2	63.3	8.27	NA	*SANDY CLAY to SILTY CLAY
24.0	56.0	49.2	6.35	NA	*SANDY CLAY to SILTY CLAY
24.5	39.3	34.2	8.32	NA	*SANDY CLAY to SILTY CLAY
25.0	36.6	31.5	8.11	NA	*SANDY CLAY to SILTY CLAY
25.5	33.2	28.3	8.09	NA	*SANDY CLAY to SILTY CLAY
26.0	47.6	40.2	6.30	NA	*SANDY CLAY to SILTY CLAY
26.5	90.4	75.6	6.93	NA	*SANDY CLAY to SILTY CLAY
27.0	101.7	84.3	8.27	NA	*SANDY CLAY to SILTY CLAY
27.5	84.6	69.4	6.48	NA	*SANDY CLAY to SILTY CLAY
28.0	114.7	93.2	5.67	NA	*SANDY CLAY to SILTY CLAY
28.5	126.8	102.1	5.34	NA	*SANDY CLAY to SILTY CLAY
29.0	100.5	80.1	6.67	NA	*SANDY CLAY to SILTY CLAY
29.5	76.4	60.3	6.47	NA	*SANDY CLAY to SILTY CLAY
30.0	52.8	41.3	6.06	NA	*SANDY CLAY to SILTY CLAY
30.5	36.1	28.0	6.86	NA	*SANDY CLAY to SILTY CLAY
31.0	30.9	23.8	8.67	NA	*SANDY CLAY to SILTY CLAY
31.5	24.6	18.7	9.60	NA	*SANDY CLAY to SILTY CLAY
32.0	28.4	21.4	8.97	NA	*SANDY CLAY to SILTY CLAY
32.5	23.5	17.6	7.66	NA	SILTY CLAY TO CLAY
33.0	35.6	26.4	5.61	NA	*SANDY CLAY to SILTY CLAY
33.5	55.8	41.0	6.59	NA	*SANDY CLAY to SILTY CLAY
34.0	54.4	39.6	6.31	NA	*SANDY CLAY to SILTY CLAY
34.5	77.6	56.0	8.54	NA	*SANDY CLAY to SILTY CLAY
35.0	108.9	77.9	7.38	NA	*SANDY CLAY to SILTY CLAY
35.5	103.8	74.0	6.16	NA	*SANDY CLAY to SILTY CLAY
36.0	100.8	71.6	5.03	NA	*SANDY CLAY to SILTY CLAY
36.5	88.4	62.6	3.47	NA	SANDY SILT to CLAYEY SILT
37.0	64.1	45.2	3.60	NA	SANDY SILT to CLAYEY SILT
37.5	91.5	64.2	3.95	NA	*CLAYEY SAND to SANDY CLAY
38.0	72.2	50.5	5.34	NA	*SANDY CLAY to SILTY CLAY
38.5	60.3	42.1	4.09	NA	CLAYEY SILT to SILTY CLAY
39.0	64.3	44.6	4.53	NA	*SANDY CLAY to SILTY CLAY
39.5	64.9	44.9	5.27	NA	*SANDY CLAY to SILTY CLAY
40.0	66.4	45.8	7.36	NA	*SANDY CLAY to SILTY CLAY
40.5	59.2	40.7	7.89	NA	*SANDY CLAY to SILTY CLAY
41.0	74.1	50.7	5.91	NA	*SANDY CLAY to SILTY CLAY
41.5	72.2	49.3	6.93	NA	*SANDY CLAY to SILTY CLAY
42.0	56.8	38.6	7.58	NA	*SANDY CLAY to SILTY CLAY
42.5	60.9	41.2	6.06	NA	*SANDY CLAY to SILTY CLAY
43.0	86.2	58.1	5.97	NA	*SANDY CLAY to SILTY CLAY
43.5	92.2	62.0	5.17	NA	*SANDY CLAY to SILTY CLAY
44.0	89.0	59.6	4.89	NA	*SANDY CLAY to SILTY CLAY
44.5	81.0	54.0	4.76	NA	*SANDY CLAY to SILTY CLAY
45.0	70.1	46.6	4.51	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-92

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
45.5	60.9	40.3	4.59	NA	*SANDY CLAY to SILTY CLAY
46.0	64.8	42.8	6.01	NA	*SANDY CLAY to SILTY CLAY
46.5	58.2	38.3	5.28	NA	*SANDY CLAY to SILTY CLAY
47.0	59.9	39.2	4.58	NA	*SANDY CLAY to SILTY CLAY
47.5	59.8	39.1	5.24	NA	*SANDY CLAY to SILTY CLAY
48.0	56.9	37.0	5.57	NA	*SANDY CLAY to SILTY CLAY
48.5	47.9	31.1	5.10	NA	*SANDY CLAY to SILTY CLAY
49.0	46.3	29.9	5.20	NA	*SANDY CLAY to SILTY CLAY
49.5	51.0	32.8	5.30	NA	*SANDY CLAY to SILTY CLAY
50.0	58.0	37.2	5.24	NA	*SANDY CLAY to SILTY CLAY
50.5	64.6	41.3	5.00	NA	*SANDY CLAY to SILTY CLAY
51.0	78.5	50.0	5.93	NA	*SANDY CLAY to SILTY CLAY
51.5	68.4	43.4	6.78	NA	*SANDY CLAY to SILTY CLAY
52.0	63.9	40.4	6.44	NA	*SANDY CLAY to SILTY CLAY
52.5	52.4	33.0	6.39	NA	*SANDY CLAY to SILTY CLAY
53.0	45.1	28.3	6.86	NA	*SANDY CLAY to SILTY CLAY
53.5	35.8	22.4	6.38	NA	*SANDY CLAY to SILTY CLAY
54.0	32.1	20.0	5.54	NA	SILTY CLAY TO CLAY
54.5	30.4	18.9	5.97	NA	SILTY CLAY TO CLAY
55.0	29.8	18.5	6.22	NA	SILTY CLAY TO CLAY
55.5	29.3	18.1	5.43	NA	SILTY CLAY TO CLAY
56.0	28.3	17.4	5.77	NA	SILTY CLAY TO CLAY
56.5	26.9	16.5	5.60	NA	SILTY CLAY TO CLAY
57.0	26.2	16.0	4.55	NA	CLAYEY SILT to SILTY CLAY
57.5	27.7	16.9	5.24	NA	SILTY CLAY TO CLAY
58.0	38.9	23.6	5.11	NA	CLAYEY SILT to SILTY CLAY
58.5	49.6	30.0	4.65	NA	CLAYEY SILT to SILTY CLAY
59.0	49.8	30.0	6.00	NA	*SANDY CLAY to SILTY CLAY
59.5	39.1	23.5	5.45	NA	SILTY CLAY TO CLAY
60.0	40.1	24.0	5.51	NA	SILTY CLAY TO CLAY
60.5	52.2	31.2	6.11	NA	*SANDY CLAY to SILTY CLAY
61.0	60.2	35.8	7.82	NA	*SANDY CLAY to SILTY CLAY
61.5	33.0	19.6	5.97	NA	SILTY CLAY TO CLAY
62.0	70.5	41.6	7.04	NA	*SANDY CLAY to SILTY CLAY
62.5	63.9	37.6	7.69	NA	*SANDY CLAY to SILTY CLAY
63.0	132.2	77.5	7.25	NA	*SANDY CLAY to SILTY CLAY
63.5	115.6	67.5	7.69	NA	*SANDY CLAY to SILTY CLAY
64.0	62.7	36.5	6.16	NA	*SANDY CLAY to SILTY CLAY
64.5	58.1	33.7	7.17	NA	*SANDY CLAY to SILTY CLAY
65.0	42.5	24.6	6.05	NA	*SANDY CLAY to SILTY CLAY
65.5	47.1	27.2	5.06	NA	CLAYEY SILT to SILTY CLAY
66.0	38.5	22.1	4.89	NA	CLAYEY SILT to SILTY CLAY
66.5	33.7	19.3	5.97	NA	SILTY CLAY TO CLAY
67.0	28.7	16.4	6.73	NA	SILTY CLAY TO CLAY
67.5	30.3	17.2	6.29	NA	SILTY CLAY TO CLAY
68.0	34.5	19.6	6.05	NA	SILTY CLAY TO CLAY
68.5	38.1	21.5	6.21	NA	SILTY CLAY TO CLAY
69.0	44.9	25.3	6.54	NA	*SANDY CLAY to SILTY CLAY
69.5	40.9	23.0	7.65	NA	*SANDY CLAY to SILTY CLAY
70.0	30.4	17.0	6.83	NA	SILTY CLAY TO CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-92

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
70.5	29.8	16.6	5.84	NA	SILTY CLAY TO CLAY
71.0	31.9	17.7	5.30	NA	SILTY CLAY TO CLAY
71.5	29.9	16.5	5.10	NA	CLAYEY SILT to SILTY CLAY
72.0	33.8	18.7	5.32	NA	SILTY CLAY TO CLAY
72.5	40.7	22.4	5.34	NA	CLAYEY SILT to SILTY CLAY
73.0	52.5	28.8	5.26	NA	*SANDY CLAY to SILTY CLAY
73.5	65.6	35.9	4.96	NA	*SANDY CLAY to SILTY CLAY
74.0	69.0	37.6	5.05	NA	*SANDY CLAY to SILTY CLAY
74.5	71.6	38.9	5.02	NA	*SANDY CLAY to SILTY CLAY
75.0	74.0	40.1	5.98	NA	*SANDY CLAY to SILTY CLAY
75.5	70.1	37.8	5.38	NA	*SANDY CLAY to SILTY CLAY
76.0	102.9	55.3	6.10	NA	*SANDY CLAY to SILTY CLAY
76.5	147.9	79.2	6.24	NA	*SANDY CLAY to SILTY CLAY
77.0	176.7	94.3	7.90	NA	*SANDY CLAY to SILTY CLAY
77.5	165.4	88.0	6.88	NA	*SANDY CLAY to SILTY CLAY
78.0	164.8	87.4	5.39	NA	*SANDY CLAY to SILTY CLAY
78.5	119.7	63.3	7.31	NA	*SANDY CLAY to SILTY CLAY
79.0	143.7	75.7	8.81	NA	*SANDY CLAY to SILTY CLAY
79.5	186.2	97.8	8.30	NA	*SANDY CLAY to SILTY CLAY
80.0	280.0	146.6	5.83	NA	*SANDY CLAY to SILTY CLAY
80.5	294.7	153.8	7.32	NA	*SANDY CLAY to SILTY CLAY
81.0	320.2	166.5	6.88	NA	*SANDY CLAY to SILTY CLAY
81.5	290.4	150.5	4.28	NA	*CLAYEY SAND to SANDY CLAY
82.0	341.0	176.1	5.42	NA	*SANDY CLAY to SILTY CLAY
82.5	302.8	155.9	7.12	NA	*SANDY CLAY to SILTY CLAY
83.0	350.3	179.8	7.16	NA	*HEAVILY O.C./CEMENT. MAT.

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

 *
 * **CONE PENETRATION TEST** *
 *
 * SOUNDING : CPT-93 PROJECT NO : 92-381-01110 *
 * PROJECT : D&M/UPRR-II INSTRUMENT : F15CCKE095 *
 * LOCATION : SACRAMENTO CA SYSTEM : T-1 *
 * DATE : 06-04-1992 OPERATOR : MR *
 *

PAGE 1 of 4

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
.0	.0	.0	.00	NA	
.5	.0	.0	.00	NA	
1.0	.0	.0	.00	NA	
1.5	.0	.0	.00	NA	
2.0	56.1	109.9	5.37	NA	*SANDY CLAY to SILTY CLAY
2.5	41.8	77.8	7.76	NA	*SANDY CLAY to SILTY CLAY
3.0	40.2	71.6	7.52	NA	*SANDY CLAY to SILTY CLAY
3.5	42.1	72.2	5.34	NA	*SANDY CLAY to SILTY CLAY
4.0	48.1	79.7	6.16	NA	*SANDY CLAY to SILTY CLAY
4.5	49.4	79.3	5.91	NA	*SANDY CLAY to SILTY CLAY
5.0	43.3	67.6	5.25	NA	*SANDY CLAY to SILTY CLAY
5.5	37.8	57.4	5.51	NA	*SANDY CLAY to SILTY CLAY
6.0	32.5	48.2	5.69	NA	*SANDY CLAY to SILTY CLAY
6.5	53.8	77.9	4.59	NA	*SANDY CLAY to SILTY CLAY
7.0	68.6	97.0	6.51	NA	*SANDY CLAY to SILTY CLAY
7.5	113.5	157.2	7.46	NA	*SANDY CLAY to SILTY CLAY
8.0	98.5	133.6	7.86	NA	*SANDY CLAY to SILTY CLAY
8.5	91.4	121.5	8.76	NA	*SANDY CLAY to SILTY CLAY
9.0	75.8	98.9	8.03	NA	*SANDY CLAY to SILTY CLAY
9.5	67.2	86.1	7.67	NA	*SANDY CLAY to SILTY CLAY
10.0	61.9	78.0	8.28	NA	*SANDY CLAY to SILTY CLAY
10.5	80.5	99.7	8.04	NA	*SANDY CLAY to SILTY CLAY
11.0	73.0	88.9	7.24	NA	*SANDY CLAY to SILTY CLAY
11.5	66.1	79.2	7.30	NA	*SANDY CLAY to SILTY CLAY
12.0	64.7	76.4	7.09	NA	*SANDY CLAY to SILTY CLAY
12.5	57.9	67.3	6.55	NA	*SANDY CLAY to SILTY CLAY
13.0	39.5	45.2	5.67	NA	*SANDY CLAY to SILTY CLAY
13.5	44.1	49.8	6.80	NA	*SANDY CLAY to SILTY CLAY
14.0	40.1	44.6	7.73	NA	*SANDY CLAY to SILTY CLAY
14.5	36.0	39.6	7.64	NA	*SANDY CLAY to SILTY CLAY
15.0	48.2	52.3	6.18	NA	*SANDY CLAY to SILTY CLAY
15.5	48.7	52.1	7.39	NA	*SANDY CLAY to SILTY CLAY
16.0	43.3	45.7	7.03	NA	*SANDY CLAY to SILTY CLAY
16.5	87.3	91.0	6.33	NA	*SANDY CLAY to SILTY CLAY
17.0	156.2	160.8	8.66	NA	*HEAVILY O.C./CEMENT. MAT.
17.5	137.2	139.5	8.98	NA	*SANDY CLAY to SILTY CLAY
18.0	104.4	104.9	8.72	NA	*SANDY CLAY to SILTY CLAY
18.5	87.0	86.4	8.84	NA	*SANDY CLAY to SILTY CLAY
19.0	102.9	100.9	7.41	NA	*SANDY CLAY to SILTY CLAY
19.5	142.7	138.4	7.45	NA	*SANDY CLAY to SILTY CLAY
20.0	153.7	147.3	7.16	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE
 TOP 1.7 FT IS DISTURBED SOIL
 *INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL
 ASSUMED TOTAL UNIT WT = 110 PCF
 ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-93

DEPTH	TIP RESISTANCE	NORMALIZED	FRICTION	CONE PORE	SOIL BEHAVIOR TYPE
(ft)	(tsf)	TIP RESISTANCE	RATIO	PRESSURE	
		(tsf)	(%)	(tsf)	
20.5	177.3	168.0	7.98	NA	*HEAVILY O.C./CEMENT. MAT.
21.0	151.9	142.4	7.81	NA	*SANDY CLAY to SILTY CLAY
21.5	131.1	121.6	6.82	NA	*SANDY CLAY to SILTY CLAY
22.0	75.4	69.1	6.25	NA	*SANDY CLAY to SILTY CLAY
22.5	81.0	73.5	5.59	NA	*SANDY CLAY to SILTY CLAY
23.0	59.9	53.7	5.93	NA	*SANDY CLAY to SILTY CLAY
23.5	47.8	42.5	7.35	NA	*SANDY CLAY to SILTY CLAY
24.0	37.2	32.7	6.26	NA	*SANDY CLAY to SILTY CLAY
24.5	23.3	20.3	6.81	NA	*SANDY CLAY to SILTY CLAY
25.0	20.5	17.7	7.38	NA	SILTY CLAY to CLAY
25.5	21.2	18.1	5.29	NA	SILTY CLAY to CLAY
26.0	72.4	61.2	4.74	NA	*SANDY CLAY to SILTY CLAY
26.5	116.2	97.2	5.97	NA	*SANDY CLAY to SILTY CLAY
27.0	143.5	118.8	6.26	NA	*SANDY CLAY to SILTY CLAY
27.5	107.3	88.0	6.18	NA	*SANDY CLAY to SILTY CLAY
28.0	60.2	48.9	5.76	NA	*SANDY CLAY to SILTY CLAY
28.5	62.4	50.2	6.52	NA	*SANDY CLAY to SILTY CLAY
29.0	48.8	38.9	8.64	NA	*SANDY CLAY to SILTY CLAY
29.5	40.7	32.1	9.45	NA	*SANDY CLAY to SILTY CLAY
30.0	88.4	69.2	7.68	NA	*SANDY CLAY to SILTY CLAY
30.5	109.5	84.9	8.37	NA	*SANDY CLAY to SILTY CLAY
31.0	77.2	59.3	9.27	NA	*SANDY CLAY to SILTY CLAY
31.5	89.8	68.4	7.51	NA	*SANDY CLAY to SILTY CLAY
32.0	84.0	63.4	9.60	NA	*SANDY CLAY to SILTY CLAY
32.5	56.1	42.0	8.81	NA	*SANDY CLAY to SILTY CLAY
33.0	54.0	40.1	7.50	NA	*SANDY CLAY to SILTY CLAY
33.5	52.0	38.2	5.07	NA	*SANDY CLAY to SILTY CLAY
34.0	50.3	36.6	5.06	NA	*SANDY CLAY to SILTY CLAY
34.5	42.0	30.3	4.76	NA	CLAYEY SILT to SILTY CLAY
35.0	49.9	35.7	4.78	NA	*SANDY CLAY to SILTY CLAY
35.5	44.4	31.6	5.43	NA	*SANDY CLAY to SILTY CLAY
36.0	42.5	30.2	4.68	NA	CLAYEY SILT to SILTY CLAY
36.5	84.4	59.7	7.26	NA	*SANDY CLAY to SILTY CLAY
37.0	106.7	75.2	9.10	NA	*SANDY CLAY to SILTY CLAY
37.5	91.0	63.9	6.14	NA	*SANDY CLAY to SILTY CLAY
38.0	61.5	43.0	6.53	NA	*SANDY CLAY to SILTY CLAY
38.5	57.0	39.8	6.56	NA	*SANDY CLAY to SILTY CLAY
39.0	62.6	43.5	6.63	NA	*SANDY CLAY to SILTY CLAY
39.5	39.5	27.3	11.05	NA	*SANDY CLAY to SILTY CLAY
40.0	30.5	21.1	8.95	NA	*SANDY CLAY to SILTY CLAY
40.5	29.3	20.2	9.01	NA	*SANDY CLAY to SILTY CLAY
41.0	34.1	23.3	8.55	NA	*SANDY CLAY to SILTY CLAY
41.5	40.0	27.3	6.66	NA	*SANDY CLAY to SILTY CLAY
42.0	64.6	43.9	5.43	NA	*SANDY CLAY to SILTY CLAY
42.5	72.3	48.9	6.02	NA	*SANDY CLAY to SILTY CLAY
43.0	68.1	45.9	6.12	NA	*SANDY CLAY to SILTY CLAY
43.5	82.5	55.4	6.58	NA	*SANDY CLAY to SILTY CLAY
44.0	64.6	43.3	7.81	NA	*SANDY CLAY to SILTY CLAY
44.5	51.9	34.6	7.43	NA	*SANDY CLAY to SILTY CLAY
45.0	74.6	49.6	6.04	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
45.5	60.8	40.3	5.73	NA	*SANDY CLAY to SILTY CLAY
46.0	71.3	47.1	7.54	NA	*SANDY CLAY to SILTY CLAY
46.5	47.6	31.3	6.33	NA	*SANDY CLAY to SILTY CLAY
47.0	52.5	34.4	5.70	NA	*SANDY CLAY to SILTY CLAY
47.5	54.4	35.5	5.97	NA	*SANDY CLAY to SILTY CLAY
48.0	52.0	33.8	6.19	NA	*SANDY CLAY to SILTY CLAY
48.5	51.2	33.2	6.86	NA	*SANDY CLAY to SILTY CLAY
49.0	48.3	31.2	6.92	NA	*SANDY CLAY to SILTY CLAY
49.5	44.6	28.7	7.05	NA	*SANDY CLAY to SILTY CLAY
50.0	36.5	23.4	7.42	NA	*SANDY CLAY to SILTY CLAY
50.5	32.8	20.9	6.85	NA	*SANDY CLAY to SILTY CLAY
51.0	34.2	21.8	7.31	NA	*SANDY CLAY to SILTY CLAY
51.5	26.2	16.7	7.84	NA	SILTY CLAY TO CLAY
52.0	19.1	12.1	10.50	NA	CLAY TO ORGANIC CLAY
52.5	8.7	5.5	5.97	NA	SILTY CLAY TO CLAY
53.0	6.9	4.3	5.33	NA	SILTY CLAY TO CLAY
53.5	7.8	4.9	5.37	NA	SILTY CLAY TO CLAY
54.0	12.1	7.6	6.43	NA	SILTY CLAY TO CLAY
54.5	14.8	9.2	6.45	NA	SILTY CLAY TO CLAY
55.0	15.3	9.5	7.23	NA	SILTY CLAY TO CLAY
55.5	12.4	7.7	6.65	NA	SILTY CLAY TO CLAY
56.0	19.6	12.0	6.63	NA	SILTY CLAY TO CLAY
56.5	18.1	11.1	7.42	NA	SILTY CLAY TO CLAY
57.0	21.8	13.3	6.31	NA	SILTY CLAY TO CLAY
57.5	30.5	18.5	6.59	NA	SILTY CLAY TO CLAY
58.0	41.2	25.0	6.17	NA	*SANDY CLAY to SILTY CLAY
58.5	53.3	32.2	5.30	NA	*SANDY CLAY to SILTY CLAY
59.0	132.8	80.0	6.19	NA	*SANDY CLAY to SILTY CLAY
59.5	153.8	92.4	6.41	NA	*SANDY CLAY to SILTY CLAY
60.0	219.2	131.2	5.62	NA	*SANDY CLAY to SILTY CLAY
60.5	310.0	184.9	5.17	NA	*SANDY CLAY to SILTY CLAY
61.0	408.7	243.0	4.63	NA	*CLAYEY SAND to SANDY CLAY
61.5	274.1	162.4	8.43	NA	*HEAVILY O.C./CEMENT. MAT.
62.0	203.9	120.4	9.18	NA	*SANDY CLAY to SILTY CLAY
62.5	194.8	114.7	9.82	NA	*SANDY CLAY to SILTY CLAY
63.0	187.6	110.0	9.44	NA	*SANDY CLAY to SILTY CLAY
63.5	101.2	59.2	8.60	NA	*SANDY CLAY to SILTY CLAY
64.0	41.3	24.1	5.38	NA	CLAYEY SILT to SILTY CLAY
64.5	40.3	23.4	3.60	NA	CLAYEY SILT to SILTY CLAY
65.0	38.4	22.2	3.96	NA	CLAYEY SILT to SILTY CLAY
65.5	39.9	23.0	4.38	NA	CLAYEY SILT to SILTY CLAY
66.0	43.9	25.2	4.83	NA	CLAYEY SILT to SILTY CLAY
66.5	51.2	29.3	4.97	NA	CLAYEY SILT to SILTY CLAY
67.0	43.4	24.8	5.99	NA	*SANDY CLAY to SILTY CLAY
67.5	36.2	20.6	5.64	NA	SILTY CLAY TO CLAY
68.0	31.9	18.1	4.98	NA	CLAYEY SILT to SILTY CLAY
68.5	29.5	16.7	4.52	NA	CLAYEY SILT to SILTY CLAY
69.0	31.2	17.6	3.84	NA	CLAYEY SILT to SILTY CLAY
69.5	40.3	22.6	4.25	NA	CLAYEY SILT to SILTY CLAY
70.0	84.3	47.2	5.66	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-93

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
70.5	164.1	91.5	8.53	NA	*SANDY CLAY to SILTY CLAY
71.0	162.3	90.2	6.82	NA	*SANDY CLAY to SILTY CLAY
71.5	191.1	105.8	8.28	NA	*SANDY CLAY to SILTY CLAY
72.0	268.8	148.4	5.16	NA	*SANDY CLAY to SILTY CLAY
72.5	251.7	138.5	5.70	NA	*SANDY CLAY to SILTY CLAY
73.0	210.2	115.3	4.93	NA	*SANDY CLAY to SILTY CLAY
73.5	186.2	101.7	4.13	NA	*CLAYEY SAND to SANDY CLAY
74.0	180.7	98.4	3.05	NA	*CLAYEY SAND to SANDY CLAY
74.5	162.9	88.4	3.38	NA	*CLAYEY SAND to SANDY CLAY
75.0	183.0	99.0	3.60	NA	*CLAYEY SAND to SANDY CLAY
75.5	205.4	110.7	3.56	NA	*CLAYEY SAND to SANDY CLAY
76.0	212.0	113.9	3.62	NA	*CLAYEY SAND to SANDY CLAY
76.5	233.0	124.8	2.69	NA	SILTY SAND to SANDY SILT
77.0	263.1	140.5	2.91	NA	*SILTY SAND to CLAYEY SAND
77.5	339.1	180.4	3.21	NA	*SILTY SAND to CLAYEY SAND
78.0	398.4	211.3	4.09	NA	*CLAYEY SAND to SANDY CLAY
78.5	401.4	212.2	3.80	NA	*CLAYEY SAND to SANDY CLAY
79.0	351.3	185.1	2.83	NA	*SILTY SAND to CLAYEY SAND
79.5	357.7	187.9	2.79	NA	*SILTY SAND to CLAYEY SAND
80.0	281.0	147.1	5.78	NA	*SANDY CLAY to SILTY CLAY
80.5	227.7	118.8	7.39	NA	*SANDY CLAY to SILTY CLAY
81.0	386.8	201.1	5.73	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

CONE PENETRATION TEST

* SOUNDING : CPT-94	* PROJECT NO : 92-381-01110
* PROJECT : D&M/UPRR-II	* INSTRUMENT : F15CKE095
* LOCATION : SACRAMENTO CA	* SYSTEM : T-1
* DATE : 06-04-1992	* OPERATOR : MR

PAGE 1 of 4

DEPTH	TIP RESISTANCE	NORMALIZED	FRICTION	CONE PORE	SOIL BEHAVIOR TYPE
(ft)	(tsf)	TIP RESISTANCE (tsf)	RATIO (%)	PRESSURE (tsf)	
.0	.0	.0	.00	NA	
.5	.0	.0	.00	NA	
1.0	.0	.0	.00	NA	
1.5	6.8	14.1	13.60	NA	CLAY TO ORGANIC CLAY
2.0	30.4	59.5	4.23	NA	*SANDY CLAY to SILTY CLAY
2.5	233.0	433.9	7.36	NA	*HEAVILY O.C./CEMENT. MAT.
3.0	168.4	300.3	7.37	NA	*HEAVILY O.C./CEMENT. MAT.
3.5	85.1	145.9	7.95	NA	*SANDY CLAY to SILTY CLAY
4.0	86.7	143.7	8.62	NA	*SANDY CLAY to SILTY CLAY
4.5	90.5	145.4	8.21	NA	*SANDY CLAY to SILTY CLAY
5.0	78.7	122.8	8.26	NA	*SANDY CLAY to SILTY CLAY
5.5	67.9	103.1	8.47	NA	*SANDY CLAY to SILTY CLAY
6.0	41.6	61.7	7.34	NA	*SANDY CLAY to SILTY CLAY
6.5	38.3	55.5	6.68	NA	*SANDY CLAY to SILTY CLAY
7.0	31.6	44.8	6.42	NA	*SANDY CLAY to SILTY CLAY
7.5	22.7	31.4	5.74	NA	*SANDY CLAY to SILTY CLAY
8.0	22.7	30.7	4.67	NA	CLAYEY SILT to SILTY CLAY
8.5	26.3	35.0	5.50	NA	*SANDY CLAY to SILTY CLAY
9.0	25.4	33.2	5.42	NA	*SANDY CLAY to SILTY CLAY
9.5	34.1	43.7	5.80	NA	*SANDY CLAY to SILTY CLAY
10.0	33.2	41.8	6.55	NA	*SANDY CLAY to SILTY CLAY
10.5	28.4	35.1	6.67	NA	*SANDY CLAY to SILTY CLAY
11.0	21.4	26.1	6.46	NA	*SANDY CLAY to SILTY CLAY
11.5	12.8	15.3	8.66	NA	CLAY TO ORGANIC CLAY
12.0	27.1	32.0	5.14	NA	*SANDY CLAY to SILTY CLAY
12.5	81.0	94.2	5.22	NA	*SANDY CLAY to SILTY CLAY
13.0	45.7	52.4	7.38	NA	*SANDY CLAY to SILTY CLAY
13.5	77.0	87.0	6.18	NA	*SANDY CLAY to SILTY CLAY
14.0	97.4	108.4	6.90	NA	*SANDY CLAY to SILTY CLAY
14.5	93.0	102.1	6.61	NA	*SANDY CLAY to SILTY CLAY
15.0	87.8	95.1	6.76	NA	*SANDY CLAY to SILTY CLAY
15.5	87.4	93.4	6.82	NA	*SANDY CLAY to SILTY CLAY
16.0	76.6	80.8	7.83	NA	*SANDY CLAY to SILTY CLAY
16.5	64.8	67.5	6.94	NA	*SANDY CLAY to SILTY CLAY
17.0	43.7	45.0	6.48	NA	*SANDY CLAY to SILTY CLAY
17.5	44.5	45.2	6.52	NA	*SANDY CLAY to SILTY CLAY
18.0	55.0	55.3	7.91	NA	*SANDY CLAY to SILTY CLAY
18.5	288.6	286.4	7.56	NA	*HEAVILY O.C./CEMENT. MAT.
19.0	142.4	139.7	8.94	NA	*SANDY CLAY to SILTY CLAY
19.5	118.0	114.4	7.64	NA	*SANDY CLAY to SILTY CLAY
20.0	144.2	138.2	6.37	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE
 TOP 1.2 FT IS DISTURBED SOIL
 *INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL
 ASSUMED TOTAL UNIT WT = 110 PCF
 ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-94

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
20.5	97.6	92.5	8.15	NA	*SANDY CLAY to SILTY CLAY
21.0	106.7	100.0	8.53	NA	*SANDY CLAY to SILTY CLAY
21.5	154.3	143.1	8.36	NA	*SANDY CLAY to SILTY CLAY
22.0	169.2	155.2	5.71	NA	*SANDY CLAY to SILTY CLAY
22.5	98.0	88.9	8.35	NA	*SANDY CLAY to SILTY CLAY
23.0	76.3	68.5	9.06	NA	*SANDY CLAY to SILTY CLAY
23.5	75.6	67.2	6.99	NA	*SANDY CLAY to SILTY CLAY
24.0	94.8	83.4	5.97	NA	*SANDY CLAY to SILTY CLAY
24.5	114.5	99.6	6.12	NA	*SANDY CLAY to SILTY CLAY
25.0	127.1	109.6	7.87	NA	*SANDY CLAY to SILTY CLAY
25.5	165.3	141.0	7.22	NA	*SANDY CLAY to SILTY CLAY
26.0	111.1	93.8	9.37	NA	*SANDY CLAY to SILTY CLAY
26.5	120.6	100.9	8.15	NA	*SANDY CLAY to SILTY CLAY
27.0	96.9	80.2	7.38	NA	*SANDY CLAY to SILTY CLAY
27.5	102.5	84.1	5.51	NA	*SANDY CLAY to SILTY CLAY
28.0	116.3	94.5	6.25	NA	*SANDY CLAY to SILTY CLAY
28.5	95.3	76.7	9.22	NA	*SANDY CLAY to SILTY CLAY
29.0	103.0	82.1	6.20	NA	*SANDY CLAY to SILTY CLAY
29.5	105.1	83.0	6.22	NA	*SANDY CLAY to SILTY CLAY
30.0	81.3	63.6	7.91	NA	*SANDY CLAY to SILTY CLAY
30.5	59.4	46.1	6.99	NA	*SANDY CLAY to SILTY CLAY
31.0	80.8	62.1	6.03	NA	*SANDY CLAY to SILTY CLAY
31.5	50.5	38.5	9.02	NA	*SANDY CLAY to SILTY CLAY
32.0	51.5	38.8	10.18	NA	*SANDY CLAY to SILTY CLAY
32.5	59.4	44.4	9.61	NA	*SANDY CLAY to SILTY CLAY
33.0	56.9	42.2	10.73	NA	*SANDY CLAY to SILTY CLAY
33.5	78.2	57.4	9.00	NA	*SANDY CLAY to SILTY CLAY
34.0	75.7	55.2	8.72	NA	*SANDY CLAY to SILTY CLAY
34.5	93.0	67.2	8.59	NA	*SANDY CLAY to SILTY CLAY
35.0	78.3	56.0	9.38	NA	*SANDY CLAY to SILTY CLAY
35.5	96.7	68.9	9.19	NA	*SANDY CLAY to SILTY CLAY
36.0	76.9	54.6	8.97	NA	*SANDY CLAY to SILTY CLAY
36.5	62.4	44.2	6.29	NA	*SANDY CLAY to SILTY CLAY
37.0	58.8	41.4	5.50	NA	*SANDY CLAY to SILTY CLAY
37.5	62.4	43.8	5.40	NA	*SANDY CLAY to SILTY CLAY
38.0	67.9	47.5	5.53	NA	*SANDY CLAY to SILTY CLAY
38.5	59.8	41.7	6.32	NA	*SANDY CLAY to SILTY CLAY
39.0	77.0	53.5	5.18	NA	*SANDY CLAY to SILTY CLAY
39.5	77.1	53.4	5.53	NA	*SANDY CLAY to SILTY CLAY
40.0	59.3	40.9	6.08	NA	*SANDY CLAY to SILTY CLAY
40.5	39.8	27.4	6.15	NA	*SANDY CLAY to SILTY CLAY
41.0	38.9	26.6	5.32	NA	CLAYEY SILT to SILTY CLAY
41.5	66.0	45.0	5.57	NA	*SANDY CLAY to SILTY CLAY
42.0	59.6	40.5	5.42	NA	*SANDY CLAY to SILTY CLAY
42.5	54.2	36.7	5.40	NA	*SANDY CLAY to SILTY CLAY
43.0	56.9	38.4	9.28	NA	*SANDY CLAY to SILTY CLAY
43.5	42.3	28.4	8.73	NA	*SANDY CLAY to SILTY CLAY
44.0	53.3	35.7	10.05	NA	*SANDY CLAY to SILTY CLAY
44.5	79.6	53.1	8.53	NA	*SANDY CLAY to SILTY CLAY
45.0	70.8	47.1	8.99	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-94

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
45.5	66.0	43.7	9.77	NA	*SANDY CLAY to SILTY CLAY
46.0	91.7	60.5	6.41	NA	*SANDY CLAY to SILTY CLAY
46.5	122.9	80.9	5.53	NA	*SANDY CLAY to SILTY CLAY
47.0	122.9	80.6	6.35	NA	*SANDY CLAY to SILTY CLAY
47.5	132.3	86.4	7.28	NA	*SANDY CLAY to SILTY CLAY
48.0	113.3	73.7	7.25	NA	*SANDY CLAY to SILTY CLAY
48.5	132.8	86.1	6.79	NA	*SANDY CLAY to SILTY CLAY
49.0	80.5	52.0	7.43	NA	*SANDY CLAY to SILTY CLAY
49.5	53.4	34.4	5.15	NA	*SANDY CLAY to SILTY CLAY
50.0	41.6	26.7	5.17	NA	CLAYEY SILT to SILTY CLAY
50.5	42.5	27.2	5.35	NA	*SANDY CLAY to SILTY CLAY
51.0	34.1	21.7	5.63	NA	SILTY CLAY TO CLAY
51.5	31.0	19.7	5.34	NA	SILTY CLAY TO CLAY
52.0	27.5	17.4	5.43	NA	SILTY CLAY TO CLAY
52.5	26.8	16.9	5.89	NA	SILTY CLAY TO CLAY
53.0	25.8	16.2	6.93	NA	SILTY CLAY TO CLAY
53.5	28.4	17.8	5.21	NA	SILTY CLAY TO CLAY
54.0	38.7	24.1	6.27	NA	*SANDY CLAY to SILTY CLAY
54.5	23.7	14.7	7.23	NA	SILTY CLAY TO CLAY
55.0	36.1	22.4	6.30	NA	*SANDY CLAY to SILTY CLAY
55.5	47.6	29.4	6.69	NA	*SANDY CLAY to SILTY CLAY
56.0	57.7	35.5	5.65	NA	*SANDY CLAY to SILTY CLAY
56.5	162.9	99.9	5.50	NA	*SANDY CLAY to SILTY CLAY
57.0	75.6	46.2	6.96	NA	*SANDY CLAY to SILTY CLAY
57.5	71.4	43.5	6.12	NA	*SANDY CLAY to SILTY CLAY
58.0	67.1	40.7	5.76	NA	*SANDY CLAY to SILTY CLAY
58.5	61.1	36.9	6.15	NA	*SANDY CLAY to SILTY CLAY
59.0	57.5	34.7	6.80	NA	*SANDY CLAY to SILTY CLAY
59.5	49.1	29.5	7.57	NA	*SANDY CLAY to SILTY CLAY
60.0	51.7	31.0	8.10	NA	*SANDY CLAY to SILTY CLAY
60.5	50.3	30.0	7.17	NA	*SANDY CLAY to SILTY CLAY
61.0	49.2	29.2	6.93	NA	*SANDY CLAY to SILTY CLAY
61.5	52.7	31.2	7.16	NA	*SANDY CLAY to SILTY CLAY
62.0	53.4	31.5	6.14	NA	*SANDY CLAY to SILTY CLAY
62.5	66.5	39.1	7.04	NA	*SANDY CLAY to SILTY CLAY
63.0	49.6	29.1	6.73	NA	*SANDY CLAY to SILTY CLAY
63.5	51.8	30.3	4.82	NA	CLAYEY SILT to SILTY CLAY
64.0	83.7	48.7	5.75	NA	*SANDY CLAY to SILTY CLAY
64.5	98.8	57.3	5.30	NA	*SANDY CLAY to SILTY CLAY
65.0	99.6	57.6	6.58	NA	*SANDY CLAY to SILTY CLAY
65.5	94.7	54.6	6.19	NA	*SANDY CLAY to SILTY CLAY
66.0	79.2	45.5	6.61	NA	*SANDY CLAY to SILTY CLAY
66.5	82.2	47.1	5.85	NA	*SANDY CLAY to SILTY CLAY
67.0	72.3	41.3	5.73	NA	*SANDY CLAY to SILTY CLAY
67.5	93.6	53.2	4.59	NA	*SANDY CLAY to SILTY CLAY
68.0	111.4	63.2	6.15	NA	*SANDY CLAY to SILTY CLAY
68.5	146.1	82.6	8.19	NA	*SANDY CLAY to SILTY CLAY
69.0	227.0	127.8	7.05	NA	*SANDY CLAY to SILTY CLAY
69.5	224.3	125.9	7.96	NA	*SANDY CLAY to SILTY CLAY
70.0	113.8	63.7	7.83	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
70.5	77.0	42.9	4.22	NA	*SANDY CLAY to SILTY CLAY
71.0	108.1	60.1	4.76	NA	*SANDY CLAY to SILTY CLAY
71.5	205.8	114.0	6.49	NA	*SANDY CLAY to SILTY CLAY
72.0	134.4	74.2	7.00	NA	*SANDY CLAY to SILTY CLAY
72.5	82.4	45.3	7.96	NA	*SANDY CLAY to SILTY CLAY
73.0	117.0	64.2	6.54	NA	*SANDY CLAY to SILTY CLAY
73.5	180.6	98.7	5.08	NA	*SANDY CLAY to SILTY CLAY
74.0	241.8	131.7	3.72	NA	*CLAYEY SAND to SANDY CLAY
74.5	287.8	156.3	3.90	NA	*CLAYEY SAND to SANDY CLAY
75.0	386.3	209.0	3.83	NA	*CLAYEY SAND to SANDY CLAY
75.5	439.4	237.0	5.24	NA	*SANDY CLAY to SILTY CLAY
76.0	416.9	224.1	7.15	NA	*HEAVILY O.C./CEMENT. MAT.
76.5	296.5	158.8	4.71	NA	*SANDY CLAY to SILTY CLAY
77.0	200.4	107.0	3.13	NA	*CLAYEY SAND to SANDY CLAY
77.5	393.7	209.5	4.43	NA	*CLAYEY SAND to SANDY CLAY
78.0	311.4	165.2	9.15	NA	*HEAVILY O.C./CEMENT. MAT.
78.5	421.0	222.6	4.85	NA	*SANDY CLAY to SILTY CLAY
79.0	504.0	265.6	2.81	NA	*SILTY SAND to CLAYEY SAND
79.5	423.1	222.2	3.46	NA	*CLAYEY SAND to SANDY CLAY
80.0	324.0	169.6	2.80	NA	*SILTY SAND to CLAYEY SAND
80.5	354.4	184.9	3.02	NA	*SILTY SAND to CLAYEY SAND
81.0	344.0	178.9	3.25	NA	*SILTY SAND to CLAYEY SAND
81.5	320.7	166.2	3.28	NA	*SILTY SAND to CLAYEY SAND
82.0	313.8	162.1	3.30	NA	*CLAYEY SAND to SANDY CLAY
82.5	331.2	170.6	2.86	NA	*SILTY SAND to CLAYEY SAND
83.0	273.1	140.1	3.77	NA	*CLAYEY SAND to SANDY CLAY
83.5	351.9	180.0	2.24	NA	SILTY SAND to SANDY SILT

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

```
*****  
*                                     *  
*          CONE PENETRATION TEST    *  
*                                     *  
* SOUNDING : CPT-95                 PROJECT NO : 92-381-01110 *  
* PROJECT   : D&M/UPRR-II           INSTRUMENT  : F15CKE095  *  
* LOCATION  : SACRAMENTO CA         SYSTEM      : T-1        *  
* DATE      : 06-05-1992            OPERATOR    : MR         *  
*                                     *  
*****
```

DEPTH	TIP RESISTANCE	NORMALIZED	FRICTION	CONE PORE	SOIL BEHAVIOR TYPE
(ft)	(tsf)	TIP RESISTANCE	RATIO	PRESSURE	
		(tsf)	(%)	(tsf)	
.0	.0	.0	.00	NA	
.5	.0	.0	.00	NA	
1.0	.0	.0	.00	NA	
1.5	19.4	40.4	4.38	NA	*SANDY CLAY to SILTY CLAY
2.0	19.3	37.7	5.51	NA	*SANDY CLAY to SILTY CLAY
2.5	103.1	191.9	5.29	NA	*SANDY CLAY to SILTY CLAY
3.0	219.4	391.1	5.44	NA	*HEAVILY O.C./CEMENT. MAT.
3.5	135.2	232.0	7.55	NA	*HEAVILY O.C./CEMENT. MAT.
4.0	124.9	207.1	7.78	NA	*HEAVILY O.C./CEMENT. MAT.
4.5	128.6	206.6	7.34	NA	*HEAVILY O.C./CEMENT. MAT.
5.0	135.3	211.1	7.39	NA	*HEAVILY O.C./CEMENT. MAT.
5.5	127.3	193.4	6.90	NA	*HEAVILY O.C./CEMENT. MAT.
6.0	120.1	178.0	6.12	NA	*SANDY CLAY to SILTY CLAY
6.5	108.5	156.9	6.01	NA	*SANDY CLAY to SILTY CLAY
7.0	235.1	332.5	4.72	NA	*HEAVILY O.C./CEMENT. MAT.
7.5	177.6	245.9	5.82	NA	*HEAVILY O.C./CEMENT. MAT.
8.0	106.7	144.7	7.06	NA	*SANDY CLAY to SILTY CLAY
8.5	54.3	72.2	6.95	NA	*SANDY CLAY to SILTY CLAY
9.0	59.4	77.5	6.04	NA	*SANDY CLAY to SILTY CLAY
9.5	53.8	68.9	6.39	NA	*SANDY CLAY to SILTY CLAY
10.0	53.6	67.5	6.91	NA	*SANDY CLAY to SILTY CLAY
10.5	52.1	64.6	7.27	NA	*SANDY CLAY to SILTY CLAY
11.0	50.2	61.2	6.45	NA	*SANDY CLAY to SILTY CLAY
11.5	48.8	58.6	6.67	NA	*SANDY CLAY to SILTY CLAY
12.0	53.0	62.5	6.69	NA	*SANDY CLAY to SILTY CLAY
12.5	42.3	49.2	7.97	NA	*SANDY CLAY to SILTY CLAY
13.0	28.6	32.8	6.78	NA	*SANDY CLAY to SILTY CLAY
13.5	29.1	32.8	6.54	NA	*SANDY CLAY to SILTY CLAY
14.0	24.3	27.1	6.72	NA	*SANDY CLAY to SILTY CLAY
14.5	33.8	37.1	5.01	NA	*SANDY CLAY to SILTY CLAY
15.0	38.4	41.6	4.74	NA	*SANDY CLAY to SILTY CLAY
15.5	34.9	37.3	4.34	NA	CLAYEY SILT to SILTY CLAY
16.0	48.0	50.7	4.34	NA	*SANDY CLAY to SILTY CLAY
16.5	56.4	58.7	5.06	NA	*SANDY CLAY to SILTY CLAY
17.0	61.1	62.8	5.29	NA	*SANDY CLAY to SILTY CLAY
17.5	51.5	52.4	5.36	NA	*SANDY CLAY to SILTY CLAY
18.0	50.7	50.9	5.32	NA	*SANDY CLAY to SILTY CLAY
18.5	54.6	54.2	6.09	NA	*SANDY CLAY to SILTY CLAY
19.0	66.7	65.4	6.69	NA	*SANDY CLAY to SILTY CLAY
19.5	71.9	69.7	5.87	NA	*SANDY CLAY to SILTY CLAY
20.0	96.6	92.6	9.02	NA	*SANDY CLAY to SILTY CLAY

The Earth Technology Corporation

SOUNDING : CPT-95

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
20.5	103.6	98.2	6.29	NA	*SANDY CLAY to SILTY CLAY
21.0	111.9	104.9	6.20	NA	*SANDY CLAY to SILTY CLAY
21.5	133.5	123.8	7.40	NA	*SANDY CLAY to SILTY CLAY
22.0	103.5	94.9	6.36	NA	*SANDY CLAY to SILTY CLAY
22.5	85.4	77.5	7.95	NA	*SANDY CLAY to SILTY CLAY
23.0	80.1	71.9	6.48	NA	*SANDY CLAY to SILTY CLAY
23.5	75.9	67.4	6.81	NA	*SANDY CLAY to SILTY CLAY
24.0	65.5	57.6	6.48	NA	*SANDY CLAY to SILTY CLAY
24.5	63.4	55.2	5.38	NA	*SANDY CLAY to SILTY CLAY
25.0	61.1	52.7	6.71	NA	*SANDY CLAY to SILTY CLAY
25.5	53.1	45.3	6.75	NA	*SANDY CLAY to SILTY CLAY
26.0	39.6	33.5	6.42	NA	*SANDY CLAY to SILTY CLAY
26.5	36.1	30.2	8.39	NA	*SANDY CLAY to SILTY CLAY
27.0	30.0	24.8	7.33	NA	*SANDY CLAY to SILTY CLAY
27.5	59.5	48.8	5.30	NA	*SANDY CLAY to SILTY CLAY
28.0	67.4	54.8	5.52	NA	*SANDY CLAY to SILTY CLAY
28.5	70.2	56.5	5.92	NA	*SANDY CLAY to SILTY CLAY
29.0	53.7	42.8	5.14	NA	*SANDY CLAY to SILTY CLAY
29.5	53.1	41.9	5.48	NA	*SANDY CLAY to SILTY CLAY
30.0	46.6	36.4	6.16	NA	*SANDY CLAY to SILTY CLAY
30.5	38.8	30.1	5.79	NA	*SANDY CLAY to SILTY CLAY
31.0	37.6	28.9	5.38	NA	*SANDY CLAY to SILTY CLAY
31.5	28.4	21.6	5.96	NA	SILTY CLAY TO CLAY
32.0	28.0	21.1	6.13	NA	SILTY CLAY TO CLAY
32.5	29.2	21.8	5.61	NA	SILTY CLAY TO CLAY
33.0	39.4	29.2	5.48	NA	*SANDY CLAY to SILTY CLAY
33.5	47.2	34.7	5.39	NA	*SANDY CLAY to SILTY CLAY
34.0	49.5	36.0	4.92	NA	*SANDY CLAY to SILTY CLAY
34.5	43.4	31.3	5.11	NA	*SANDY CLAY to SILTY CLAY
35.0	69.3	49.6	7.14	NA	*SANDY CLAY to SILTY CLAY
35.5	77.4	55.2	8.84	NA	*SANDY CLAY to SILTY CLAY
36.0	62.2	44.2	8.86	NA	*SANDY CLAY to SILTY CLAY
36.5	38.6	27.3	10.81	NA	*SANDY CLAY to SILTY CLAY
37.0	40.9	28.8	9.72	NA	*SANDY CLAY to SILTY CLAY
37.5	29.4	20.6	10.99	NA	*SANDY CLAY to SILTY CLAY
38.0	45.6	31.9	9.64	NA	*SANDY CLAY to SILTY CLAY
38.5	36.1	25.2	9.62	NA	*SANDY CLAY to SILTY CLAY
39.0	32.8	22.8	8.96	NA	*SANDY CLAY to SILTY CLAY
39.5	43.0	29.7	8.06	NA	*SANDY CLAY to SILTY CLAY
40.0	59.2	40.8	6.05	NA	*SANDY CLAY to SILTY CLAY
40.5	69.8	48.0	5.59	NA	*SANDY CLAY to SILTY CLAY
41.0	63.3	43.3	5.19	NA	*SANDY CLAY to SILTY CLAY
41.5	48.6	33.1	5.37	NA	*SANDY CLAY to SILTY CLAY
42.0	36.6	24.9	5.55	NA	SILTY CLAY TO CLAY
42.5	32.2	21.8	6.93	NA	*SANDY CLAY to SILTY CLAY
43.0	27.1	18.3	6.78	NA	SILTY CLAY TO CLAY
43.5	16.2	10.9	12.07	NA	CLAY TO ORGANIC CLAY
44.0	49.5	33.2	6.95	NA	*SANDY CLAY to SILTY CLAY
44.5	50.4	33.6	5.63	NA	*SANDY CLAY to SILTY CLAY
45.0	38.9	25.8	6.64	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
45.5	55.3	36.6	5.49	NA	*SANDY CLAY to SILTY CLAY
46.0	42.4	28.0	5.89	NA	*SANDY CLAY to SILTY CLAY
46.5	44.9	29.5	6.46	NA	*SANDY CLAY to SILTY CLAY
47.0	40.7	26.7	5.68	NA	*SANDY CLAY to SILTY CLAY
47.5	43.0	28.1	5.13	NA	CLAYEY SILT to SILTY CLAY
48.0	52.6	34.3	5.98	NA	*SANDY CLAY to SILTY CLAY
48.5	54.3	35.2	6.55	NA	*SANDY CLAY to SILTY CLAY
49.0	47.7	30.8	6.87	NA	*SANDY CLAY to SILTY CLAY
49.5	43.5	28.0	6.62	NA	*SANDY CLAY to SILTY CLAY
50.0	43.0	27.6	6.57	NA	*SANDY CLAY to SILTY CLAY
50.5	38.5	24.6	6.08	NA	*SANDY CLAY to SILTY CLAY
51.0	35.9	22.9	5.80	NA	SILTY CLAY TO CLAY
51.5	34.2	21.7	6.49	NA	*SANDY CLAY to SILTY CLAY
52.0	32.6	20.6	6.48	NA	SILTY CLAY TO CLAY
52.5	32.4	20.5	6.23	NA	SILTY CLAY TO CLAY
53.0	30.6	19.3	5.98	NA	SILTY CLAY TO CLAY
53.5	30.3	18.9	5.95	NA	SILTY CLAY TO CLAY
54.0	25.8	16.1	6.24	NA	SILTY CLAY TO CLAY
54.5	22.3	13.9	5.77	NA	SILTY CLAY TO CLAY
55.0	20.5	12.7	6.11	NA	SILTY CLAY TO CLAY
55.5	17.1	10.6	5.30	NA	SILTY CLAY TO CLAY
56.0	18.0	11.1	6.44	NA	SILTY CLAY TO CLAY
56.5	32.7	20.0	6.55	NA	SILTY CLAY TO CLAY
57.0	28.6	17.5	7.08	NA	SILTY CLAY TO CLAY
57.5	22.5	13.7	5.32	NA	SILTY CLAY TO CLAY
58.0	37.5	22.8	6.01	NA	SILTY CLAY TO CLAY
58.5	89.5	54.1	6.91	NA	*SANDY CLAY to SILTY CLAY
59.0	78.6	47.4	8.65	NA	*SANDY CLAY to SILTY CLAY
59.5	81.3	48.9	7.21	NA	*SANDY CLAY to SILTY CLAY
60.0	84.5	50.6	7.07	NA	*SANDY CLAY to SILTY CLAY
60.5	90.0	53.7	7.01	NA	*SANDY CLAY to SILTY CLAY
61.0	108.6	64.6	7.28	NA	*SANDY CLAY to SILTY CLAY
61.5	133.3	79.0	8.98	NA	*SANDY CLAY to SILTY CLAY
62.0	157.8	93.2	8.55	NA	*SANDY CLAY to SILTY CLAY
62.5	188.9	111.2	9.07	NA	*SANDY CLAY to SILTY CLAY
63.0	63.7	37.3	9.12	NA	*SANDY CLAY to SILTY CLAY
63.5	33.5	19.6	5.96	NA	SILTY CLAY TO CLAY
64.0	28.4	16.5	5.13	NA	CLAYEY SILT to SILTY CLAY
64.5	31.2	18.1	5.01	NA	CLAYEY SILT to SILTY CLAY
65.0	35.7	20.7	5.30	NA	CLAYEY SILT to SILTY CLAY
65.5	35.9	20.7	5.65	NA	SILTY CLAY TO CLAY
66.0	34.3	19.7	5.51	NA	SILTY CLAY TO CLAY
66.5	38.3	21.9	5.49	NA	SILTY CLAY TO CLAY
67.0	43.7	25.0	6.22	NA	*SANDY CLAY to SILTY CLAY
67.5	39.8	22.6	6.37	NA	*SANDY CLAY to SILTY CLAY
68.0	31.7	18.0	6.70	NA	SILTY CLAY TO CLAY
68.5	27.2	15.4	7.39	NA	SILTY CLAY TO CLAY
69.0	27.3	15.4	7.03	NA	SILTY CLAY TO CLAY
69.5	25.7	14.4	6.86	NA	SILTY CLAY TO CLAY
70.0	26.6	14.9	7.11	NA	SILTY CLAY TO CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
70.5	25.2	14.1	5.87	NA	SILTY CLAY TO CLAY
71.0	31.3	17.4	4.93	NA	CLAYEY SILT to SILTY CLAY
71.5	29.5	16.3	5.42	NA	SILTY CLAY TO CLAY
72.0	35.0	19.3	5.54	NA	SILTY CLAY TO CLAY
72.5	36.1	19.9	6.01	NA	SILTY CLAY TO CLAY
73.0	28.5	15.6	5.66	NA	SILTY CLAY TO CLAY
73.5	30.0	16.4	5.00	NA	CLAYEY SILT to SILTY CLAY
74.0	35.2	19.2	5.82	NA	SILTY CLAY TO CLAY
74.5	43.0	23.3	4.49	NA	CLAYEY SILT to SILTY CLAY
75.0	40.0	21.6	7.52	NA	*SANDY CLAY to SILTY CLAY
75.5	32.8	17.7	7.36	NA	SILTY CLAY TO CLAY
76.0	39.0	21.0	7.20	NA	*SANDY CLAY to SILTY CLAY
76.5	46.5	24.9	7.29	NA	*SANDY CLAY to SILTY CLAY
77.0	44.8	23.9	6.76	NA	*SANDY CLAY to SILTY CLAY
77.5	42.8	22.8	6.67	NA	*SANDY CLAY to SILTY CLAY
78.0	40.4	21.4	6.54	NA	*SANDY CLAY to SILTY CLAY
78.5	39.9	21.1	6.15	NA	SILTY CLAY TO CLAY
79.0	45.3	23.9	5.49	NA	SILTY CLAY TO CLAY
79.5	49.2	25.8	6.39	NA	*SANDY CLAY to SILTY CLAY
80.0	44.5	23.3	6.13	NA	*SANDY CLAY to SILTY CLAY
80.5	35.1	18.3	5.96	NA	SILTY CLAY TO CLAY
81.0	30.0	15.6	5.44	NA	SILTY CLAY TO CLAY
81.5	28.0	14.5	5.11	NA	SILTY CLAY TO CLAY
82.0	32.4	16.8	4.16	NA	CLAYEY SILT to SILTY CLAY
82.5	82.8	42.6	4.34	NA	*SANDY CLAY to SILTY CLAY
83.0	326.2	167.4	5.72	NA	*SANDY CLAY to SILTY CLAY
83.5	152.5	78.0	9.91	NA	*SANDY CLAY to SILTY CLAY
84.0	247.9	126.4	9.05	NA	*SANDY CLAY to SILTY CLAY
84.5	218.1	110.9	9.95	NA	*SANDY CLAY to SILTY CLAY
85.0	214.4	108.6	4.08	NA	*CLAYEY SAND to SANDY CLAY
85.5	200.6	101.3	5.22	NA	*SANDY CLAY to SILTY CLAY
86.0	491.7	247.4	3.28	NA	*SILTY SAND to CLAYEY SAND

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

```
*****  
*                                     *  
*                                CONE PENETRATION TEST                                *  
*                                     *  
* SOUNDING : CPT-96                      PROJECT NO : 92-381-01110                *  
* PROJECT   : D&M/UPRR-II                 INSTRUMENT : F15CKE095                  *  
* LOCATION  : SACRAMENTO CA               SYSTEM      : T-1                     *  
* DATE      : 06-05-1992                 OPERATOR     : MR                      *  
*                                     *  
*****
```

DEPTH	TIP RESISTANCE	NORMALIZED	FRICTION	CONE PORE	SOIL BEHAVIOR TYPE
(ft)	(tsf)	TIP RESISTANCE	RATIO	PRESSURE	
		(tsf)	(%)	(tsf)	
.0	.0	.0	.00	NA	
.5	.0	.0	.00	NA	
1.0	.0	.0	.00	NA	
1.5	16.3	34.0	4.87	NA	*SANDY CLAY to SILTY CLAY
2.0	12.6	24.6	4.62	NA	CLAYEY SILT to SILTY CLAY
2.5	21.9	40.7	5.51	NA	*SANDY CLAY to SILTY CLAY
3.0	43.4	77.3	5.59	NA	*SANDY CLAY to SILTY CLAY
3.5	64.4	110.4	6.48	NA	*SANDY CLAY to SILTY CLAY
4.0	87.5	145.0	5.15	NA	*SANDY CLAY to SILTY CLAY
4.5	111.3	178.8	5.76	NA	*SANDY CLAY to SILTY CLAY
5.0	141.5	220.8	5.83	NA	*HEAVILY O.C./CEMENT. MAT.
5.5	164.2	249.5	6.06	NA	*HEAVILY O.C./CEMENT. MAT.
6.0	158.3	234.6	6.41	NA	*HEAVILY O.C./CEMENT. MAT.
6.5	208.3	301.3	7.24	NA	*HEAVILY O.C./CEMENT. MAT.
7.0	302.3	427.7	8.66	NA	*HEAVILY O.C./CEMENT. MAT.
7.5	246.9	341.9	10.14	NA	*HEAVILY O.C./CEMENT. MAT.
8.0	170.6	231.4	10.37	NA	*HEAVILY O.C./CEMENT. MAT.
8.5	205.0	272.7	9.94	NA	*HEAVILY O.C./CEMENT. MAT.
9.0	238.1	310.8	8.88	NA	*HEAVILY O.C./CEMENT. MAT.
9.5	226.2	289.9	8.59	NA	*HEAVILY O.C./CEMENT. MAT.
10.0	256.3	322.9	8.26	NA	*HEAVILY O.C./CEMENT. MAT.
10.5	186.1	230.5	8.84	NA	*HEAVILY O.C./CEMENT. MAT.
11.0	108.3	132.0	8.94	NA	*SANDY CLAY to SILTY CLAY
11.5	55.3	66.3	6.10	NA	*SANDY CLAY to SILTY CLAY
12.0	43.6	51.5	6.51	NA	*SANDY CLAY to SILTY CLAY
12.5	35.8	41.6	6.69	NA	*SANDY CLAY to SILTY CLAY
13.0	25.0	28.6	5.77	NA	*SANDY CLAY to SILTY CLAY
13.5	20.1	22.7	5.41	NA	SILTY CLAY to CLAY
14.0	9.2	10.3	9.14	NA	CLAY to ORGANIC CLAY
14.5	20.6	22.7	6.72	NA	*SANDY CLAY to SILTY CLAY
15.0	39.9	43.3	5.88	NA	*SANDY CLAY to SILTY CLAY
15.5	123.0	131.5	6.76	NA	*SANDY CLAY to SILTY CLAY
16.0	137.4	145.0	7.78	NA	*SANDY CLAY to SILTY CLAY
16.5	109.3	113.9	8.50	NA	*SANDY CLAY to SILTY CLAY
17.0	105.3	108.4	7.74	NA	*SANDY CLAY to SILTY CLAY
17.5	97.2	98.8	7.95	NA	*SANDY CLAY to SILTY CLAY
18.0	86.4	86.8	6.71	NA	*SANDY CLAY to SILTY CLAY
18.5	78.5	77.9	7.32	NA	*SANDY CLAY to SILTY CLAY
19.0	110.0	107.9	6.83	NA	*SANDY CLAY to SILTY CLAY
19.5	267.9	259.8	7.87	NA	*HEAVILY O.C./CEMENT. MAT.
20.0	168.5	161.5	9.21	NA	*HEAVILY O.C./CEMENT. MAT.

The Earth Technology Corporation

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
20.5	111.2	105.4	8.11	NA	*SANDY CLAY to SILTY CLAY
21.0	86.8	81.4	8.54	NA	*SANDY CLAY to SILTY CLAY
21.5	107.3	99.5	7.26	NA	*SANDY CLAY to SILTY CLAY
22.0	86.1	78.9	7.99	NA	*SANDY CLAY to SILTY CLAY
22.5	71.6	65.0	7.81	NA	*SANDY CLAY to SILTY CLAY
23.0	51.4	46.2	7.25	NA	*SANDY CLAY to SILTY CLAY
23.5	45.4	40.4	6.88	NA	*SANDY CLAY to SILTY CLAY
24.0	62.1	54.6	6.54	NA	*SANDY CLAY to SILTY CLAY
24.5	57.8	50.3	6.71	NA	*SANDY CLAY to SILTY CLAY
25.0	55.0	47.4	7.82	NA	*SANDY CLAY to SILTY CLAY
25.5	50.2	42.8	8.01	NA	*SANDY CLAY to SILTY CLAY
26.0	84.1	71.1	7.57	NA	*SANDY CLAY to SILTY CLAY
26.5	82.8	69.3	9.60	NA	*SANDY CLAY to SILTY CLAY
27.0	101.8	84.3	5.06	NA	*SANDY CLAY to SILTY CLAY
27.5	115.7	94.9	5.69	NA	*SANDY CLAY to SILTY CLAY
28.0	85.0	69.1	6.32	NA	*SANDY CLAY to SILTY CLAY
28.5	72.5	58.3	5.32	NA	*SANDY CLAY to SILTY CLAY
29.0	58.5	46.7	6.47	NA	*SANDY CLAY to SILTY CLAY
29.5	71.5	56.5	6.60	NA	*SANDY CLAY to SILTY CLAY
30.0	83.2	65.1	9.36	NA	*SANDY CLAY to SILTY CLAY
30.5	60.2	46.7	8.72	NA	*SANDY CLAY to SILTY CLAY
31.0	42.0	32.3	6.47	NA	*SANDY CLAY to SILTY CLAY
31.5	34.5	26.3	7.68	NA	*SANDY CLAY to SILTY CLAY
32.0	32.0	24.1	7.43	NA	*SANDY CLAY to SILTY CLAY
32.5	42.7	32.0	7.98	NA	*SANDY CLAY to SILTY CLAY
33.0	51.0	37.8	7.93	NA	*SANDY CLAY to SILTY CLAY
33.5	49.0	36.0	10.05	NA	*SANDY CLAY to SILTY CLAY
34.0	42.4	30.9	7.80	NA	*SANDY CLAY to SILTY CLAY
34.5	34.1	24.6	5.89	NA	*SANDY CLAY to SILTY CLAY
35.0	50.4	36.0	5.25	NA	*SANDY CLAY to SILTY CLAY
35.5	54.9	39.1	5.25	NA	*SANDY CLAY to SILTY CLAY
36.0	71.6	50.9	5.12	NA	*SANDY CLAY to SILTY CLAY
36.5	75.4	53.4	5.95	NA	*SANDY CLAY to SILTY CLAY
37.0	60.4	42.6	4.97	NA	*SANDY CLAY to SILTY CLAY
37.5	74.2	52.1	6.40	NA	*SANDY CLAY to SILTY CLAY
38.0	142.4	99.7	5.53	NA	*SANDY CLAY to SILTY CLAY
38.5	119.6	83.4	5.53	NA	*SANDY CLAY to SILTY CLAY
39.0	100.8	70.0	5.35	NA	*SANDY CLAY to SILTY CLAY
39.5	64.3	44.5	5.76	NA	*SANDY CLAY to SILTY CLAY
40.0	53.8	37.1	9.11	NA	*SANDY CLAY to SILTY CLAY
40.5	55.4	38.1	9.80	NA	*SANDY CLAY to SILTY CLAY
41.0	63.3	43.4	9.97	NA	*SANDY CLAY to SILTY CLAY
41.5	59.4	40.5	9.06	NA	*SANDY CLAY to SILTY CLAY
42.0	49.9	33.9	4.72	NA	*SANDY CLAY to SILTY CLAY
42.5	72.7	49.2	5.12	NA	*SANDY CLAY to SILTY CLAY
43.0	75.2	50.8	4.88	NA	*SANDY CLAY to SILTY CLAY
43.5	114.8	77.2	5.88	NA	*SANDY CLAY to SILTY CLAY
44.0	94.1	63.0	6.02	NA	*SANDY CLAY to SILTY CLAY
44.5	62.3	41.6	5.63	NA	*SANDY CLAY to SILTY CLAY
45.0	44.3	29.5	5.55	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-96

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
45.5	39.8	26.4	4.84	NA	CLAYEY SILT to SILTY CLAY
46.0	42.7	28.2	5.25	NA	*SANDY CLAY to SILTY CLAY
46.5	41.3	27.2	7.68	NA	*SANDY CLAY to SILTY CLAY
47.0	43.9	28.8	8.93	NA	*SANDY CLAY to SILTY CLAY
47.5	49.4	32.2	9.14	NA	*SANDY CLAY to SILTY CLAY
48.0	54.0	35.2	10.46	NA	*SANDY CLAY to SILTY CLAY
48.5	52.9	34.3	10.00	NA	*SANDY CLAY to SILTY CLAY
49.0	63.6	41.1	9.02	NA	*SANDY CLAY to SILTY CLAY
49.5	66.0	42.5	10.02	NA	*SANDY CLAY to SILTY CLAY
50.0	67.2	43.1	9.45	NA	*SANDY CLAY to SILTY CLAY
50.5	53.9	34.5	7.99	NA	*SANDY CLAY to SILTY CLAY
51.0	52.7	33.6	8.35	NA	*SANDY CLAY to SILTY CLAY
51.5	113.3	71.9	6.97	NA	*SANDY CLAY to SILTY CLAY
52.0	114.6	72.5	7.11	NA	*SANDY CLAY to SILTY CLAY
52.5	140.2	88.4	5.86	NA	*SANDY CLAY to SILTY CLAY
53.0	185.9	116.8	5.06	NA	*SANDY CLAY to SILTY CLAY
53.5	188.2	117.8	4.88	NA	*SANDY CLAY to SILTY CLAY
54.0	150.6	94.0	4.55	NA	*SANDY CLAY to SILTY CLAY
54.5	180.9	112.5	6.17	NA	*SANDY CLAY to SILTY CLAY
55.0	183.4	113.7	9.10	NA	*SANDY CLAY to SILTY CLAY
55.5	124.2	76.7	8.98	NA	*SANDY CLAY to SILTY CLAY
56.0	143.9	88.6	6.03	NA	*SANDY CLAY to SILTY CLAY
56.5	222.2	136.2	6.23	NA	*SANDY CLAY to SILTY CLAY
57.0	120.2	73.5	7.22	NA	*SANDY CLAY to SILTY CLAY
57.5	126.6	77.1	6.64	NA	*SANDY CLAY to SILTY CLAY
58.0	182.7	110.9	6.80	NA	*SANDY CLAY to SILTY CLAY
58.5	148.5	89.8	7.34	NA	*SANDY CLAY to SILTY CLAY
59.0	48.7	29.4	4.69	NA	CLAYEY SILT to SILTY CLAY
59.5	31.5	18.9	3.40	NA	CLAYEY SILT to SILTY CLAY
60.0	96.2	57.6	5.96	NA	*SANDY CLAY to SILTY CLAY
60.5	113.2	67.5	5.80	NA	*SANDY CLAY to SILTY CLAY
61.0	121.2	72.1	6.45	NA	*SANDY CLAY to SILTY CLAY
61.5	127.6	75.6	6.67	NA	*SANDY CLAY to SILTY CLAY
62.0	76.6	45.2	8.54	NA	*SANDY CLAY to SILTY CLAY
62.5	44.6	26.2	7.22	NA	*SANDY CLAY to SILTY CLAY
63.0	41.3	24.2	6.03	NA	*SANDY CLAY to SILTY CLAY
63.5	37.8	22.1	6.11	NA	SILTY CLAY TO CLAY
64.0	35.6	20.7	7.00	NA	*SANDY CLAY to SILTY CLAY
64.5	37.0	21.5	7.22	NA	*SANDY CLAY to SILTY CLAY
65.0	25.3	14.7	7.09	NA	SILTY CLAY TO CLAY
65.5	25.9	14.9	4.94	NA	CLAYEY SILT to SILTY CLAY
66.0	41.1	23.6	5.18	NA	CLAYEY SILT to SILTY CLAY
66.5	118.6	67.9	5.76	NA	*SANDY CLAY to SILTY CLAY
67.0	119.3	68.1	8.00	NA	*SANDY CLAY to SILTY CLAY
67.5	161.2	91.7	8.05	NA	*SANDY CLAY to SILTY CLAY
68.0	178.1	101.0	6.18	NA	*SANDY CLAY to SILTY CLAY
68.5	173.2	97.9	6.50	NA	*SANDY CLAY to SILTY CLAY
69.0	193.7	109.1	5.75	NA	*SANDY CLAY to SILTY CLAY
69.5	161.9	90.9	6.43	NA	*SANDY CLAY to SILTY CLAY
70.0	130.0	72.7	6.65	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-96

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
70.5	91.1	50.8	8.60	NA	*SANDY CLAY to SILTY CLAY
71.0	112.6	62.6	8.93	NA	*SANDY CLAY to SILTY CLAY
71.5	115.6	64.0	8.47	NA	*SANDY CLAY to SILTY CLAY
72.0	106.3	58.7	8.07	NA	*SANDY CLAY to SILTY CLAY
72.5	114.7	63.1	10.32	NA	*SANDY CLAY to SILTY CLAY
73.0	94.7	51.9	10.45	NA	*SANDY CLAY to SILTY CLAY
73.5	137.9	75.4	8.62	NA	*SANDY CLAY to SILTY CLAY
74.0	108.4	59.1	9.10	NA	*SANDY CLAY to SILTY CLAY
74.5	93.3	50.7	8.97	NA	*SANDY CLAY to SILTY CLAY
75.0	136.7	74.0	8.47	NA	*SANDY CLAY to SILTY CLAY
75.5	119.4	64.4	10.28	NA	*SANDY CLAY to SILTY CLAY
76.0	160.9	86.5	6.72	NA	*SANDY CLAY to SILTY CLAY
76.5	157.9	84.6	8.86	NA	*SANDY CLAY to SILTY CLAY
77.0	102.8	54.9	10.05	NA	*SANDY CLAY to SILTY CLAY
77.5	118.4	63.0	8.17	NA	*SANDY CLAY to SILTY CLAY
78.0	104.1	55.2	8.33	NA	*SANDY CLAY to SILTY CLAY
78.5	132.8	70.2	8.09	NA	*SANDY CLAY to SILTY CLAY
79.0	195.4	103.0	6.34	NA	*SANDY CLAY to SILTY CLAY
79.5	296.9	155.9	5.95	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

CONE PENETRATION TEST

SOUNDING : CPT-83 PROJECT NO : 92-381-01110
 PROJECT : D&M/UPRR-II INSTRUMENT : F15CKE095
 LOCATION : SACRAMENTO CA SYSTEM : T-1
 DATE : 05-28-1992 OPERATOR : MR/DH

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
.0	.0	.0	.00	NA	
.5	.0	.0	.00	NA	
1.0	.0	.0	.00	NA	
1.5	.0	.0	.00	NA	
2.0	.0	.0	.00	NA	
2.5	.0	.0	.00	NA	
3.0	.0	.0	.00	NA	
3.5	173.1	296.9	6.93	NA	*HEAVILY O.C./CEMENT. MAT.
4.0	114.7	190.1	7.68	NA	*HEAVILY O.C./CEMENT. MAT.
4.5	84.9	136.4	5.77	NA	*SANDY CLAY to SILTY CLAY
5.0	92.1	143.7	7.02	NA	*SANDY CLAY to SILTY CLAY
5.5	71.1	108.1	5.93	NA	*SANDY CLAY to SILTY CLAY
6.0	57.2	84.8	6.19	NA	*SANDY CLAY to SILTY CLAY
6.5	74.3	107.4	5.85	NA	*SANDY CLAY to SILTY CLAY
7.0	152.9	216.2	6.93	NA	*HEAVILY O.C./CEMENT. MAT.
7.5	131.1	181.5	9.22	NA	*HEAVILY O.C./CEMENT. MAT.
8.0	123.0	166.8	7.16	NA	*SANDY CLAY to SILTY CLAY
8.5	98.2	130.6	7.62	NA	*SANDY CLAY to SILTY CLAY
9.0	90.5	118.2	7.06	NA	*SANDY CLAY to SILTY CLAY
9.5	97.1	124.5	7.43	NA	*SANDY CLAY to SILTY CLAY
10.0	88.2	111.1	7.16	NA	*SANDY CLAY to SILTY CLAY
10.5	75.5	93.5	6.86	NA	*SANDY CLAY to SILTY CLAY
11.0	137.1	167.0	6.37	NA	*SANDY CLAY to SILTY CLAY
11.5	103.9	124.5	7.80	NA	*SANDY CLAY to SILTY CLAY
12.0	79.0	93.3	7.13	NA	*SANDY CLAY to SILTY CLAY
12.5	67.0	77.9	6.29	NA	*SANDY CLAY to SILTY CLAY
13.0	66.4	76.1	5.82	NA	*SANDY CLAY to SILTY CLAY
13.5	42.2	47.6	6.46	NA	*SANDY CLAY to SILTY CLAY
14.0	38.2	42.6	6.43	NA	*SANDY CLAY to SILTY CLAY
14.5	111.3	122.2	6.23	NA	*SANDY CLAY to SILTY CLAY
15.0	144.2	156.2	8.89	NA	*HEAVILY O.C./CEMENT. MAT.
15.5	159.2	170.2	9.21	NA	*HEAVILY O.C./CEMENT. MAT.
16.0	150.5	158.8	9.40	NA	*HEAVILY O.C./CEMENT. MAT.
16.5	94.4	98.4	8.57	NA	*SANDY CLAY to SILTY CLAY
17.0	148.7	153.0	7.51	NA	*SANDY CLAY to SILTY CLAY
17.5	461.2	468.8	5.28	NA	*HEAVILY O.C./CEMENT. MAT.

NA = NOT APPLICABLE

TOP 3.3 FT IS DISTURBED SOIL

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

 *
 * **CONE PENETRATION TEST** *
 *
 * SOUNDING : CPT-83A PROJECT NO : 92-381-01110 *
 * PROJECT : D&M/UPRR-II INSTRUMENT : F15CCKE095 *
 * LOCATION : SACRAMENTO CA SYSTEM : T-1 *
 * DATE : 05-28-1992 OPERATOR : MR/DH *
 *

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
.0	.0	.0	.00	NA	
.5	.0	.0	.00	NA	
1.0	.0	.0	.00	NA	
1.5	.0	.0	.00	NA	
2.0	.0	.0	.00	NA	
2.5	.0	.0	.00	NA	
3.0	.0	.0	.00	NA	
3.5	90.0	154.5	2.68	NA	*SILTY SAND to CLAYEY SAND
4.0	97.5	161.6	4.43	NA	*CLAYEY SAND to SANDY CLAY
4.5	91.5	147.0	5.07	NA	*SANDY CLAY to SILTY CLAY
5.0	103.1	160.9	6.19	NA	*SANDY CLAY to SILTY CLAY
5.5	93.2	141.5	6.41	NA	*SANDY CLAY to SILTY CLAY
6.0	112.4	166.4	6.76	NA	*SANDY CLAY to SILTY CLAY
6.5	113.3	163.9	6.68	NA	*SANDY CLAY to SILTY CLAY
7.0	191.4	270.8	7.48	NA	*HEAVILY O.C./CEMENT. MAT.
7.5	139.6	193.2	8.85	NA	*HEAVILY O.C./CEMENT. MAT.
8.0	133.8	181.5	8.20	NA	*HEAVILY O.C./CEMENT. MAT.
8.5	107.3	142.7	7.49	NA	*SANDY CLAY to SILTY CLAY
9.0	93.2	121.6	7.34	NA	*SANDY CLAY to SILTY CLAY
9.5	65.7	84.2	6.40	NA	*SANDY CLAY to SILTY CLAY
10.0	65.9	83.0	5.47	NA	*SANDY CLAY to SILTY CLAY
10.5	62.5	77.4	6.06	NA	*SANDY CLAY to SILTY CLAY
11.0	59.8	72.9	6.48	NA	*SANDY CLAY to SILTY CLAY
11.5	69.4	83.3	6.57	NA	*SANDY CLAY to SILTY CLAY
12.0	76.0	89.7	6.85	NA	*SANDY CLAY to SILTY CLAY
12.5	91.7	106.7	7.05	NA	*SANDY CLAY to SILTY CLAY
13.0	63.1	72.3	6.30	NA	*SANDY CLAY to SILTY CLAY
13.5	41.2	46.5	6.12	NA	*SANDY CLAY to SILTY CLAY
14.0	47.4	52.7	5.76	NA	*SANDY CLAY to SILTY CLAY
14.5	97.0	106.5	4.84	NA	*SANDY CLAY to SILTY CLAY
15.0	136.1	147.4	5.96	NA	*SANDY CLAY to SILTY CLAY
15.5	127.8	136.7	9.44	NA	*HEAVILY O.C./CEMENT. MAT.
16.0	89.2	94.1	8.07	NA	*SANDY CLAY to SILTY CLAY
16.5	80.2	83.5	6.30	NA	*SANDY CLAY to SILTY CLAY
17.0	284.2	292.5	2.63	NA	*SILTY SAND to CLAYEY SAND
17.5	130.4	132.5	.00	NA	*HEAVILY O.C./CEMENT. MAT.
18.0	99.9	100.4	.00	NA	
18.5	99.9	99.1	.00	NA	

NA = NOT APPLICABLE

TOP 3.3 FT IS DISTURBED SOIL

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

[illegible]

NA = NOT APPLICABLE
*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL
ASSUMED TOTAL UNIT WT = 110 PCF
ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-84

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
20.5	74.4	70.5	6.42	NA	*SANDY CLAY to SILTY CLAY
21.0	88.3	82.8	5.55	NA	*SANDY CLAY to SILTY CLAY
21.5	200.9	186.2	7.16	NA	*HEAVILY O.C./CEMENT. MAT.
22.0	279.5	256.3	7.85	NA	*HEAVILY O.C./CEMENT. MAT.
22.5	198.1	179.7	6.62	NA	*SANDY CLAY to SILTY CLAY
23.0	148.2	133.1	5.55	NA	*SANDY CLAY to SILTY CLAY
23.5	67.2	59.8	5.72	NA	*SANDY CLAY to SILTY CLAY
24.0	72.7	64.0	4.74	NA	*SANDY CLAY to SILTY CLAY
24.5	96.8	84.3	6.32	NA	*SANDY CLAY to SILTY CLAY
25.0	101.5	87.4	6.72	NA	*SANDY CLAY to SILTY CLAY
25.5	83.1	70.9	7.27	NA	*SANDY CLAY to SILTY CLAY
26.0	55.9	47.2	6.59	NA	*SANDY CLAY to SILTY CLAY
26.5	45.0	37.6	5.47	NA	*SANDY CLAY to SILTY CLAY
27.0	43.6	36.1	6.03	NA	*SANDY CLAY to SILTY CLAY
27.5	40.7	33.4	6.26	NA	*SANDY CLAY to SILTY CLAY
28.0	57.6	46.8	6.11	NA	*SANDY CLAY to SILTY CLAY
28.5	69.3	55.8	6.96	NA	*SANDY CLAY to SILTY CLAY
29.0	75.5	60.2	6.54	NA	*SANDY CLAY to SILTY CLAY
29.5	76.3	60.3	5.64	NA	*SANDY CLAY to SILTY CLAY
30.0	85.9	67.2	5.77	NA	*SANDY CLAY to SILTY CLAY
30.5	73.9	57.3	6.35	NA	*SANDY CLAY to SILTY CLAY
31.0	65.6	50.4	6.28	NA	*SANDY CLAY to SILTY CLAY
31.5	61.2	46.6	6.15	NA	*SANDY CLAY to SILTY CLAY
32.0	97.9	73.9	5.69	NA	*SANDY CLAY to SILTY CLAY
32.5	142.1	106.3	7.64	NA	*SANDY CLAY to SILTY CLAY
33.0	135.8	100.7	10.34	NA	*SANDY CLAY to SILTY CLAY
33.5	96.0	70.5	9.74	NA	*SANDY CLAY to SILTY CLAY
34.0	68.0	49.5	8.73	NA	*SANDY CLAY to SILTY CLAY
34.5	46.5	33.5	6.38	NA	*SANDY CLAY to SILTY CLAY
35.0	52.5	37.6	6.06	NA	*SANDY CLAY to SILTY CLAY
35.5	64.6	46.1	6.24	NA	*SANDY CLAY to SILTY CLAY
36.0	77.2	54.8	6.85	NA	*SANDY CLAY to SILTY CLAY
36.5	84.0	59.4	8.08	NA	*SANDY CLAY to SILTY CLAY
37.0	80.4	56.7	8.34	NA	*SANDY CLAY to SILTY CLAY
37.5	84.6	59.4	7.61	NA	*SANDY CLAY to SILTY CLAY
38.0	84.0	58.8	7.15	NA	*SANDY CLAY to SILTY CLAY
38.5	96.0	66.9	6.04	NA	*SANDY CLAY to SILTY CLAY
39.0	106.3	73.9	6.46	NA	*SANDY CLAY to SILTY CLAY
39.5	125.7	87.0	8.41	NA	*SANDY CLAY to SILTY CLAY
40.0	171.4	118.2	6.72	NA	*SANDY CLAY to SILTY CLAY
40.5	117.6	80.8	6.42	NA	*SANDY CLAY to SILTY CLAY
41.0	121.7	83.3	3.73	NA	*CLAYEY SAND to SANDY CLAY
41.5	107.5	73.3	3.33	NA	SANDY SILT to CLAYEY SILT
42.0	89.3	60.7	3.03	NA	SANDY SILT to CLAYEY SILT
42.5	91.8	62.1	4.16	NA	*CLAYEY SAND to SANDY CLAY
43.0	72.2	48.7	3.62	NA	SANDY SILT to CLAYEY SILT
43.5	95.7	64.3	3.87	NA	*CLAYEY SAND to SANDY CLAY
44.0	89.2	59.8	6.06	NA	*SANDY CLAY to SILTY CLAY
44.5	73.2	48.8	6.99	NA	*SANDY CLAY to SILTY CLAY
45.0	74.6	49.6	7.60	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
45.5	105.9	70.2	5.46	NA	*SANDY CLAY to SILTY CLAY
46.0	98.6	65.1	5.67	NA	*SANDY CLAY to SILTY CLAY
46.5	106.0	69.7	6.16	NA	*SANDY CLAY to SILTY CLAY
47.0	92.3	60.5	6.69	NA	*SANDY CLAY to SILTY CLAY
47.5	104.4	68.2	8.42	NA	*SANDY CLAY to SILTY CLAY
48.0	76.1	49.5	9.03	NA	*SANDY CLAY to SILTY CLAY
48.5	70.4	45.7	8.61	NA	*SANDY CLAY to SILTY CLAY
49.0	70.1	45.3	6.27	NA	*SANDY CLAY to SILTY CLAY
49.5	63.2	40.7	4.68	NA	*SANDY CLAY to SILTY CLAY
50.0	63.4	40.7	6.18	NA	*SANDY CLAY to SILTY CLAY
50.5	60.6	38.8	6.05	NA	*SANDY CLAY to SILTY CLAY
51.0	52.8	33.6	6.71	NA	*SANDY CLAY to SILTY CLAY
51.5	43.8	27.8	5.97	NA	*SANDY CLAY to SILTY CLAY
52.0	42.2	26.7	6.30	NA	*SANDY CLAY to SILTY CLAY
52.5	39.0	24.6	5.87	NA	*SANDY CLAY to SILTY CLAY
53.0	44.1	27.7	6.25	NA	*SANDY CLAY to SILTY CLAY
53.5	43.2	27.0	6.77	NA	*SANDY CLAY to SILTY CLAY
54.0	42.5	26.5	6.49	NA	*SANDY CLAY to SILTY CLAY
54.5	36.7	22.8	6.90	NA	*SANDY CLAY to SILTY CLAY
55.0	31.9	19.8	5.67	NA	SILTY CLAY to CLAY
55.5	24.9	15.4	4.24	NA	CLAYEY SILT to SILTY CLAY
56.0	33.6	20.7	4.84	NA	CLAYEY SILT to SILTY CLAY
56.5	33.3	20.4	5.89	NA	SILTY CLAY to CLAY
57.0	35.2	21.5	5.31	NA	CLAYEY SILT to SILTY CLAY
57.5	44.5	27.1	5.52	NA	*SANDY CLAY to SILTY CLAY
58.0	58.3	35.4	5.15	NA	*SANDY CLAY to SILTY CLAY
58.5	107.2	64.8	4.77	NA	*SANDY CLAY to SILTY CLAY
59.0	89.1	53.7	6.26	NA	*SANDY CLAY to SILTY CLAY
59.5	180.3	108.3	3.88	NA	*CLAYEY SAND to SANDY CLAY
60.0	401.7	240.5	2.23	NA	*SILTY SAND to CLAYEY SAND
60.5	542.1	323.4	2.35	NA	*SILTY SAND to CLAYEY SAND
61.0	737.8	438.6	1.59	NA	*SAND to SILTY SAND
61.5	774.5	458.9	1.89	NA	*SAND to SILTY SAND
62.0	690.4	407.6	3.15	NA	*SILTY SAND to CLAYEY SAND
62.5	554.1	326.1	3.95	NA	*CLAYEY SAND to SANDY CLAY
63.0	408.1	239.4	4.17	NA	*CLAYEY SAND to SANDY CLAY
63.5	151.6	88.6	8.60	NA	*SANDY CLAY to SILTY CLAY
64.0	422.5	246.1	2.82	NA	*SILTY SAND to CLAYEY SAND
64.5	278.3	161.5	3.33	NA	*CLAYEY SAND to SANDY CLAY
65.0	82.0	47.4	4.79	NA	*SANDY CLAY to SILTY CLAY
65.5	108.2	62.4	3.02	NA	SANDY SILT to CLAYEY SILT
66.0	171.0	98.2	4.73	NA	*SANDY CLAY to SILTY CLAY
66.5	131.6	75.4	6.06	NA	*SANDY CLAY to SILTY CLAY
67.0	134.5	76.8	4.46	NA	*SANDY CLAY to SILTY CLAY
67.5	90.2	51.3	5.48	NA	*SANDY CLAY to SILTY CLAY
68.0	66.1	37.4	4.71	NA	*SANDY CLAY to SILTY CLAY
68.5	70.0	39.5	4.22	NA	CLAYEY SILT to SILTY CLAY
69.0	112.4	63.3	4.16	NA	*CLAYEY SAND to SANDY CLAY
69.5	108.0	60.6	5.48	NA	*SANDY CLAY to SILTY CLAY
70.0	109.1	61.1	8.11	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-84

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
70.5	111.1	62.0	7.57	NA	*SANDY CLAY to SILTY CLAY
71.0	97.7	54.3	7.31	NA	*SANDY CLAY to SILTY CLAY
71.5	90.9	50.3	7.83	NA	*SANDY CLAY to SILTY CLAY
72.0	101.5	56.0	8.64	NA	*SANDY CLAY to SILTY CLAY
72.5	86.3	47.5	7.66	NA	*SANDY CLAY to SILTY CLAY
73.0	123.5	67.7	8.67	NA	*SANDY CLAY to SILTY CLAY
73.5	184.0	100.6	7.96	NA	*SANDY CLAY to SILTY CLAY
74.0	245.3	133.6	6.40	NA	*SANDY CLAY to SILTY CLAY
74.5	274.5	149.0	3.69	NA	*CLAYEY SAND to SANDY CLAY
75.0	230.5	124.7	3.24	NA	*CLAYEY SAND to SANDY CLAY
75.5	226.8	122.3	2.81	NA	*SILTY SAND to CLAYEY SAND
76.0	173.3	93.2	1.84	NA	SILTY SAND to SANDY SILT
76.5	131.9	70.7	1.89	NA	SILTY SAND to SANDY SILT
77.0	96.2	51.4	1.87	NA	SILTY SAND to SANDY SILT
77.5	126.3	67.2	2.05	NA	SILTY SAND to SANDY SILT
78.0	110.9	58.8	2.30	NA	SILTY SAND to SANDY SILT
78.5	130.3	68.9	2.91	NA	SANDY SILT to CLAYEY SILT
79.0	111.5	58.7	3.38	NA	SANDY SILT to CLAYEY SILT
79.5	110.1	57.8	3.30	NA	SANDY SILT to CLAYEY SILT
80.0	168.4	88.2	2.83	NA	SILTY SAND to SANDY SILT
80.5	246.2	128.4	7.63	NA	*SANDY CLAY to SILTY CLAY
81.0	203.8	106.0	10.24	NA	*SANDY CLAY to SILTY CLAY
81.5	247.8	128.5	9.00	NA	*SANDY CLAY to SILTY CLAY
82.0	342.3	176.8	4.74	NA	*SANDY CLAY to SILTY CLAY
82.5	334.9	172.5	5.60	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

```
* SOUNDING : CPT-85 PROJECT NO : 92-381-01110
* PROJECT : D&M/UPRR-II INSTRUMENT : F15CKE095
* LOCATION : SACRAMENTO CA SYSTEM : T-1
* DATE : 05-29-1992 OPERATOR : MR/DH
```

DEPTH	TIP RESISTANCE	NORMALIZED	FRICTION	CONE PORE	SOIL BEHAVIOR TYPE
(ft)	(tsf)	TIP RESISTANCE	RATIO	PRESSURE	
		(tsf)	(%)	(tsf)	
.0	.0	.0	.00	NA	
.5	.0	.0	.00	NA	
1.0	.0	.0	.00	NA	
1.5	.0	.0	.00	NA	
2.0	34.6	67.8	7.03	NA	*SANDY CLAY to SILTY CLAY
2.5	48.1	89.6	6.13	NA	*SANDY CLAY to SILTY CLAY
3.0	59.0	105.2	4.11	NA	*CLAYEY SAND to SANDY CLAY
3.5	74.0	127.0	3.51	NA	*CLAYEY SAND to SANDY CLAY
4.0	129.9	215.3	6.08	NA	*HEAVILY O.C./CEMENT. MAT.
4.5	96.1	154.3	5.77	NA	*SANDY CLAY to SILTY CLAY
5.0	90.9	141.8	7.11	NA	*SANDY CLAY to SILTY CLAY
5.5	81.0	123.1	6.10	NA	*SANDY CLAY to SILTY CLAY
6.0	76.0	112.5	7.00	NA	*SANDY CLAY to SILTY CLAY
6.5	61.4	88.8	6.94	NA	*SANDY CLAY to SILTY CLAY
7.0	56.7	80.2	5.62	NA	*SANDY CLAY to SILTY CLAY
7.5	62.3	86.2	6.26	NA	*SANDY CLAY to SILTY CLAY
8.0	63.4	86.0	6.53	NA	*SANDY CLAY to SILTY CLAY
8.5	62.6	83.3	6.38	NA	*SANDY CLAY to SILTY CLAY
9.0	68.9	90.0	6.29	NA	*SANDY CLAY to SILTY CLAY
9.5	62.2	79.8	6.90	NA	*SANDY CLAY to SILTY CLAY
10.0	103.8	130.8	6.22	NA	*SANDY CLAY to SILTY CLAY
10.5	125.4	155.3	6.72	NA	*SANDY CLAY to SILTY CLAY
11.0	122.5	149.2	7.13	NA	*SANDY CLAY to SILTY CLAY
11.5	54.0	64.7	6.82	NA	*SANDY CLAY to SILTY CLAY
12.0	26.7	31.5	5.31	NA	*SANDY CLAY to SILTY CLAY
12.5	56.4	65.6	5.02	NA	*SANDY CLAY to SILTY CLAY
13.0	88.6	101.5	6.05	NA	*SANDY CLAY to SILTY CLAY
13.5	103.6	117.0	8.00	NA	*SANDY CLAY to SILTY CLAY
14.0	105.1	117.0	6.72	NA	*SANDY CLAY to SILTY CLAY
14.5	125.9	138.3	7.15	NA	*SANDY CLAY to SILTY CLAY
15.0	118.4	128.3	6.55	NA	*SANDY CLAY to SILTY CLAY
15.5	100.5	107.5	6.26	NA	*SANDY CLAY to SILTY CLAY
16.0	104.7	110.6	6.42	NA	*SANDY CLAY to SILTY CLAY
16.5	83.7	87.2	9.23	NA	*SANDY CLAY to SILTY CLAY
17.0	79.4	81.7	7.30	NA	*SANDY CLAY to SILTY CLAY
17.5	102.1	103.8	6.02	NA	*SANDY CLAY to SILTY CLAY
18.0	210.5	211.4	8.60	NA	*HEAVILY O.C./CEMENT. MAT.
18.5	126.8	125.8	8.62	NA	*SANDY CLAY to SILTY CLAY
19.0	94.8	93.0	8.65	NA	*SANDY CLAY to SILTY CLAY
19.5	82.8	80.3	7.46	NA	*SANDY CLAY to SILTY CLAY
20.0	110.1	105.6	7.43	NA	*SANDY CLAY to SILTY CLAY

The Earth Technology Corporation

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
20.5	142.4	135.0	7.72	NA	*SANDY CLAY to SILTY CLAY
21.0	120.7	113.2	7.00	NA	*SANDY CLAY to SILTY CLAY
21.5	113.4	105.2	6.30	NA	*SANDY CLAY to SILTY CLAY
22.0	93.2	85.4	7.22	NA	*SANDY CLAY to SILTY CLAY
22.5	127.2	115.4	6.48	NA	*SANDY CLAY to SILTY CLAY
23.0	153.5	137.9	7.19	NA	*SANDY CLAY to SILTY CLAY
23.5	108.4	96.3	7.35	NA	*SANDY CLAY to SILTY CLAY
24.0	83.5	73.5	5.85	NA	*SANDY CLAY to SILTY CLAY
24.5	108.1	94.1	6.64	NA	*SANDY CLAY to SILTY CLAY
25.0	104.9	90.4	5.80	NA	*SANDY CLAY to SILTY CLAY
25.5	184.3	157.2	4.70	NA	*SANDY CLAY to SILTY CLAY
26.0	157.9	133.4	6.62	NA	*SANDY CLAY to SILTY CLAY
26.5	167.1	139.8	6.85	NA	*SANDY CLAY to SILTY CLAY
27.0	101.9	84.4	7.64	NA	*SANDY CLAY to SILTY CLAY
27.5	130.6	107.1	4.81	NA	*SANDY CLAY to SILTY CLAY
28.0	88.2	71.7	7.05	NA	*SANDY CLAY to SILTY CLAY
28.5	52.9	42.6	5.43	NA	*SANDY CLAY to SILTY CLAY
29.0	50.1	40.0	4.66	NA	*SANDY CLAY to SILTY CLAY
29.5	48.7	38.5	4.92	NA	*SANDY CLAY to SILTY CLAY
30.0	43.4	34.0	5.51	NA	*SANDY CLAY to SILTY CLAY
30.5	39.7	30.8	5.04	NA	*SANDY CLAY to SILTY CLAY
31.0	47.5	36.5	5.05	NA	*SANDY CLAY to SILTY CLAY
31.5	71.4	54.3	5.02	NA	*SANDY CLAY to SILTY CLAY
32.0	80.1	60.4	5.33	NA	*SANDY CLAY to SILTY CLAY
32.5	57.2	42.8	5.00	NA	*SANDY CLAY to SILTY CLAY
33.0	64.5	47.8	5.34	NA	*SANDY CLAY to SILTY CLAY
33.5	90.5	66.4	8.50	NA	*SANDY CLAY to SILTY CLAY
34.0	64.4	46.9	8.94	NA	*SANDY CLAY to SILTY CLAY
34.5	67.9	49.0	7.93	NA	*SANDY CLAY to SILTY CLAY
35.0	38.3	27.4	7.70	NA	*SANDY CLAY to SILTY CLAY
35.5	69.2	49.3	6.96	NA	*SANDY CLAY to SILTY CLAY
36.0	70.7	50.2	4.82	NA	*SANDY CLAY to SILTY CLAY
36.5	100.1	70.8	7.64	NA	*SANDY CLAY to SILTY CLAY
37.0	118.2	83.4	4.73	NA	*SANDY CLAY to SILTY CLAY
37.5	106.8	75.0	4.15	NA	*CLAYEY SAND to SANDY CLAY
38.0	120.4	84.2	4.89	NA	*SANDY CLAY to SILTY CLAY
38.5	97.0	67.6	5.37	NA	*SANDY CLAY to SILTY CLAY
39.0	98.5	68.4	6.04	NA	*SANDY CLAY to SILTY CLAY
39.5	81.8	56.6	5.28	NA	*SANDY CLAY to SILTY CLAY
40.0	120.6	83.1	4.48	NA	*SANDY CLAY to SILTY CLAY
40.5	109.5	75.2	7.05	NA	*SANDY CLAY to SILTY CLAY
41.0	83.5	57.2	4.90	NA	*SANDY CLAY to SILTY CLAY
41.5	118.0	80.5	5.75	NA	*SANDY CLAY to SILTY CLAY
42.0	121.4	82.5	4.73	NA	*SANDY CLAY to SILTY CLAY
42.5	105.9	71.7	5.41	NA	*SANDY CLAY to SILTY CLAY
43.0	96.9	65.4	7.59	NA	*SANDY CLAY to SILTY CLAY
43.5	98.8	66.4	5.82	NA	*SANDY CLAY to SILTY CLAY
44.0	93.3	62.5	5.89	NA	*SANDY CLAY to SILTY CLAY
44.5	77.2	51.5	6.32	NA	*SANDY CLAY to SILTY CLAY
45.0	56.0	37.2	5.58	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-85

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
45.5	43.3	28.7	4.78	NA	CLAYEY SILT to SILTY CLAY
46.0	46.4	30.6	4.71	NA	CLAYEY SILT to SILTY CLAY
46.5	47.8	31.4	6.00	NA	*SANDY CLAY to SILTY CLAY
47.0	40.4	26.5	6.18	NA	*SANDY CLAY to SILTY CLAY
47.5	43.4	28.4	4.91	NA	CLAYEY SILT to SILTY CLAY
48.0	39.6	25.7	5.49	NA	SILTY CLAY to CLAY
48.5	29.4	19.0	4.97	NA	CLAYEY SILT to SILTY CLAY
49.0	36.4	23.5	4.72	NA	CLAYEY SILT to SILTY CLAY
49.5	39.0	25.1	5.65	NA	*SANDY CLAY to SILTY CLAY
50.0	40.2	25.8	5.72	NA	*SANDY CLAY to SILTY CLAY
50.5	44.6	28.5	5.16	NA	*SANDY CLAY to SILTY CLAY
51.0	55.5	35.4	4.85	NA	*SANDY CLAY to SILTY CLAY
51.5	57.9	36.8	5.26	NA	*SANDY CLAY to SILTY CLAY
52.0	49.7	31.4	5.03	NA	*SANDY CLAY to SILTY CLAY
52.5	42.4	26.8	4.82	NA	CLAYEY SILT to SILTY CLAY
53.0	42.3	26.6	5.48	NA	*SANDY CLAY to SILTY CLAY
53.5	47.5	29.7	4.85	NA	CLAYEY SILT to SILTY CLAY
54.0	49.9	31.1	4.98	NA	*SANDY CLAY to SILTY CLAY
54.5	40.6	25.2	5.46	NA	SILTY CLAY to CLAY
55.0	37.3	23.1	5.69	NA	SILTY CLAY to CLAY
55.5	31.4	19.4	4.67	NA	CLAYEY SILT to SILTY CLAY
56.0	51.7	31.8	6.75	NA	*SANDY CLAY to SILTY CLAY
56.5	105.5	64.7	6.20	NA	*SANDY CLAY to SILTY CLAY
57.0	83.2	50.8	7.67	NA	*SANDY CLAY to SILTY CLAY
57.5	68.0	41.4	8.32	NA	*SANDY CLAY to SILTY CLAY
58.0	57.4	34.9	7.40	NA	*SANDY CLAY to SILTY CLAY
58.5	55.5	33.6	7.03	NA	*SANDY CLAY to SILTY CLAY
59.0	57.7	34.8	6.81	NA	*SANDY CLAY to SILTY CLAY
59.5	54.4	32.7	7.57	NA	*SANDY CLAY to SILTY CLAY
60.0	37.8	22.6	6.71	NA	*SANDY CLAY to SILTY CLAY
60.5	39.0	23.3	5.49	NA	SILTY CLAY to CLAY
61.0	36.5	21.7	5.78	NA	SILTY CLAY to CLAY
61.5	32.3	19.2	5.64	NA	SILTY CLAY to CLAY
62.0	33.1	19.6	5.32	NA	SILTY CLAY to CLAY
62.5	33.5	19.7	5.53	NA	SILTY CLAY to CLAY
63.0	34.5	20.2	5.78	NA	SILTY CLAY to CLAY
63.5	43.6	25.5	5.16	NA	CLAYEY SILT to SILTY CLAY
64.0	61.2	35.7	5.25	NA	*SANDY CLAY to SILTY CLAY
64.5	58.6	34.0	5.21	NA	*SANDY CLAY to SILTY CLAY
65.0	66.3	38.4	5.58	NA	*SANDY CLAY to SILTY CLAY
65.5	67.9	39.2	6.72	NA	*SANDY CLAY to SILTY CLAY
66.0	74.1	42.6	6.02	NA	*SANDY CLAY to SILTY CLAY
66.5	81.2	46.5	6.09	NA	*SANDY CLAY to SILTY CLAY
67.0	74.7	42.6	6.08	NA	*SANDY CLAY to SILTY CLAY
67.5	85.5	48.6	5.38	NA	*SANDY CLAY to SILTY CLAY
68.0	82.6	46.8	5.43	NA	*SANDY CLAY to SILTY CLAY
68.5	78.4	44.3	5.09	NA	*SANDY CLAY to SILTY CLAY
69.0	71.0	40.0	7.15	NA	*SANDY CLAY to SILTY CLAY
69.5	71.4	40.1	6.00	NA	*SANDY CLAY to SILTY CLAY
70.0	64.1	35.9	6.37	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-85

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
70.5	59.4	33.1	6.71	NA	*SANDY CLAY to SILTY CLAY
71.0	57.5	31.9	6.49	NA	*SANDY CLAY to SILTY CLAY
71.5	60.0	33.2	6.04	NA	*SANDY CLAY to SILTY CLAY
72.0	54.8	30.3	6.98	NA	*SANDY CLAY to SILTY CLAY
72.5	111.9	61.6	7.26	NA	*SANDY CLAY to SILTY CLAY
73.0	231.8	127.1	9.28	NA	*SANDY CLAY to SILTY CLAY
73.5	263.5	144.0	7.85	NA	*SANDY CLAY to SILTY CLAY
74.0	287.5	156.6	5.71	NA	*SANDY CLAY to SILTY CLAY
74.5	382.7	207.8	5.54	NA	*SANDY CLAY to SILTY CLAY
75.0	191.3	103.5	7.48	NA	*SANDY CLAY to SILTY CLAY
75.5	222.0	119.7	7.59	NA	*SANDY CLAY to SILTY CLAY
76.0	326.5	175.5	6.10	NA	*SANDY CLAY to SILTY CLAY
76.5	313.6	168.0	4.49	NA	*CLAYEY SAND to SANDY CLAY
77.0	465.4	248.5	3.95	NA	*CLAYEY SAND to SANDY CLAY
77.5	343.7	182.9	5.83	NA	*SANDY CLAY to SILTY CLAY
78.0	284.1	150.7	6.64	NA	*SANDY CLAY to SILTY CLAY
78.5	343.6	181.6	6.49	NA	*SANDY CLAY to SILTY CLAY
79.0	329.4	173.5	9.02	NA	*HEAVILY O.C./CEMENT. MAT.
79.5	315.2	165.5	9.63	NA	*HEAVILY O.C./CEMENT. MAT.
80.0	396.4	207.5	7.97	NA	*HEAVILY O.C./CEMENT. MAT.
80.5	205.0	107.0	8.37	NA	*SANDY CLAY to SILTY CLAY
81.0	203.5	105.8	5.95	NA	*SANDY CLAY to SILTY CLAY
81.5	279.5	144.9	4.04	NA	*CLAYEY SAND to SANDY CLAY
82.0	232.3	120.0	3.18	NA	*CLAYEY SAND to SANDY CLAY
82.5	276.4	142.3	2.88	NA	*SILTY SAND to CLAYEY SAND
83.0	267.3	137.2	2.22	NA	SILTY SAND to SANDY SILT
83.5	300.3	153.6	1.93	NA	SILTY SAND to SANDY SILT
84.0	295.6	150.7	2.35	NA	SILTY SAND to SANDY SILT
84.5	339.8	172.7	2.38	NA	SILTY SAND to SANDY SILT
85.0	380.9	193.0	2.67	NA	*SILTY SAND to CLAYEY SAND
85.5	495.5	250.1	2.14	NA	*SILTY SAND to CLAYEY SAND

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

```

*****
*
*
*
*   SOUNDING   : CPT-86                      PROJECT NO : 92-381-01110
*   PROJECT    : D&M/UPRR-II                 INSTRUMENT  : F15CKE095
*   LOCATION   : SACRAMENTO CA              SYSTEM      : T-1
*   DATE       : 06-01-1992                OPERATOR    : MR/DH
*
*****

```

NA = NOT APPLICABLE
TOP 1.0 FT IS DISTURBED SOIL
*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL
ASSUMED TOTAL UNIT WT = 110 PCF
ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-86

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
20.5	64.6	61.2	5.69	NA	*SANDY CLAY to SILTY CLAY
21.0	82.3	77.1	7.26	NA	*SANDY CLAY to SILTY CLAY
21.5	78.8	73.0	7.40	NA	*SANDY CLAY to SILTY CLAY
22.0	79.1	72.5	6.64	NA	*SANDY CLAY to SILTY CLAY
22.5	75.8	68.8	6.30	NA	*SANDY CLAY to SILTY CLAY
23.0	71.3	64.0	5.93	NA	*SANDY CLAY to SILTY CLAY
23.5	83.7	74.4	5.60	NA	*SANDY CLAY to SILTY CLAY
24.0	66.0	58.0	4.79	NA	*SANDY CLAY to SILTY CLAY
24.5	57.5	50.1	5.77	NA	*SANDY CLAY to SILTY CLAY
25.0	64.8	55.9	5.07	NA	*SANDY CLAY to SILTY CLAY
25.5	52.5	44.8	6.39	NA	*SANDY CLAY to SILTY CLAY
26.0	46.8	39.5	6.38	NA	*SANDY CLAY to SILTY CLAY
26.5	47.1	39.4	8.54	NA	*SANDY CLAY to SILTY CLAY
27.0	57.5	47.6	7.94	NA	*SANDY CLAY to SILTY CLAY
27.5	45.2	37.1	7.59	NA	*SANDY CLAY to SILTY CLAY
28.0	39.9	32.4	7.23	NA	*SANDY CLAY to SILTY CLAY
28.5	42.4	34.2	8.48	NA	*SANDY CLAY to SILTY CLAY
29.0	50.3	40.1	9.95	NA	*SANDY CLAY to SILTY CLAY
29.5	69.5	54.9	8.21	NA	*SANDY CLAY to SILTY CLAY
30.0	96.5	75.5	6.10	NA	*SANDY CLAY to SILTY CLAY
30.5	90.3	70.0	8.23	NA	*SANDY CLAY to SILTY CLAY
31.0	92.6	71.2	6.54	NA	*SANDY CLAY to SILTY CLAY
31.5	112.2	85.4	4.58	NA	*SANDY CLAY to SILTY CLAY
32.0	126.5	95.4	5.44	NA	*SANDY CLAY to SILTY CLAY
32.5	126.0	94.2	8.28	NA	*SANDY CLAY to SILTY CLAY
33.0	118.9	88.1	6.37	NA	*SANDY CLAY to SILTY CLAY
33.5	134.4	98.7	4.73	NA	*SANDY CLAY to SILTY CLAY
34.0	141.0	102.6	5.32	NA	*SANDY CLAY to SILTY CLAY
34.5	149.5	107.9	5.93	NA	*SANDY CLAY to SILTY CLAY
35.0	167.2	119.6	6.90	NA	*SANDY CLAY to SILTY CLAY
35.5	143.7	102.5	8.43	NA	*SANDY CLAY to SILTY CLAY
36.0	208.4	148.0	6.32	NA	*SANDY CLAY to SILTY CLAY
36.5	148.0	104.7	6.21	NA	*SANDY CLAY to SILTY CLAY
37.0	278.9	196.6	4.54	NA	*CLAYEY SAND to SANDY CLAY
37.5	198.9	139.7	4.58	NA	*CLAYEY SAND to SANDY CLAY
38.0	167.7	117.3	2.79	NA	SILTY SAND to SANDY SILT
38.5	247.1	172.3	2.41	NA	SILTY SAND to SANDY SILT
39.0	250.0	173.7	2.80	NA	*SILTY SAND to CLAYEY SAND
39.5	179.9	124.5	3.54	NA	*CLAYEY SAND to SANDY CLAY
40.0	158.0	108.9	2.88	NA	SILTY SAND to SANDY SILT
40.5	209.1	143.6	2.57	NA	SILTY SAND to SANDY SILT
41.0	212.2	145.3	2.97	NA	*SILTY SAND to CLAYEY SAND
41.5	219.4	149.7	1.72	NA	SAND to SILTY SAND
42.0	218.2	148.3	2.61	NA	*SILTY SAND to CLAYEY SAND
42.5	200.8	135.9	3.57	NA	*CLAYEY SAND to SANDY CLAY
43.0	222.6	150.2	2.97	NA	*SILTY SAND to CLAYEY SAND
43.5	234.1	157.3	3.30	NA	*CLAYEY SAND to SANDY CLAY
44.0	244.2	163.6	3.35	NA	*CLAYEY SAND to SANDY CLAY
44.5	244.7	163.3	3.20	NA	*SILTY SAND to CLAYEY SAND
45.0	260.6	173.3	2.34	NA	SILTY SAND to SANDY SILT

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
45.5	217.9	144.4	2.92	NA	*SILTY SAND to CLAYEY SAND
46.0	218.3	144.1	2.74	NA	*SILTY SAND to CLAYEY SAND
46.5	244.2	160.6	1.99	NA	SILTY SAND to SANDY SILT
47.0	295.0	193.3	2.01	NA	SILTY SAND to SANDY SILT
47.5	286.1	186.9	2.46	NA	*SILTY SAND to CLAYEY SAND
48.0	305.4	198.8	2.83	NA	*SILTY SAND to CLAYEY SAND
48.5	263.2	170.7	2.93	NA	*SILTY SAND to CLAYEY SAND
49.0	300.2	194.0	1.98	NA	SAND to SILTY SAND
49.5	265.2	170.8	2.68	NA	*SILTY SAND to CLAYEY SAND
50.0	251.2	161.2	3.00	NA	*SILTY SAND to CLAYEY SAND
50.5	297.9	190.5	2.95	NA	*SILTY SAND to CLAYEY SAND
51.0	199.3	127.0	3.84	NA	*CLAYEY SAND to SANDY CLAY
51.5	60.9	38.6	3.68	NA	SANDY SILT to CLAYEY SILT
52.0	52.1	33.0	2.14	NA	SILTY SAND to SANDY SILT
52.5	43.9	27.7	2.64	NA	SANDY SILT to CLAYEY SILT
53.0	40.4	25.4	3.09	NA	SANDY SILT to CLAYEY SILT
53.5	36.7	23.0	3.44	NA	SANDY SILT to CLAYEY SILT
54.0	36.2	22.6	3.18	NA	SANDY SILT to CLAYEY SILT
54.5	33.4	20.7	3.90	NA	CLAYEY SILT to SILTY CLAY
55.0	40.4	25.0	4.08	NA	CLAYEY SILT to SILTY CLAY
55.5	38.2	23.6	4.67	NA	CLAYEY SILT to SILTY CLAY
56.0	78.9	48.5	5.07	NA	*SANDY CLAY to SILTY CLAY
56.5	81.3	49.9	6.31	NA	*SANDY CLAY to SILTY CLAY
57.0	71.3	43.6	5.13	NA	*SANDY CLAY to SILTY CLAY
57.5	78.1	47.6	4.74	NA	*SANDY CLAY to SILTY CLAY
58.0	84.0	51.0	5.14	NA	*SANDY CLAY to SILTY CLAY
58.5	89.7	54.2	5.37	NA	*SANDY CLAY to SILTY CLAY
59.0	94.6	57.0	5.64	NA	*SANDY CLAY to SILTY CLAY
59.5	88.8	53.3	5.52	NA	*SANDY CLAY to SILTY CLAY
60.0	88.1	52.7	5.03	NA	*SANDY CLAY to SILTY CLAY
60.5	86.1	51.4	5.41	NA	*SANDY CLAY to SILTY CLAY
61.0	83.3	49.5	4.99	NA	*SANDY CLAY to SILTY CLAY
61.5	88.9	52.7	4.94	NA	*SANDY CLAY to SILTY CLAY
62.0	109.1	64.4	6.71	NA	*SANDY CLAY to SILTY CLAY
62.5	114.9	67.6	6.24	NA	*SANDY CLAY to SILTY CLAY
63.0	116.9	68.5	6.47	NA	*SANDY CLAY to SILTY CLAY
63.5	140.3	82.0	5.26	NA	*SANDY CLAY to SILTY CLAY
64.0	116.7	68.0	5.72	NA	*SANDY CLAY to SILTY CLAY
64.5	137.0	79.5	5.21	NA	*SANDY CLAY to SILTY CLAY
65.0	169.1	97.8	6.67	NA	*SANDY CLAY to SILTY CLAY
65.5	161.1	92.9	5.72	NA	*SANDY CLAY to SILTY CLAY
66.0	173.6	99.8	7.71	NA	*SANDY CLAY to SILTY CLAY
66.5	196.2	112.4	5.93	NA	*SANDY CLAY to SILTY CLAY
67.0	188.1	107.4	4.60	NA	*SANDY CLAY to SILTY CLAY
67.5	174.9	99.5	5.82	NA	*SANDY CLAY to SILTY CLAY
68.0	203.7	115.5	7.52	NA	*SANDY CLAY to SILTY CLAY
68.5	180.8	102.1	9.54	NA	*SANDY CLAY to SILTY CLAY
69.0	182.0	102.5	6.47	NA	*SANDY CLAY to SILTY CLAY
69.5	238.6	133.9	3.52	NA	*CLAYEY SAND to SANDY CLAY
70.0	230.3	128.8	5.61	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

SOUNDING : CPT-86

DEPTH (ft)	TIP RESISTANCE (tsf)	NORMALIZED TIP RESISTANCE (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)	SOIL BEHAVIOR TYPE
70.5	216.0	120.4	5.59	NA	*SANDY CLAY to SILTY CLAY
71.0	189.6	105.4	4.27	NA	*CLAYEY SAND to SANDY CLAY
71.5	183.4	101.6	2.98	NA	SILTY SAND to SANDY SILT
72.0	180.9	99.8	3.29	NA	*CLAYEY SAND to SANDY CLAY
72.5	188.2	103.5	3.81	NA	*CLAYEY SAND to SANDY CLAY
73.0	191.1	104.8	3.60	NA	*CLAYEY SAND to SANDY CLAY
73.5	201.4	110.1	2.79	NA	SILTY SAND to SANDY SILT
74.0	186.1	101.4	4.91	NA	*SANDY CLAY to SILTY CLAY
74.5	192.3	104.4	4.62	NA	*SANDY CLAY to SILTY CLAY
75.0	172.2	93.1	3.82	NA	*CLAYEY SAND to SANDY CLAY
75.5	184.5	99.5	3.82	NA	*CLAYEY SAND to SANDY CLAY
76.0	193.1	103.8	3.63	NA	*CLAYEY SAND to SANDY CLAY
76.5	230.1	123.3	3.51	NA	*CLAYEY SAND to SANDY CLAY
77.0	199.7	106.6	4.02	NA	*CLAYEY SAND to SANDY CLAY
77.5	244.0	129.9	3.91	NA	*CLAYEY SAND to SANDY CLAY
78.0	246.7	130.9	3.88	NA	*CLAYEY SAND to SANDY CLAY
78.5	241.4	127.6	3.57	NA	*CLAYEY SAND to SANDY CLAY
79.0	272.9	143.8	3.10	NA	*SILTY SAND to CLAYEY SAND
79.5	259.4	136.2	2.20	NA	SILTY SAND to SANDY SILT
80.0	270.4	141.6	2.16	NA	SILTY SAND to SANDY SILT
80.5	266.0	138.8	1.85	NA	SILTY SAND to SANDY SILT
81.0	256.4	133.3	1.37	NA	SAND to SILTY SAND
81.5	341.9	177.2	1.45	NA	SAND to SILTY SAND
82.0	305.7	157.9	2.32	NA	SILTY SAND to SANDY SILT
82.5	237.5	122.3	5.61	NA	*SANDY CLAY to SILTY CLAY
83.0	287.5	147.6	4.93	NA	*SANDY CLAY to SILTY CLAY

NA = NOT APPLICABLE

*INDICATES OVERCONSOLIDATED OR CEMENTED MATERIAL

ASSUMED TOTAL UNIT WT = 110 PCF

ASSUMED DEPTH OF WATER TABLE = 35.0 FT

Appendix B

APPENDIX B
ANALYTICAL LABORATORY REPORTS AND CHAIN-OF-CUSTODY RECORDS



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

PURGEABLE HALOCARBONS
EPA #601

Client: Dames & Moore
Address: 8801 Folsom Blvd., Suite 200
Sacramento, CA 95826

Attn: Mark Eisen
Purchase Order #: NA
Job Number: 00173-072-044
Location: UPRR Sacramento
Sample Number: 143208-1
Sample Description: HP-86-80.5

Report #: 143208
Date of Report: May 29, 1992
Date/Time Sampled: 05/26/92, 1645
Date/Time Sample Rec'd: 05/26/92, 1700
Date Extracted: NA
Date Analyzed: 05/27/92
Units: ug/l

COMPOUND	CONCENTRATION	MDL
Bromodichloromethane.....	ND	0.5
Bromoform.....	ND	0.5
Bromomethane.....	ND	0.5
Carbon tetrachloride.....	1.1	0.5
Chlorobenzene.....	ND	0.5
Chloroethane.....	ND	0.5
2-Chloroethylvinyl ether.....	ND	1.0
Chloroform.....	ND	0.5
Chloromethane.....	ND	0.5
Dibromochloromethane.....	ND	0.5
1,2-Dichlorobenzene.....	ND	0.5
1,3-Dichlorobenzene.....	ND	0.5
1,4-Dichlorobenzene.....	ND	0.5
Dichlorodifluoromethane.....	ND	0.5
1,1-Dichloroethane.....	ND	0.5
1,2-Dichloroethane.....	ND	0.5
1,1-Dichloroethene.....	ND	0.2
trans-1,2-Dichloroethene.....	ND	0.5
1,2-Dichloropropane.....	ND	0.5
cis-1,3-Dichloropropene.....	ND	0.5
trans-1,3-Dichloropropene.....	ND	0.5
Methylene chloride.....	ND	0.5
1,1,2,2-Tetrachloroethane.....	ND	0.5
Tetrachloroethene.....	ND	0.5
1,1,1-Trichloroethane.....	ND	0.5
1,1,2-Trichloroethane.....	ND	0.5
Trichloroethene.....	ND	0.5
Trichlorofluoromethane.....	ND	0.5
Vinyl Chloride.....	ND	1.0

NA = Not Applicable
ND = Not Detected

Note: QA/QC report to follow

Data Certified by Michael T. Lehto Report Approved by Kendra T. Santolo

:1mr

This report is applicable only to the sample received by the laboratory. The liability of the laboratory is limited to the amount paid for this report. This report is for the use of the client to whom it is addressed and upon the condition that the client assumes all liability for the further distribution of the report or its contents.



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

June 5, 1992

Sample Date: 05/26/92

Sample Rec'd Date: 05/26/92

Report #: 143208 (ADDENDUM)

Dames & Moore
8801 Folsom Blvd., Suite 200
Sacramento, CA 95826

Attn: Mark Eisen

QUALITY CONTROL SUMMARY

CONSTITUENT	LABORATORY CONTROL STANDARD % RECOVERY	--MATRIX QC ACCURACY--		--MATRIX QC PRECISION--		
		MATRIX SPIKE 1	MATRIX SPIKE 2	RELATIVE % DIFFERENCE	METHOD BLANK	MDL
Bromodichloromethane	117	97	96	1.0	ND	0.5
Bromoform	108	110	104	5.6	ND	0.5
Carbon Tetrachloride	108	97	101	4.0	ND	0.5
Chloroform	109	98	98	-0-	ND	0.5
1,1-Dichloroethane	107	97	99	2.0	ND	0.5
1,1-Dichloroethene	120	96	97	1.0	ND	0.2
trans-1,2-Dichloroethene	108	97	99	2.0	ND	0.5
cis-1,2-Dichloropropene	93	98	94	4.2	ND	0.5
trans-1,3-Dichloropropene	82	93	98	5.2	ND	0.5
Methylene Chloride	110	100	97	3.0	ND	0.5
1,1,1-Trichloroethane	118	97	99	2.0	ND	0.5
Trichloroethene	106	96	99	3.1		
<u>Surrogate</u>						
4-Bromofluorobenzene	98	96	99	5.3	ND	0.5
<u>Surrogate-143208-1</u>						
4-Bromofluorobenzene	78					

Control Limits Accuracy - 70-130%

Control Limits Precision - $\leq 20\%$

ND = Not Detected

Data Certified by

Patricia Bucknely

Report Approved by

Candra T. Davila

:LHR



ANALYTICAL LABORATORY

1910 S. STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

PURGEABLE HALOCARBONS
EPA #601

Client: Dames & Moore
Address: 8801 Folsom Blvd., Suite 200
Sacramento, CA 95826

Attn: Mark Eisen
Purchase Order #: NA
Job Number: 00173-072-044
Location: UPRR Sacramento
Sample Number: 143230
Sample Description: HP-87-74

Report #: 143230
Date of Report: May 29, 1992
Date/Time Sampled: 05/27/92, 1530
Date/Time Sample Rec'd: 05/27/92, 1610
Date Extracted: NA
Date Analyzed: 05/27/92
Units: ug/l

COMPOUND	CONCENTRATION	MDL
Bromodichloromethane.....	ND	0.5
Bromoform.....	ND	0.5
Bromomethane.....	ND	0.5
Carbon tetrachloride.....	ND	0.5
Chlorobenzene.....	ND	0.5
Chloroethane.....	ND	0.5
2-Chloroethylvinyl ether.....	ND	1.0
Chloroform.....	ND	0.5
Chloromethane.....	ND	0.5
Dibromochloromethane.....	ND	0.5
1,2-Dichlorobenzene.....	ND	0.5
1,3-Dichlorobenzene.....	ND	0.5
1,4-Dichlorobenzene.....	ND	0.5
Dichlorodifluoromethane.....	ND	0.5
1,1-Dichloroethane.....	ND	0.5
1,2-Dichloroethane.....	ND	0.5
1,1-Dichloroethene.....	ND	0.2
trans-1,2-Dichloroethene.....	ND	0.5
1,2-Dichloropropane.....	ND	0.5
cis-1,3-Dichloropropene.....	ND	0.5
trans-1,3-Dichloropropene.....	ND	0.5
Methylene chloride.....	ND	0.5
1,1,2,2-Tetrachloroethane.....	ND	0.5
Tetrachloroethene.....	ND	0.5
1,1,1-Trichloroethane.....	ND	0.5
1,1,2-Trichloroethane.....	ND	0.5
Trichloroethene.....	ND	0.5
Trichlorofluoromethane.....	ND	0.5
Vinyl Chloride.....	ND	1.0

NA = Not Applicable

ND = Not Detected

Data Certified by Sam K. L. Report Approved by Kendra T. Delantalo

:lmr



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

PURGEABLE HALOCARBONS
EPA #601

Client: Dames & Moore
Address: 8801 Folsom Blvd., Suite 200
Sacramento, CA 95826

Attn: Mark Eisen
Purchase Order #: NA
Job Number: NA
Location: Aquifers-Sacramento, UPRR-Sacramento
Sample Number: 143254-1
Sample Description: HP-88-80

Report #: 143254
Date of Report: May 30, 1992
Date/Time Sampled: 05/28/92, 1000
Date/Time Sample Rec'd: 05/28/92, 1630
Date Extracted: NA
Date Analyzed: 05/28/92
Units: ug/l

COMPOUND	CONCENTRATION	MDL
Bromodichloromethane.....	ND	0.5
Bromoform.....	ND	0.5
Bromomethane.....	ND	0.5
Carbon tetrachloride.....	ND	0.5
Chlorobenzene.....	ND	0.5
Chloroethane.....	ND	0.5
2-Chloroethylvinyl ether.....	ND	1.0
Chloroform.....	0.64	0.5
Chloromethane.....	ND	0.5
Dibromochloromethane.....	ND	0.5
1,2-Dichlorobenzene.....	ND	0.5
1,3-Dichlorobenzene.....	ND	0.5
1,4-Dichlorobenzene.....	ND	0.5
Dichlorodifluoromethane.....	ND	0.5
1,1-Dichloroethane.....	ND	0.5
1,2-Dichloroethane.....	ND	0.5
1,1-Dichloroethene.....	ND	0.2
trans-1,2-Dichloroethene.....	ND	0.5
1,2-Dichloropropane.....	ND	0.5
cis-1,3-Dichloropropene.....	ND	0.5
trans-1,3-Dichloropropene.....	ND	0.5
Methylene chloride.....	ND	0.5
1,1,2,2-Tetrachloroethane.....	ND	0.5
Tetrachloroethene.....	ND	0.5
1,1,1-Trichloroethane.....	ND	0.5
1,1,2-Trichloroethane.....	ND	0.5
Trichloroethene.....	ND	0.5
Trichlorofluoromethane.....	ND	0.5
Vinyl Chloride.....	ND	1.0

NA = Not Applicable
ND = Not Detected

Note: Quality Control Report to follow.

Data Certified by Patricia Gershwin Report Approved by Andrea T. Santolo

:lmr



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

PURGEABLE HALOCARBONS
EPA #601

Client: Dames & Moore
Address: 8801 Folsom Blvd., Suite 200
Sacramento, CA 95826

Attn: Mark Eisen
Purchase Order #: NA
Job Number: NA
Location: Aquiters-Sacramento, UPRR Sacramento
Sample Number: 143254-2
Sample Description: HP-89-78

Page: 2
Report #: 143254
Date of Report: May 30, 1992
Date/Time Sampled: 05/28/92, 1330
Date/Time Sample Rec'd: 05/28/92, 1630
Date Extracted: NA
Date Analyzed: 05/28/92
Units: ug/l

COMPOUND	CONCENTRATION	MDL
Bromodichloromethane.....	ND	0.5
Bromoform.....	ND	0.5
Bromomethane.....	ND	0.5
Carbon tetrachloride.....	ND	0.5
Chlorobenzene.....	ND	0.5
Chloroethane.....	ND	0.5
2-Chloroethylvinyl ether.....	ND	1.0
Chloroform.....	0.65	0.5
Chloromethane.....	ND	0.5
Dibromochloromethane.....	ND	0.5
1,2-Dichlorobenzene.....	ND	0.5
1,3-Dichlorobenzene.....	ND	0.5
1,4-Dichlorobenzene.....	ND	0.5
Dichlorodifluoromethane.....	ND	0.5
1,1-Dichloroethane.....	ND	0.5
1,2-Dichloroethane.....	ND	0.5
1,1-Dichloroethene.....	ND	0.2
trans-1,2-Dichloroethene.....	ND	0.5
1,2-Dichloropropane.....	ND	0.5
cis-1,3-Dichloropropene.....	ND	0.5
trans-1,3-Dichloropropene.....	ND	0.5
Methylene chloride.....	ND	0.5
1,1,2,2-Tetrachloroethane.....	ND	0.5
Tetrachloroethene.....	ND	0.5
1,1,1-Trichloroethane.....	ND	0.5
1,1,2-Trichloroethane.....	ND	0.5
Trichloroethene.....	ND	0.5
Trichlorofluoromethane.....	ND	0.5
Vinyl Chloride.....	ND	1.0

NA = Not Applicable
ND = Not Detected

Data Certified by

Binkrell

Report Approved by

C. Santolo

:lmr



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

JUN 11 1992

June 9, 1992

Sample Date: 05/27/92

Sample Rec'd Date: 05/27/92

Report #: 143230 (ADDENDUM)

Dames & Moore
8801 Folsom Blvd., Suite 200
Sacramento, CA 95826

Attn: Mark Eisen

QUALITY CONTROL SUMMARY

CONSTITUENT	LABORATORY CONTROL STANDARD % RECOVERY	--MATRIX QC ACCURACY--		--MATRIX QC PRECISION--		
		MATRIX SPIKE 1	MATRIX SPIKE 2	RELATIVE % DIFFERENCE	METHOD BLANK	MDL
Bromodichloromethane	126	79	78	1.3	ND	0.5
Bromoform	100	78	92	16	ND	0.5
Carbon Tetrachloride	114	87	94	7.7	ND	0.5
Chloroform	114	89	93	4.4	ND	0.5
1,1-Dichloroethane	112	88	94	6.6	ND	0.5
1,1-Dichloroethene	121	86	90	4.5	ND	0.2
trans-1,2-Dichloroethene	66*	94	75*	22*	ND	0.5
cis-1,2-Dichloropropene	107	81	76	6.4	ND	0.5
trans-1,3-Dichloropropene	89	77	70	9.5	ND	0.5
Methylene Chloride	121	105	92	13	ND	0.5
1,1,1-Trichloroethane	116	89	94	5.5	ND	0.5
Trichloroethene	110	89	91	2.2	ND	0.5
<u>Surrogate</u>						
4-Bromofluorobenzene	111	89	87	2.3	ND	0.5
<u>Surrogate-143230-1</u>						
4-Bromofluorobenzene	75					

Control Limits Accuracy - 70-130%

Control Limits Precision - $\leq 20\%$

*Peak co-elutes with chloroform.

ND = Not Detected

Data Certified by

Report Approved by

:lwr



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

PURGEABLE HALOCARBONS
EPA #601

Client: Dames & Moore
Address: 8801 Folsom Blvd., Suite 200
Sacramento, CA 95826

Attn: Mark Eisen
Purchase Order #: NA
Job Number: NA
Location: Aquifers-Sacto, UPRR Sacramento
Sample Number: 143280-1
Sample Description: HP-90-80

Page 1
Report #: 143280
Date of Report: June 3, 1992
Date/Time Sampled: 05/29/92, 0915
Date/Time Sample Rec'd: 05/29/92, 1620
Date Extracted: NA
Date Analyzed: 06/01/92
Units: ug/l

COMPOUND	CONCENTRATION	MDL
Bromodichloromethane.....	ND	0.5
Bromoform.....	ND	0.5
Bromomethane.....	ND	0.5
Carbon tetrachloride.....	ND	0.5
Chlorobenzene.....	ND	0.5
Chloroethane.....	ND	0.5
2-Chloroethylvinyl ether.....	ND	1.0
Chloroform.....	ND	0.5
Chloromethane.....	ND	0.5
Dibromochloromethane.....	ND	0.5
1,2-Dichlorobenzene.....	ND	0.5
1,3-Dichlorobenzene.....	ND	0.5
1,4-Dichlorobenzene.....	ND	0.5
Dichlorodifluoromethane.....	ND	0.5
1,1-Dichloroethane.....	ND	0.5
1,2-Dichloroethane.....	ND	0.5
1,1-Dichloroethene.....	ND	0.2
trans-1,2-Dichloroethene.....	ND	0.5
1,2-Dichloropropane.....	ND	0.5
cis-1,3-Dichloropropene.....	ND	0.5
trans-1,3-Dichloropropene.....	ND	0.5
Methylene chloride.....	ND	0.5
1,1,2,2-Tetrachloroethane.....	ND	0.5
Tetrachloroethene.....	ND	0.5
1,1,1-Trichloroethane.....	ND	0.5
1,1,2-Trichloroethane.....	ND	0.5
Trichloroethene.....	ND	0.5
Trichlorofluoromethane.....	ND	0.5
Vinyl Chloride.....	ND	1.0

NA = Not Applicable
ND = Not Detected

Data Certified by

Jimmy Glenn

Report Approved by

Kendra T DeSanto

:lmr



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

PURGEABLE HALOCARBONS
EPA #601

Client: Dames & Moore
Address: 8801 Folsom Blvd., Suite 200
Sacramento, CA 95826

Attn: Mark Eisen
Purchase Order #: NA
Job Number: NA
Location: Aquifers-Sacto, UPRR Sacramento
Sample Number: 143280-2
Sample Description: HP-90A-80

Page 2
Report #: 143280
Date of Report: June 3, 1992
Date/Time Sampled: 05/29/92, 0930
Date/Time Sample Rec'd: 05/29/92, 1620
Date Extracted: NA
Date Analyzed: 06/01/92
Units: ug/l

COMPOUND	CONCENTRATION	MDL
Bromodichloromethane.....	ND	0.5
Bromoform.....	ND	0.5
Bromomethane.....	ND	0.5
Carbon tetrachloride.....	ND	0.5
Chlorobenzene.....	ND	0.5
Chloroethane.....	ND	0.5
2-Chloroethylvinyl ether.....	ND	1.0
Chloroform.....	ND	0.5
Chloromethane.....	ND	0.5
Dibromochloromethane.....	ND	0.5
1,2-Dichlorobenzene.....	ND	0.5
1,3-Dichlorobenzene.....	ND	0.5
1,4-Dichlorobenzene.....	ND	0.5
Dichlorodifluoromethane.....	ND	0.5
1,1-Dichloroethane.....	ND	0.5
1,2-Dichloroethane.....	ND	0.5
1,1-Dichloroethene.....	ND	0.2
trans-1,2-Dichloroethene.....	ND	0.5
1,2-Dichloropropane.....	ND	0.5
cis-1,3-Dichloropropene.....	ND	0.5
trans-1,3-Dichloropropene.....	ND	0.5
Methylene chloride.....	ND	0.5
1,1,2,2-Tetrachloroethane.....	ND	0.5
Tetrachloroethene.....	ND	0.5
1,1,1-Trichloroethane.....	ND	0.5
1,1,2-Trichloroethane.....	ND	0.5
Trichloroethene.....	ND	0.5
Trichlorofluoromethane.....	ND	0.5
Vinyl Chloride.....	ND	1.0

NA = Not Applicable
ND = Not Detected

Data Certified by

Report Approved by

:lmr



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

PURGEABLE HALOCARBONS
EPA #601

Client: Dames & Moore
Address: 8801 Folsom Blvd., Suite 200
Sacramento, CA 95826

Attn: Mark Eisen
Purchase Order #: NA
Job Number: NA
Location: Aquifers-Sacto, UPRR Sacramento
Sample Number: 143280-3
Sample Description: HP-91-83

Page 3
Report #: 143280
Date of Report: June 3, 1992
Date/Time Sampled: 05/29/92, 1230
Date/Time Sample Rec'd: 05/29/92, 1620
Date Extracted: NA
Date Analyzed: 06/01/92
Units: ug/l

COMPOUND	CONCENTRATION	MDL
Bromodichloromethane.....	ND	0.5
Bromoform.....	ND	0.5
Bromomethane.....	ND	0.5
Carbon tetrachloride.....	ND	0.5
Chlorobenzene.....	ND	0.5
Chloroethane.....	ND	0.5
2-Chloroethylvinyl ether.....	ND	1.0
Chloroform.....	0.85	0.5
Chloromethane.....	ND	0.5
Dibromochloromethane.....	ND	0.5
1,2-Dichlorobenzene.....	ND	0.5
1,3-Dichlorobenzene.....	ND	0.5
1,4-Dichlorobenzene.....	ND	0.5
Dichlorodifluoromethane.....	ND	0.5
1,1-Dichloroethane.....	ND	0.5
1,2-Dichloroethane.....	ND	0.5
1,1-Dichloroethene.....	ND	0.2
trans-1,2-Dichloroethene.....	ND	0.5
1,2-Dichloropropane.....	ND	0.5
cis-1,3-Dichloropropene.....	ND	0.5
trans-1,3-Dichloropropene.....	ND	0.5
Methylene chloride.....	ND	0.5
1,1,2,2-Tetrachloroethane.....	ND	0.5
Tetrachloroethene.....	ND	0.5
1,1,1-Trichloroethane.....	ND	0.5
1,1,2-Trichloroethane.....	ND	0.5
Trichloroethene.....	ND	0.5
Trichlorofluoromethane.....	ND	0.5
Vinyl Chloride.....	ND	1.0

NA = Not Applicable

ND = Not Detected

Data Certified by

Report Approved by

:lmr



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

PURGEABLE HALOCARBONS
EPA #601

Client: Dames & Moore
Address: 8801 Folsom Blvd., Suite 200
Sacramento, CA 95826

Attn: Mark Eisen
Purchase Order #: NA
Job Number: NA
Location: Aquifers-Sacto, UPRR Sacramento
Sample Number: 143280-4
Sample Description: HP-92-72

Page 4
Report #: 143280
Date of Report: June 3, 1992
Date/Time Sampled: 05/29/92, 1445
Date/Time Sample Rec'd: 05/29/92, 1620
Date Extracted: NA
Date Analyzed: 06/01/92
Units: ug/l

COMPOUND	CONCENTRATION	MDL
Bromodichloromethane.....	ND	0.5
Bromoform.....	ND	0.5
Bromomethane.....	ND	0.5
Carbon tetrachloride.....	ND	0.5
Chlorobenzene.....	ND	0.5
Chloroethane.....	ND	0.5
2-Chloroethylvinyl ether.....	ND	1.0
Chloroform.....	ND	0.5
Chloromethane.....	ND	0.5
Dibromochloromethane.....	ND	0.5
1,2-Dichlorobenzene.....	ND	0.5
1,3-Dichlorobenzene.....	ND	0.5
1,4-Dichlorobenzene.....	ND	0.5
Dichlorodifluoromethane.....	ND	0.5
1,1-Dichloroethane.....	ND	0.5
1,2-Dichloroethane.....	ND	0.5
1,1-Dichloroethene.....	ND	0.2
trans-1,2-Dichloroethene.....	ND	0.5
1,2-Dichloropropane.....	ND	0.5
cis-1,3-Dichloropropene.....	ND	0.5
trans-1,3-Dichloropropene.....	ND	0.5
Methylene chloride.....	ND	0.5
1,1,2,2-Tetrachloroethane.....	ND	0.5
Tetrachloroethene.....	ND	0.5
1,1,1-Trichloroethane.....	ND	0.5
1,1,2-Trichloroethane.....	ND	0.5
Trichloroethene.....	ND	0.5
Trichlorofluoromethane.....	ND	0.5
Vinyl Chloride.....	ND	1.0

NA = Not Applicable
ND = Not Detected

Data Certified by  Report Approved by 

:lmr



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

PURGEABLE HALOCARBONS
EPA #601

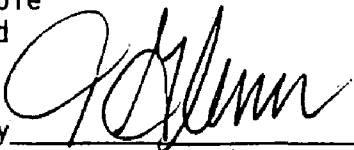
Client: Dames & Moore
Address: 8801 Folsom Blvd., Suite 200
Sacramento, CA 95826

Attn: Mark Eisen
Purchase Order #: NA
Job Number: NA
Location: Aquifers-Sacto, UPRR Sacramento
Sample Number: 143280-TB
Sample Description: Travel Blank

Page 5
Report #: 143280
Date of Report: June 3, 1992
Date/Time Sampled: NA
Date/Time Sample Rec'd: 05/29/92, 1620
Date Extracted: NA
Date Analyzed: 06/01/92
Units: ug/l

COMPOUND	CONCENTRATION	MDL
Bromodichloromethane.....	ND	0.5
Bromoform.....	ND	0.5
Bromomethane.....	ND	0.5
Carbon tetrachloride.....	ND	0.5
Chlorobenzene.....	ND	0.5
Chloroethane.....	ND	0.5
2-Chloroethylvinyl ether.....	ND	1.0
Chloroform.....	ND	0.5
Chloromethane.....	ND	0.5
Dibromochloromethane.....	ND	0.5
1,2-Dichlorobenzene.....	ND	0.5
1,3-Dichlorobenzene.....	ND	0.5
1,4-Dichlorobenzene.....	ND	0.5
Dichlorodifluoromethane.....	ND	0.5
1,1-Dichloroethane.....	ND	0.5
1,2-Dichloroethane.....	ND	0.5
1,1-Dichloroethene.....	ND	0.2
trans-1,2-Dichloroethene.....	ND	0.5
1,2-Dichloropropane.....	ND	0.5
cis-1,3-Dichloropropene.....	ND	0.5
trans-1,3-Dichloropropene.....	ND	0.5
Methylene chloride.....	ND	0.5
1,1,2,2-Tetrachloroethane.....	ND	0.5
Tetrachloroethene.....	ND	0.5
1,1,1-Trichloroethane.....	ND	0.5
1,1,2-Trichloroethane.....	ND	0.5
Trichloroethene.....	ND	0.5
Trichlorofluoromethane.....	ND	0.5
Vinyl Chloride.....	ND	1.0

NA = Not Applicable
ND = Not Detected

Data Certified by  Report Approved by 

:1mr



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

June 3, 1992

Sample Date: 05/29/92

Sample Rec'd Date: 05/29/92

Report #: 143280

Page 6

Dames & Moore
8801 Polson Blvd., Suite 200
Sacramento, CA 95826

Attn: Mark Eisen

QUALITY CONTROL SUMMARY

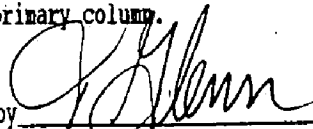
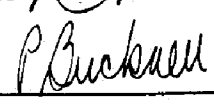
CONSTITUENT	LABORATORY CONTROL STANDARD % RECOVERY	--MATRIX QC ACCURACY--		--MATRIX QC PRECISION--		
		MATRIX SPIKE 1	MATRIX SPIKE 2	RELATIVE % DIFFERENCE	METHOD BLANK	MDL
Bromodichloromethane	90	103	99	4.0	ND	0.5
Bromoform	78	101	99	2.0	ND	0.5
Carbon Tetrachloride	113	103	100	3.0	ND	0.5
Chloroform	104	108	99	8.7	ND	0.5
1,1-Dichloroethane	106	108	105	2.8	ND	0.5
1,1-Dichloroethene	111	104	101	2.9	ND	0.2
trans-1,2-Dichloroethene	*	97	91	6.4	ND	0.5
cis-1,2-Dichloropropene	75	101	95	6.1	ND	0.5
trans-1,3-Dichloropropene	--	97	91	6.4	ND	0.5
Methylene Chloride	97	89	101	13	ND	0.5
1,1,1-Trichloroethane	102	103	99	4.0	ND	0.5
Trichloroethene	100	104	102	1.9	ND	0.5
<u>Surrogate</u>						
4-Bromofluorobenzene	81	102	96	6.1	ND	0.5
<u>Surrogate-143280-1</u>						
4-Bromofluorobenzene	81					

Control Limits Accuracy - 70-130%

Control Limits Precision - $\leq 20\%$

ND = Not Detected

*This compound co-elutes with chloroform on the primary column.

Data Certified by Report Approved by 

:lmr

This report is applicable only to the sample received by the laboratory. The liability of the laboratory is limited to the amount paid for this report. This report is for the exclusive use of the client to whom it is addressed and upon the condition that the client assumes all liability for the further distribution of the report or its contents.



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

JUN 1 1992

June 2, 1992

Dames & Moore
8801 Folsom Blvd., Suite 200
Sacramento, CA 95826
Attn: Mark Eisen

Below are results of analysis of 2 samples received for examination
on June 1, 1992:

Client code: 497 **SAMPLE DESCRIPTION:** HP-93-83
LAB I.D. AA02046 Turn-Around-Time: RUSH 24
Collection Date: 06/01/92 Collection Time: 12:30
Submittal Date: 06/01/92 Submittal Time: 17:22
Sample disposal: LAB

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT
Multicomponent analysis: EPA 601 PURGEABLE HALOCARBONS			
Bromodichloromethane	ug/l	ND	0.5
Bromoform	ug/l	ND	0.5
Bromomethane	ug/l	ND	0.5
Carbon tetrachloride	ug/l	ND	0.5
Chlorobenzene	ug/l	ND	0.5
Chloroethane	ug/l	ND	0.5
2-Chloroethyl vinyl ether	ug/l	ND	1.0
Chloroform	ug/l	ND	0.5
Chloromethane	ug/l	ND	0.5
Dibromochloromethane	ug/l	ND	0.5
1,2-Dichlorobenzene	ug/l	ND	0.5
1,3-Dichlorobenzene	ug/l	ND	0.5
1,4-Dichlorobenzene	ug/l	ND	0.5
Dichlorodifluoromethane	ug/l	ND	0.5
1,1-Dichloroethane	ug/l	ND	0.5
1,2-Dichloroethane	ug/l	ND	0.5
1,1-Dichloroethene	ug/l	ND	0.2
trans-1,2-Dichloroethene	ug/l	ND	0.5
1,2-Dichloropropane	ug/l	ND	0.5
cis-1,3-Dichloropropene	ug/l	ND	0.5
trans-1,3-Dichloropropene	ug/l	ND	0.5
Methylene chloride	ug/l	ND	0.5
1,1,2,2-Tetrachloroethane	ug/l	ND	0.5
Tetrachloroethene	ug/l	ND	0.5
1,1,1-Trichloroethane	ug/l	ND	0.5
1,1,2-Trichloroethane	ug/l	ND	0.5
Trichloroethene	ug/l	ND	0.5
Trichlorofluoromethane	ug/l	ND	0.5
Vinyl chloride	ug/l	ND	1.0

:slw



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

Dames & Moore

Page: 2

June 2, 1992

Client code: 497 **SAMPLE DESCRIPTION:** HP-94-76

LAB I.D. AA02047 Turn-Around-Time: RUSH 24

Collection Date: 06/01/92

Collection Time: 16:45

Submittal Date: 06/01/92

Submittal Time: 17:22

Sample disposal: LAB

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT
-------------------	-------	----------------	--------------------

Multicomponent analysis: EPA 601 PURGEABLE HALOCARBONS

Bromodichloromethane	ug/l	ND	0.5
Bromoform	ug/l	ND	0.5
Bromomethane	ug/l	ND	0.5
Carbon tetrachloride	ug/l	2.1	0.5
Chlorobenzene	ug/l	ND	0.5
Chloroethane	ug/l	ND	0.5
2-Chloroethyl vinyl ether	ug/l	ND	1.0
Chloroform	ug/l	1	0.5
Chloromethane	ug/l	ND	0.5
Dibromochloromethane	ug/l	ND	0.5
1,2-Dichlorobenzene	ug/l	ND	0.5
1,3-Dichlorobenzene	ug/l	ND	0.5
1,4-Dichlorobenzene	ug/l	ND	0.5
Dichlorodifluoromethane	ug/l	ND	0.5
1,1-Dichloroethane	ug/l	ND	0.5
1,2-Dichloroethane	ug/l	ND	0.5
1,1-Dichloroethene	ug/l	ND	0.2
trans-1,2-Dichloroethene	ug/l	ND	0.5
1,2-Dichloropropane	ug/l	ND	0.5
cis-1,3-Dichloropropene	ug/l	ND	0.5
trans-1,3-Dichloropropene	ug/l	ND	0.5
Methylene chloride	ug/l	ND	0.5
1,1,2,2-Tetrachloroethane	ug/l	ND	0.5
Tetrachloroethene	ug/l	ND	0.5
1,1,1-Trichloroethane	ug/l	ND	0.5
1,1,2-Trichloroethane	ug/l	ND	0.5
Trichloroethene	ug/l	ND	0.5
Trichlorofluoromethane	ug/l	ND	0.5
Vinyl chloride	ug/l	ND	1.0



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

Dames & Moore

Page: 3

June 2, 1992

Client code: 497 **SAMPLE DESCRIPTION: TRAVEL BLANK**

LAB I.D. AA02048 Turn-Around-Time: RUSH 24

Collection Date: 06/01/92

Submittal Date: 06/01/92

Submittal Time: 17:26

Sample disposal: LAB

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT
Multicomponent analysis: EPA 601 PURGEABLE HALOCARBONS			
Bromodichloromethane	ug/l	ND	0.5
Bromoform	ug/l	ND	0.5
Bromomethane	ug/l	ND	0.5
Carbon tetrachloride	ug/l	ND	0.5
Chlorobenzene	ug/l	ND	0.5
Chloroethane	ug/l	ND	0.5
2-Chloroethyl vinyl ether	ug/l	ND	1.0
Chloroform	ug/l	ND	0.5
Chloromethane	ug/l	ND	0.5
Dibromochloromethane	ug/l	ND	0.5
1,2-Dichlorobenzene	ug/l	ND	0.5
1,3-Dichlorobenzene	ug/l	ND	0.5
1,4-Dichlorobenzene	ug/l	ND	0.5
Dichlorodifluoromethane	ug/l	ND	0.5
1,1-Dichloroethane	ug/l	ND	0.5
1,2-Dichloroethane	ug/l	ND	0.5
1,1-Dichloroethene	ug/l	ND	0.2
trans-1,2-Dichloroethene	ug/l	ND	0.5
1,2-Dichloropropane	ug/l	ND	0.5
cis-1,3-Dichloropropene	ug/l	ND	0.5
trans-1,3-Dichloropropene	ug/l	ND	0.5
Methylene chloride	ug/l	ND	0.5
1,1,2,2-Tetrachloroethane	ug/l	ND	0.5
Tetrachloroethene	ug/l	ND	0.5
1,1,1-Trichloroethane	ug/l	ND	0.5
1,1,2-Trichloroethane	ug/l	ND	0.5
Trichloroethene	ug/l	ND	0.5
Trichlorofluoromethane	ug/l	ND	0.5
Vinyl chloride	ug/l	ND	1.0

ND = Not Detected

Please advise should you have questions concerning these data.

Data Certified by

Patricia Buckner

Report Approved by

Michael V. Lehto

:slw

This report is applicable only to the sample received by the laboratory. The liability of the laboratory is limited to the amount paid for this report. This report is for the use of the client and is not to be distributed outside the client's organization. The client assumes all liability for the further distribution of the report or its contents.



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

June 4, 1992

Dames & Moore
8801 Folsom Blvd. #200
Sacramento, CA 95826
Attn: Mark Eisen

Below are results of analysis of 3 samples received for examination
on June 2, 1992:

LOCATION: UPRR-SAC

Client code: 497 **Sample Description:** HP-95-74
LAB I.D. AA02200 Turn-Around-Time: RUSH 24
Collection Date: 06/02/92 Collection Time: 10:45
Submittal Date: 06/02/92 Submittal Time: 16:00
Sample disposal: LAB

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT
Multicomponent analysis: EPA 601 PURGEABLE HALOCARBONS			
Bromodichloromethane	ug/l	ND	0.5
Bromoform	ug/l	ND	0.5
Bromomethane	ug/l	ND	0.5
Carbon tetrachloride	ug/l	0.58	0.5
Chlorobenzene	ug/l	ND	0.5
Chloroethane	ug/l	ND	0.5
2-Chloroethyl vinyl ether	ug/l	ND	1.0
Chloroform	ug/l	2.8	0.5
Chloromethane	ug/l	ND	0.5
Dibromochloromethane	ug/l	ND	0.5
1,2-Dichlorobenzene	ug/l	ND	0.5
1,3-Dichlorobenzene	ug/l	ND	0.5
1,4-Dichlorobenzene	ug/l	ND	0.5
Dichlorodifluoromethane	ug/l	ND	0.5
1,1-Dichloroethane	ug/l	ND	0.5
1,2-Dichloroethane	ug/l	ND	0.5
1,1-Dichloroethene	ug/l	ND	0.2
trans-1,2-Dichloroethene	ug/l	ND	0.5
1,2-Dichloropropane	ug/l	ND	0.5
cis-1,3-Dichloropropene	ug/l	ND	0.5
trans-1,3-Dichloropropene	ug/l	ND	0.5
Methylene chloride	ug/l	ND	0.5
1,1,2,2-Tetrachloroethane	ug/l	ND	0.5
Tetrachloroethene	ug/l	ND	0.5
1,1,1-Trichloroethane	ug/l	ND	0.5
1,1,2-Trichloroethane	ug/l	ND	0.5
Trichloroethene	ug/l	ND	0.5
Trichlorofluoromethane	ug/l	ND	0.5
Vinyl chloride	ug/l	ND	1.0



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

Dames & Moore

Page: 2

June 4, 1992

Client code: 497 Sample Description: HP-96-79

LAB I.D. AA02201 Turn-Around-Time: RUSH 24

Collection Date: 06/02/92

Collection Time: 14:15

Submittal Date: 06/02/92

Submittal Time: 16:00

Sample disposal: LAB

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT
Multicomponent analysis: EPA 601 PURGEABLE HALOCARBONS			
Bromodichloromethane	ug/l	ND	0.5
Bromoform	ug/l	ND	0.5
Bromomethane	ug/l	ND	0.5
Carbon tetrachloride	ug/l	2.8	0.5
Chlorobenzene	ug/l	ND	0.5
Chloroethane	ug/l	ND	0.5
2-Chloroethyl vinyl ether	ug/l	ND	1.0
Chloroform	ug/l	2.2	0.5
Chloromethane	ug/l	ND	0.5
Dibromochloromethane	ug/l	ND	0.5
1,2-Dichlorobenzene	ug/l	ND	0.5
1,3-Dichlorobenzene	ug/l	ND	0.5
1,4-Dichlorobenzene	ug/l	ND	0.5
Dichlorodifluoromethane	ug/l	ND	0.5
1,1-Dichloroethane	ug/l	ND	0.5
1,2-Dichloroethane	ug/l	1.2	0.5
1,1-Dichloroethene	ug/l	ND	0.2
trans-1,2-Dichloroethene	ug/l	ND	0.5
1,2-Dichloropropane	ug/l	ND	0.5
cis-1,3-Dichloropropene	ug/l	ND	0.5
trans-1,3-Dichloropropene	ug/l	ND	0.5
Methylene chloride	ug/l	ND	0.5
1,1,2,2-Tetrachloroethane	ug/l	ND	0.5
Tetrachloroethene	ug/l	ND	0.5
1,1,1-Trichloroethane	ug/l	ND	0.5
1,1,2-Trichloroethane	ug/l	ND	0.5
Trichloroethene	ug/l	ND	0.5
Trichlorofluoromethane	ug/l	ND	0.5
Vinyl chloride	ug/l	ND	1.0



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

Dames & Moore

Page: 3

June 4, 1992

Client code: 497 Sample Description: TRAVEL BLANK

LAB I.D. AA02202 Turn-Around-Time: RUSH 24

Collection Date: 06/02/92

Submittal Date: 06/02/92

Submittal Time: 16:00

Sample disposal: LAB

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT
Multicomponent analysis: EPA 601 PURGEABLE HALOCARBONS			
Bromodichloromethane	ug/l	ND	0.5
Bromoform	ug/l	ND	0.5
Bromomethane	ug/l	ND	0.5
Carbon tetrachloride	ug/l	ND	0.5
Chlorobenzene	ug/l	ND	0.5
Chloroethane	ug/l	ND	0.5
2-Chloroethyl vinyl ether	ug/l	ND	1.0
Chloroform	ug/l	ND	0.5
Chloromethane	ug/l	ND	0.5
Dibromochloromethane	ug/l	ND	0.5
1,2-Dichlorobenzene	ug/l	ND	0.5
1,3-Dichlorobenzene	ug/l	ND	0.5
1,4-Dichlorobenzene	ug/l	ND	0.5
Dichlorodifluoromethane	ug/l	ND	0.5
1,1-Dichloroethane	ug/l	ND	0.5
1,2-Dichloroethane	ug/l	ND	0.5
1,1-Dichloroethene	ug/l	ND	0.2
trans-1,2-Dichloroethene	ug/l	ND	0.5
1,2-Dichloropropane	ug/l	ND	0.5
cis-1,3-Dichloropropene	ug/l	ND	0.5
trans-1,3-Dichloropropene	ug/l	ND	0.5
Methylene chloride	ug/l	ND	0.5
1,1,2,2-Tetrachloroethane	ug/l	ND	0.5
Tetrachloroethene	ug/l	ND	0.5
1,1,1-Trichloroethane	ug/l	ND	0.5
1,1,2-Trichloroethane	ug/l	ND	0.5
Trichloroethene	ug/l	ND	0.5
Trichlorofluoromethane	ug/l	ND	0.5
Vinyl chloride	ug/l	ND	1.0

Data Certified by

Report Approved by

:mtl



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

June 4, 1992

Dames & Moore
8801 Folsom Blvd., Suite 200
Sacramento, CA 95826

Attn: Mark Eisen

QUALITY CONTROL SUMMARY
LAB I.D. AA02200

CONSTITUENT	LABORATORY CONTROL STANDARD % RECOVERY	--MATRIX QC ACCURACY--		--MATRIX QC PRECISION--		METHOD BLANK	MDL
		MATRIX SPIKE 1	MATRIX SPIKE 2	RELATIVE % DIFFERENCE			
Bromodichloromethane	114	104	102	1.9		ND	0.5
Bromoform	127	127	113	12		ND	0.5
Carbon Tetrachloride	115	94	95	1.1		ND	0.5
Chloroform	108	106	108	1.9		ND	0.5
1,1-Dichloroethane	112	95	96	1.0		ND	0.5
1,1-Dichloroethene	119	96	98	1.0		ND	0.2
Cis-1,2 Dichloroethene		107	105	1.9		ND	0.5
Trans 1,3-Dichloropropene		113	110	2.7		ND	0.5
Methylene Chloride	111	105	107	1.9		ND	0.5
1,1,1-Trichloroethane	117	96	98	2.1		ND	0.5
Trichloroethene	107	98	99	1.0		ND	0.5
Surrogate							
4-Bromofluorobenzene	107	102	101	1.0		ND	0.5

Control Limits Accuracy - 70-130%

Control Limits Precision - 0-20%

ND = Not Detected

Data Certified by

Report Approved by

:mtl



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

June 5, 1992

Dames & Moore
8801 Folsom Blvd. #200
Sacramento, CA 95826
Attn: Mark Eisen

Below are results of analysis of 2 samples received for examination
on June 3, 1992:

Client code: 497 Sample Description: HP-97-78
LAB I.D. AA02521 Turn-Around-Time: RUSH 24H
Collection Date: 06/03/92 Collection Time: 11:00
Submittal Date: 06/03/92 Submittal Time: 16:54
Sample disposal: LAB

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT
Multicomponent analysis: EPA 601 PURGEABLE HALOCARBONS			
Bromodichloromethane	ug/l	ND	0.5
Bromoform	ug/l	ND	0.5
Bromomethane	ug/l	ND	0.5
Carbon tetrachloride	ug/l	.76	0.5
Chlorobenzene	ug/l	ND	0.5
Chloroethane	ug/l	ND	0.5
2-Chloroethyl vinyl ether	ug/l	ND	1.0
Chloroform	ug/l	ND	0.5
Chloromethane	ug/l	ND	0.5
Dibromochloromethane	ug/l	ND	0.5
1,2-Dichlorobenzene	ug/l	ND	0.5
1,3-Dichlorobenzene	ug/l	ND	0.5
1,4-Dichlorobenzene	ug/l	ND	0.5
Dichlorodifluoromethane	ug/l	ND	0.5
1,1-Dichloroethane	ug/l	ND	0.5
1,2-Dichloroethane	ug/l	ND	0.5
1,1-Dichloroethene	ug/l	ND	0.2
trans-1,2-Dichloroethene	ug/l	ND	0.5
1,2-Dichloropropane	ug/l	ND	0.5
cis-1,3-Dichloropropene	ug/l	ND	0.5
trans-1,3-Dichloropropene	ug/l	ND	0.5
Methylene chloride	ug/l	ND	0.5
1,1,2,2-Tetrachloroethane	ug/l	ND	0.5
Tetrachloroethene	ug/l	ND	0.5
1,1,1-Trichloroethane	ug/l	ND	0.5
1,1,2-Trichloroethane	ug/l	ND	0.5
Trichloroethene	ug/l	ND	0.5
Trichlorofluoromethane	ug/l	ND	0.5
Vinyl chloride	ug/l	ND	1.0



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

Client code: 497 Sample Description: HP-98-70
LAB I.D. AA02523 Turn-Around-Time: RUSH 24h
Collection Date: 06/03/92 Collection Time: 14:15
Submittal Date: 06/03/92 Submittal Time: 16:54
Sample disposal: LAB

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT
-------------------	-------	----------------	--------------------

Multicomponent analysis: EPA 601 PURGEABLE HALOCARBONS

Bromodichloromethane	ug/l	ND	0.5
Bromoform	ug/l	ND	0.5
Bromomethane	ug/l	ND	0.5
Carbon tetrachloride	ug/l	3.3	0.5
Chlorobenzene	ug/l	ND	0.5
Chloroethane	ug/l	ND	0.5
2-Chloroethyl vinyl ether	ug/l	ND	1.0
Chloroform	ug/l	ND	0.5
Chloromethane	ug/l	ND	0.5
Dibromochloromethane	ug/l	ND	0.5
1,2-Dichlorobenzene	ug/l	ND	0.5
1,3-Dichlorobenzene	ug/l	ND	0.5
1,4-Dichlorobenzene	ug/l	ND	0.5
Dichlorodifluoromethane	ug/l	ND	0.5
1,1-Dichloroethane	ug/l	ND	0.5
1,2-Dichloroethane	ug/l	ND	0.5
1,1-Dichloroethene	ug/l	ND	0.2
trans-1,2-Dichloroethene	ug/l	ND	0.5
1,2-Dichloropropane	ug/l	ND	0.5
cis-1,3-Dichloropropene	ug/l	ND	0.5
trans-1,3-Dichloropropene	ug/l	ND	0.5
Methylene chloride	ug/l	ND	0.5
1,1,2,2-Tetrachloroethane	ug/l	ND	0.5
Tetrachloroethene	ug/l	ND	0.5
1,1,1-Trichloroethane	ug/l	ND	0.5
1,1,2-Trichloroethane	ug/l	ND	0.5
Trichloroethene	ug/l	ND	0.5
Trichlorofluoromethane	ug/l	ND	0.5
Vinyl chloride	ug/l	ND	1.0

ND = NOT DETECTED

Data Certified by

Report Approved by

:tjn



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

June 5, 1992

Dames & Moore
8801 Folsom Blvd., #200
Sacramento, CA 95826
Attn: Mark Eisen

Below are results of analysis of 4 samples received for examination
on June 4, 1992:

Client code: 497 Sample Description: HP-99-82
LAB I.D. AA02656 Turn-Around-Time: RUSH 24
Collection Date: 06/04/92 Collection Time: 12:15
Submittal Date: 06/04/92 Submittal Time: 16:46
Sample disposal: LAB

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT

Multicomponent analysis: EPA 601 PURGEABLE HALOCARBONS			
Bromodichloromethane	ug/l	ND	0.5
Bromoform	ug/l	ND	0.5
Bromomethane	ug/l	ND	0.5
Carbon tetrachloride	ug/l	ND	0.5
Chlorobenzene	ug/l	ND	0.5
Chloroethane	ug/l	ND	0.5
2-Chloroethyl vinyl ether	ug/l	ND	1.0
Chloroform	ug/l	ND	0.5
Chloromethane	ug/l	ND	0.5
Dibromochloromethane	ug/l	ND	0.5
1,2-Dichlorobenzene	ug/l	ND	0.5
1,3-Dichlorobenzene	ug/l	ND	0.5
1,4-Dichlorobenzene	ug/l	ND	0.5
Dichlorodifluoromethane	ug/l	ND	0.5
1,1-Dichloroethane	ug/l	ND	0.5
1,2-Dichloroethane	ug/l	ND	0.5
1,1-Dichloroethene	ug/l	ND	0.2
trans-1,2-Dichloroethene	ug/l	ND	0.5
1,2-Dichloropropane	ug/l	ND	0.5
cis-1,3-Dichloropropene	ug/l	ND	0.5
trans-1,3-Dichloropropene	ug/l	ND	0.5
Methylene chloride	ug/l	ND	0.5
1,1,2,2-Tetrachloroethane	ug/l	ND	0.5
Tetrachloroethene	ug/l	ND	0.5
1,1,1-Trichloroethane	ug/l	ND	0.5
1,1,2-Trichloroethane	ug/l	ND	0.5
Trichloroethene	ug/l	ND	0.5
Trichlorofluoromethane	ug/l	ND	0.5
Vinyl chloride	ug/l	ND	1.0



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

Dames & Moore

Page: 2

June 5, 1992

Client code: 497 Sample Description: HP-99A-82

LAB I.D. AA02657 Turn-Around-Time: RUSH 24

Collection Date: 06/04/92 Collection Time: 12:30

Submittal Date: 06/04/92 Submittal Time: 16:46

Sample disposal: LAB

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT
Multicomponent analysis: EPA 601 PURGEABLE HALOCARBONS			
Bromodichloromethane	ug/l	ND	0.5
Bromoform	ug/l	ND	0.5
Bromomethane	ug/l	ND	0.5
Carbon tetrachloride	ug/l	ND	0.5
Chlorobenzene	ug/l	ND	0.5
Chloroethane	ug/l	ND	0.5
2-Chloroethyl vinyl ether	ug/l	ND	1.0
Chloroform	ug/l	ND	0.5
Chloromethane	ug/l	ND	0.5
Dibromochloromethane	ug/l	ND	0.5
1,2-Dichlorobenzene	ug/l	ND	0.5
1,3-Dichlorobenzene	ug/l	ND	0.5
1,4-Dichlorobenzene	ug/l	ND	0.5
Dichlorodifluoromethane	ug/l	ND	0.5
1,1-Dichloroethane	ug/l	ND	0.5
1,2-Dichloroethane	ug/l	ND	0.5
1,1-Dichloroethene	ug/l	ND	0.2
trans-1,2-Dichloroethene	ug/l	ND	0.5
1,2-Dichloropropane	ug/l	ND	0.5
cis-1,3-Dichloropropene	ug/l	ND	0.5
trans-1,3-Dichloropropene	ug/l	ND	0.5
Methylene chloride	ug/l	ND	0.5
1,1,2,2-Tetrachloroethane	ug/l	ND	0.5
Tetrachloroethene	ug/l	ND	0.5
1,1,1-Trichloroethane	ug/l	ND	0.5
1,1,2-Trichloroethane	ug/l	ND	0.5
Trichloroethene	ug/l	ND	0.5
Trichlorofluoromethane	ug/l	ND	0.5
Vinyl chloride	ug/l	ND	1.0



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

Dames & Moore

Page: 3

June 5, 1992

Client code: 497 Sample Description: HP-100-80

LAB I.D. AA02658 Turn-Around-Time: RUSH 24

Collection Date: 06/04/92

Collection Time: 15:15

Submittal Date: 06/04/92

Submittal Time: 16:46

Sample disposal: LAB

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT
Multicomponent analysis: EPA 601 PURGEABLE HALOCARBONS			
Bromodichloromethane	ug/l	ND	0.5
Bromoform	ug/l	ND	0.5
Bromomethane	ug/l	ND	0.5
Carbon tetrachloride	ug/l	2.5	0.5
Chlorobenzene	ug/l	ND	0.5
Chloroethane	ug/l	ND	0.5
2-Chloroethyl vinyl ether	ug/l	ND	1.0
Chloroform	ug/l	ND	0.5
Chloromethane	ug/l	ND	0.5
Dibromochloromethane	ug/l	ND	0.5
1,2-Dichlorobenzene	ug/l	ND	0.5
1,3-Dichlorobenzene	ug/l	ND	0.5
1,4-Dichlorobenzene	ug/l	ND	0.5
Dichlorodifluoromethane	ug/l	ND	0.5
1,1-Dichloroethane	ug/l	ND	0.5
1,2-Dichloroethane	ug/l	ND	0.5
1,1-Dichloroethene	ug/l	ND	0.2
trans-1,2-Dichloroethene	ug/l	ND	0.5
1,2-Dichloropropane	ug/l	ND	0.5
cis-1,3-Dichloropropene	ug/l	ND	0.5
trans-1,3-Dichloropropene	ug/l	ND	0.5
Methylene chloride	ug/l	ND	0.5
1,1,2,2-Tetrachloroethane	ug/l	ND	0.5
Tetrachloroethene	ug/l	ND	0.5
1,1,1-Trichloroethane	ug/l	ND	0.5
1,1,2-Trichloroethane	ug/l	ND	0.5
Trichloroethene	ug/l	ND	0.5
Trichlorofluoromethane	ug/l	ND	0.5
Vinyl chloride	ug/l	ND	1.0



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

Dames & Moore

Page: 4

June 5, 1992

Client code: 497 Sample Description: Travel Blank

LAB I.D. AA02660 Turn-Around-Time: RUSH 24

Collection Date: 06/04/92

Collection Time: 15:15

Submittal Date: 06/04/92

Submittal Time: 16:46

Sample disposal: LAB

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT

Multicomponent analysis: EPA 601 PURGEABLE HALOCARBONS			
Bromodichloromethane	ug/l	ND	0.5
Bromoform	ug/l	ND	0.5
Bromomethane	ug/l	ND	0.5
Carbon tetrachloride	ug/l	ND	0.5
Chlorobenzene	ug/l	ND	0.5
Chloroethane	ug/l	ND	0.5
2-Chloroethyl vinyl ether	ug/l	ND	1.0
Chloroform	ug/l	ND	0.5
Chloromethane	ug/l	ND	0.5
Dibromochloromethane	ug/l	ND	0.5
1,2-Dichlorobenzene	ug/l	ND	0.5
1,3-Dichlorobenzene	ug/l	ND	0.5
1,4-Dichlorobenzene	ug/l	ND	0.5
Dichlorodifluoromethane	ug/l	ND	0.5
1,1-Dichloroethane	ug/l	ND	0.5
1,2-Dichloroethane	ug/l	ND	0.5
1,1-Dichloroethene	ug/l	ND	0.2
trans-1,2-Dichloroethene	ug/l	ND	0.5
1,2-Dichloropropane	ug/l	ND	0.5
cis-1,3-Dichloropropene	ug/l	ND	0.5
trans-1,3-Dichloropropene	ug/l	ND	0.5
Methylene chloride	ug/l	ND	0.5
1,1,2,2-Tetrachloroethane	ug/l	ND	0.5
Tetrachloroethene	ug/l	ND	0.5
1,1,1-Trichloroethane	ug/l	ND	0.5
1,1,2-Trichloroethane	ug/l	ND	0.5
Trichloroethene	ug/l	ND	0.5
Trichlorofluoromethane	ug/l	ND	0.5
Vinyl chloride	ug/l	ND	1.0

Data Certified by

Report Approved by



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

JUN 12 1992

June 8, 1992

Dames & Moore
8801 Folsom blvd. #200
Sacramento, CA 95826
Attn: Mark Eisen

Below are results of analysis of 4 samples received for examination
on June 5, 1992:

Client code: 497 Sample Description: HP-101-75
LAB I.D. AA02737 Turn-Around-Time: RUSH 24H
Collection Date: 06/04/92 Collection Time: 18:30
Submittal Date: 06/05/92 Submittal Time: 14:01
Sample disposal: LAB

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT
Multicomponent analysis: EPA 601 PURGEABLE HALOCARBONS			
Bromodichloromethane	ug/l	ND	0.5
Bromoform	ug/l	ND	0.5
Bromomethane	ug/l	ND	0.5
Carbon tetrachloride	ug/l	0.71	0.5
Chlorobenzene	ug/l	ND	0.5
Chloroethane	ug/l	ND	0.5
2-Chloroethyl vinyl ether	ug/l	ND	1.0
Chloroform	ug/l	ND	0.5
Chloromethane	ug/l	ND	0.5
Dibromochloromethane	ug/l	ND	0.5
1,2-Dichlorobenzene	ug/l	ND	0.5
1,3-Dichlorobenzene	ug/l	ND	0.5
1,4-Dichlorobenzene	ug/l	ND	0.5
Dichlorodifluoromethane	ug/l	ND	0.5
1,1-Dichloroethane	ug/l	ND	0.5
1,2-Dichloroethane	ug/l	ND	0.5
1,1-Dichloroethene	ug/l	ND	0.2
trans-1,2-Dichloroethene	ug/l	ND	0.5
1,2-Dichloropropane	ug/l	ND	0.5
cis-1,3-Dichloropropene	ug/l	ND	0.5
trans-1,3-Dichloropropene	ug/l	ND	0.5
Methylene chloride	ug/l	ND	0.5
1,1,2,2-Tetrachloroethane	ug/l	ND	0.5
Tetrachloroethene	ug/l	ND	0.5
1,1,1-Trichloroethane	ug/l	ND	0.5
1,1,2-Trichloroethane	ug/l	ND	0.5
Trichloroethene	ug/l	ND	0.5
Trichlorofluoromethane	ug/l	ND	0.5
Vinyl chloride	ug/l	ND	1.0



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

Dames & Moore

Page: 2

June 8, 1992

Client code: 497 Sample Description: HP-102-82
LAB I.D. AA02738 Turn-Around-Time: RUSH 24H
Collection Date: 06/04/92 Collection Time: 09:45
Submittal Date: 06/05/92 Submittal Time: 14:01
Sample disposal: LAB

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT

Multicomponent analysis: EPA 601 PURGEABLE HALOCARBONS			
Bromodichloromethane	ug/l	ND	0.5
Bromoform	ug/l	ND	0.5
Bromomethane	ug/l	ND	0.5
Carbon tetrachloride	ug/l	ND	0.5
Chlorobenzene	ug/l	ND	0.5
Chloroethane	ug/l	ND	0.5
2-Chloroethyl vinyl ether	ug/l	ND	1.0
Chloroform	ug/l	ND	0.5
Chloromethane	ug/l	ND	0.5
Dibromochloromethane	ug/l	ND	0.5
1,2-Dichlorobenzene	ug/l	ND	0.5
1,3-Dichlorobenzene	ug/l	ND	0.5
1,4-Dichlorobenzene	ug/l	ND	0.5
Dichlorodifluoromethane	ug/l	ND	0.5
1,1-Dichloroethane	ug/l	ND	0.5
1,2-Dichloroethane	ug/l	ND	0.5
1,1-Dichloroethene	ug/l	ND	0.2
trans-1,2-Dichloroethene	ug/l	ND	0.5
1,2-Dichloropropane	ug/l	ND	0.5
cis-1,3-Dichloropropene	ug/l	ND	0.5
trans-1,3-Dichloropropene	ug/l	ND	0.5
Methylene chloride	ug/l	ND	0.5
1,1,2,2-Tetrachloroethane	ug/l	ND	0.5
Tetrachloroethene	ug/l	ND	0.5
1,1,1-Trichloroethane	ug/l	ND	0.5
1,1,2-Trichloroethane	ug/l	ND	0.5
Trichloroethene	ug/l	ND	0.5
Trichlorofluoromethane	ug/l	ND	0.5
Vinyl chloride	ug/l	ND	1.0



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

Dames & Moore

Page: 4

June 8, 1992

Client code: 497 Sample Description: HP-103-80

LAB I.D. AA02740 Turn-Around-Time: RUSH 24H

Collection Date: 06/04/92

Collection Time: 12:05

Submittal Date: 06/05/92

Submittal Time: 14:01

Sample disposal: LAB

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT

Multicomponent analysis: EPA 601 PURGEABLE HALOCARBONS			
Bromodichloromethane	ug/l	ND	0.5
Bromoform	ug/l	ND	0.5
Bromomethane	ug/l	ND	0.5
Carbon tetrachloride	ug/l	ND	0.5
Chlorobenzene	ug/l	ND	0.5
Chloroethane	ug/l	ND	0.5
2-Chloroethyl vinyl ether	ug/l	ND	1.0
Chloroform	ug/l	ND	0.5
Chloromethane	ug/l	ND	0.5
Dibromochloromethane	ug/l	ND	0.5
1,2-Dichlorobenzene	ug/l	ND	0.5
1,3-Dichlorobenzene	ug/l	ND	0.5
1,4-Dichlorobenzene	ug/l	ND	0.5
Dichlorodifluoromethane	ug/l	ND	0.5
1,1-Dichloroethane	ug/l	ND	0.5
1,2-Dichloroethane	ug/l	ND	0.5
1,1-Dichloroethene	ug/l	ND	0.2
trans-1,2-Dichloroethene	ug/l	ND	0.5
1,2-Dichloropropane	ug/l	ND	0.5
cis-1,3-Dichloropropene	ug/l	ND	0.5
trans-1,3-Dichloropropene	ug/l	ND	0.5
Methylene chloride	ug/l	ND	0.5
1,1,2,2-Tetrachloroethane	ug/l	ND	0.5
Tetrachloroethene	ug/l	ND	0.5
1,1,1-Trichloroethane	ug/l	ND	0.5
1,1,2-Trichloroethane	ug/l	ND	0.5
Trichloroethene	ug/l	ND	0.5
Trichlorofluoromethane	ug/l	ND	0.5
Vinyl chloride	ug/l	ND	1.0



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

Dames & Moore
8801 Folsom Blvd., Suite 200
Sacramento, CA 95826

Attn: Mark Eisen

QUALITY CONTROL SUMMARY
LAB I.D. AAD2740

CONSTITUENT	LABORATORY CONTROL STANDARD	--MATRIX QC ACCURACY--		--MATRIX QC PRECISION--		METHOD BLANK	MDL
	% RECOVERY	MATRIX SPIKE 1	MATRIX SPIKE 2	RELATIVE % DIFFERENCE			
Bromodichloromethane	113	97	99	2.0	ND	0.5	
Bromoform	103	82	89	8.2	ND	0.5	
Carbon Tetrachloride	119	99	103	4.0	ND	0.5	
Chloroform	115	100	102	2.0	ND	0.5	
1,1-Dichloroethane	112	100	103	3.0	ND	0.5	
1,1-Dichloroethene	122	98	102	4.0	ND	0.2	
Cis-1,3 Dichloropropene		99	99	0	ND	0.5	
Trans 1,3-Dichloropropene	*	96	98	2.1	ND	0.5	
Methylene Chloride	114	107	109	1.9	ND	0.5	
1,1,1-Trichloroethane	120	98	103	5.0	ND	0.5	
Trichloroethene	109	101	102	1.0	ND	0.5	
Surrogate							
4 Bromofluorobenzene	93	93	96	3.2	ND	0.5	

* Coelutes with Chloroform

Control Limits Accuracy - 70-130%

Control Limits Precision - 0-20%

ND = Not Detected

Data Certified by Michael F. LichterReport Approved by P. Bucknell

:mtl



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

Dames & Moore

Page: 3

June 8, 1992

Client code: 497 **Sample Description:** HP-RB-1
LAB I.D. AA02739 Turn-Around-Time: RUSH 24H
Collection Date: 06/04/92 Collection Time: 10:30
Submittal Date: 06/05/92 Submittal Time: 14:01
Sample disposal: LAB

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT

Multicomponent analysis: EPA 601 PURGEABLE HALOCARBONS			
Bromodichloromethane	ug/l	ND	0.5
Bromoform	ug/l	ND	0.5
Bromomethane	ug/l	ND	0.5
Carbon tetrachloride	ug/l	ND	0.5
Chlorobenzene	ug/l	ND	0.5
Chloroethane	ug/l	ND	0.5
2-Chloroethyl vinyl ether	ug/l	ND	1.0
Chloroform	ug/l	ND	0.5
Chloromethane	ug/l	ND	0.5
Dibromochloromethane	ug/l	ND	0.5
1,2-Dichlorobenzene	ug/l	ND	0.5
1,3-Dichlorobenzene	ug/l	ND	0.5
1,4-Dichlorobenzene	ug/l	ND	0.5
Dichlorodifluoromethane	ug/l	ND	0.5
1,1-Dichloroethane	ug/l	ND	0.5
1,2-Dichloroethane	ug/l	ND	0.5
1,1-Dichloroethene	ug/l	ND	0.2
trans-1,2-Dichloroethene	ug/l	ND	0.5
1,2-Dichloropropane	ug/l	ND	0.5
cis-1,3-Dichloropropene	ug/l	ND	0.5
trans-1,3-Dichloropropene	ug/l	ND	0.5
Methylene chloride	ug/l	ND	0.5
1,1,2,2-Tetrachloroethane	ug/l	ND	0.5
Tetrachloroethene	ug/l	ND	0.5
1,1,1-Trichloroethane	ug/l	ND	0.5
1,1,2-Trichloroethane	ug/l	ND	0.5
Trichloroethene	ug/l	ND	0.5
Trichlorofluoromethane	ug/l	ND	0.5
Vinyl chloride	ug/l	ND	1.0



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

Dames & Moore

Page: 5

June 10, 1992

Client code: 497 **Sample Description:** Travel Blank

LAB I.D. Turn-Around-Time: RUSH 24H

Collection Date: Collection Time:

Submittal Date: 06/05/92 Submittal Time: 14:01

Sample disposal: LAB

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT
-------------------	-------	----------------	--------------------

Multicomponent analysis: EPA 601 PURGEABLE HALOCARBONS

Bromodichloromethane	ug/l	ND	0.5
Bromoform	ug/l	ND	0.5
Bromomethane	ug/l	ND	0.5
Carbon tetrachloride	ug/l	ND	0.5
Chlorobenzene	ug/l	ND	0.5
Chloroethane	ug/l	ND	0.5
2-Chloroethyl vinyl ether	ug/l	ND	1.0
Chloroform	ug/l	ND	0.5
Chloromethane	ug/l	ND	0.5
Dibromochloromethane	ug/l	ND	0.5
1,2-Dichlorobenzene	ug/l	ND	0.5
1,3-Dichlorobenzene	ug/l	ND	0.5
1,4-Dichlorobenzene	ug/l	ND	0.5
Dichlorodifluoromethane	ug/l	ND	0.5
1,1-Dichloroethane	ug/l	ND	0.5
1,2-Dichloroethane	ug/l	ND	0.5
1,1-Dichloroethene	ug/l	ND	0.2
trans-1,2-Dichloroethene	ug/l	ND	0.5
1,2-Dichloropropane	ug/l	ND	0.5
cis-1,3-Dichloropropene	ug/l	ND	0.5
trans-1,3-Dichloropropene	ug/l	ND	0.5
Methylene chloride	ug/l	ND	0.5
1,1,2,2-Tetrachloroethane	ug/l	ND	0.5
Tetrachloroethene	ug/l	ND	0.5
1,1,1-Trichloroethane	ug/l	ND	0.5
1,1,2-Trichloroethane	ug/l	ND	0.5
Trichloroethene	ug/l	ND	0.5
Trichlorofluoromethane	ug/l	ND	0.5
Vinyl chloride	ug/l	ND	1.0



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

June 5, 1992

Dames & Moore
8801 Folsom Blvd., Suite 200
Sacramento, CA 95826

Attn: Mark Eisen

QUALITY CONTROL SUMMARY
LAB I.D. AA02656

CONSTITUENT	LABORATORY CONTROL STANDARD % RECOVERY	--MATRIX QC ACCURACY--		--MATRIX QC PRECISION--		METHOD BLANK	MDL
		MATRIX SPIKE 1	MATRIX SPIKE 2	RELATIVE % DIFFERENCE			
Bromodichloromethane	101	94	96	2.1		ND	0.5
Bromoform	85	85	90	5.7		ND	0.5
Carbon Tetrachloride	110	95	93	2.1		ND	0.5
Chloroform	103	97	97	0		ND	0.5
1,1-Dichloroethane	104	96	96	0		ND	0.5
1,1-Dichloroethene	116	94	93	1.1		ND	0.2
Trans-1,2-Dichloroethene							0.5
Cis-1,2-Dichloroethene		92	97	5.3		ND	0.5
Trans 1,3-Dichloropropene		89	95	6.5		ND	0.5
Methylene Chloride	107	88	98	11		ND	0.5
1,1,1-Trichloroethane	110	96	94	2.1		ND	0.5
Trichloroethene	102	97	95	2.1		ND	0.5
Surrogate							
4-Bromofluorobenzene	92	94	97	3.1		ND	0.5

Control Limits Accuracy - 70-130%

Control Limits Precision - 0-20%

ND = Not Detected

Data Certified by Michael T. Lehto

Report Approved by Patricia Bucknell

:mtl



ANALYTICAL LABORATORY

1910 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946 • FAX 916-447-8321

June 4, 1992

Sample Date: 05/28/92

Sample Rec'd Date: 05/28/92

Report #: 143254

Dames & Moore

8801 Folsom Blvd., Suite 200
Sacramento, CA 95826

Attn: Mark Eisen

JUN 0 8 1992

QUALITY CONTROL SUMMARY

CONSTITUENT	LABORATORY CONTROL STANDARD % RECOVERY	--MATRIX QC ACCURACY--		--MATRIX QC PRECISION--		
		MATRIX SPIKE 1	MATRIX SPIKE 2	RELATIVE % DIFFERENCE	METHOD BLANK	MDL
Bromodichloromethane	104	97	102	5.0	ND	0.5
Bromoform	102	104	111	6.5	ND	0.5
Carbon Tetrachloride	109	95	97	2.1	ND	0.5
Chloroform	104	101	106	4.8	ND	0.5
1,1-Dichloroethane	103	99	99	-0-	ND	0.5
1,1-Dichloroethene	114	98	97	1.0	ND	0.2
trans-1,2-Dichloroethene	58*	101	106	4.8	ND	0.5
cis-1,2-Dichloropropene	89	98	100	2.0	ND	0.5
trans-1,3-Dichloropropene	79	96	102	6.1	ND	0.5
Methylene Chloride	83	112	112	-0-	ND	0.5
1,1,1-Trichloroethane	111	96	98	2.1	ND	0.5
Trichloroethene	101	98	99	1.0	ND	0.5

Surrogate

4-Bromofluorobenzene	95	108	114	5.4	ND	0.5
----------------------	----	-----	-----	-----	----	-----

Surrogate (143254-1)

4-Bromofluorobenzene	62\108**
----------------------	----------

Control Limits Accuracy - 70-130%

Control Limits Precision - $\leq 20\%$

ND = Not Detected

*Peak co-elutes with chloroform on primary column.

** Low recovery (62%) due to matrix interference, 108% surrogate recovery was observed on a (1/20) dilution of the sample.

Data Certified by

Patricia Buckner

Report Approved by

Cynthia T. Santolo

:lmr

TABLE OF CONTENTS

ENSECO CAL LAB PROJECT NUMBER 064470

Case Narrative

Enseco Cal Lab's Quality Assurance Program

Sample Description Information

Chain of Custody Documentation

Halogenated Volatile Organics - 8010

Includes Samples: 1 through 3

Sample Data Sheets

Method Blank Report

Laboratory Control Sample Report (DCS/SCS)

CASE NARRATIVE**ENSECO CAL LAB PROJECT NUMBER 064470**

There were no anomalies associated with this report.

ENSECO CAL LAB'S QUALITY ASSURANCE PROGRAM

Enseco Cal Lab has implemented an extensive Quality Assurance (QA) program to ensure the production of scientifically sound, legally defensible data of known documental quality. A key element of this program is Enseco's Laboratory Control Sample (LCS) system. Controlling lab operations with LCS (as opposed to matrix spike/matrix spike duplicate samples), allows the lab to differentiate between bias as a result of procedural errors versus bias due to matrix effects. The analyst can then identify and implement the appropriate corrective actions at the bench level, without waiting for extensive senior level review or costly and time-consuming sample re-analyses. The LCS program also provides our client with information to assess batch, and overall laboratory performance.

Laboratory Control Samples - (LCS)

Laboratory Control Samples (LCS) are well-characterized, laboratory generated samples used to monitor the laboratory's day-to-day performance of routine analytical methods. The results of the LCS are compared to well-defined laboratory acceptance criteria to determine whether the laboratory system is "in control". Three types of LCS are routinely analyzed: Duplicate Control Samples (DCS), Single Control Samples (SCS), and method blanks. Each of these LCS are described below.

Duplicate Control Samples. A DCS is a well-characterized matrix (blank water, sand, sodium sulfate or celite) which is spiked with certain target parameters and analyzed at approximately 10% of the sample load in order to establish method-specific control limits.

Single Control Samples. An SCS consists of a control matrix that is spiked with surrogate compounds appropriate to the method being used. In cases where no surrogate is available, (e.g. metals or conventional analyses) a single control sample identical to the DCS serves as the control sample. An SCS is prepared for each sample lot. Accuracy is calculated identically to the DCS.

Method Blank Results. A method blank is a laboratory-generated sample which assesses the degree to which laboratory operations and procedures cause false-positive analytical results for your samples.

SAMPLE DESCRIPTION INFORMATION
for
Dames & Moore

Lab ID	Client ID	Matrix	Sampled		Received
			Date	Time	
064470-0001-SA	AA02658 (4P-100)	AQUEOUS	04 JUN 92	16:46	10 JUN 92
064470-0002-SA	AA02737 (4P-100)	AQUEOUS	04 JUN 92	18:30	10 JUN 92
064470-0003-SA	AA02201 (4P-92)	AQUEOUS	02 JUN 92	14:15	10 JUN 92

Halogenated Volatile Organics - 8010

Halogenated Volatile Organics

Method 601

Client Name: Dames & Moore
 Client ID: AA02658
 Lab ID: 064470-0001-SA
 Matrix: AQUEOUS
 Authorized: 10 JUN 92

Sampled: 04 JUN 92
 Prepared: NA

Received: 10 JUN 92
 Analyzed: 10 JUN 92

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	2.4	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
1,2-Dibromoethane	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	96	%

ND = Not detected
 NA = Not applicable

Reported By: Jennifer Bavetta

Approved By: Ann Marie Carroll

The cover letter is an integral part of this report.

Rev 230787

Halogenated Volatile Organics

Method 601

Client Name: Dames & Moore
 Client ID: AA02737
 Lab ID: 064470-0002-SA
 Matrix: AQUEOUS
 Authorized: 10 JUN 92

Sampled: 04 JUN 92
 Prepared: NA

Received: 10 JUN 92
 Analyzed: 10 JUN 92

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene			
(cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-Trichloro-1,2,2-			
trifluoroethane (Freon 113)	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	1.2	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
1,2-Dibromoethane	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	84	%

ND = Not detected
 NA = Not applicable

Reported By: Jennifer Bavetta

Approved By: Ann Marie Carroll

The cover letter is an integral part of this report.

Rev 230787

Halogenated Volatile Organics

Method 601

Client Name: Damos & Moore
 Client ID: AA02201
 Lab ID: 064470-0003-SA
 Matrix: AQUEOUS
 Authorized: 10 JUN 92

Sampled: 02 JUN 92
 Prepared: NA

Received: 10 JUN 92
 Analyzed: 10 JUN 92

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	2.5	ug/L	0.50
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	ug/L	1.0
1,2-Dichloroethane	1.5	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	3.5	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
1,2-Dibromoethane	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0
Surrogate	Recovery		
Bromochloromethane	89	%	

ND = Not detected
 NA = Not applicable

Reported By: Jennifer Bavetta

Approved By: Ann Marie Carroll

The cover letter is an integral part of this report.
 Rev 230787

QC LOT ASSIGNMENT REPORT
Volatile Organics by GC

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
064470-0001-SA	AQUEOUS	601-A	08 JUN 92-38A	10 JUN 92-38A
064470-0002-SA	AQUEOUS	601-A	08 JUN 92-38A	10 JUN 92-38A
064470-0003-SA	AQUEOUS	601-A	08 JUN 92-38A	10 JUN 92-38A

METHOD BLANK REPORT
Volatile Organics by GC

Analyte	Result	Units	Reporting Limit
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 08 JUN 92-38A QC Run: 10 JUN 92-38A			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene			
(cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-Trichloro-1,2,2-			
trifluoroethane (Freon 113)	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
1,2-Dibromoethane	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

DUPLICATE CONTROL SAMPLE REPORT
Volatile Organics by GC

Analyte	Concentration		Measured	AVG	Accuracy		Precision	
	Spiked	DCS1	DCS2		Average(%)	Limits	(RPD)	DCS Limit
Category: 601-A								
Matrix: AQUEOUS								
QC Lot: 08 JUN 92-38A								
Concentration Units: ug/L								
1,1-Dichloroethane	5.00	4.85	4.52	4.68	94	83-127	7.0	11.0
Chloroform	5.00	4.73	4.61	4.67	93	80-125	2.6	14.0
Bromodichloromethane	5.00	4.34	4.50	4.42	88	82-121	3.6	10.0
Trichloroethene	5.00	4.81	4.81	4.81	96	88-122	0.0	11.0
Chlorobenzene	5.00	4.60	4.57	4.58	92	88-117	0.6	12.0

Calculations are performed before rounding to avoid round-off errors in calculated results.

SINGLE CONTROL SAMPLE REPORT
Volatile Organics by GC

Analyte	Concentration		Accuracy(%)	
	Spiked	Measured	SCS	Limits

Category: 601-A

Matrix: AQUEOUS

QC Lot: 08 JUN 92-38A QC Run: 10 JUN 92-38A

Concentration Units: ug/L

Bromochloromethane	4.00	3.57	89	80-117
--------------------	------	------	----	--------

Calculations are performed before rounding to avoid round-off errors in calculated results.

Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to collector.

ANALYTICAL LABORATORY
A DIVISION OF DEWANTE & STOWELL

1914 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946

CHAIN OF CUSTODY

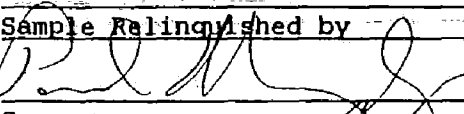
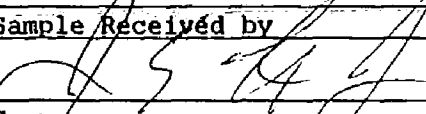
DATE 5/28/92 WEATHER clear 90+° F

PAGE 1 OF 1

LOCATION WDR - SAC
SAMPLER SIGNATURE Paul M. Murphy
PRINTED NAME PAUL MURPHY
COMPANY NAME DAMES & MOORE
LAB REPORT RECIPIENT MARK EISEN (387-7532)
TELEPHONE NUMBER 387-8800
ADDRESS 8801 FOLSOM BLVD #200 SAC 75826

[illegible]

Precautions:

Sample Relinquished by			DATE	TIME	Sample Received by			DATE	TIME	COMMENTS
			5/28/92	16:30				5/28/92	1630	
Company DAMES & MOORE					Company					
Sample Relinquished by			DATE	TIME	Sample Received by			DATE	TIME	
Company					Company					
Sample Relinquished by			DATE	TIME	Sample Received by			DATE	TIME	
Company					Company					

Samples are discarded 30 days after results are reported unless other arrangements are made.

ANALYTICAL LABORATORY
A DIVISION OF DEWANTE & STOWELL

1914 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946

LOCATION WRR - SACRAMENTO
 SAMPLER SIGNATURE [Signature]
 PRINTED NAME PAUL MURPHY
 COMPANY NAME DAMES & MOORE
 LAB REPORT RECIPIENT MARK EISEN (387-7532)
 TELEPHONE NUMBER 387-8800
 ADDRESS 8801 FOLSOM BLVD. #200 SAC 95826

CHAIN OF CUSTODY

DATE 5/29/92 WEATHER clear 90+°F

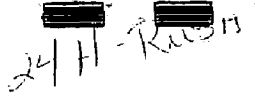
PAGE 1 OF 1

[illegible]

Precautions: 24 Hr TURN AROUND

Sample Relinquished by	DATE	TIME	Sample Received by	DATE	TIME	COMMENTS
<i>[Signature]</i>	5/29/92	16:10	<i>[Signature]</i>	5/29/92	16:10	
Company <i>DAMES & MOORE</i>			Company <i>Anlab</i>			
Sample Relinquished by	DATE	TIME	Sample Received by	DATE	TIME	
Company			Company			
Sample Relinquished by	DATE	TIME	Sample Received by	DATE	TIME	
Company			Company			

Samples are discarded 30 days after results are reported unless other arrangements are made.



1914 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946

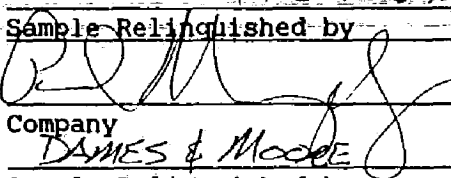
DATE 6/1/92 WEATHER CLEAR 90+° F

PAGE 1 OF 1

LOCATION 0000 - SACRAMENTO
SAMPLER SIGNATURE [Signature]
PRINTED NAME PAUL MURPHY
COMPANY NAME DAMES & MOORE
LAB REPORT RECIPIENT MARK EISON (387-7532)
TELEPHONE NUMBER 387-5600 (GENERAL #)
ADDRESS 8801 FOLSOM BLVD #200 S.F. CA 95826

Precautions:

24 Hr Turnaround

Sample Relinquished by	DATE	TIME	Sample Received by	DATE	TIME	COMMENTS
	6/1/92	1705	Christine Alexander	6/1/92	1705	
Company DAMES & MOORE			Company ANLAB			
Sample Relinquished by	DATE	TIME	Sample Received by	DATE	TIME	
Company			Company			
Sample Relinquished by	DATE	TIME	Sample Received by	DATE	TIME	
Company			Company			

Samples are discarded 30 days after results are reported unless other arrangements are made.

Samples are discarded 30 days after results are reported unless other arrangements are made.

1914 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946

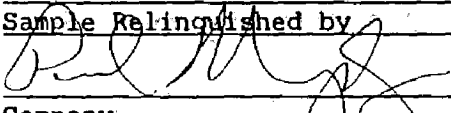
CHAIN OF CUSTODY

DATE 6/3/92 WEATHER clear, 95° F PAGE 1 OF 1

LOCATION UOBBR - SAC
SAMPLER SIGNATURE Paul Murphy
PRINTED NAME PAUL MURPHY
COMPANY NAME DAMES & MOORE
LAB REPORT RECIPIENT MARK EISEN
TELEPHONE NUMBER 387-7532
ADDRESS 8801 FOLSOM BLVD. #200 SAC 95826

[illegible]

Precautions: 24 hr TURN AROUND

Sample Relinquished by	DATE	TIME	Sample Received by	DATE	TIME	COMMENTS
	6/3/92	18:35	Christine Alexander	6/3/92	16:40	
Company DAMES & MOORE			Company ANLAB			
Sample Relinquished by	DATE	TIME	Sample Received by	DATE	TIME	
Company			Company			
Sample Relinquished by	DATE	TIME	Sample Received by	DATE	TIME	
Company			Company			

Samples are discarded 30 days after results are reported unless otherwise noted.

Samples are discarded 30 days after results are reported unless other arrangements are made.

CHAIN OF CUSTODY

DATE 6/5/72 WEATHER 96° F

PAGE / OF /

ANALYTICAL LABORATORY
DIVISION OF DEWANTE & STOWELL

14 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946

LOCATION UPRR - SAC
 SAMPLER SIGNATURE [Signature]
 PRINTED NAME PAUL MURPHY
 COMPANY NAME DAMES & MOORE
 LAB REPORT RECIPIENT MARK EISEN
 TELEPHONE NUMBER 387-7532
 ADDRESS 8801 FOLSOM BLVD. #200, SAC CA 95826

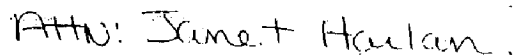
[illegible]

cautions: 24 He Turnaround

Sample Relinquished by	DATE	TIME	Sample Received by	DATE	TIME
<i>[Signature]</i>	6/5/92	13:50	<i>Mike McMan</i>	6/5/92	13:20
Company <i>DAMES & MOORE</i>			Company <i>Anlab</i>		
Sample Relinquished by	DATE	TIME	Sample Received by	DATE	TIME
Company			Company		
Sample Relinquished by	DATE	TIME	Sample Received by	DATE	TIME
Company			Company		

COMMENTS
the last
~~the of~~
project
for a couple
end of project
for a couple
weeks.

Samples are discarded 30 days after results are reported unless other arrangements are made.



1914 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946

DATE 22 Feb 65 WEATHER

PAGE / OF /

SAMPLER SIGNATURE

PRINTED NAME

COMPANY NAME Dames & Moore

LAB REPORT RECIPIENT Rene Murphy

TELEPHONE NUMBER

ADDRESS 9305 Tech Center Dr. Ste. 100
Exeter, NH 05826

[illegible]

Precautions:

Sample Relinquished by	DATE	TIME	Sample Received by	DATE	TIME	COMMENTS
Wote Graham	6/10/92	10:00	George E. Pore	6-10-92		
Company Hnlab			Company			Bile Dames+More
Sample Relinquished by	DATE	TIME	Sample Received by	DATE	TIME	72 hrs Park
George E. Pore	6-10-92	10:00	U	6-10-92	10:15	
Company			Company Ensew			
Sample Relinquished by	DATE	TIME	Sample Received by	DATE	TIME	
Company			Company			

Samples are discarded 30 days after results are reported unless other arrangements are made.