RO 2522

Delta
Environmental
Consultants, Inc.

Solving environment-related business problems worldwide

175 Bernal Road • Suite 200
San Jose, California 95119 USA

408.224.4724 800.477.7411
Fax 408.225.8506

www.deltaenv.com

March 3, 2004
Project SJ67-50S-1.2004

Mr. Scott O. Seery
Alameda County Health Care Services
Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: Cone PenetrationTest (CPT) Groundwater Investigation
Shell Service Station
6750 Santa Rita Road
Pleasanton, California

Dear Mr. Seery:

Delta Environmental Consultants, Inc. (Delta), on behalf of Equilon Enterprises LLC dba Shell Oil Products US (Shell), has prepared this Cone Penetration Test (CPT) Groundwater Investigation report for the site referenced above (Figure 1). Work was performed in accordance with a work plan prepared by Delta, dated May 15, 2003. In a letter to the Alameda County Health Care Services Agency (ACHCSA), dated October 28, 2003, Delta stated that they had received no response to their work plan, and were proceeding with the proposed groundwater investigation.

BACKGROUND

The following section provides a brief summary of previous site data.

SITE DESCRIPTION

The subject site is located in a commercial area on the southeast corner of Santa Rita Road and Pimlico Drive in Pleasanton, California (Figure 1). The property is the site of an active Shell service station, consisting of a small convenience store, a storage and restroom building, a car wash, ten fuel dispensers, and four underground fuel storage tanks (USTs). The station layout is shown on Figure 2.

Topographically, the immediate site area is fairly flat, at approximately 350 feet above mean sea level (MSL). The groundwater gradient at the site was anticipated to be towards the west-southwest, based on local topography (USGS Livermore topographic quadrangle). Quarterly gauging of four on-site groundwater monitoring wells since December 2002 has confirmed a fairly consistent southwest gradient at the site.

SENSITIVE RECEPTOR STUDY

In December 2003, Delta performed a sensitive receptor survey field reconnaissance of the site area. Two water supply wells were identified within approximately 3,000 feet of the site (Figure 1). A private well (located in the parking lot of a car storage business) was identified at approximately 2,200 feet southwest of the site. This well is designated as Well 3S/1E 5R1 by the Zone 7 Water Resources Management District (Zone 7). The well is 8-inches in diameter, and has a submersible pump and an adjacent, approximately 100 gallon pressure tank. The depth of the well is reported to be 101 feet.

A municipal water supply well was field located approximately 3,200 feet southeast of the site. The well is designated as Well No. 0110010-010 (Zone 7 Stoneridge Well) by the State Water Resources Control Board (SWRCB) on-line Geotracker database, and as Well 3S/1E 9B 1 by Zone 7. Mr. Wyman Hong of Zone 7 told Delta that the first well screen is 250 feet below ground surface (bgs).

A Zone 7 flood control channel is located about 1,500 feet east-southeast of the site. No other surface water bodies, or sensitive receptors, were identified within ½-mile of the site.

PREVIOUS SITE INVESTIGATIONS

GRASP

On October 8 and 9, 2002, KHM Environmental Management, Inc. (now part of Delta) supervised the drilling and installation of four groundwater monitoring wells (MW-1 through MW-4) as part of Shell's GRoundwater ASsessment Program (GRASP). GRASP is a voluntary initiative by SHELL to install groundwater monitoring wells at numerous retail service stations nationwide that do not have any active release cases but have been identified to be in close proximity to one or more sensitive receptors. Site monitoring well locations are shown on Figure 2.

Wells MW-1 through MW-4 are each approximately 44 feet deep, and screened from approximately 29 feet to 44 feet below grade (bg). Borings for Wells MW-1 through MW-4 primarily encountered clays, with inter-bedded sand layers below a depth of approximately 30 feet bg. Groundwater was encountered in the borings at an average depth of approximately 33 feet bg. During well installations, soil samples were collected and retained for laboratory analysis. No petroleum hydrocarbons or fuel oxygenates were detected in the soil samples submitted for analysis.

Initial groundwater samples were collected on December 20, 2002. Based on the detection of methyl tert-butyl ether (MTBE) (8,000 ug/l) and tert-butanol (TBA) (1,500 ug/l) in the initial samples, Shell submitted an Unauthorized Release Report (URR) to the Livermore-Pleasanton Fire Department, dated January 6, 2003. In response to the URR, the ACHCSA requested that Shell submit a work plan to obtain further vertical and horizontal plume definition.

FUEL SYSTEM REMOVAL/REPLACEMENT

In November 2002, site USTs, fuel dispensers, and associated product piping were removed and replaced with an upgraded system. Delta performed soil sampling during the upgrade activities under the direction of Mr. Paul Smith of the Livermore-Pleasanton Fire Department. MTBE and TBA were detected in soil and groundwater samples collected from beneath the USTs. The maximum MTBE and TBA concentrations in the soil samples from the base of the UST excavation were 2.5 milligrams per kilogram (mg/kg) and 6.1 mg/kg, respectively.

Groundwater observed in the UST excavation was collected and submitted by Delta for laboratory analysis. MTBE was detected in two water samples at concentrations of 11,000 ug/l and 8,000 ug/l. Total petroleum hydrocarbons as gasoline (TPH-G) and total petroleum hydrocarbons as diesel (TPH-D) were also detected in the water samples, at maximum concentrations of 9,300 ug/l and 55,000 ug/l, respectively. Approximately 17,000 gallons of water was pumped from the UST excavation into a 20,000 gallon Baker tank, which was transported to Shell's Martinez, California refinery for recycling.

GROUNDWATER MONITORING PROGRAM

Site wells have been gauged and sampled six times since their installation in October 2002. Quarterly monitoring reports have been routinely submitted to the ACHCSA. Oxygenates, MTBE and TBA, have been consistently detected in all four site wells (with the exception of Well MW-4, which has no TBA detections to date). Historic maximum MTBE and TBA concentrations at the site are 15,000 ug/l and 9,300 ug/l (MW-3), respectively. In May 2003, Delta implemented monthly groundwater batch extraction from Wells MW-2 and MW-3 as an interim remedial action. Current maximum MTBE and TBA concentrations in groundwater samples collected in January 2004 are 9,800 ug/l and 3,800 ug/l (MW-3), respectively.

CPT GROUNDWATER INVESTIGATION

CPT BORINGS

In order to define the vertical extent of the fuel oxygenate impact at the site, Delta directed three CPT borings (CPT-1 through CPT-3) on December 18th and 19th, 2003. Boring locations are shown on Figure 2. Boring CPT-1 was located near the zone of greatest groundwater impact (Well MW-3). Borings CPT-2 and CPT-3 were located off-site to define the horizontal extent of fuel oxygenates in the downgradient direction. The borings were completed under permit from Zone 7. A copy of the permit is included as Attachment A.

Each of the three CPT locations consisted of two separate boreholes – one for stratigraphic profiling, and a second for collecting discrete groundwater samples. Prior to CPT drilling and sampling, the three locations were surveyed by a geophysical locator and marked for nearby underground utilities. Underground Services Alert (USA) was notified of the proposed borings a minimum of 48-hours before Delta began work at the site. Lastly, each borehole was air-excavated to approximately 7 feet bg in order to minimize potential damage to any unmarked underground utilities.

The CPT borings were advanced by Gregg In Situ, Inc. (Gregg) using an integrated electronic cone system. Gregg's *Presentation of Cone Penetration Test Data* report is included as Attachment B. Boring CPT-1 was pushed to a maximum depth of 117 feet bg. Borings CPT-2 and CPT-3 were pushed to maximum depths of 105 feet bg and 104 feet bg, respectively. The cone was pushed with a maximum 20 ton down pressure applied by the rig. The cone sensor measured penetration resistance, sleeve friction and pore pressure. These parameters were recorded and displayed simultaneously as the borings were advanced. Soil classification is based on a ratio that compares sleeve friction to penetration resistance. Pore pressure readings measure hydrostatic pressure, and are indicative of soil permeability. An initial soil classification print out and pore pressure graphs for each boring were interpreted by a Delta field geologist in order to determine appropriate depths at which to collect groundwater samples. Following soil profiling and interpretation, each boring was backfilled with cement grout by retraction grouting utilizing a detachable "grout collar" located near the cone tip (Attachment C).

Groundwater samples were collected using a Hydropunch® groundwater sampling system. At the depths indicated by the field geologist on site, the CPT rods were retracted exposing a PVC filter screen which allowed for groundwater infiltration. A stainless steel bailer, lowered through the rods, was then used to collect a groundwater sample from within the screened interval. Delta collected up to three discrete groundwater samples at various depths within each sampling borehole. Upon sample completion, each Hydropunch® borehole was tremmie filled with cement grout through the push rods.

HYDROGEOLOGY

The CPT borings predominantly encountered fine-grained clayey and silty soils to the total depths explored. Interbedded, thin (< 5 ft thick) sandy units were encountered below a depth of approximately 45 feet in all three borings. The most sand layers were encountered at depths between approximately 45 feet and 55 feet bg ("50-foot aquifer"). A thin, but pervasive silty bed (< 3 feet thick) underlies the sand. A geologic cross-section is included as Figure 3.

Identified sandy zones were selected for Hydropunch® sampling. These zones potentially could provide for the migration of fuel oxygenates and petroleum hydrocarbons within coarse-grained preferential pathways. In Boring CPT-1 two groundwater samples were collected at the apparent sandy intervals of 56 to 59 feet bg, and 70 to 75 feet bg. Three groundwater samples were collected from Boring CPT-2 at the intervals of 47 to 51 feet bg, 80 to 85 feet bg and 98 to 103 feet bg. Three groundwater samples were also collected from Boring CPT-3 at the intervals of 46 to 51 feet bg, 72 to 75 feet bg and 97 to 100 feet bg. Groundwater samples were decanted into 40-milliliter glass VOA bottles, and placed on ice for transportation to a testing laboratory.

GROUNDWATER ANALYSIS

Groundwater samples were submitted to Severn Trent Laboratories, Inc. (STL) in Pleasanton, California for analysis of the following parameters: TPH-G, benzene, toluene, ethylbenzene, and total xylenes (BTEX compounds), MTBE, di-isopropyl ether (DIPE), ethyl tert-butyl ether (ETBE), and tert-amyl methyl ether (TAME), and TBA by Method 8260B; and TPH-D by Method 8015M. MTBE was detected in Sample CPT-3 @ 46 at a concentration of 18 ug/l. MTBE was not detected in any other CPT groundwater samples. TPH-D was detected in Samples CPT-1 @ 56, CPT-1 @ 70, CPT-2 @ 47 and CPT-3 @ 97 at concentrations ranging from 73 ug/l to 300 ug/l. The hydrocarbons reported as TPH-D were within the early diesel range, and therefore did not match the laboratory standard for diesel. All other analytes were below the method detection limits in all groundwater samples. Groundwater analytical data is summarized in Table 1. Groundwater certified analytical results and chain-of-custody documentation from the testing laboratory are included as Attachment D. MTBE concentrations in groundwater are included on Figure 2.

CONCLUSIONS

Delta concludes:

- Site area soils are characterized as predominantly fine-grained, and act to retard the horizontal and downward movement of fluids.
- First encountered groundwater is located within a sandy aquifer (< 5 feet thick) identified at approximately 50 feet bg.
- Fuel oxygenates have impacted the shallow groundwater zone.

- A fine-grained silt layer underlying the 50-foot aquifer acts as an aquitard to further vertical migration of fuel oxygenates from within the shallow groundwater.
- MTBE (comparatively low level) was detected in only one downgradient water sample, collected approximately 80 feet downgradient.
- The petroleum hydrocarbon plume appears to be concentrated on-site within the station property.
- Interim remedial actions appear to have prevented the plume from moving downgradient.
- The plume is not considered to be a threat to the nearest municipal water supply well based on the presence of an extensive fine-grained soil package (> 40 feet thick) between the impacted shallow groundwater zone, and the aquifer screened by the municipal well at 250 feet bg and approximately 3,000 ft southeast of the site.

RECOMMENDATIONS

Delta recommends:

- Continued quarterly monitoring of site wells. Groundwater samples will be analyzed for TPH-G, BTEX compounds, and the five fuel oxygenates.
- Installation of a downgradient well (Well MW-5) in order to monitor the 50-foot aquifer near the location of Boring CPT-3 (Figure 2).

REMARKS

The recommendations contained in this report represent Delta's professional opinions based upon the currently available information and are arrived at in accordance with currently acceptable professional standards. This report is based upon a specific scope of work requested by the client. The Contract between Delta and its client outlines the scope of work, and only those tasks specifically authorized by that contract or outlined in this report were performed. This report is intended only for the use of Delta's Client and anyone else specifically listed on this report. Delta will not and cannot be liable for unauthorized reliance by any other third party. Other than as contained in this paragraph, Delta makes no express or implied warranty as to the contents of this report.

If you have any questions or comments regarding this report, please call us at (408) 224-4724.

Sincerely,
Delta Environmental Consultants, Inc.

Debbie Arnold
Project Geologist

R. Lee Dooley, CHG 183
Certified Hydrogeologist

REGISTERED GEOLOGIST
R. LEE DOOLEY
No. 0183
CERTIFIED
HYDROGEOLOGIST
EXP. 4/05
STATE OF CALIFORNIA

ATTACHMENTS:

TABLES:
Table 1 – Summary of Groundwater Analytical Data

FIGURES:
Figure 1 – Site Location and Well Survey Map
Figure 2 – Site Area Map
Figure 3 – Geologic Cross-section

ATTACHMENTS:

Attachment A – Drilling Permits
Attachment B – Presentation of Cone Penetration Test Data (Gregg)
Attachment C – Retraction Grouting
Attachment D – Certified Groundwater Analytical Report and Chain-of-Custody Documents

cc: Karen Petryna, Shell Oil Products US, Carson
Danielle Stefani, Livermore-Pleasanton Fire Department, Livermore
Betty Graham, RWQCB, Oakland
Matt Katen, Zone 7 Water Agency, Pleasanton

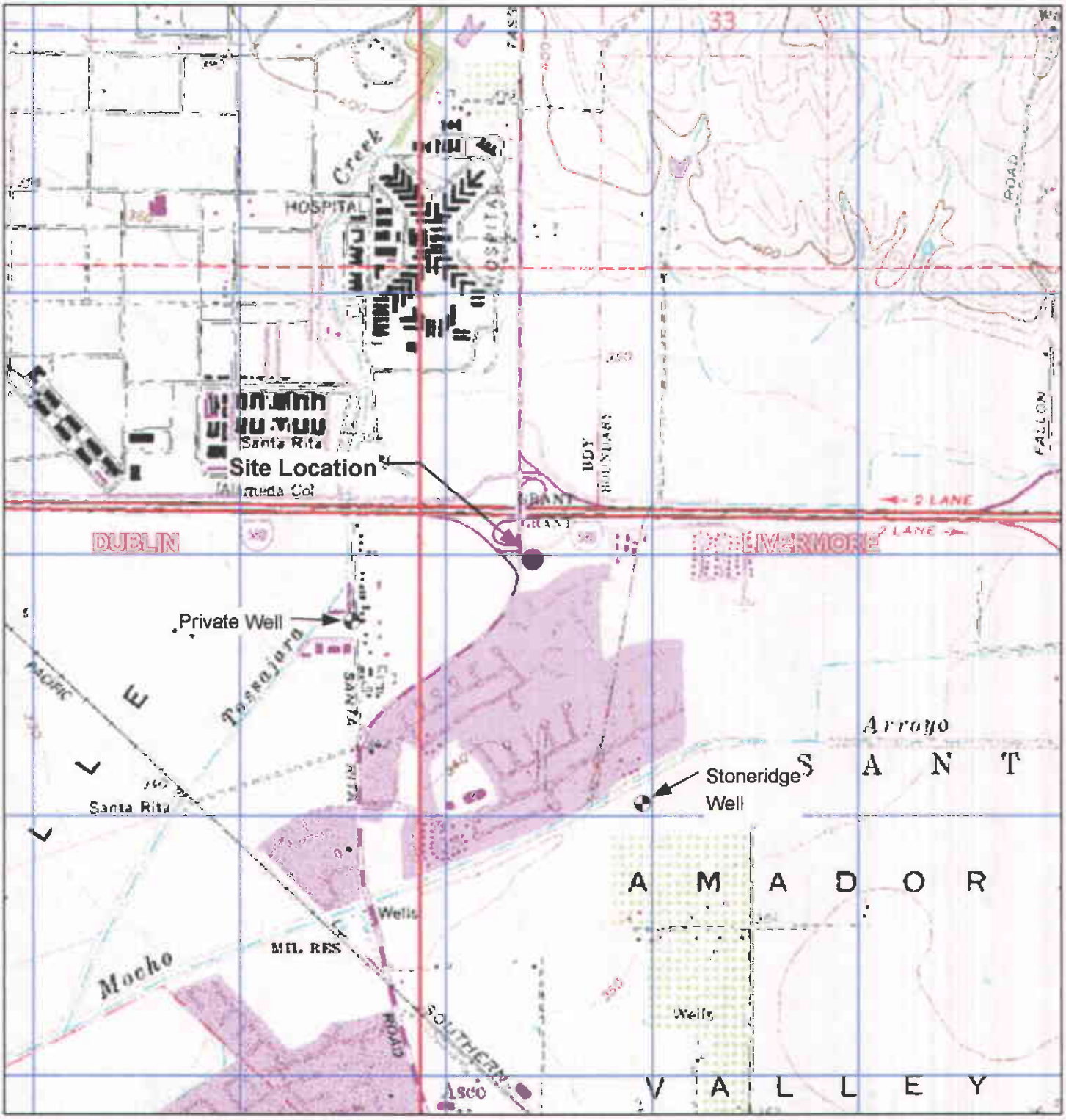
Tables and Figures

Table 1
Summary of Groundwater Data
Shell Service Station
6750 Santa Rita Road
Pleasanton, California

Sample Designation	Date Sampled	TPH-g (ug/l)	TPH-d (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Ethlybenzene (ug/l)	Xylene (ug/l)	MTBE (ug/l)	DIPE (ug/l)	ETBE (ug/l)	TAME (ug/l)	TBA (ug/l)
CPT-1 @ 56	12/18/2003	<50	130*	<0.50	<0.50	<0.50	<1.0	<0.50	<2.0	<2.0	<2.0	<5.0
CPT-1 @ 70	12/18/2003	<50	300*	<0.50	<0.50	<0.50	<1.0	<0.50	<2.0	<2.0	<2.0	<5.0
CPT-2 @ 47	12/19/2003	<50	90*	<0.50	<0.50	<0.50	<1.0	<0.50	<2.0	<2.0	<2.0	<5.0
CPT-2 @ 80	12/19/2003	<50	<260	<0.50	<0.50	<0.50	<1.0	<0.50	<2.0	<2.0	<2.0	<5.0
CPT-2 @ 98	12/19/2003	<50	<50	<0.50	<0.50	<0.50	<1.0	<0.50	<2.0	<2.0	<2.0	<5.0
CPT-3 @ 46	12/18/2003	<50	<50	<0.50	<0.50	<0.50	<1.0	18	<2.0	<2.0	<2.0	<5.0
CPT-3 @ 72	12/18/2003	<50	<50	<0.50	<0.50	<0.50	<1.0	<0.50	<2.0	<2.0	<2.0	<5.0
CPT-3 @ 97	12/19/2003	<50	73*	<0.50	<0.50	<0.50	<1.0	<0.50	<2.0	<2.0	<2.0	<5.0

Notes:
All analysis performed by EPA Method 8260B, except TPH-D by EPA Method 8015
ug/l = micrograms per liter
TPH-G = Total petroleum hydrocarbons as gasoline
TPH-D = Total petroleum hydrocarbon as diesel
MTBE = Methyl tert-butyl ether
DIPE = Diisopropyl ether
ETBE = Ethyl-t-butyl ether
TAME = Tert-amyl methyl ether
TBA = Tert-Butanol
TOC = Top of Well Casing
NM = Not measured
NA = Not analyzed

***Hydrocarbon reported is in the early diesel range, and does not match the laboratory's diesel standard**



GENERAL NOTES:
Base Map from: DeLorme Yarmouth, ME 04096
Source Data: USGS

North

QUADRANGLE LOCATION

0 1,800 3,600
Scale, Feet

FIGURE 1
SITE LOCATION AND WELL SURVEY MAP

SHELL-BRANDED SERVICE STATION
6750 Santa Rita Road
Pleasanton, California

PROJECT NO. SJ67-505-1.2004	DRAWN BY VF 12/04/03
FILE NO. SJ67-505-1.2004	PREPARED BY VF
REVISION NO.	REVIEWED BY

Delta Environmental Consultants, Inc.

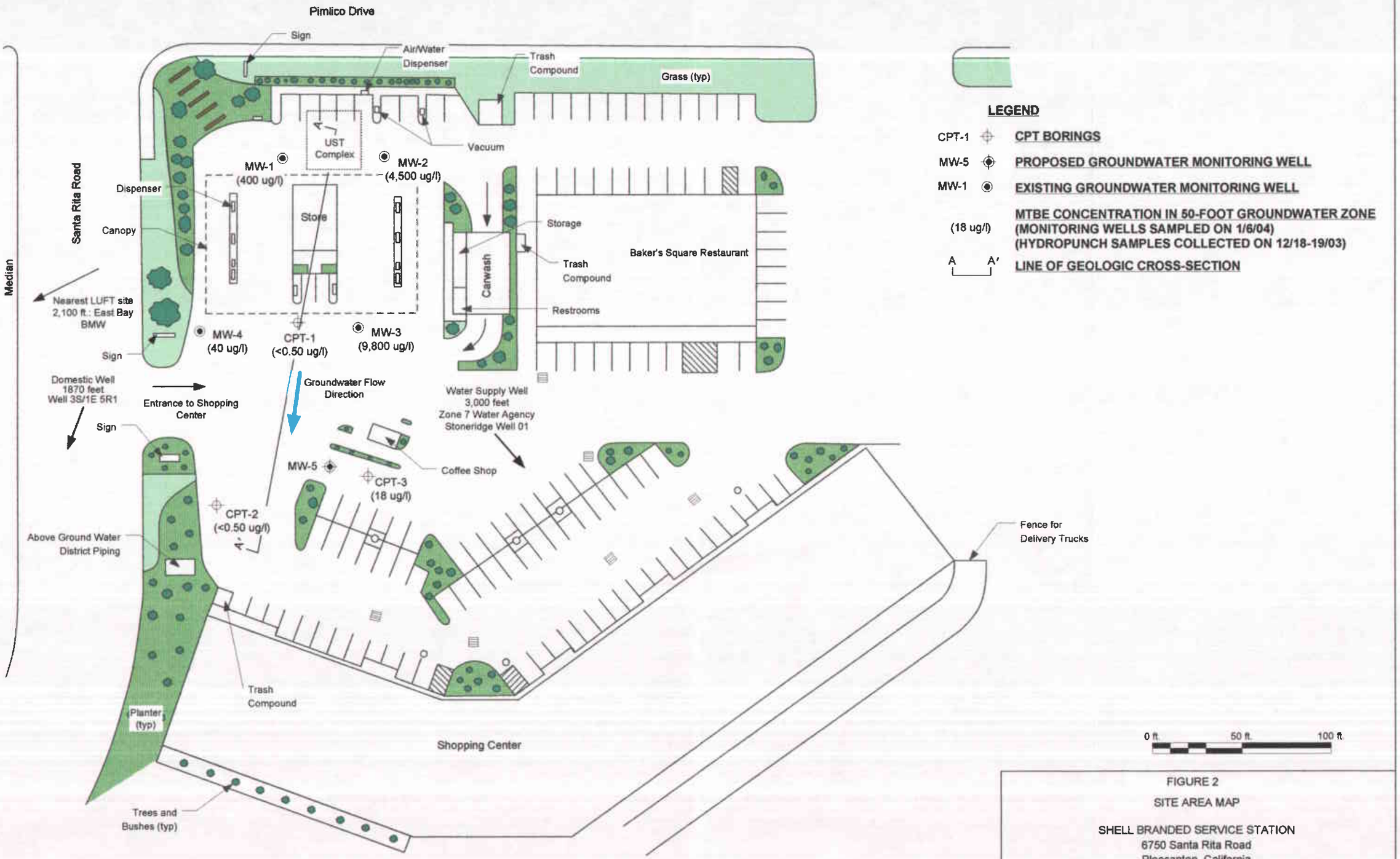


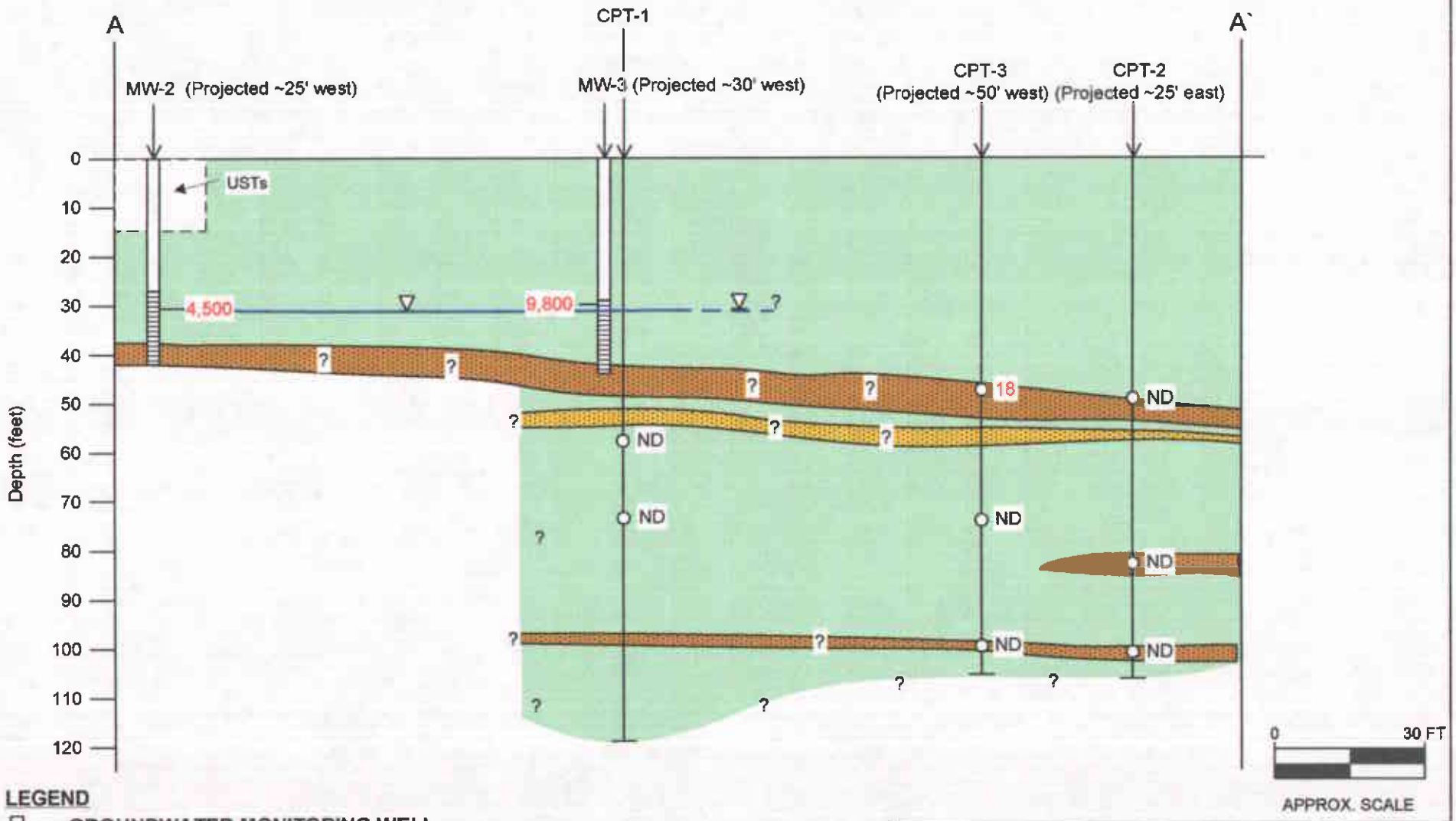
FIGURE 2

SITE AREA MAP

SHELL BRANDED SERVICE STATION
6750 Santa Rita Road
Pleasanton, California

PROJECT NO. SJ67-505-1.2004	DRAWN BY VF
FILE NO. SJ67-505-1.2001	PREPARED BY
REVISION NO. 2	REVIEWED BY

Delta Environmental Consultants, Inc.



LEGEND

- GROUNDWATER MONITORING WELL
- WELL SCREEN INTERVAL
- CPT BORING
- HYDROPUNCH WATER SAMPLE
- 500 MTBE CONCENTRATION (UG/L)
- ND NOT DETECTED AT LABORATORY REPORTING LIMIT
- WATER TABLE, 1/6/04
- SILTY AND CLAYEY SOILS
- SANDS AND SILTY SANDS
- SILTY SANDS AND SANDY SILTS

FIGURE 3

GEOLOGIC CROSS-SECTION

SHELL-BRANDED SERVICE STATION
6750 Santa Rita Road
Pleasanton, California

PROJECT NO. SJ67-506-1.2004	DRAWN BY V. F. 2/17/04
FILE NO. SJ67-506-1.2004	PREPARED BY V. F.
REVISION NO. 1	REVIEWED BY

Delta Environmental Consultants, Inc.

Attachment A

DRILLING PERMITS

ZONE 7 WATER AGENCY

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94588-5127 VOICE (925) 484-2600 X235 FAX (925) 462-3914

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 6750 Santa Rita Rd. Pleasanton, CA and 6700 Santa Rita Rd. Pleasanton, CA

California Coordinates Source _____ Accuracy± _____ ft.
CCN _____ ft. CCE _____ ft.
APN 946-1101-37 and 946-1101-39

CLIENT
Name Shell Oil Products US
Address P.O. Box 7869 Phone (559) 645-9306
City Bordan CA Zip 93510

APPLICANT
Name Delta Environmental Management
Fax (408) 225-8506
Address 175 Bernal Rd. Ste. 200 Phone (408) 224-4724
City San Jose CA Zip 95119

TYPE OF PROJECT:
Well Construction •• Geotechnical Investigation ••
Well Destruction •• Contamination Investigation ••
Cathodic Protection •• Other MW ••

PROPOSED WELL USE:
Domestic •• Irrigation ••
Municipal •• Remediation ••
Industrial •• Groundwater Monitoring ••
Dewatering •• Other _____ ••

DRILLING METHOD:
Mud Rotary •• Air Rotary •• Hollow Stem Auger ••
Cable Tool •• Direct Push •• Other CPT ••

DRILLING COMPANY Gregg Drilling and Testing
DRILLER'S LICENSE NO. C57-485165

WELL SPECIFICATIONS:
Drill Hole Diameter _____ in. Maximum
Casing Diameter _____ in. Depth _____ ft.
Surface Seal Depth _____ ft. Number _____

SOIL BORINGS:
Number of Borings 12 Maximum
Hole Diameter 3 in. Depth 125 ft.

ESTIMATED STARTING DATE Dec. 1, 2003
ESTIMATED COMPLETION DATE Dec 5, 2003

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE Rebecca Wolff Date 11-7-03

ATTACH SITE PLAN OR SKETCH

FOR OFFICE USE

PERMIT NUMBER 23154
WELL NUMBER _____
APN 946-1101-037-00 & 946-1101-039-00

PERMIT CONDITIONS

Circled Permit Requirements Apply

(A.) GENERAL
1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects, or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

B. WATER SUPPLY WELLS
1. Minimum surface seal diameter is four inches greater than the well casing diameter.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved.
3. Grout placed by tremie.
4. An access port at least 0.5 inches in diameter is required on the wellhead for water level measurements.
5. A sample port is required on the discharge pipe near the wellhead.

C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal diameter is four inches greater than the well or piezometer casing diameter.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.
3. Grout placed by tremie.

(D.) GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

E. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

F. WELL DESTRUCTION. See attached.

(G.) SPECIAL CONDITIONS:, Submit to Zone 7 within 60 days after completion of permitted work the well installation report **including all soil and water laboratory analysis results.**

Approved Wyman Hong Date 11/14/03
Wyman Hong

Attachment B

PRESENTATION OF CONE PENETRATION TEST DATA

PRESENTATION OF CONE PENETRATION TEST DATA

6750 SANTA RITA ROAD

PLEASANTON, CALIFORNIA

Prepared for:

DELTA ENVIRONMENTAL

Prepared by:

GREGG IN SITU, INC.
Martinez, California
03-399ma

Prepared on:

January 6, 2004

TABLE OF CONTENTS

PRESENTATION OF CONE PENETRATION TEST DATA

1.0 INTRODUCTION

This report presents the results of a Cone Penetration Testing (CPT) and in situ groundwater sampling program carried out at the site located at 6750 Santa Rita Road in Pleasanton, CA. The work was performed on December 18th and 19th, 2003. The scope of work was performed as directed by Delta Environmental personnel.

2.0 FIELD EQUIPMENT & PROCEDURES

The Cone Penetration Tests (CPT) were carried out by GREGG IN SITU, INC. of Martinez, CA using an integrated electronic cone system. The CPT soundings were performed in accordance with ASTM standards (D 5778-95). A 20 ton capacity cone was used for all of the soundings (figure 1). This cone has a tip area of 15 cm^2 and friction sleeve area of 225 cm^2. The cone is designed with an equal end area friction sleeve and a tip end area ratio of 0.85.

The cones used during the program recorded the following parameters at 5 cm depth intervals:

- Tip Resistance (qc)
- Sleeve Friction (fs)
- Dynamic Pore Pressure (U)

The above parameters were printed simultaneously on a printer and stored on a computer diskette for future analysis and reference.

The pore water pressure element was located directly behind the cone tip. The pore water pressure element was 5.0 mm thick and consisted of porous plastic. Each of the elements were saturated in silicon oil under vacuum pressure prior to penetration. Pore pressure dissipations were recorded at 5 second intervals when appropriate during pauses in the penetration.

A complete set of baseline readings was taken prior to each sounding to determine temperature shifts and any zero load offsets. Monitoring base line readings ensures that the cone electronics are operating properly.

The cones were pushed using GREGG IN SITU's CPT rig, having a down pressure capacity of approximately 20 tons. Three CPT soundings were performed. The penetration tests were carried to depths of approximately 117 feet below ground surface. Test locations and depths were determined in the field by Delta Environmental personnel.

In situ groundwater samples were taken at three locations. Groundwater samples were collected using a Hydropunch® type groundwater sampling system (figure 2). The groundwater sampler operates by pushing 1.75 inch diameter hollow rods with a retrievable tip. A stainless steel filter screen is attached to the tip. At the desired sampling depth, the rods are retracted exposing the filter screen and allowing for groundwater infiltration. A small diameter bailer is then used to collect groundwater samples through the hollow rod.

3.0 CONE PENETRATION TEST DATA & INTERPRETATION

The cone penetration test data is presented in graphical form. Penetration depths are referenced to existing ground surface. This data includes CPT logs of measured soil parameters and a computer tabulation of interpreted soil types along with additional geotechnical parameters and pore pressure dissipation data.

The stratigraphic interpretation is based on relationships between cone bearing (qc), sleeve friction (fs), and penetration pore pressure (U). The friction ratio (Rf), which is sleeve friction divided by cone bearing, is a calculated parameter which is used to infer soil behavior type. Generally, cohesive soils (clays) have high friction ratios, low cone bearing and generate large excess pore water pressures. Cohesionless soils (sands) have lower friction ratios, high cone bearing and generate little in the way of excess pore water pressures.

Pore Pressure Dissipation Tests (PPDT's) were taken at various intervals in order to measure hydrostatic water pressures and approximate depth to groundwater table. In addition, the PPDT data can be used to estimate the horizontal permeability (k_h) of the soil. The correlation to permeability is based on the time required for 50 percent of the measured dynamic pore pressure to dissipate (t_{50}). The PPDT correlation figure (figure 3) is provided in the Appendix.

The interpretation of soils encountered on this project was carried out using recent correlations developed by Robertson et al, 1990. It should be noted that it is not always possible to clearly identify a soil type based on qc, fs and U. In these situations, experience and judgement and an assessment of the pore pressure dissipation data should be used to infer the soil behavior type. The soil classification chart (figure 4) used to interpret soil types based on qc and Rf is provided in the Appendix.

Interpreted output requires that depth of water be entered for calculation purposes, where depth to water is unknown an arbitrary depth in excess of 10 feet of the deepest sounding is entered as the groundwater depth.

GREGG IN SITU, INC.
January 6, 2004
03-399ma

DELTA ENVIRONMENTAL
6750 Santa Rita Road
Pleasanton, Ca.

We hope the information presented is sufficient for your purposes. We recommend that all data be carefully reviewed by qualified personnel to verify the data and make appropriate recommendations. If you have any questions, please do not hesitate to contact our office at (925) 313-5800.

Sincerely,
GREGG IN SITU, INC.

Mary Walden
Operations Manager

ELECTRICAL PIEZOCONE

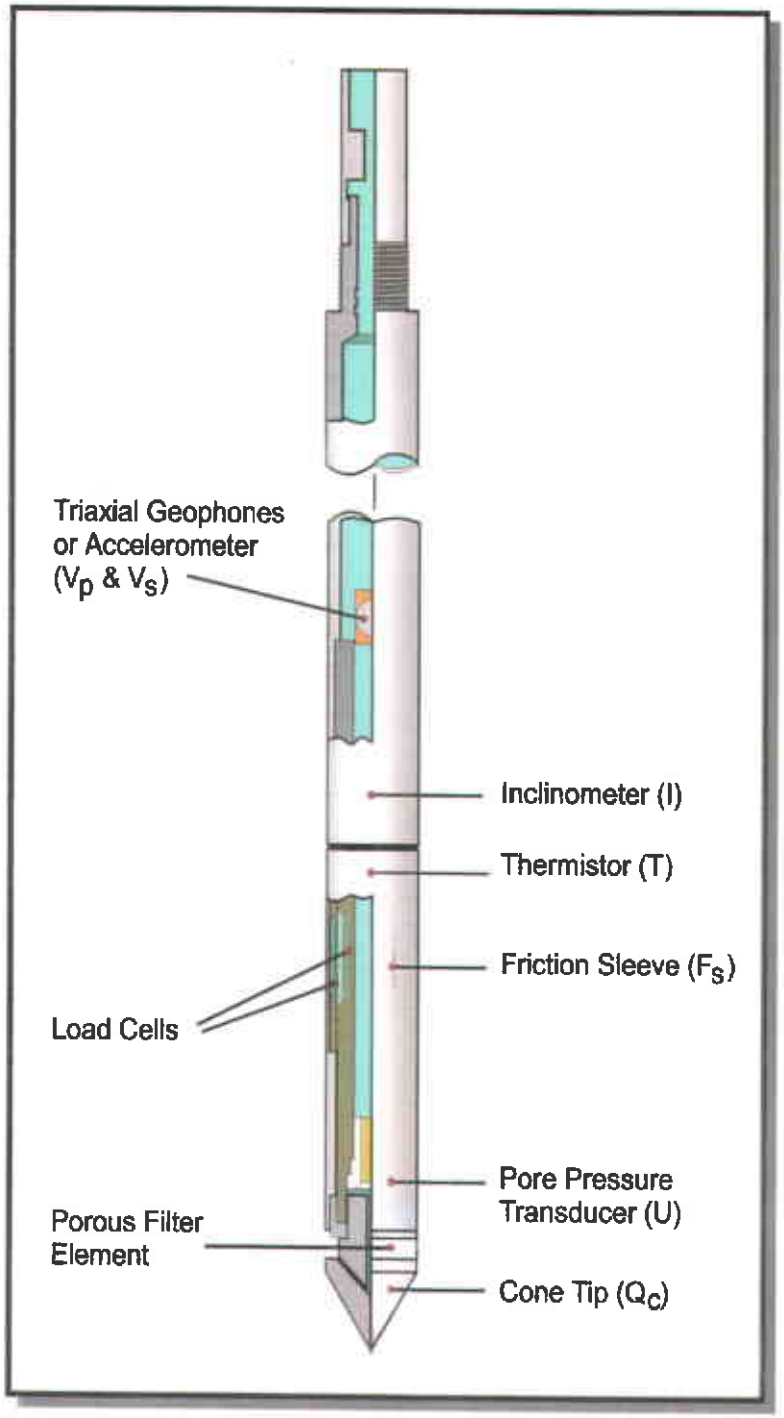


Figure 1

GROUNDWATER SAMPLER (HYDROPUNCH)

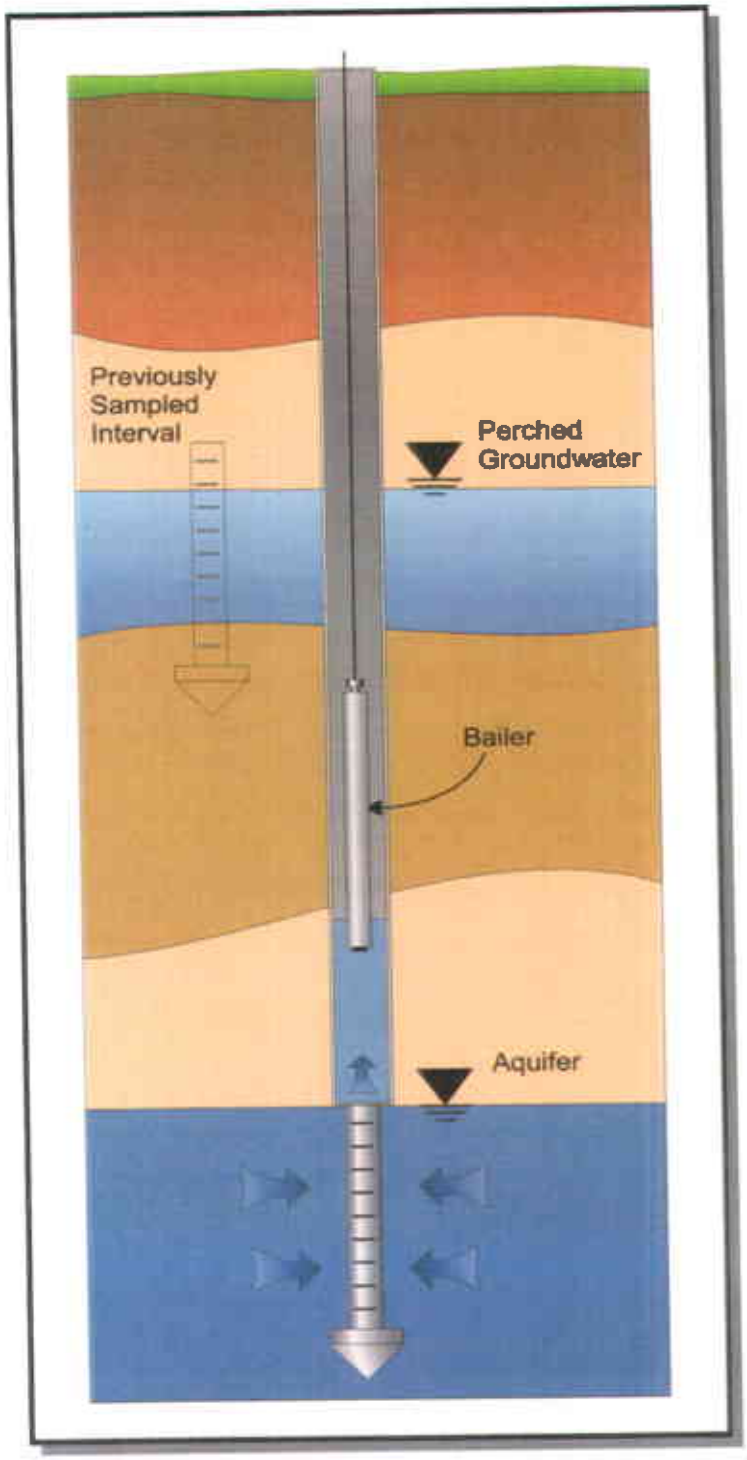
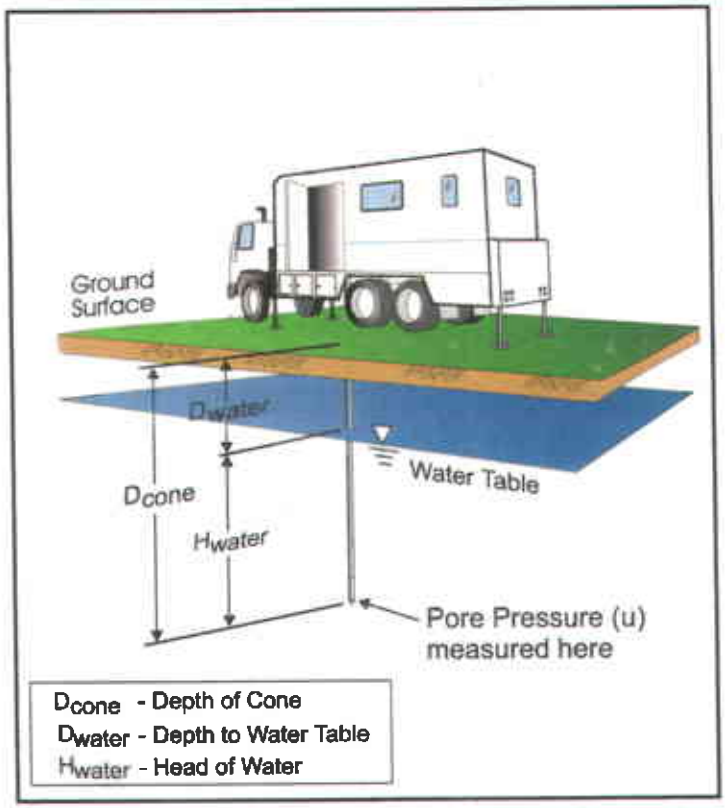
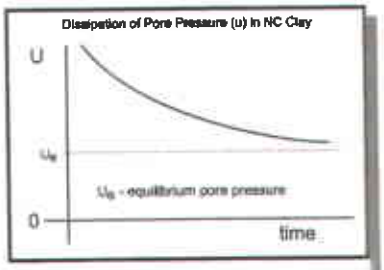
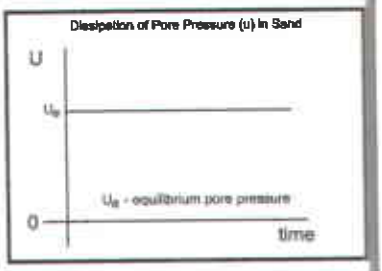


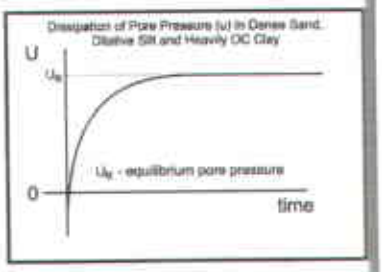
Figure 2

PPDT CORRELATION









Water Table Calculation

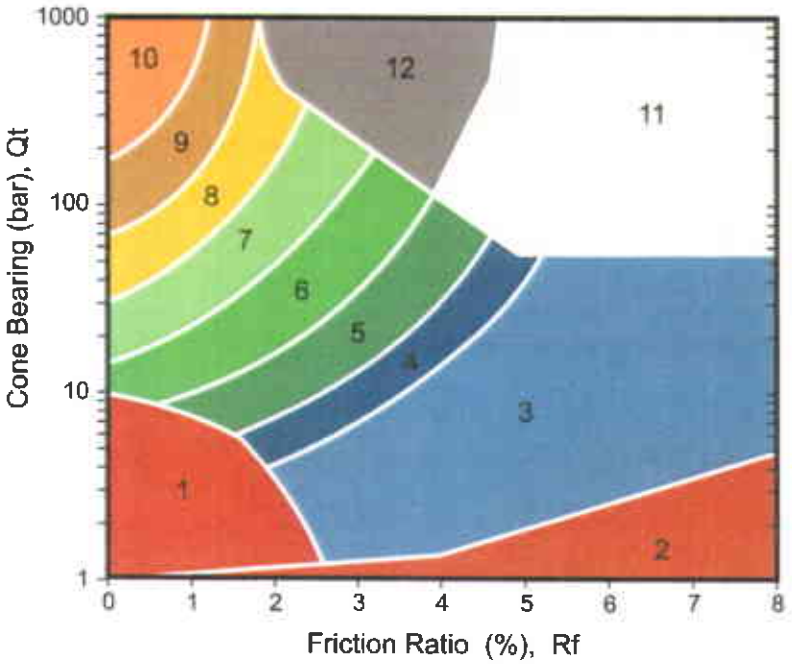
$$D_{water} = D_{cone} - H_{water}$$

where $H_{water} = U_e$ (depth units)

Useful Conversion Factors: 1psi = 0.704m = 2.31 feet (water)
1tsf = 0.958 bar = 13.9 psi
1m = 3.28 feet

Figure 3

SOIL CLASSIFICATION CHART



Zone	Q_t / N	Soil Behaviour Type
1	2	sensitive fine grained
2	1	organic material
3	1	clay
4	1.5	silty clay to clay
5	2	clayey silt to silty clay
6	2.5	sandy silt to clayey silt
7	3	silty sand to sandy silt
8	4	sand to silty sand
9	5	sand
10	6	gravelly sand to sand
11	1	very stiff fine grained *
12	2	sand to clayey sand *

* overconsolidated or cemented

After Robertson and Campenella

Figure 4

REFERENCES

Robertson, P.K. and Campanella, R.G. and Wightman, A., 1983 "SPT-CPT Correlations", Journal of the Geotechnical Division, ASCE, Vol. 109, No. GT11, Nov., pp. 1449-1460.

Robertson, P.K. and Wride C.E., 1998 "Evaluating Cyclic Liquefaction Potential Using The Cone Penetration Test", Journal of Geotechnical Division, Mar. 1998, pp. 442-459.

Robertson, P.K. and Campanella, R.G., Gillespie, D. and Greig, J., 1986, "Use of Piezometer Cone Data", Proceedings of In Situ 86, ASCE Specialty Conference, Blacksburg, Virginia.

Robertson, P.K. and Campanella, R.G., 1988, "Guidelines for Use, Interpretation and Application of the CPT and CPTU", UBC, Soil Mechanics Series No. 105, Civil Eng. Dept., Vancouver, B.C., V6T 1W5, Canada.

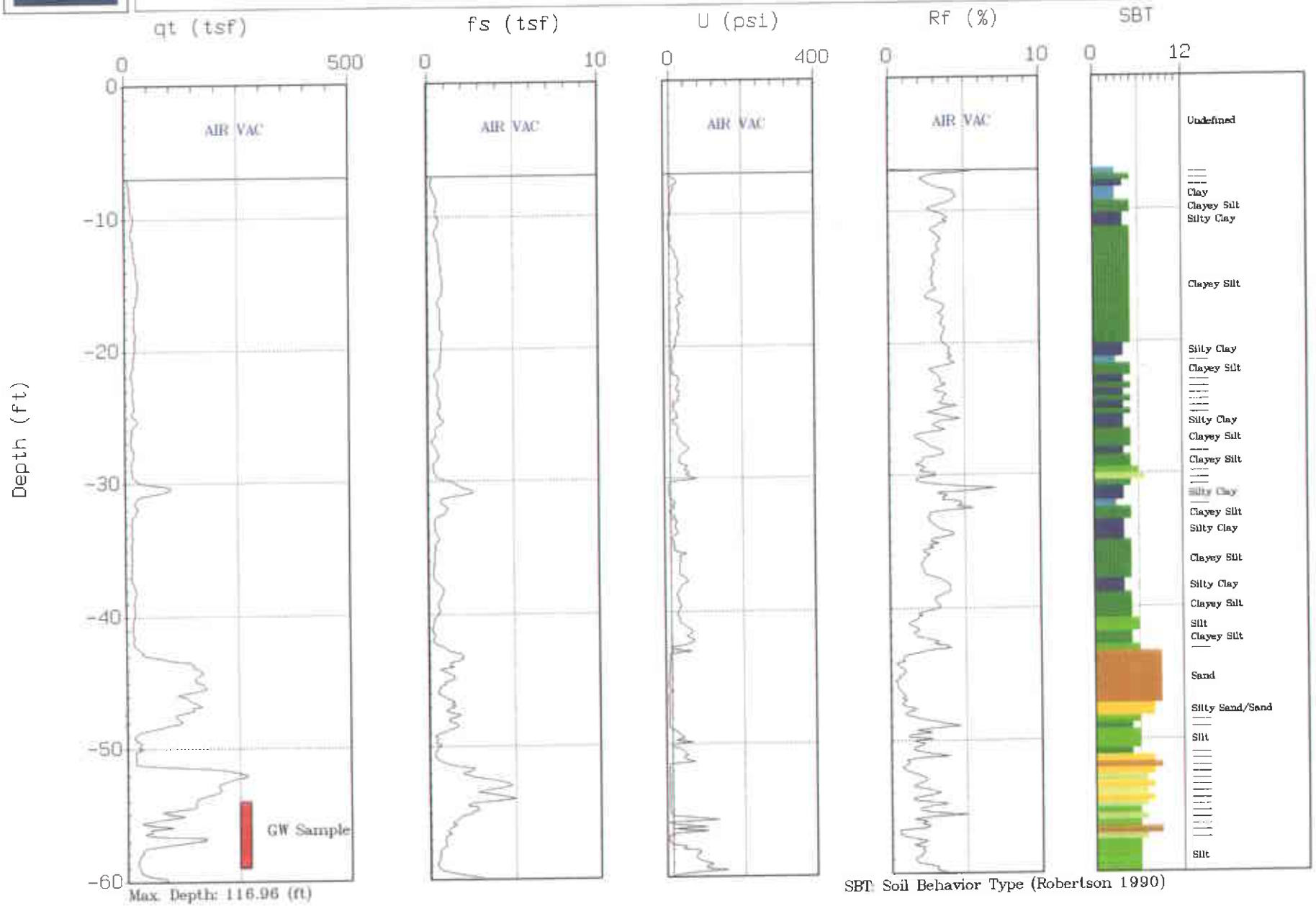
Robertson, P.K., Campanella, R.G., Gillespie, D. and Rice, A., 1986, "Seismic CPT to Measure In Situ Shear Wave Velocity", Journal of Geotechnical Engineering, ASCE, Vol. 112, No. 8, pp. 791-803.

GREGG

DELTA

Site : 6750 SANTA RITA
Location : CPT-01

Geologist : D. ARNOLD
Date : 12:18:03 08:33



Max. Depth: 116.96 (ft)

Depth Inc.: 0.164 (ft)

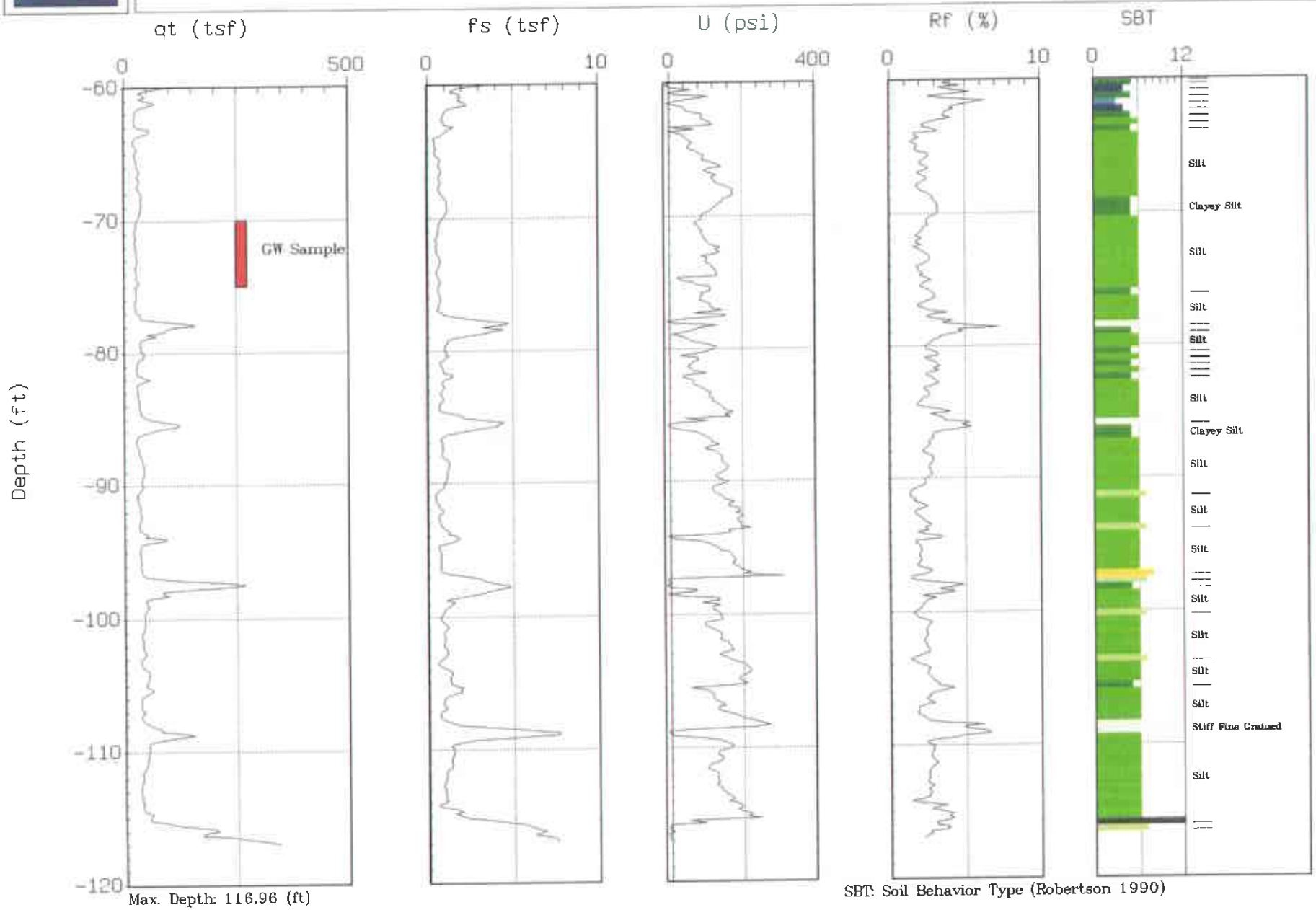
SBT: Soil Behavior Type (Robertson 1990)

GREGG

DELTA

Site : 6750 SANTA RITA
Location : CPT-01

Geologist : D. ARNOLD
Date : 12:18:03 08:33



Max. Depth: 116.96 (ft)

Depth Inc.: 0.164 (ft)

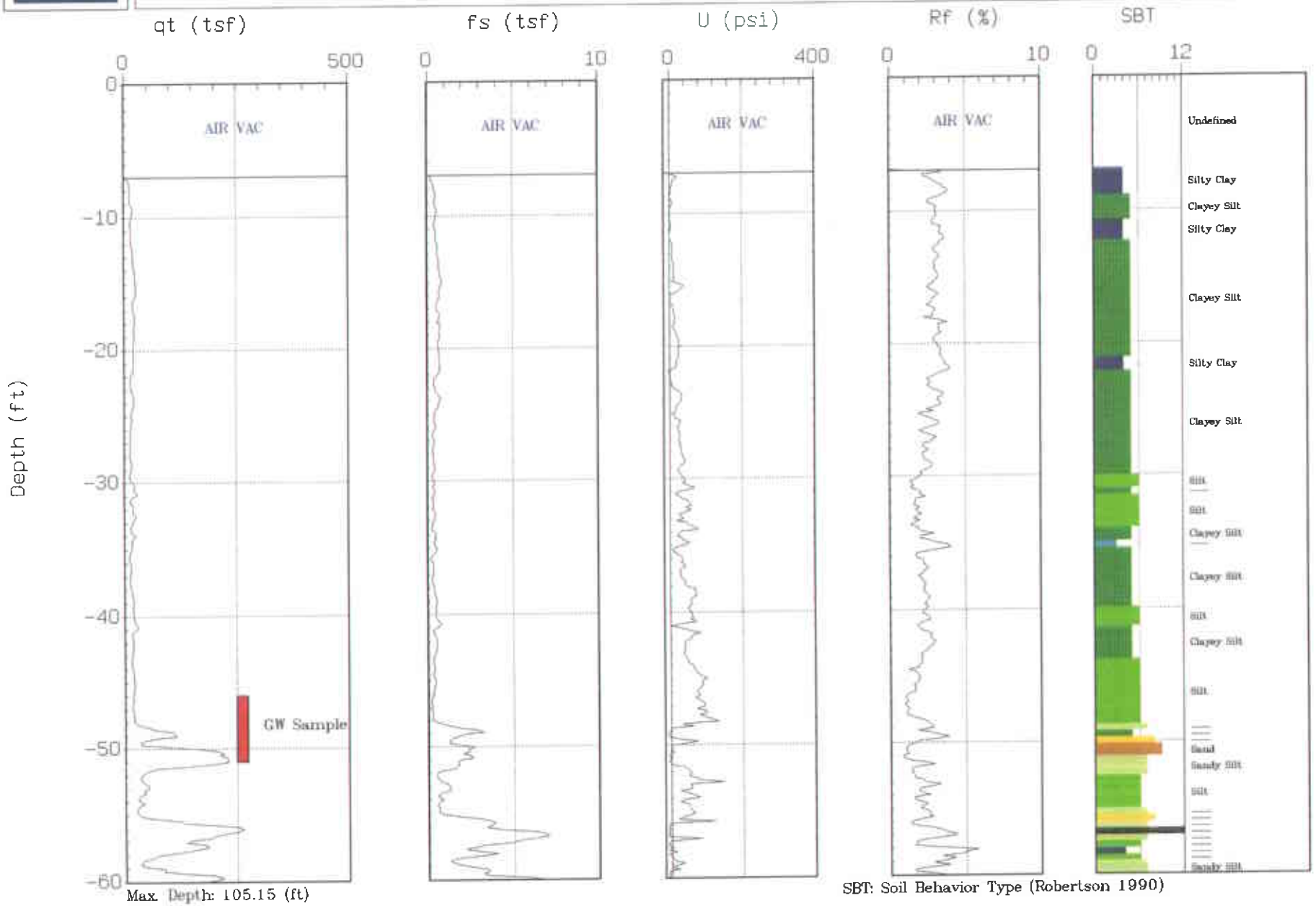
SBT: Soil Behavior Type (Robertson 1990)

GREGG

DELTA

Site : 6750 SANTA RITA
Location : CPT-02

Geologist : D. ARNOLD
Date : 12:19:03 09:54



Max. Depth: 105.15 (ft)

Depth Inc.: 0.164 (ft)

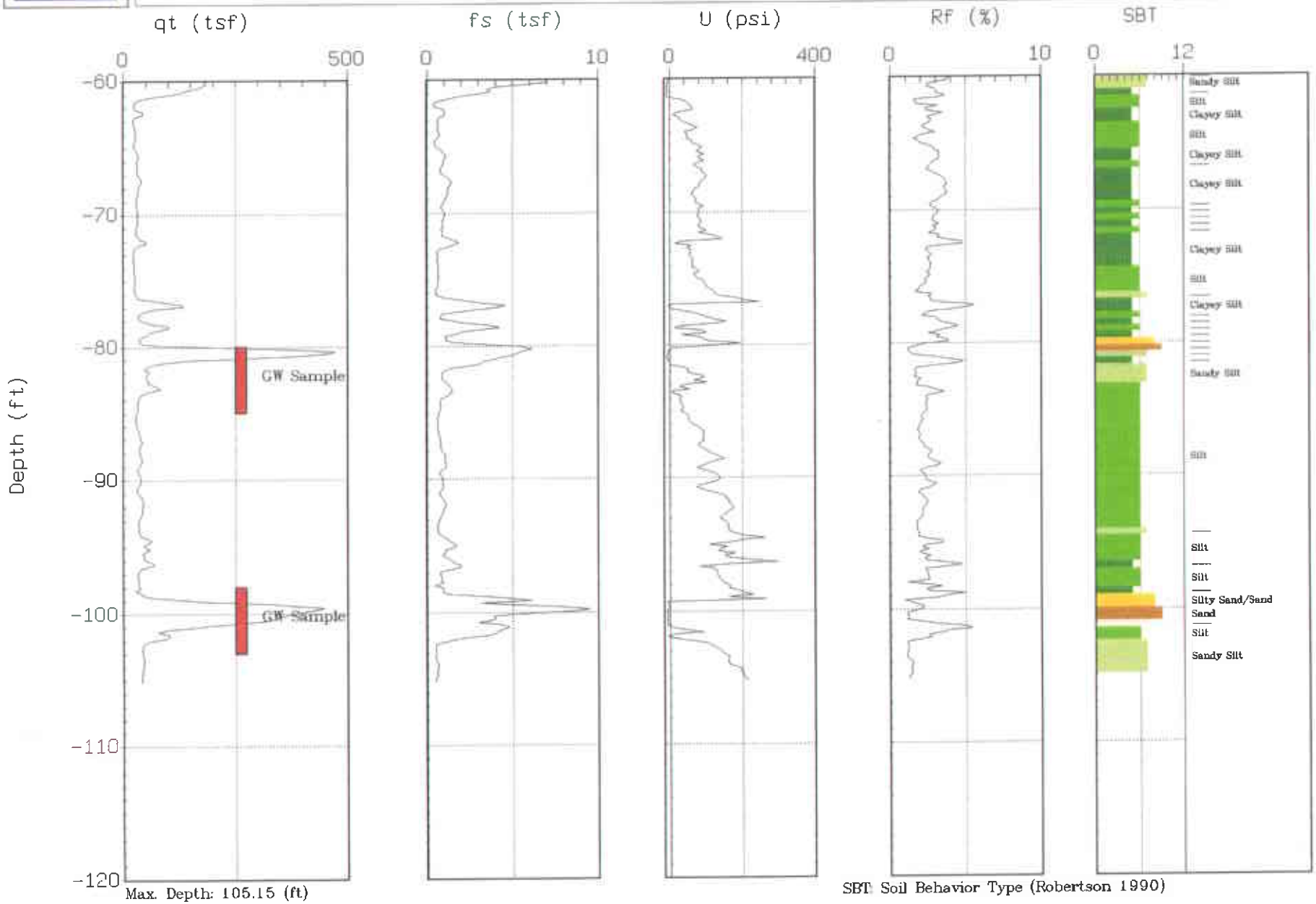
SBT: Soil Behavior Type (Robertson 1990)

GREGG

DELTA

Site : 6750 SANTA RITA
Location : CPT-02

Geologist : D. ARNOLD
Date : 12:19:03 09:54



Max. Depth: 105.15 (ft)

Depth Inc.: 0.164 (ft)

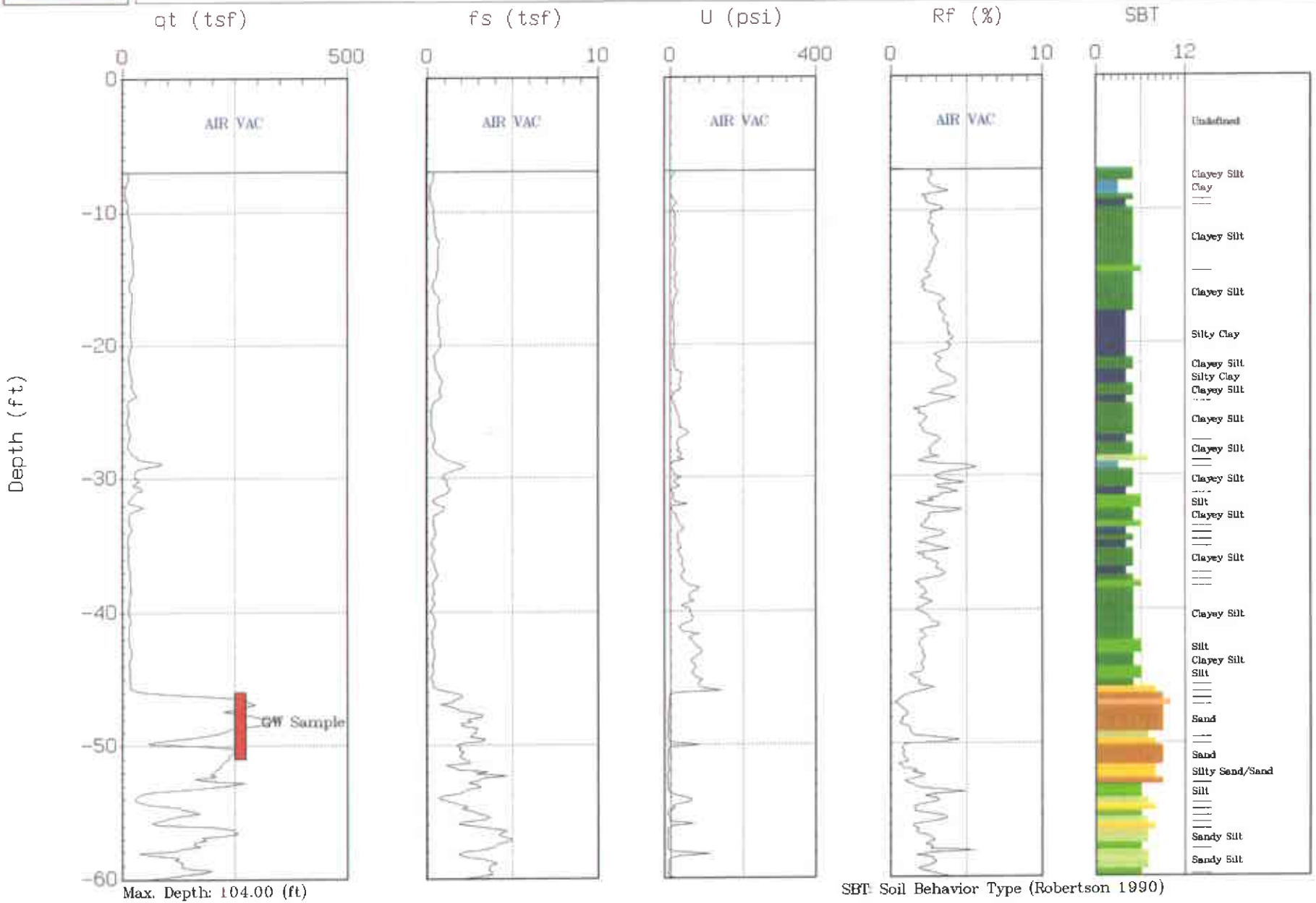
SBT: Soil Behavior Type (Robertson 1990)

GREGG

DELTA

Site : 6750 SANTA RITA
Location : CPT-03

Geologist : D. ARNOLD
Date : 12:18:03 14:13



Max. Depth: 104.00 (ft)

Depth Inc.: 0.164 (ft)

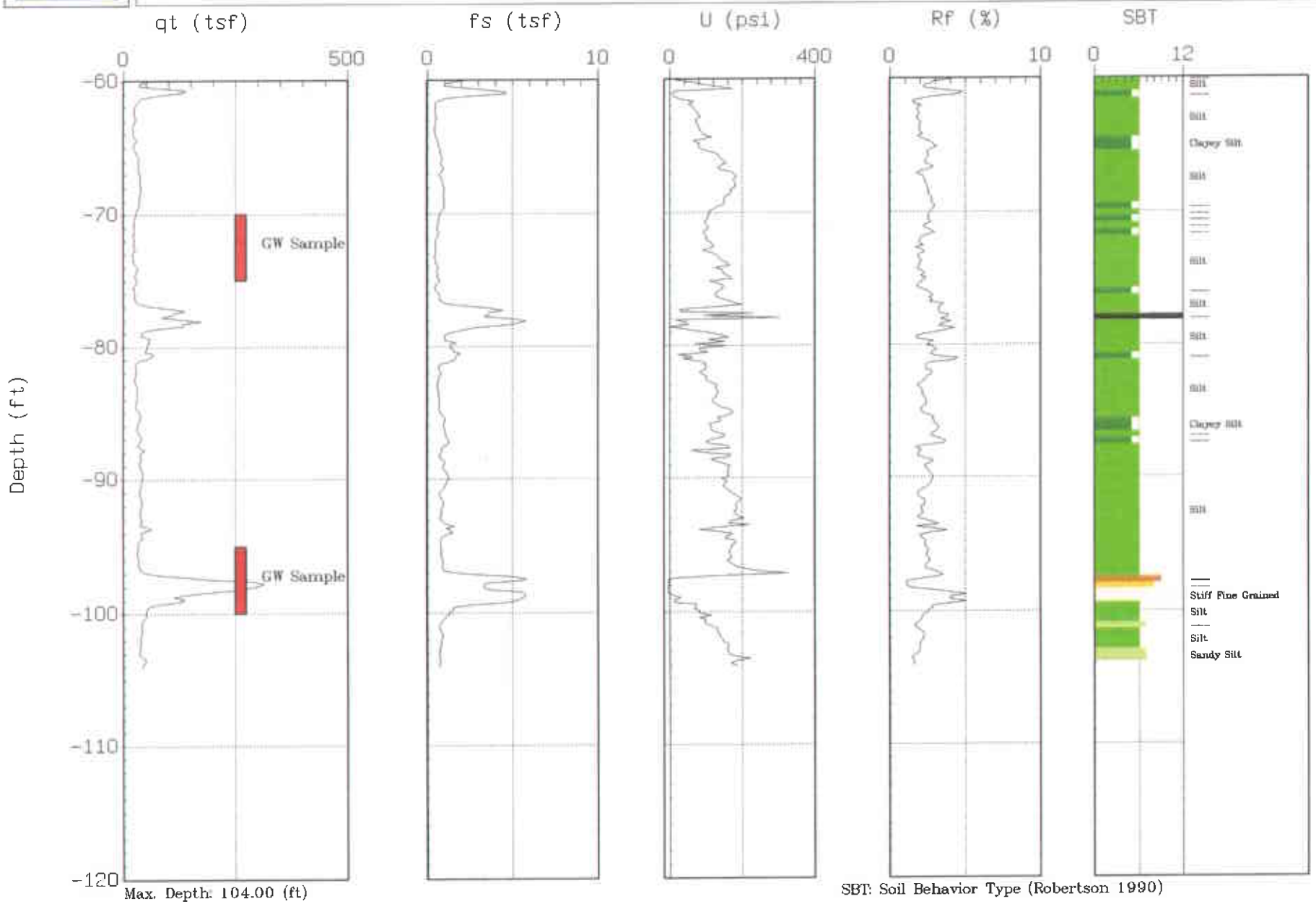
SBT: Soil Behavior Type (Robertson 1990)

GREGG

DELTA

Site : 6750 SANTA RITA
Location : CPT-03

Geologist : D. ARNOLD
Date : 12:18:03 14:13



Max. Depth: 104.00 (ft)

Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

3.2 INTERPRETED OUTPUT

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e
Run No: 04-0105-1555-4128
Job No: 03-399ma
Client: DELTA
Project: CPT SITE INVESTIGATION
Site: 6750 SANTA RITA
Location: CPT-01
Engineer: D. ARNOLD
CPT Date: 03/18/12
CPT Time: 08:33
CPT File: 399C01.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 13.72 (ft): 45.0
Su Nkt used: 12.50
Averaging Increment (m): 0.30
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
0.49	0.0	0.00	0.00	0.0	UnDef	124.1	0.03	0.03	0.00	2.00	UnDef	UnDef	UnDef	0.00
1.48	0.0	0.00	0.00	0.0	UnDef	124.1	0.09	0.09	0.00	2.00	UnDef	UnDef	UnDef	0.00
2.46	0.0	0.00	0.00	0.0	UnDef	124.1	0.15	0.15	0.00	2.00	UnDef	UnDef	UnDef	0.00
3.44	0.0	0.00	0.00	0.0	UnDef	124.1	0.21	0.21	0.00	2.00	UnDef	UnDef	UnDef	0.00
4.43	0.0	0.00	0.00	0.0	UnDef	124.1	0.27	0.27	0.00	1.91	UnDef	UnDef	UnDef	0.00
5.41	0.0	0.00	0.00	0.0	UnDef	124.1	0.34	0.34	0.00	1.73	UnDef	UnDef	UnDef	0.00
6.40	0.0	0.00	0.00	0.0	UnDef	124.1	0.40	0.40	0.00	1.59	UnDef	UnDef	UnDef	0.00
7.30	8.3	0.23	2.76	29.7	4	114.6	0.45	0.45	0.00	1.49	5.3	7.9	0.63	0.10
8.20	11.1	0.39	3.56	16.0	3	111.4	0.50	0.50	0.00	1.41	10.6	15.0	0.85	0.12
9.19	13.3	0.51	3.83	6.6	3	111.4	0.56	0.56	0.00	1.34	12.7	17.1	1.02	0.14
10.17	17.6	0.58	3.31	2.4	4	114.6	0.61	0.61	0.00	1.28	11.3	14.4	1.36	0.20
11.15	14.3	0.45	3.18	-1.8	4	114.6	0.67	0.67	0.00	1.22	9.1	11.1	1.09	0.14
12.14	18.3	0.60	3.28	9.1	5	114.6	0.73	0.73	0.00	1.17	8.8	10.3	1.41	0.19
13.21	22.6	0.69	3.08	45.0	5	114.6	0.79	0.79	0.00	1.13	10.8	12.2	1.74	0.26

Gregg In Situ, Inc.
Run No: 04-0105-1555-4128
CPT File: 399C01.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
14.27	26.7	0.78	2.92	54.3	5	114.6	0.85	0.85	0.00	1.09	12.8	13.9	2.06	0.34
15.26	28.7	0.83	2.90	50.4	5	114.6	0.90	0.90	0.00	1.05	13.7	14.4	2.22	0.38
16.24	23.7	0.64	2.71	66.8	5	114.6	0.96	0.96	0.00	1.02	11.4	11.6	1.82	0.23
17.22	19.9	0.69	3.49	50.8	4	114.6	1.02	1.02	0.00	0.99	12.7	12.6	1.51	0.16
18.21	20.8	0.73	3.49	57.7	4	114.6	1.07	1.07	0.00	0.97	13.3	12.8	1.57	0.17
19.19	22.1	0.79	3.58	43.9	4	114.6	1.13	1.13	0.00	0.94	14.1	13.3	1.68	0.18
20.18	20.0	0.76	3.80	23.3	4	114.6	1.19	1.19	0.00	0.92	12.8	11.8	1.51	0.00
21.16	16.4	0.66	4.05	13.5	3	111.4	1.24	1.24	0.00	0.90	15.7	14.1	1.21	0.00
22.15	14.7	0.45	3.07	34.4	5	114.6	1.30	1.30	0.00	0.88	7.0	6.2	1.07	0.10
23.13	16.7	0.56	3.33	48.3	4	114.6	1.35	1.35	0.00	0.86	10.7	9.2	1.23	0.00
24.11	18.5	0.65	3.53	35.2	4	114.6	1.41	1.41	0.00	0.84	11.8	10.0	1.37	0.00
25.10	20.9	0.71	3.39	33.2	5	114.6	1.47	1.47	0.00	0.83	10.0	8.3	1.56	0.00
26.08	14.3	0.50	3.49	40.1	4	114.6	1.52	1.52	0.00	0.81	9.1	7.4	1.02	0.00
27.07	13.8	0.29	2.12	71.9	5	114.6	1.58	1.58	0.00	0.80	6.6	5.3	0.98	0.09
28.05	17.1	0.53	3.12	83.8	5	114.6	1.64	1.64	0.00	0.78	8.2	6.4	1.24	0.00
29.04	14.9	0.32	2.13	89.7	5	114.6	1.69	1.69	0.00	0.77	7.1	5.5	1.06	0.10
30.02	63.3	1.30	2.06	67.1	7	117.8	1.75	1.75	0.00	0.76	20.2	15.3	UnDef	0.30
31.00	39.3	1.69	4.30	-7.3	4	114.6	1.81	1.81	0.00	0.74	25.1	18.7	3.00	0.00
31.99	22.3	0.97	4.36	15.0	3	111.4	1.86	1.86	0.00	0.73	21.4	15.7	1.64	0.00
32.97	13.4	0.38	2.82	27.0	5	114.6	1.92	1.92	0.00	0.72	6.4	4.6	0.92	0.00
33.96	13.6	0.48	3.54	30.9	4	114.6	1.97	1.97	0.00	0.71	8.7	6.2	0.93	0.00
34.94	12.9	0.39	2.99	21.0	4	114.6	2.03	2.03	0.00	0.70	8.3	5.8	0.87	0.00
35.92	13.6	0.32	2.35	66.2	5	114.6	2.09	2.09	0.00	0.69	6.5	4.5	0.92	0.09
36.91	12.7	0.28	2.18	62.0	5	114.6	2.14	2.14	0.00	0.68	6.1	4.2	0.85	0.09
37.89	20.3	0.72	3.55	78.3	4	114.6	2.20	2.20	0.00	0.67	12.9	8.7	1.45	0.00
38.88	18.2	0.63	3.48	46.7	4	114.6	2.26	2.26	0.00	0.67	11.6	7.7	1.28	0.00
39.86	17.3	0.50	2.88	50.5	5	114.6	2.31	2.31	0.00	0.66	8.3	5.5	1.20	0.00
40.85	14.2	0.23	1.64	80.0	6	114.6	2.37	2.37	0.00	0.65	5.4	3.5	0.95	0.09
41.83	16.9	0.33	1.94	126.0	6	114.6	2.42	2.42	0.00	0.64	6.5	4.2	1.16	0.09
42.81	53.6	1.50	2.79	31.8	6	114.6	2.48	2.48	0.00	0.63	20.5	13.0	4.09	0.00
43.80	156.1	1.18	0.75	-10.9	9	124.1	2.54	2.54	0.00	0.63	29.9	18.8	UnDef	0.26
44.78	161.2	1.20	0.74	-16.2	9	124.1	2.60	2.60	0.00	0.62	30.9	19.1	UnDef	0.26
45.77	143.4	0.64	0.44	-12.9	9	124.1	2.66	2.64	0.02	0.62	27.5	16.9	UnDef	0.14
46.75	149.8	1.25	0.83	-18.3	9	124.1	2.72	2.67	0.05	0.61	28.7	17.6	UnDef	0.25
47.74	111.3	1.38	1.24	-16.7	8	120.9	2.78	2.70	0.09	0.61	26.6	16.2	UnDef	0.25
48.72	34.4	0.98	2.85	4.7	5	114.6	2.84	2.73	0.12	0.61	16.5	10.0	2.52	0.18

Gregg In Situ, Inc.
Run No: 04-0105-1555-4128
CPT File: 399C01.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
49.70	25.9	0.46	1.79	47.4	6	114.6	2.90	2.75	0.15	0.60	9.9	6.0	1.84	0.12
50.69	18.2	0.41	2.24	77.2	5	114.6	2.95	2.78	0.18	0.60	8.7	5.2	1.22	0.09
51.67	206.7	1.98	0.96	7.3	9	124.1	3.01	2.80	0.21	0.60	39.6	23.6	UnDef	0.43
52.66	214.7	3.96	1.85	-16.3	8	120.9	3.07	2.83	0.24	0.59	51.4	30.5	UnDef	0.00
53.64	170.7	3.84	2.25	-16.9	7	117.8	3.13	2.86	0.27	0.59	54.5	32.2	UnDef	0.00
54.63	120.4	2.50	2.08	-16.2	7	117.8	3.19	2.89	0.30	0.59	38.4	22.6	UnDef	0.00
55.61	64.6	1.50	2.33	78.8	6	114.6	3.25	2.92	0.33	0.59	24.7	14.5	4.91	0.00
56.59	106.1	0.98	0.92	70.4	8	120.9	3.30	2.94	0.36	0.58	25.4	14.8	UnDef	0.20
57.58	47.0	0.72	1.52	46.0	7	117.8	3.36	2.97	0.39	0.58	15.0	8.7	UnDef	0.30
58.56	24.4	0.46	1.87	179.8	6	114.6	3.42	3.00	0.42	0.58	9.4	5.4	1.68	0.11
59.55	57.0	1.78	3.13	153.7	6	114.6	3.48	3.02	0.45	0.58	21.8	12.5	4.28	0.00
60.53	42.0	1.71	4.07	68.9	5	114.6	3.53	3.05	0.48	0.57	20.1	11.5	3.08	0.00
61.52	40.6	1.68	4.13	70.5	5	114.6	3.59	3.07	0.52	0.57	19.5	11.1	2.96	0.00
62.42	23.3	0.90	3.85	188.7	4	114.6	3.64	3.10	0.54	0.57	14.9	8.5	1.58	0.00
63.32	41.3	1.06	2.57	127.0	6	114.6	3.69	3.12	0.57	0.57	15.8	9.0	3.01	0.22
64.30	24.0	0.40	1.65	116.9	6	114.6	3.75	3.15	0.60	0.56	9.2	5.2	1.62	0.11
65.29	26.0	0.56	2.16	189.1	6	114.6	3.81	3.17	0.63	0.56	9.9	5.6	1.77	0.11
66.27	31.2	0.71	2.26	270.1	6	114.6	3.86	3.20	0.66	0.56	12.0	6.7	2.19	0.14
67.26	31.7	0.68	2.14	300.7	6	114.6	3.92	3.22	0.69	0.56	12.2	6.8	2.23	0.14
68.24	38.5	0.88	2.28	383.3	6	114.6	3.98	3.25	0.73	0.55	14.8	8.2	2.76	0.19
69.22	36.2	1.12	3.09	285.8	5	114.6	4.03	3.28	0.76	0.55	17.3	9.6	2.57	0.00
70.21	26.7	0.74	2.77	186.8	5	114.6	4.09	3.30	0.79	0.55	12.8	7.0	1.81	0.00
71.19	24.3	0.51	2.12	205.0	6	114.6	4.14	3.33	0.82	0.55	9.3	5.1	1.61	0.11
72.18	26.5	0.49	1.87	278.9	6	114.6	4.20	3.35	0.85	0.55	10.1	5.5	1.78	0.11
73.16	27.3	0.68	2.50	244.9	6	114.6	4.26	3.38	0.88	0.54	10.4	5.7	1.84	0.12
74.15	28.3	0.56	1.98	248.6	6	114.6	4.31	3.40	0.91	0.54	10.8	5.9	1.92	0.12
75.13	27.1	0.63	2.33	192.0	6	114.6	4.37	3.43	0.94	0.54	10.4	5.6	1.82	0.11
76.11	25.0	0.70	2.78	212.3	5	114.6	4.43	3.45	0.97	0.54	12.0	6.4	1.64	0.00
77.10	41.3	1.10	2.66	284.0	6	114.6	4.48	3.48	1.00	0.54	15.8	8.5	2.95	0.20
78.08	105.9	3.98	3.76	124.2	6	114.6	4.54	3.51	1.03	0.53	40.6	21.7	8.11	0.00
79.07	43.9	1.74	3.96	105.6	5	114.6	4.60	3.53	1.06	0.53	21.0	11.2	3.15	0.00
80.05	39.4	1.05	2.66	214.5	6	114.6	4.65	3.56	1.09	0.53	15.1	8.0	2.78	0.18
81.04	28.4	0.83	2.92	149.1	5	114.6	4.71	3.58	1.13	0.53	13.6	7.2	1.89	0.00
82.02	38.7	1.06	2.74	139.0	6	114.6	4.76	3.61	1.16	0.53	14.8	7.8	2.71	0.17
83.00	30.6	0.83	2.72	210.8	6	114.6	4.82	3.63	1.19	0.52	11.7	6.1	2.06	0.00
83.99	34.4	0.74	2.16	295.2	6	114.6	4.88	3.66	1.22	0.52	13.2	6.9	2.36	0.14

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
84.97	72.1	2.36	3.28	300.6	6	114.6	4.93	3.69	1.25	0.52	27.6	14.4	5.37	0.00
85.96	58.8	2.63	4.47	69.2	5	114.6	4.99	3.71	1.28	0.52	28.2	14.6	4.31	0.00
86.94	29.7	0.82	2.75	258.8	5	114.6	5.05	3.74	1.31	0.52	14.2	7.4	1.97	0.00
87.93	37.9	0.95	2.50	299.1	6	114.6	5.10	3.76	1.34	0.52	14.5	7.5	2.62	0.16
88.91	43.1	1.17	2.71	344.4	6	114.6	5.16	3.79	1.37	0.51	16.5	8.5	3.03	0.20
89.89	39.1	0.98	2.51	313.4	6	114.6	5.22	3.81	1.40	0.51	15.0	7.7	2.71	0.17
90.88	30.3	0.47	1.54	303.2	6	114.6	5.27	3.84	1.43	0.51	11.6	5.9	2.00	0.12
91.86	35.8	0.70	1.96	407.3	6	114.6	5.33	3.87	1.46	0.51	13.7	7.0	2.44	0.15
92.85	33.9	0.70	2.07	443.1	6	114.6	5.38	3.89	1.49	0.51	13.0	6.6	2.29	0.14
93.83	60.5	1.43	2.37	263.0	6	114.6	5.44	3.92	1.52	0.51	23.2	11.7	4.41	0.39
94.82	35.2	0.74	2.11	282.7	6	114.6	5.50	3.94	1.56	0.50	13.5	6.8	2.37	0.14
95.80	36.5	0.72	1.97	399.6	6	114.6	5.55	3.97	1.59	0.50	14.0	7.0	2.47	0.15
96.78	88.4	1.79	2.02	426.3	7	117.8	5.61	3.99	1.62	0.50	28.2	14.1	UnDef	0.00
97.77	157.6	3.94	2.50	49.6	7	117.8	5.67	4.02	1.65	0.50	50.3	25.2	UnDef	0.00
98.75	51.0	1.52	2.98	194.1	6	114.6	5.73	4.05	1.68	0.50	19.5	9.8	3.62	0.26
99.74	44.3	0.82	1.84	296.5	7	117.8	5.78	4.07	1.71	0.50	14.1	7.1	UnDef	0.20
100.72	41.1	0.98	2.38	258.2	6	114.6	5.84	4.10	1.74	0.50	15.8	7.9	2.82	0.17
101.70	39.1	0.91	2.33	332.5	6	114.6	5.90	4.13	1.77	0.50	15.0	7.5	2.66	0.16
102.69	40.7	0.98	2.41	358.5	6	114.6	5.95	4.15	1.80	0.50	15.6	7.8	2.78	0.17
103.67	44.6	0.88	1.96	455.5	6	114.6	6.01	4.18	1.83	0.50	17.1	8.6	3.09	0.19
104.66	49.5	1.30	2.62	462.3	6	114.6	6.07	4.20	1.86	0.50	19.0	9.5	3.48	0.23
105.64	45.5	1.52	3.33	250.8	5	114.6	6.12	4.23	1.89	0.50	21.8	10.9	3.15	0.00
106.63	37.1	0.89	2.39	302.8	6	114.6	6.18	4.25	1.92	0.50	14.2	7.1	2.48	0.14
107.61	45.4	0.96	2.11	450.4	6	114.6	6.24	4.28	1.95	0.50	17.4	8.7	3.14	0.20
108.59	106.5	5.71	5.36	215.5	11	130.5	6.30	4.31	1.99	0.50	102.0	51.0	UnDef	0.00
109.58	52.9	1.76	3.33	329.6	5	114.6	6.36	4.34	2.02	0.50	25.3	12.7	3.72	0.00
110.56	48.5	1.33	2.75	309.1	6	114.6	6.41	4.37	2.05	0.50	18.6	9.3	3.37	0.22
111.55	40.1	1.11	2.76	261.6	6	114.6	6.47	4.39	2.08	0.50	15.3	7.7	2.69	0.00
112.53	35.2	0.90	2.56	296.8	6	114.6	6.53	4.42	2.11	0.50	13.5	6.7	2.29	0.00
113.52	37.5	0.93	2.48	358.6	6	114.6	6.58	4.44	2.14	0.50	14.4	7.2	2.47	0.14
114.50	49.0	1.38	2.81	447.2	6	114.6	6.64	4.47	2.17	0.50	18.8	9.4	3.39	0.22
115.48	134.9	4.67	3.46	226.0	6	114.6	6.69	4.49	2.20	0.50	51.7	25.8	10.25	0.00

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e
Run No: 04-0105-1555-4128
Job No: 03-399ma
Client: DELTA
Project: CPT SITE INVESTIGATION
Site: 6750 SANTA RITA
Location: CPT-01
Engineer: D. ARNOLD
CPT Date: 03/18/12
CPT Time: 08:33
CPT File: 399C01.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 13.72 (ft): 45.0
Su Nkt used: 12.50
Averaging Increment (m): 0.30
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
0.49	1.0E-15	0.00	2.4	0.10	1	0.2	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDef
1.48	1.0E-15	0.00	0.1	0.10	1	0.2	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDef
2.46	1.0E-15	0.00	0.1	0.10	1	0.2	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDef
3.44	1.0E-15	0.00	0.0	0.10	1	0.2	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDef
4.43	1.0E-15	0.00	0.0	0.10	1	0.2	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDef
5.41	1.0E-15	0.00	0.0	0.10	1	0.2	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDef
6.40	1.0E-15	0.00	0.0	0.10	1	0.2	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDef
7.30	5.0E-07	0.12	17.4	2.92	6	12.1	48.3	60.4	45.7	UnDef	UnDef	6.0	UnDef	7.9	15.8
8.20	5.0E-08	0.05	21.1	3.73	6	15.3	61.2	76.5	45.7	UnDef	UnDef	6.0	UnDef	15.0	30.0
9.19	5.0E-08	0.02	22.9	4.00	6	17.4	69.8	87.2	45.3	UnDef	UnDef	6.0	UnDef	17.1	34.1
10.17	5.0E-07	0.00	27.8	3.42	6	22.1	88.2	110.3	39.4	UnDef	UnDef	6.0	UnDef	14.4	28.8
11.15	5.0E-07	0.00	20.3	3.33	6	17.1	68.3	85.3	44.7	UnDef	UnDef	6.0	UnDef	11.1	22.3
12.14	5.0E-06	0.02	24.2	3.41	6	21.0	84.1	105.1	41.8	UnDef	UnDef	6.0	UnDef	10.3	20.6
13.21	5.0E-06	0.06	27.7	3.19	6	24.9	99.6	124.5	38.4	UnDef	UnDef	6.0	UnDef	12.2	24.4

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
14.27	5.0E-06	0.07	30.5	3.02	6	28.3	113.4	141.7	36.0	UnDef	UnDef	6.0	UnDef	13.9	27.7
15.26	5.0E-06	0.06	30.7	2.99	6	29.5	118.0	147.5	35.8	UnDef	UnDef	6.0	UnDef	14.4	28.9
16.24	5.0E-06	0.09	23.7	2.83	6	23.7	94.7	118.4	39.4	UnDef	UnDef	6.0	UnDef	11.6	23.2
17.22	5.0E-07	0.08	18.6	3.67	4	19.3	77.2	96.5	48.0	UnDef	UnDef	6.0	UnDef	12.6	25.2
18.21	5.0E-07	0.09	18.3	3.68	4	19.6	78.4	98.0	48.3	UnDef	UnDef	6.0	UnDef	12.8	25.6
19.19	5.0E-07	0.07	18.6	3.77	4	20.3	81.4	101.7	48.4	UnDef	UnDef	6.0	UnDef	13.3	26.6
20.18	5.0E-07	0.04	15.9	4.04	1	18.0	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDef
21.16	5.0E-08	0.03	12.2	4.38	1	14.4	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
22.15	5.0E-06	0.08	10.3	3.37	4	12.6	50.4	63.0	59.5	UnDef	UnDef	3.0	UnDef	6.2	12.3
23.13	5.0E-07	0.10	11.4	3.62	1	14.1	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
24.11	5.0E-07	0.06	12.1	3.83	1	15.3	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
25.10	5.0E-06	0.05	13.3	3.64	1	16.9	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDef
26.08	5.0E-07	0.10	8.4	3.91	1	11.3	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
27.07	5.0E-06	0.18	7.7	2.39	4	10.8	43.0	53.8	60.9	UnDef	UnDef	3.0	UnDef	5.3	10.5
28.05	5.0E-06	0.17	9.5	3.45	1	13.1	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
29.04	5.0E-06	0.21	7.8	2.40	4	11.2	44.9	56.1	60.8	UnDef	UnDef	3.0	UnDef	5.5	11.0
30.02	5.0E-04	0.03	35.2	2.12	7	46.8	86.3	133.1	29.3	38	45.5	1.0	-0.15	10.4	25.7
31.00	5.0E-07	-0.01	20.8	4.51	1	28.6	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDef
31.99	5.0E-08	0.02	11.0	4.75	1	16.0	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
32.97	5.0E-06	0.07	6.0	3.29	1	9.5	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDef
33.96	5.0E-07	0.08	5.9	4.14	1	9.5	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDef
34.94	5.0E-07	0.06	5.4	3.55	1	8.9	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDef
35.92	5.0E-06	0.18	5.5	2.77	4	9.2	36.9	46.1	72.6	UnDef	UnDef	1.5	UnDef	4.5	9.0
36.91	5.0E-06	0.18	4.9	2.63	4	8.5	34.0	42.5	75.0	UnDef	UnDef	1.5	UnDef	4.2	8.3
37.89	5.0E-07	0.14	8.2	3.99	1	13.4	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
38.88	5.0E-07	0.09	7.1	3.97	1	11.9	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
39.86	5.0E-06	0.10	6.5	3.32	1	11.2	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
40.85	5.0E-05	0.21	5.0	1.97	4	9.0	36.1	45.1	69.8	30	30.0	1.5	0.09	3.5	7.1
41.83	5.0E-05	0.27	6.0	2.26	4	10.6	42.5	53.1	67.0	30	30.0	1.5	0.07	4.2	8.3
42.81	5.0E-05	0.02	20.6	2.92	6	33.3	133.3	166.6	42.4	34	35.8	6.0	-0.13	13.0	26.1
43.80	5.0E-02	0.00	60.5	0.77	9	95.8	27.8	123.7	13.4	40	66.1	1.0	-0.12	3.1	21.8
44.78	5.0E-02	0.00	61.0	0.76	9	97.8	27.6	125.5	13.3	40	66.6	1.0	-0.12	3.1	22.2
45.77	5.0E-02	0.00	53.3	0.45	9	86.4	0.0	86.4	5.0	40	63.1	1.0	-0.06	0.0	16.9
46.75	5.0E-02	0.00	55.1	0.85	9	89.8	33.1	122.8	15.1	40	64.2	1.0	-0.12	3.6	21.1
47.74	5.0E-03	-0.01	40.2	1.27	7	66.3	55.7	122.0	22.1	38	55.5	1.0	-0.12	6.5	22.7
48.72	5.0E-06	0.00	11.6	3.11	4	20.4	81.5	101.9	55.4	UnDef	UnDef	3.0	UnDef	10.0	19.9

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
49.70	5.0E-05	0.06	8.4	2.02	4	15.3	61.1	76.4	56.5	30	30.0	3.0	0.01	6.0	12.0
50.69	5.0E-06	0.15	5.5	2.68	4	10.7	42.7	53.3	72.2	UnDef	UnDef	1.5	UnDef	5.2	10.4
51.67	5.0E-02	0.00	72.6	0.97	9	120.8	34.2	155.0	13.3	40	72.7	1.0	-0.15	3.8	27.4
52.66	5.0E-03	0.00	74.7	1.87	7	124.8	70.5	195.3	18.5	40	73.6	1.0	-0.22	8.9	39.4
53.64	5.0E-04	0.00	58.5	2.29	7	98.7	95.1	193.9	23.4	40	66.9	1.0	-0.22	14.3	46.5
54.63	5.0E-04	-0.01	40.6	2.14	7	69.3	102.3	171.6	27.3	38	56.8	1.0	-0.17	13.4	36.1
55.61	5.0E-05	0.03	21.0	2.45	6	37.0	148.1	185.1	39.6	34	38.8	6.0	-0.11	14.5	29.0
56.59	5.0E-03	0.02	34.9	0.95	7	60.5	47.3	107.8	21.4	38	52.9	1.0	-0.08	5.6	20.4
57.58	5.0E-04	0.02	14.7	1.64	6	26.7	106.7	133.4	41.2	32	30.0	1.0	-0.04	8.7	17.4
58.56	5.0E-05	0.25	7.0	2.17	4	13.8	55.3	69.1	62.0	30	30.0	3.0	0.05	5.4	10.8
59.55	5.0E-05	0.08	17.7	3.33	6	32.1	128.2	160.3	47.4	32	34.7	6.0	-0.12	12.5	25.1
60.53	5.0E-06	0.04	12.6	4.44	1	23.6	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDef
61.52	5.0E-06	0.05	12.1	4.53	1	22.7	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
62.42	5.0E-07	0.27	6.4	4.56	1	13.0	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
63.32	5.0E-05	0.09	12.0	2.83	4	22.9	91.5	114.4	53.0	30	30.0	3.0	-0.05	9.0	17.9
64.30	5.0E-05	0.15	6.4	1.96	4	13.3	53.0	66.3	62.6	30	30.0	3.0	0.05	5.2	10.4
65.29	5.0E-05	0.24	7.0	2.53	4	14.3	57.1	71.3	64.6	30	30.0	3.0	0.04	5.6	11.2
66.27	5.0E-05	0.28	8.6	2.57	4	17.1	68.4	85.5	59.6	30	30.0	3.0	0.02	6.7	13.4
67.26	5.0E-05	0.31	8.6	2.44	4	17.3	69.2	86.5	58.5	30	30.0	3.0	0.03	6.8	13.5
68.24	5.0E-05	0.33	10.6	2.54	4	20.9	83.6	104.5	54.2	30	30.0	3.0	0.01	8.2	16.4
69.22	5.0E-06	0.25	9.8	3.47	1	19.6	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
70.21	5.0E-06	0.22	6.8	3.28	1	14.4	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
71.19	5.0E-05	0.28	6.1	2.55	4	13.0	52.2	65.2	68.5	30	30.0	1.5	0.06	5.1	10.2
72.18	5.0E-05	0.35	6.6	2.22	4	14.2	56.6	70.8	63.8	30	30.0	3.0	0.07	5.5	11.1
73.16	5.0E-05	0.29	6.8	2.96	4	14.5	58.1	72.6	67.9	30	30.0	3.0	0.05	5.7	11.4
74.15	5.0E-05	0.29	7.0	2.34	4	15.0	59.9	74.9	63.1	30	30.0	3.0	0.05	5.9	11.7
75.13	5.0E-05	0.22	6.6	2.77	4	14.3	57.4	71.7	67.5	30	30.0	3.0	0.04	5.6	11.2
76.11	5.0E-06	0.28	5.9	3.38	1	13.1	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDef
77.10	5.0E-05	0.21	10.6	2.98	4	21.7	86.7	108.4	56.8	30	30.0	3.0	-0.02	8.5	17.0
78.08	5.0E-05	0.03	28.9	3.93	6	55.4	221.4	276.8	40.8	36	50.3	6.0	-0.23	21.7	43.3
79.07	5.0E-06	0.06	11.1	4.43	1	22.9	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
80.05	5.0E-05	0.16	9.8	3.02	4	20.4	81.8	102.2	58.9	30	30.0	3.0	-0.02	8.0	16.0
81.04	5.0E-06	0.15	6.6	3.50	1	14.7	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
82.02	5.0E-05	0.09	9.4	3.13	4	19.9	79.7	99.6	60.5	30	30.0	3.0	-0.03	7.8	15.6
83.00	5.0E-05	0.21	7.1	3.23	1	15.7	UnDef	UnDef	100.0	30	30.0	3.0	0.02	UnDef	UnDef
83.99	5.0E-05	0.27	8.1	2.51	4	17.6	70.4	88.0	60.7	30	30.0	3.0	0.03	6.9	13.8

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
84.97	5.0E-05	0.12	18.2	3.52	6	36.8	147.0	183.8	47.7	32	38.6	6.0	-0.12	14.4	28.8
85.96	5.0E-06	0.02	14.5	4.89	1	29.9	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDef
86.94	5.0E-06	0.27	6.6	3.32	1	15.0	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
87.93	5.0E-05	0.24	8.7	2.89	4	19.1	76.5	95.6	61.0	30	30.0	3.0	0.01	7.5	15.0
88.91	5.0E-05	0.25	10.0	3.08	4	21.7	86.7	108.3	58.7	30	30.0	3.0	-0.01	8.5	17.0
89.89	5.0E-05	0.25	8.9	2.90	4	19.6	78.3	97.9	60.6	30	30.0	3.0	0.01	7.7	15.3
90.88	5.0E-05	0.32	6.5	1.86	4	15.1	60.5	75.6	61.6	30	30.0	3.0	0.08	5.9	11.8
91.86	5.0E-05	0.37	7.9	2.30	4	17.8	71.3	89.1	59.9	30	30.0	3.0	0.05	7.0	14.0
92.85	5.0E-05	0.43	7.3	2.46	4	16.8	67.4	84.2	62.8	30	30.0	3.0	0.07	6.6	13.2
93.83	5.0E-05	0.12	14.1	2.60	6	29.9	119.7	149.6	48.3	32	32.7	6.0	-0.06	11.7	23.4
94.82	5.0E-05	0.25	7.5	2.51	4	17.3	69.3	86.6	62.4	30	30.0	3.0	0.04	6.8	13.6
95.80	5.0E-05	0.35	7.8	2.32	4	17.9	71.7	89.6	60.3	30	30.0	3.0	0.05	7.0	14.0
96.78	5.0E-04	0.14	20.7	2.16	6	43.3	173.2	216.5	38.2	34	43.3	1.0	-0.08	14.1	28.3
97.77	5.0E-04	0.00	37.8	2.60	6	76.9	168.5	245.4	30.7	38	59.7	1.0	-0.19	18.9	44.1
98.75	5.0E-05	0.10	11.2	3.36	4	24.8	99.3	124.1	57.5	30	30.0	3.0	-0.06	9.8	19.5
99.74	5.0E-04	0.20	9.4	2.12	4	21.5	85.9	107.3	54.2	30	30.0	1.0	0.01	7.1	14.1
100.72	5.0E-05	0.18	8.6	2.77	4	19.9	79.5	99.4	60.7	30	30.0	3.0	0.00	7.9	15.8
101.70	5.0E-05	0.26	8.0	2.75	4	18.8	75.3	94.1	62.2	30	30.0	3.0	0.02	7.5	15.0
102.69	5.0E-05	0.27	8.4	2.82	4	19.6	78.2	97.8	61.6	30	30.0	3.0	0.02	7.8	15.6
103.67	5.0E-05	0.32	9.2	2.27	4	21.4	85.5	106.9	55.7	30	30.0	3.0	0.03	8.6	17.1
104.66	5.0E-05	0.29	10.3	2.98	4	23.6	94.6	118.2	57.4	30	30.0	3.0	-0.01	9.5	19.0
105.64	5.0E-06	0.15	9.3	3.85	1	21.7	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
106.63	5.0E-05	0.24	7.3	2.87	4	17.6	70.5	88.1	65.6	30	30.0	3.0	0.03	7.1	14.2
107.61	5.0E-05	0.31	9.2	2.45	4	21.5	86.0	107.4	57.1	30	30.0	3.0	0.02	8.7	17.4
108.59	1.0E-15	0.05	23.3	5.70	1	50.2	UnDef	UnDef	100.0	34	47.5	1.0	-0.33	UnDef	UnDef
109.58	5.0E-06	0.18	10.7	3.78	1	24.8	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
110.56	5.0E-05	0.18	9.6	3.16	4	22.7	90.9	113.6	60.0	30	30.0	3.0	-0.02	9.3	18.6
111.55	5.0E-05	0.18	7.6	3.29	1	18.7	UnDef	UnDef	100.0	30	30.0	3.0	0.01	UnDef	UnDef
112.53	5.0E-05	0.25	6.5	3.14	1	16.4	UnDef	UnDef	100.0	30	30.0	3.0	0.04	UnDef	UnDef
113.52	5.0E-05	0.29	7.0	3.01	4	17.4	69.6	87.0	67.6	30	30.0	3.0	0.04	7.2	14.4
114.50	5.0E-05	0.28	9.5	3.26	4	22.7	90.7	113.4	61.0	30	30.0	3.0	0.00	9.4	18.8
115.48	5.0E-05	0.04	28.5	3.64	6	62.3	249.1	311.3	39.9	36	53.7	6.0	-0.21	25.8	51.7

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e
Run No: 04-0105-1555-4205
Job No: 03-399ma
Client: DELTA
Project: CPT SITE INVESTIGATION
Site: 6750 SANTA RITA
Location: CPT-02
Engineer: D. ARNOLD
CPT Date: 03/19/12
CPT Time: 09:54
CPT File: 399C02.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 12.19 (ft): 40.0
Su Nkt used: 12.50
Averaging Increment (m): 0.30
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
0.49	0.0	0.00	0.00	0.0	UnDef	124.1	0.03	0.03	0.00	2.00	UnDef	UnDef	UnDef	0.00
1.48	0.0	0.00	0.00	0.0	UnDef	124.1	0.09	0.09	0.00	2.00	UnDef	UnDef	UnDef	0.00
2.46	0.0	0.00	0.00	0.0	UnDef	124.1	0.15	0.15	0.00	2.00	UnDef	UnDef	UnDef	0.00
3.44	0.0	0.00	0.00	0.0	UnDef	124.1	0.21	0.21	0.00	2.00	UnDef	UnDef	UnDef	0.00
4.43	0.0	0.00	0.00	0.0	UnDef	124.1	0.27	0.27	0.00	1.91	UnDef	UnDef	UnDef	0.00
5.41	0.0	0.00	0.00	0.0	UnDef	124.1	0.34	0.34	0.00	1.73	UnDef	UnDef	UnDef	0.00
6.40	0.0	0.00	0.00	0.0	UnDef	124.1	0.40	0.40	0.00	1.59	UnDef	UnDef	UnDef	0.00
7.30	9.6	0.25	2.63	27.1	4	114.6	0.45	0.45	0.00	1.49	6.1	9.1	0.73	0.11
8.20	12.1	0.44	3.60	8.1	3	111.4	0.50	0.50	0.00	1.41	11.6	16.4	0.93	0.13
9.19	16.3	0.46	2.85	9.9	5	114.6	0.56	0.56	0.00	1.34	7.8	10.4	1.26	0.19
10.17	14.7	0.45	3.03	3.8	5	114.6	0.61	0.61	0.00	1.28	7.1	9.0	1.13	0.15
11.15	14.6	0.46	3.17	5.9	4	114.6	0.67	0.67	0.00	1.22	9.3	11.4	1.11	0.14
12.14	16.6	0.56	3.37	10.4	4	114.6	0.73	0.73	0.00	1.17	10.6	12.4	1.27	0.16
13.21	20.0	0.62	3.07	19.1	5	114.6	0.79	0.79	0.00	1.13	9.6	10.8	1.54	0.21

Gregg In Situ, Inc.
Run No: 04-0105-1555-4205
CPT File: 399C02.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
14.27	23.7	0.72	3.04	26.0	5	114.6	0.85	0.85	0.00	1.09	11.3	12.3	1.83	0.27
15.26	26.3	0.75	2.86	56.9	5	114.6	0.91	0.91	0.00	1.05	12.6	13.3	2.03	0.31
16.24	20.4	0.60	2.95	10.2	5	114.6	0.96	0.96	0.00	1.02	9.7	9.9	1.55	0.18
17.22	21.8	0.61	2.79	25.5	5	114.6	1.02	1.02	0.00	0.99	10.4	10.3	1.66	0.19
18.21	21.7	0.67	3.09	27.4	5	114.6	1.07	1.07	0.00	0.96	10.4	10.0	1.65	0.18
19.19	21.1	0.66	3.14	48.2	5	114.6	1.13	1.13	0.00	0.94	10.1	9.5	1.60	0.17
20.18	20.0	0.65	3.23	56.9	5	114.6	1.19	1.19	0.00	0.92	9.6	8.8	1.51	0.15
21.16	19.7	0.70	3.56	44.4	4	114.6	1.24	1.24	0.00	0.90	12.6	11.3	1.48	0.00
22.15	13.6	0.45	3.32	-0.5	4	114.6	1.30	1.30	0.00	0.88	8.7	7.6	0.98	0.00
23.13	17.1	0.48	2.80	37.3	5	114.6	1.36	1.36	0.00	0.86	8.2	7.0	1.26	0.11
24.11	19.1	0.64	3.36	61.6	5	114.6	1.41	1.41	0.00	0.84	9.1	7.7	1.42	0.00
25.10	15.2	0.38	2.47	37.9	5	114.6	1.47	1.47	0.00	0.83	7.3	6.0	1.10	0.10
26.08	13.5	0.37	2.76	56.7	5	114.6	1.53	1.53	0.00	0.81	6.5	5.2	0.96	0.09
27.07	12.6	0.33	2.65	62.6	5	114.6	1.58	1.58	0.00	0.80	6.0	4.8	0.88	0.09
28.05	13.2	0.30	2.27	79.7	5	114.6	1.64	1.64	0.00	0.78	6.3	5.0	0.93	0.09
29.04	13.7	0.35	2.57	67.8	5	114.6	1.69	1.69	0.00	0.77	6.5	5.0	0.96	0.09
30.02	17.8	0.30	1.71	87.6	6	114.6	1.75	1.75	0.00	0.76	6.8	5.2	1.29	0.11
31.00	19.2	0.33	1.73	81.4	6	114.6	1.81	1.81	0.00	0.74	7.4	5.5	1.39	0.11
31.99	19.7	0.34	1.71	116.8	6	114.6	1.86	1.86	0.00	0.73	7.5	5.5	1.43	0.11
32.97	17.5	0.32	1.81	78.2	6	114.6	1.92	1.92	0.00	0.72	6.7	4.8	1.24	0.10
33.96	18.7	0.37	2.00	99.7	6	114.6	1.98	1.98	0.00	0.71	7.2	5.1	1.34	0.11
34.94	13.8	0.42	3.05	62.7	4	114.6	2.03	2.03	0.00	0.70	8.8	6.2	0.94	0.00
35.92	12.4	0.25	2.00	69.7	5	114.6	2.09	2.09	0.00	0.69	5.9	4.1	0.83	0.09
36.91	12.3	0.28	2.24	70.5	5	114.6	2.15	2.15	0.00	0.68	5.9	4.0	0.81	0.09
37.89	14.6	0.32	2.21	116.0	5	114.6	2.20	2.20	0.00	0.67	7.0	4.7	0.99	0.09
38.88	19.0	0.46	2.42	144.7	5	114.6	2.26	2.26	0.00	0.67	9.1	6.1	1.34	0.10
39.86	19.9	0.46	2.32	127.8	5	114.6	2.31	2.31	0.00	0.66	9.5	6.3	1.41	0.10
40.85	22.9	0.51	2.22	92.4	6	114.6	2.37	2.34	0.03	0.65	8.8	5.7	1.64	0.12
41.83	17.6	0.46	2.62	130.4	5	114.6	2.43	2.37	0.06	0.65	8.4	5.5	1.21	0.00
42.81	16.2	0.40	2.50	90.1	5	114.6	2.48	2.40	0.09	0.65	7.8	5.0	1.10	0.00
43.80	16.2	0.32	1.98	128.6	5	114.6	2.54	2.42	0.12	0.64	7.7	5.0	1.09	0.09
44.78	20.1	0.35	1.72	196.0	6	114.6	2.60	2.45	0.15	0.64	7.7	4.9	1.40	0.10
45.77	18.4	0.29	1.56	183.6	6	114.6	2.65	2.47	0.18	0.64	7.1	4.5	1.26	0.10
46.75	16.5	0.17	1.02	188.7	6	114.6	2.71	2.50	0.21	0.63	6.3	4.0	1.10	0.09
47.74	22.2	0.31	1.41	238.9	6	114.6	2.77	2.52	0.24	0.63	8.5	5.3	1.55	0.11
48.72	86.9	2.14	2.46	33.2	7	117.8	2.82	2.55	0.27	0.63	27.7	17.4	UnDef	0.00

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
49.70	96.9	1.75	1.81	54.8	7	117.8	2.88	2.58	0.30	0.62	30.9	19.3	UnDef	0.37
50.69	220.1	2.16	0.98	-0.4	9	124.1	2.94	2.61	0.33	0.62	42.2	26.1	UnDef	0.00
51.67	61.9	1.09	1.76	71.8	7	117.8	3.00	2.64	0.36	0.62	19.8	12.2	UnDef	0.00
52.66	43.8	0.89	2.04	175.6	6	114.6	3.06	2.66	0.40	0.61	16.8	10.3	3.26	0.29
53.64	36.1	0.75	2.09	120.0	6	114.6	3.11	2.69	0.43	0.61	13.8	8.4	2.64	0.20
54.63	29.6	0.61	2.06	114.3	6	114.6	3.17	2.71	0.46	0.61	11.4	6.9	2.12	0.14
55.61	172.6	3.23	1.87	83.6	8	120.9	3.23	2.74	0.49	0.60	41.3	25.0	UnDef	0.00
56.59	191.7	6.03	3.15	19.6	7	117.8	3.29	2.77	0.52	0.60	61.2	36.8	UnDef	0.00
57.58	139.6	3.36	2.40	0.0	7	117.8	3.34	2.80	0.55	0.60	44.6	26.7	UnDef	0.00
58.56	51.3	2.00	3.89	22.8	5	114.6	3.40	2.82	0.58	0.60	24.6	14.6	3.83	0.00
59.55	169.6	4.41	2.60	2.3	7	117.8	3.46	2.85	0.61	0.59	54.1	32.1	UnDef	0.00
60.53	149.6	4.44	2.96	-17.1	6	114.6	3.52	2.88	0.64	0.59	57.3	33.8	11.69	0.00
61.52	35.0	0.93	2.66	59.4	6	114.6	3.57	2.90	0.67	0.59	13.4	7.9	2.51	0.17
62.42	33.3	0.92	2.78	81.2	6	114.6	3.62	2.92	0.70	0.58	12.8	7.5	2.37	0.16
63.32	25.4	0.61	2.42	118.9	6	114.6	3.68	2.95	0.73	0.58	9.7	5.7	1.74	0.12
64.30	26.3	0.56	2.14	117.5	6	114.6	3.73	2.97	0.76	0.58	10.1	5.8	1.81	0.12
65.29	30.6	0.87	2.86	191.4	5	114.6	3.79	3.00	0.79	0.58	14.6	8.5	2.14	0.14
66.27	31.2	0.89	2.86	185.6	5	114.6	3.85	3.02	0.82	0.58	14.9	8.6	2.19	0.14
67.26	37.1	1.17	3.16	214.1	5	114.6	3.90	3.05	0.85	0.57	17.7	10.2	2.65	0.00
68.24	32.9	1.22	3.69	161.7	5	114.6	3.96	3.08	0.88	0.57	15.8	9.0	2.32	0.00
69.22	30.8	0.92	3.00	178.4	5	114.6	4.01	3.10	0.91	0.57	14.7	8.4	2.14	0.00
70.21	32.2	0.96	2.99	186.5	5	114.6	4.07	3.13	0.94	0.57	15.4	8.7	2.25	0.00
71.19	30.5	0.88	2.90	205.5	5	114.6	4.13	3.15	0.97	0.56	14.6	8.2	2.11	0.00
72.18	37.1	1.36	3.68	164.4	5	114.6	4.18	3.18	1.00	0.56	17.7	10.0	2.63	0.00
73.16	23.5	0.59	2.52	135.3	5	114.6	4.24	3.20	1.04	0.56	11.2	6.3	1.54	0.00
74.15	24.9	0.64	2.59	156.2	5	114.6	4.30	3.23	1.07	0.56	11.9	6.6	1.65	0.00
75.13	25.9	0.61	2.37	205.8	6	114.6	4.35	3.26	1.10	0.55	9.9	5.5	1.72	0.11
76.11	44.9	1.07	2.38	336.4	6	114.6	4.41	3.28	1.13	0.55	17.2	9.5	3.24	0.25
77.10	76.7	2.87	3.74	135.8	5	114.6	4.47	3.31	1.16	0.55	36.7	20.2	5.78	0.00
78.08	64.0	2.13	3.32	231.6	6	114.6	4.52	3.33	1.19	0.55	24.5	13.4	4.75	0.00
79.07	49.5	1.75	3.54	156.1	5	114.6	4.58	3.36	1.22	0.55	23.7	12.9	3.60	0.00
80.05	280.8	4.56	1.62	165.7	8	120.9	4.64	3.39	1.25	0.54	67.2	36.5	UnDef	0.00
81.04	165.9	3.63	2.19	-9.4	7	117.8	4.69	3.41	1.28	0.54	53.0	28.7	UnDef	0.00
82.02	52.9	0.98	1.86	147.2	7	117.8	4.75	3.44	1.31	0.54	16.9	9.1	UnDef	0.33
83.00	63.1	1.31	2.07	113.0	7	117.8	4.81	3.47	1.34	0.54	20.2	10.8	UnDef	0.00
83.99	33.9	0.92	2.72	60.9	6	114.6	4.87	3.49	1.37	0.53	13.0	6.9	2.32	0.15

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
84.97	30.0	0.69	2.31	94.0	6	114.6	4.92	3.52	1.40	0.53	11.5	6.1	2.00	0.12
85.96	31.4	0.62	1.99	159.2	6	114.6	4.98	3.55	1.43	0.53	12.0	6.4	2.11	0.13
86.94	38.9	0.75	1.93	208.4	6	114.6	5.04	3.57	1.47	0.53	14.9	7.9	2.71	0.18
87.93	38.1	0.94	2.48	243.8	6	114.6	5.09	3.60	1.50	0.53	14.6	7.7	2.64	0.17
88.91	36.0	1.01	2.80	247.2	6	114.6	5.15	3.62	1.53	0.53	13.8	7.2	2.47	0.00
89.89	37.8	0.86	2.27	290.1	6	114.6	5.21	3.65	1.56	0.52	14.5	7.6	2.61	0.16
90.88	35.4	0.83	2.34	250.2	6	114.6	5.26	3.67	1.59	0.52	13.6	7.1	2.41	0.15
91.86	43.6	1.02	2.34	383.2	6	114.6	5.32	3.70	1.62	0.52	16.7	8.7	3.06	0.21
92.85	36.7	0.76	2.06	347.4	6	114.6	5.38	3.73	1.65	0.52	14.1	7.3	2.51	0.16
93.83	38.5	0.70	1.81	395.2	6	114.6	5.43	3.75	1.68	0.52	14.8	7.6	2.65	0.17
94.82	54.3	1.38	2.55	400.1	6	114.6	5.49	3.78	1.71	0.51	20.8	10.7	3.90	0.32
95.80	53.1	1.23	2.32	440.7	6	114.6	5.54	3.80	1.74	0.51	20.4	10.4	3.81	0.30
96.78	37.8	1.24	3.29	295.3	5	114.6	5.60	3.83	1.77	0.51	18.1	9.2	2.57	0.00
97.77	34.1	0.82	2.41	348.6	6	114.6	5.66	3.85	1.80	0.51	13.1	6.7	2.28	0.14
98.75	131.0	3.20	2.44	400.0	7	117.8	5.71	3.88	1.83	0.51	41.8	21.2	UnDef	0.00
99.74	396.7	6.87	1.73	-10.3	8	120.9	5.77	3.91	1.87	0.51	95.0	48.1	UnDef	0.00
100.72	225.1	4.07	1.81	-7.2	8	120.9	5.83	3.94	1.90	0.50	53.9	27.2	UnDef	0.00
101.70	80.6	2.79	3.47	86.7	6	114.6	5.89	3.96	1.93	0.50	30.9	15.5	5.98	0.00
102.69	42.5	0.49	1.15	293.9	7	117.8	5.95	3.99	1.96	0.50	13.6	6.8	UnDef	0.18
103.67	44.5	0.57	1.28	382.2	7	117.8	6.01	4.02	1.99	0.50	14.2	7.1	UnDef	0.20

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e
Run No: 04-0105-1555-4205
Job No: 03-399ma
Client: DELTA
Project: CPT SITE INVESTIGATION
Site: 6750 SANTA RITA
Location: CPT-02
Engineer: D. ARNOLD
CPT Date: 03/19/12
CPT Time: 09:54
CPT File: 399C02.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 12.19 (ft): 40.0
Su Nkt used: 12.50
Averaging Increment (m): 0.30
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
0.49	1.0E-15	0.00	2.4	0.10	1	0.2	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDef
1.48	1.0E-15	0.00	0.1	0.10	1	0.2	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDef
2.46	1.0E-15	0.00	0.1	0.10	1	0.2	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDef
3.44	1.0E-15	0.00	0.0	0.10	1	0.2	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDef
4.43	1.0E-15	0.00	0.0	0.10	1	0.2	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDef
5.41	1.0E-15	0.00	0.0	0.10	1	0.2	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDef
6.40	1.0E-15	0.00	0.0	0.10	1	0.2	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDef
7.30	5.0E-07	0.09	20.3	2.76	6	14.0	55.9	69.9	41.9	UnDef	UnDef	6.0	UnDef	9.1	18.2
8.20	5.0E-08	0.02	23.1	3.75	6	16.7	67.0	83.7	44.1	UnDef	UnDef	6.0	UnDef	16.4	32.8
9.19	5.0E-06	0.02	28.2	2.95	6	21.3	85.2	106.5	37.0	UnDef	UnDef	6.0	UnDef	10.4	20.9
10.17	5.0E-06	0.01	23.0	3.16	6	18.4	73.7	92.1	41.5	UnDef	UnDef	6.0	UnDef	9.0	18.0
11.15	5.0E-07	0.01	20.8	3.32	6	17.4	69.8	87.2	44.2	UnDef	UnDef	6.0	UnDef	11.4	22.8
12.14	5.0E-07	0.02	21.9	3.52	6	19.1	76.3	95.4	44.2	UnDef	UnDef	6.0	UnDef	12.4	24.9
13.21	5.0E-06	0.03	24.4	3.20	6	22.1	88.4	110.5	40.6	UnDef	UnDef	6.0	UnDef	10.8	21.6

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
14.27	5.0E-06	0.04	26.9	3.15	6	25.2	100.7	125.9	38.7	UnDef	UnDef	6.0	UnDef	12.3	24.6
15.26	5.0E-06	0.07	28.1	2.96	6	27.1	108.3	135.4	37.1	UnDef	UnDef	6.0	UnDef	13.3	26.5
16.24	5.0E-06	0.02	20.2	3.09	6	20.3	81.3	101.6	43.7	UnDef	UnDef	6.0	UnDef	9.9	19.9
17.22	5.0E-06	0.04	20.4	2.93	6	21.1	84.5	105.7	42.7	UnDef	UnDef	6.0	UnDef	10.3	20.7
18.21	5.0E-06	0.04	19.2	3.25	6	20.5	81.9	102.4	45.4	UnDef	UnDef	6.0	UnDef	10.0	20.0
19.19	5.0E-06	0.08	17.7	3.32	6	19.4	77.7	97.1	47.4	UnDef	UnDef	6.0	UnDef	9.5	19.0
20.18	5.0E-06	0.09	15.9	3.43	4	18.0	71.9	89.9	50.1	UnDef	UnDef	6.0	UnDef	8.8	17.6
21.16	5.0E-07	0.07	14.9	3.80	1	17.3	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDef
22.15	5.0E-07	0.00	9.4	3.68	1	11.7	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
23.13	5.0E-06	0.07	11.6	3.04	4	14.3	57.4	71.7	55.0	UnDef	UnDef	3.0	UnDef	7.0	14.0
24.11	5.0E-06	0.11	12.5	3.63	1	15.7	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDef
25.10	5.0E-06	0.09	9.4	2.74	4	12.3	49.1	61.4	58.4	UnDef	UnDef	3.0	UnDef	6.0	12.0
26.08	5.0E-06	0.15	7.8	3.11	4	10.7	42.8	53.4	65.0	UnDef	UnDef	3.0	UnDef	5.2	10.5
27.07	5.0E-06	0.18	6.9	3.03	4	9.8	39.1	48.9	67.7	UnDef	UnDef	3.0	UnDef	4.8	9.6
28.05	5.0E-06	0.21	7.1	2.59	4	10.1	40.5	50.6	64.6	UnDef	UnDef	3.0	UnDef	5.0	9.9
29.04	5.0E-06	0.18	7.1	2.93	4	10.3	41.1	51.3	66.7	UnDef	UnDef	3.0	UnDef	5.0	10.0
30.02	5.0E-05	0.17	9.2	1.89	6	13.2	52.7	65.9	53.3	30	30.0	3.0	0.02	5.2	10.3
31.00	5.0E-05	0.15	9.6	1.91	6	14.0	56.0	70.0	52.2	30	30.0	3.0	0.01	5.5	11.0
31.99	5.0E-05	0.20	9.6	1.88	6	14.1	56.5	70.6	52.2	30	30.0	3.0	0.02	5.5	11.1
32.97	5.0E-05	0.16	8.1	2.03	4	12.3	49.3	61.6	57.4	30	30.0	3.0	0.03	4.8	9.7
33.96	5.0E-05	0.19	8.5	2.24	4	13.0	52.0	65.1	57.7	30	30.0	3.0	0.02	5.1	10.2
34.94	5.0E-07	0.17	5.8	3.58	1	9.5	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDef
35.92	5.0E-06	0.21	4.9	2.41	4	8.4	33.6	42.0	73.4	UnDef	UnDef	1.5	UnDef	4.1	8.2
36.91	5.0E-06	0.22	4.7	2.72	4	8.2	32.9	41.1	76.8	UnDef	UnDef	1.5	UnDef	4.0	8.0
37.89	5.0E-06	0.29	5.6	2.60	4	9.6	38.5	48.2	70.9	UnDef	UnDef	1.5	UnDef	4.7	9.4
38.88	5.0E-06	0.27	7.4	2.75	4	12.4	49.5	61.8	64.3	UnDef	UnDef	3.0	UnDef	6.1	12.1
39.86	5.0E-06	0.23	7.6	2.63	4	12.8	51.2	64.0	63.0	UnDef	UnDef	3.0	UnDef	6.3	12.5
40.85	5.0E-05	0.14	8.8	2.47	4	14.6	58.5	73.2	58.4	30	30.0	3.0	0.00	5.7	11.5
41.83	5.0E-06	0.27	6.4	3.04	1	11.2	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
42.81	5.0E-06	0.20	5.7	2.95	1	10.2	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDef
43.80	5.0E-06	0.29	5.6	2.35	4	10.2	40.7	50.8	69.3	UnDef	UnDef	1.5	UnDef	5.0	10.0
44.78	5.0E-05	0.34	7.2	1.98	4	12.6	50.4	63.0	60.0	30	30.0	3.0	0.07	4.9	9.9
45.77	5.0E-05	0.35	6.4	1.82	4	11.5	45.9	57.4	61.8	30	30.0	3.0	0.08	4.5	9.0
46.75	5.0E-05	0.41	5.5	1.22	4	10.2	40.7	50.9	60.2	30	30.0	1.5	0.13	4.0	8.0
47.74	5.0E-05	0.37	7.7	1.61	6	13.7	54.6	68.3	55.3	30	30.0	3.0	0.07	5.3	10.7
48.72	5.0E-04	0.01	33.0	2.54	6	53.3	146.8	200.1	32.5	36	49.2	1.0	-0.17	14.7	32.1

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	QclN	DeltaQclN	QclNcs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
49.70	5.0E-04	0.01	36.5	1.86	7	59.1	86.7	145.7	27.3	38	52.2	1.0	-0.15	11.4	30.7
50.69	5.0E-02	0.00	83.3	0.99	9	133.4	31.5	164.9	12.1	42	75.5	1.0	-0.17	3.5	29.7
51.67	5.0E-04	0.03	22.3	1.85	6	37.3	147.5	184.8	34.9	34	39.0	1.0	-0.09	12.1	24.3
52.66	5.0E-05	0.12	15.3	2.19	6	26.3	105.1	131.3	44.2	32	30.0	6.0	-0.05	10.3	20.6
53.64	5.0E-05	0.10	12.3	2.29	6	21.5	86.1	107.7	49.4	30	30.0	3.0	-0.04	8.4	16.9
54.63	5.0E-05	0.12	9.8	2.31	4	17.6	70.4	88.0	54.7	30	30.0	3.0	-0.01	6.9	13.8
55.61	5.0E-03	0.01	61.8	1.91	7	102.0	74.2	176.3	20.8	40	67.9	1.0	-0.21	8.9	33.9
56.59	5.0E-04	0.00	68.0	3.20	7	112.7	137.0	249.7	25.5	40	70.7	1.0	-0.30	19.2	56.0
57.58	5.0E-04	0.00	48.7	2.46	7	81.7	110.4	192.1	26.5	38	61.5	1.0	-0.21	15.0	41.6
58.56	5.0E-06	0.00	17.0	4.17	1	29.9	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDef
59.55	5.0E-04	0.00	58.3	2.65	7	98.3	114.1	212.4	25.1	40	66.8	1.0	-0.25	16.2	48.3
60.53	5.0E-05	-0.01	50.8	3.04	6	86.4	146.4	232.7	28.6	38	63.1	10.0	-0.25	21.9	55.7
61.52	5.0E-05	0.04	10.8	2.96	4	20.1	80.4	100.5	56.2	30	30.0	3.0	-0.05	7.9	15.7
62.42	5.0E-05	0.06	10.1	3.11	4	19.1	76.2	95.3	58.5	30	30.0	3.0	-0.04	7.5	14.9
63.32	5.0E-05	0.14	7.4	2.83	4	14.5	57.8	72.3	65.0	30	30.0	3.0	0.02	5.7	11.3
64.30	5.0E-05	0.13	7.6	2.49	4	14.9	59.8	74.7	62.1	30	30.0	3.0	0.02	5.8	11.7
65.29	5.0E-06	0.19	8.9	3.26	4	17.3	69.1	86.4	62.5	UnDef	UnDef	3.0	UnDef	8.5	16.9
66.27	5.0E-06	0.18	9.0	3.26	4	17.6	70.2	87.8	62.2	UnDef	UnDef	3.0	UnDef	8.6	17.2
67.26	5.0E-06	0.18	10.9	3.53	1	20.8	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
68.24	5.0E-06	0.14	9.4	4.20	1	18.4	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
69.22	5.0E-06	0.17	8.6	3.45	1	17.1	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
70.21	5.0E-06	0.17	9.0	3.43	1	17.8	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
71.19	5.0E-06	0.21	8.4	3.35	1	16.8	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
72.18	5.0E-06	0.13	10.3	4.15	1	20.3	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
73.16	5.0E-06	0.17	6.0	3.08	1	12.8	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDef
74.15	5.0E-06	0.18	6.4	3.13	1	13.6	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
75.13	5.0E-05	0.25	6.6	2.85	4	14.0	56.1	70.1	68.0	30	30.0	3.0	0.05	5.5	11.0
76.11	5.0E-05	0.23	12.3	2.64	6	24.3	97.0	121.3	51.4	30	30.0	3.0	-0.03	9.5	19.0
77.10	5.0E-06	0.04	21.8	3.97	4	41.3	165.1	206.4	46.1	UnDef	UnDef	6.0	UnDef	20.2	40.4
78.08	5.0E-05	0.10	17.8	3.58	4	34.3	137.1	171.4	48.4	32	36.6	6.0	-0.13	13.4	26.8
79.07	5.0E-06	0.08	13.4	3.90	1	26.5	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDef
80.05	5.0E-03	0.01	81.6	1.65	7	149.3	65.6	214.9	16.4	42	78.8	1.0	-0.22	8.6	45.2
81.04	5.0E-04	-0.01	47.2	2.25	7	87.9	110.7	198.6	25.9	38	63.6	1.0	-0.20	15.3	44.0
82.02	5.0E-04	0.07	14.0	2.04	6	27.9	111.6	139.5	45.0	32	30.7	1.0	-0.05	9.1	18.2
83.00	5.0E-04	0.04	16.8	2.24	6	33.2	132.7	165.9	42.6	32	35.6	1.0	-0.08	10.8	21.6
83.99	5.0E-05	0.02	8.3	3.18	4	17.7	71.0	88.7	63.9	30	30.0	3.0	-0.02	6.9	13.9

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
84.97	5.0E-05	0.06	7.1	2.76	4	15.6	62.6	78.2	65.5	30	30.0	3.0	0.01	6.1	12.2
85.96	5.0E-05	0.13	7.5	2.36	4	16.3	65.3	81.6	61.8	30	30.0	3.0	0.02	6.4	12.8
86.94	5.0E-05	0.15	9.5	2.22	4	20.1	80.6	100.7	54.8	30	30.0	3.0	0.00	7.9	15.8
87.93	5.0E-05	0.19	9.2	2.86	4	19.7	78.7	98.3	59.6	30	30.0	3.0	-0.01	7.7	15.4
88.91	5.0E-05	0.20	8.5	3.26	1	18.5	UnDef	UnDef	100.0	30	30.0	3.0	0.00	UnDef	UnDef
89.89	5.0E-05	0.23	8.9	2.64	4	19.4	77.4	96.8	58.9	30	30.0	3.0	0.01	7.6	15.2
90.88	5.0E-05	0.21	8.2	2.75	4	18.1	72.3	90.4	61.7	30	30.0	3.0	0.01	7.1	14.2
91.86	5.0E-05	0.27	10.4	2.67	4	22.2	88.8	111.0	55.5	30	30.0	3.0	0.00	8.7	17.4
92.85	5.0E-05	0.29	8.4	2.41	4	18.6	74.5	93.1	59.0	30	30.0	3.0	0.03	7.3	14.6
93.83	5.0E-05	0.32	8.8	2.11	4	19.5	77.9	97.3	55.8	30	30.0	3.0	0.04	7.6	15.2
94.82	5.0E-05	0.22	12.9	2.84	4	27.3	109.3	136.7	51.5	32	30.1	6.0	-0.04	10.7	21.4
95.80	5.0E-05	0.25	12.5	2.59	6	26.7	106.7	133.3	50.8	30	30.0	6.0	-0.03	10.4	20.9
96.78	5.0E-06	0.23	8.4	3.86	1	18.9	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
97.77	5.0E-05	0.32	7.4	2.89	4	17.0	68.0	85.0	65.3	30	30.0	3.0	0.04	6.7	13.3
98.75	5.0E-04	0.09	32.3	2.55	6	65.1	189.5	254.6	32.9	36	55.0	1.0	-0.16	18.5	39.7
99.74	5.0E-03	-0.01	100.0	1.76	7	196.4	72.2	268.6	15.1	42	86.6	1.0	-0.25	9.7	57.8
100.72	5.0E-03	-0.01	55.7	1.86	7	111.0	89.4	200.4	21.7	40	70.3	1.0	-0.19	10.5	37.7
101.70	5.0E-05	0.01	18.8	3.74	4	39.6	158.5	198.1	48.0	32	40.7	6.0	-0.16	15.5	31.0
102.69	5.0E-04	0.20	9.2	1.34	6	20.8	83.2	104.0	48.8	30	30.0	1.0	0.04	6.8	13.6
103.67	5.0E-04	0.26	9.6	1.48	6	21.7	86.9	108.6	49.0	30	30.0	1.0	0.04	7.1	14.2

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e
Run No: 04-0105-1555-4259
Job No: 03-399ma
Client: DELTA
Project: CPT SITE INVESTIGATION
Site: 6750 SANTA RITA
Location: CPT-03
Engineer: D. ARNOLD
CPT Date: 03/18/12
CPT Time: 14:13
CPT File: 399C03.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 14.33 (ft): 47.0
Su Nkt used: 12.50
Averaging Increment (m): 0.30
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
0.49	0.0	0.00	0.00	0.0	UnDef	124.1	0.03	0.03	0.00	2.00	UnDef	UnDef	UnDef	0.00
1.48	0.0	0.00	0.00	0.0	UnDef	124.1	0.09	0.09	0.00	2.00	UnDef	UnDef	UnDef	0.00
2.46	0.0	0.00	0.00	0.0	UnDef	124.1	0.15	0.15	0.00	2.00	UnDef	UnDef	UnDef	0.00
3.44	0.0	0.00	0.00	0.0	UnDef	124.1	0.21	0.21	0.00	2.00	UnDef	UnDef	UnDef	0.00
4.43	0.0	0.00	0.00	0.0	UnDef	124.1	0.27	0.27	0.00	1.91	UnDef	UnDef	UnDef	0.00
5.41	0.0	0.00	0.00	0.0	UnDef	124.1	0.34	0.34	0.00	1.73	UnDef	UnDef	UnDef	0.00
6.40	0.0	0.00	0.00	0.0	UnDef	124.1	0.40	0.40	0.00	1.59	UnDef	UnDef	UnDef	0.00
7.30	12.7	0.33	2.61	13.3	5	114.6	0.45	0.45	0.00	1.49	6.1	9.0	0.98	0.15
8.20	6.1	0.18	2.95	0.7	3	111.4	0.50	0.50	0.00	1.41	5.9	8.3	0.45	0.09
9.19	10.0	0.25	2.50	23.8	5	114.6	0.56	0.56	0.00	1.34	4.8	6.4	0.76	0.11
10.17	13.3	0.38	2.83	25.0	5	114.6	0.61	0.61	0.00	1.28	6.4	8.1	1.01	0.13
11.15	17.2	0.46	2.66	29.0	5	114.6	0.67	0.67	0.00	1.22	8.2	10.1	1.32	0.18
12.14	21.0	0.63	2.99	27.2	5	114.6	0.73	0.73	0.00	1.17	10.1	11.8	1.62	0.24
13.21	21.8	0.61	2.82	29.7	5	114.6	0.79	0.79	0.00	1.13	10.4	11.7	1.68	0.24

Gregg In Situ, Inc.
Run No: 04-0105-1555-4259
CPT File: 399C03.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
14.27	23.8	0.59	2.48	31.0	6	114.6	0.85	0.85	0.00	1.09	9.1	9.9	1.83	0.27
15.26	16.5	0.37	2.27	28.7	5	114.6	0.91	0.91	0.00	1.05	7.9	8.3	1.25	0.14
16.24	20.0	0.59	2.95	35.6	5	114.6	0.96	0.96	0.00	1.02	9.6	9.7	1.52	0.17
17.22	18.5	0.60	3.24	18.2	5	114.6	1.02	1.02	0.00	0.99	8.9	8.8	1.40	0.15
18.21	18.1	0.65	3.60	20.1	4	114.6	1.07	1.07	0.00	0.96	11.5	11.1	1.36	0.00
19.19	18.1	0.70	3.89	22.8	4	114.6	1.13	1.13	0.00	0.94	11.6	10.9	1.36	0.00
20.18	17.6	0.66	3.76	22.0	4	114.6	1.19	1.19	0.00	0.92	11.3	10.3	1.32	0.00
21.16	14.1	0.43	3.08	22.1	4	114.6	1.24	1.24	0.00	0.90	9.0	8.0	1.02	0.10
22.15	18.3	0.65	3.56	57.7	4	114.6	1.30	1.30	0.00	0.88	11.7	10.2	1.36	0.00
23.13	21.6	0.77	3.59	53.9	4	114.6	1.36	1.36	0.00	0.86	13.8	11.8	1.62	0.00
24.11	17.6	0.56	3.19	18.0	5	114.6	1.41	1.41	0.00	0.84	8.4	7.1	1.29	0.12
25.10	12.4	0.25	2.00	44.7	5	114.6	1.47	1.47	0.00	0.83	6.0	4.9	0.88	0.09
26.08	12.7	0.26	2.06	72.6	5	114.6	1.53	1.53	0.00	0.81	6.1	4.9	0.89	0.09
27.07	14.0	0.40	2.84	66.9	5	114.6	1.58	1.58	0.00	0.80	6.7	5.3	0.99	0.00
28.05	22.0	0.61	2.76	56.2	5	114.6	1.64	1.64	0.00	0.78	10.6	8.2	1.63	0.14
29.04	54.6	1.71	3.14	20.3	6	114.6	1.69	1.69	0.00	0.77	20.9	16.1	4.23	0.00
30.02	29.1	1.04	3.56	37.3	5	114.6	1.75	1.75	0.00	0.76	13.9	10.5	2.19	0.20
31.00	30.2	1.04	3.45	21.7	5	114.6	1.81	1.81	0.00	0.74	14.5	10.8	2.27	0.20
31.99	26.8	0.69	2.56	32.0	6	114.6	1.86	1.86	0.00	0.73	10.3	7.5	1.99	0.16
32.97	14.7	0.40	2.72	42.2	5	114.6	1.92	1.92	0.00	0.72	7.0	5.1	1.02	0.00
33.96	16.4	0.44	2.65	62.6	5	114.6	1.98	1.98	0.00	0.71	7.9	5.6	1.16	0.10
34.94	12.3	0.33	2.68	55.1	5	114.6	2.03	2.03	0.00	0.70	5.9	4.1	0.82	0.00
35.92	12.9	0.31	2.37	68.1	5	114.6	2.09	2.09	0.00	0.69	6.2	4.3	0.86	0.09
36.91	15.6	0.51	3.28	78.3	4	114.6	2.15	2.15	0.00	0.68	10.0	6.8	1.08	0.00
37.89	17.7	0.36	2.06	124.9	6	114.6	2.20	2.20	0.00	0.67	6.8	4.6	1.24	0.10
38.88	15.8	0.36	2.30	127.2	5	114.6	2.26	2.26	0.00	0.67	7.6	5.0	1.08	0.09
39.86	14.0	0.30	2.11	115.8	5	114.6	2.31	2.31	0.00	0.66	6.7	4.4	0.93	0.09
40.85	15.3	0.42	2.76	97.1	5	114.6	2.37	2.37	0.00	0.65	7.3	4.8	1.03	0.00
41.83	13.7	0.28	2.08	132.8	5	114.6	2.43	2.43	0.00	0.64	6.5	4.2	0.90	0.09
42.81	18.9	0.38	2.01	178.7	6	114.6	2.48	2.48	0.00	0.63	7.3	4.6	1.32	0.10
43.80	15.6	0.33	2.13	146.7	5	114.6	2.54	2.54	0.00	0.63	7.5	4.7	1.04	0.09
44.78	16.2	0.28	1.74	163.4	6	114.6	2.60	2.60	0.00	0.62	6.2	3.9	1.09	0.09
45.77	60.0	1.00	1.67	153.6	7	117.8	2.65	2.65	0.00	0.61	19.1	11.7	UnDef	0.00
46.75	271.0	1.47	0.54	-5.7	9	124.1	2.71	2.71	0.00	0.61	51.9	31.5	UnDef	0.00
47.74	289.4	2.66	0.92	-11.2	9	124.1	2.77	2.75	0.02	0.60	55.4	33.4	UnDef	0.00
48.72	249.4	2.55	1.02	-11.0	9	124.1	2.84	2.78	0.05	0.60	47.8	28.6	UnDef	0.00

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
49.70	137.4	2.48	1.80	28.7	7	117.8	2.90	2.81	0.08	0.60	43.9	26.2	UnDef	0.45
50.69	240.4	2.05	0.85	-12.4	9	124.1	2.95	2.84	0.12	0.59	46.1	27.3	UnDef	0.00
51.67	211.2	2.21	1.05	-13.1	9	124.1	3.02	2.87	0.15	0.59	40.5	23.9	UnDef	0.00
52.66	213.0	3.23	1.52	-15.1	8	120.9	3.08	2.90	0.18	0.59	51.0	29.9	UnDef	0.00
53.64	53.9	1.49	2.76	42.2	6	114.6	3.13	2.93	0.21	0.58	20.6	12.1	4.06	0.42
54.63	118.5	2.20	1.85	30.5	7	117.8	3.19	2.95	0.24	0.58	37.8	22.0	UnDef	0.45
55.61	109.6	2.87	2.62	23.7	7	117.8	3.25	2.98	0.27	0.58	35.0	20.3	UnDef	0.00
56.59	224.5	4.43	1.97	-12.6	8	120.9	3.31	3.01	0.30	0.58	53.7	31.0	UnDef	0.00
57.58	130.1	3.62	2.78	-6.1	7	117.8	3.37	3.04	0.33	0.57	41.5	23.8	UnDef	0.00
58.56	117.7	3.11	2.64	43.6	7	117.8	3.42	3.06	0.36	0.57	37.6	21.5	UnDef	0.00
59.55	134.0	3.33	2.48	-3.0	7	117.8	3.48	3.09	0.39	0.57	42.8	24.3	UnDef	0.00
60.53	85.8	2.69	3.13	182.9	6	114.6	3.54	3.12	0.42	0.57	32.9	18.6	6.58	0.00
61.52	34.9	0.96	2.74	91.1	6	114.6	3.60	3.14	0.45	0.56	13.4	7.5	2.50	0.16
62.42	24.8	0.46	1.85	173.6	6	114.6	3.65	3.17	0.48	0.56	9.5	5.3	1.69	0.11
63.32	22.4	0.43	1.92	175.8	6	114.6	3.70	3.19	0.51	0.56	8.6	4.8	1.49	0.10
64.30	24.8	0.55	2.20	203.5	6	114.6	3.76	3.22	0.54	0.56	9.5	5.3	1.68	0.11
65.29	28.6	0.76	2.67	245.3	5	114.6	3.81	3.24	0.57	0.56	13.7	7.6	1.98	0.12
66.27	33.7	0.85	2.53	331.2	6	114.6	3.87	3.27	0.60	0.55	12.9	7.1	2.39	0.15
67.26	37.6	0.80	2.13	407.8	6	114.6	3.93	3.29	0.63	0.55	14.4	7.9	2.69	0.18
68.24	37.6	0.95	2.52	390.1	6	114.6	3.98	3.32	0.66	0.55	14.4	7.9	2.69	0.18
69.22	33.8	0.96	2.82	323.8	5	114.6	4.04	3.34	0.69	0.55	16.2	8.9	2.38	0.15
70.21	25.7	0.67	2.61	239.5	5	114.6	4.09	3.37	0.72	0.54	12.3	6.7	1.73	0.00
71.19	23.3	0.59	2.55	229.1	5	114.6	4.15	3.40	0.76	0.54	11.1	6.0	1.53	0.00
72.18	23.9	0.47	1.99	251.6	6	114.6	4.21	3.42	0.79	0.54	9.1	4.9	1.57	0.10
73.16	21.6	0.44	2.03	288.1	6	114.6	4.26	3.45	0.82	0.54	8.3	4.5	1.39	0.10
74.15	28.0	0.56	2.00	341.4	6	114.6	4.32	3.47	0.85	0.54	10.7	5.8	1.90	0.12
75.13	26.4	0.54	2.06	331.8	6	114.6	4.38	3.50	0.88	0.53	10.1	5.4	1.76	0.11
76.11	25.9	0.67	2.58	315.9	6	114.6	4.43	3.52	0.91	0.53	9.9	5.3	1.72	0.00
77.10	94.6	3.06	3.24	299.8	6	114.6	4.49	3.55	0.94	0.53	36.2	19.2	7.21	0.00
78.08	123.6	4.44	3.59	190.9	6	114.6	4.55	3.57	0.97	0.53	47.3	25.0	9.52	0.00
79.07	49.1	1.33	2.71	244.2	6	114.6	4.60	3.60	1.00	0.53	18.8	9.9	3.56	0.27
80.05	55.1	1.54	2.80	248.6	6	114.6	4.66	3.63	1.03	0.53	21.1	11.1	4.04	0.34
81.04	39.1	1.25	3.18	152.2	5	114.6	4.71	3.65	1.06	0.52	18.7	9.8	2.75	0.00
82.02	27.2	0.69	2.54	218.4	6	114.6	4.77	3.68	1.09	0.52	10.4	5.4	1.80	0.00
83.00	28.9	0.59	2.05	282.2	6	114.6	4.83	3.70	1.12	0.52	11.1	5.8	1.92	0.12
83.99	29.5	0.68	2.30	286.4	6	114.6	4.88	3.73	1.15	0.52	11.3	5.9	1.97	0.12

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
84.97	34.7	0.81	2.33	358.2	6	114.6	4.94	3.75	1.19	0.52	13.3	6.9	2.38	0.14
85.96	32.3	0.98	3.03	278.5	5	114.6	5.00	3.78	1.22	0.51	15.5	7.9	2.18	0.00
86.94	36.4	1.15	3.15	292.9	5	114.6	5.05	3.81	1.25	0.51	17.4	8.9	2.51	0.00
87.93	40.1	0.79	1.96	312.0	6	114.6	5.11	3.83	1.28	0.51	15.4	7.9	2.80	0.17
88.91	38.4	0.97	2.52	335.8	6	114.6	5.17	3.86	1.31	0.51	14.7	7.5	2.66	0.16
89.89	42.0	1.16	2.76	359.4	6	114.6	5.22	3.88	1.34	0.51	16.1	8.2	2.94	0.19
90.88	37.9	0.82	2.15	382.0	6	114.6	5.28	3.91	1.37	0.51	14.5	7.4	2.61	0.16
91.86	40.1	0.88	2.19	431.0	6	114.6	5.33	3.93	1.40	0.50	15.4	7.7	2.78	0.17
92.85	38.5	0.85	2.22	414.5	6	114.6	5.39	3.96	1.43	0.50	14.7	7.4	2.65	0.16
93.83	46.9	1.25	2.66	342.0	6	114.6	5.45	3.99	1.46	0.50	18.0	9.0	3.31	0.22
94.82	33.4	0.77	2.32	392.8	6	114.6	5.50	4.01	1.49	0.50	12.8	6.4	2.23	0.13
95.80	33.1	0.84	2.55	381.4	6	114.6	5.56	4.04	1.52	0.50	12.7	6.3	2.21	0.00
96.78	64.4	1.96	3.05	492.9	6	114.6	5.62	4.06	1.55	0.50	24.7	12.3	4.70	0.43
97.77	271.8	4.16	1.53	-3.6	8	120.9	5.67	4.09	1.59	0.50	65.1	32.5	UnDef	0.00
98.75	130.9	5.33	4.07	22.4	11	130.5	5.74	4.12	1.62	0.50	125.4	62.7	UnDef	0.00
99.74	53.6	1.55	2.90	188.5	6	114.6	5.80	4.15	1.65	0.50	20.5	10.3	3.82	0.28
100.72	42.5	0.81	1.90	240.8	6	114.6	5.85	4.18	1.68	0.50	16.3	8.1	2.93	0.18
101.70	39.4	0.85	2.17	320.2	6	114.6	5.91	4.20	1.71	0.50	15.1	7.5	2.68	0.16
102.69	37.8	0.74	1.95	371.3	6	114.6	5.97	4.23	1.74	0.50	14.5	7.2	2.54	0.15

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e
Run No: 04-0105-1555-4259
Job No: 03-399ma
Client: DELTA
Project: CPT SITE INVESTIGATION
Site: 6750 SANTA RITA
Location: CPT-03
Engineer: D. ARNOLD
CPT Date: 03/18/12
CPT Time: 14:13
CPT File: 399C03.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 14.33 (ft): 47.0
Su Nkt used: 12.50
Averaging Increment (m): 0.30
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
0.49	1.0E-15	0.00	2.4	0.10	1	0.2	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDef
1.48	1.0E-15	0.00	0.1	0.10	1	0.2	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDef
2.46	1.0E-15	0.00	0.1	0.10	1	0.2	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDef
3.44	1.0E-15	0.00	0.0	0.10	1	0.2	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDef
4.43	1.0E-15	0.00	0.0	0.10	1	0.2	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDef
5.41	1.0E-15	0.00	0.0	0.10	1	0.2	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDef
6.40	1.0E-15	0.00	0.0	0.10	1	0.2	UnDef	UnDef	100.0	UnDef	UnDef	1.0	UnDef	UnDef	UnDef
7.30	5.0E-06	0.03	27.1	2.70	6	18.5	73.9	92.4	36.5	UnDef	UnDef	6.0	UnDef	9.0	18.1
8.20	5.0E-08	0.00	11.2	3.21	4	8.5	33.8	42.3	56.7	UnDef	UnDef	3.0	UnDef	8.3	16.6
9.19	5.0E-06	0.08	17.0	2.65	6	13.1	52.5	65.7	44.7	UnDef	UnDef	6.0	UnDef	6.4	12.9
10.17	5.0E-06	0.06	20.6	2.97	6	16.6	66.3	82.9	42.7	UnDef	UnDef	6.0	UnDef	8.1	16.2
11.15	5.0E-06	0.05	24.7	2.77	6	20.6	82.3	102.9	38.4	UnDef	UnDef	6.0	UnDef	10.1	20.1
12.14	5.0E-06	0.04	27.9	3.09	6	24.2	96.6	120.8	37.8	UnDef	UnDef	6.0	UnDef	11.8	23.6
13.21	5.0E-06	0.04	26.6	2.93	6	24.0	96.0	120.0	37.9	UnDef	UnDef	6.0	UnDef	11.7	23.5

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	QclN	DeltaQclN	QclNcs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(N1)60	(N1)60cs
14.27	5.0E-05	0.04	27.0	2.57	6	25.2	100.9	126.2	35.8	36	30.0	6.0	-0.14	9.9	19.8
15.26	5.0E-06	0.06	17.2	2.40	6	16.9	67.8	84.7	43.1	UnDef	UnDef	6.0	UnDef	8.3	16.6
16.24	5.0E-06	0.06	19.7	3.10	6	19.9	79.6	99.5	44.1	UnDef	UnDef	6.0	UnDef	9.7	19.5
17.22	5.0E-06	0.03	17.2	3.43	4	17.9	71.8	89.7	48.5	UnDef	UnDef	6.0	UnDef	8.8	17.6
18.21	5.0E-07	0.04	15.8	3.83	1	17.0	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDef
19.19	5.0E-07	0.04	15.0	4.14	1	16.7	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDef
20.18	5.0E-07	0.04	13.8	4.03	1	15.8	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDef
21.16	5.0E-07	0.05	10.3	3.38	4	12.3	49.3	61.6	59.6	UnDef	UnDef	3.0	UnDef	8.0	16.1
22.15	5.0E-07	0.11	13.0	3.83	1	15.7	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDef
23.13	5.0E-07	0.08	14.9	3.83	1	18.1	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDef
24.11	5.0E-06	0.03	11.5	3.47	4	14.5	58.0	72.4	57.5	UnDef	UnDef	3.0	UnDef	7.1	14.2
25.10	5.0E-06	0.13	7.5	2.27	4	10.0	40.2	50.2	61.1	UnDef	UnDef	3.0	UnDef	4.9	9.8
26.08	5.0E-06	0.20	7.3	2.34	4	10.0	40.1	50.1	62.1	UnDef	UnDef	3.0	UnDef	4.9	9.8
27.07	5.0E-06	0.17	7.9	3.20	1	10.9	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
28.05	5.0E-06	0.09	12.5	2.98	4	16.9	67.4	84.3	53.1	UnDef	UnDef	3.0	UnDef	8.2	16.5
29.04	5.0E-05	0.01	31.2	3.24	6	41.0	164.1	205.1	36.7	36	41.7	6.0	-0.20	16.1	32.1
30.02	5.0E-06	0.04	15.6	3.79	4	21.5	86.1	107.6	52.1	UnDef	UnDef	6.0	UnDef	10.5	21.1
31.00	5.0E-06	0.02	15.7	3.67	4	22.0	88.1	110.1	51.4	UnDef	UnDef	6.0	UnDef	10.8	21.5
31.99	5.0E-05	0.04	13.4	2.75	6	19.2	76.8	96.0	50.3	32	30.0	6.0	-0.07	7.5	15.0
32.97	5.0E-06	0.10	6.7	3.13	1	10.4	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
33.96	5.0E-06	0.14	7.3	3.02	4	11.4	45.7	57.2	66.3	UnDef	UnDef	3.0	UnDef	5.6	11.2
34.94	5.0E-06	0.17	5.0	3.21	1	8.4	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDef
35.92	5.0E-06	0.20	5.2	2.83	4	8.7	34.9	43.6	74.9	UnDef	UnDef	1.5	UnDef	4.3	8.5
36.91	5.0E-07	0.18	6.3	3.81	1	10.4	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
37.89	5.0E-05	0.25	7.0	2.36	4	11.6	46.6	58.2	63.3	30	30.0	3.0	0.05	4.6	9.1
38.88	5.0E-06	0.29	6.0	2.69	4	10.3	41.2	51.5	69.7	UnDef	UnDef	1.5	UnDef	5.0	10.1
39.86	5.0E-06	0.31	5.0	2.53	4	9.0	36.0	45.0	73.6	UnDef	UnDef	1.5	UnDef	4.4	8.8
40.85	5.0E-06	0.23	5.5	3.27	1	9.7	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDef
41.83	5.0E-06	0.37	4.6	2.53	4	8.6	34.3	42.9	76.2	UnDef	UnDef	1.5	UnDef	4.2	8.4
42.81	5.0E-05	0.34	6.6	2.32	4	11.8	47.0	58.8	64.5	30	30.0	3.0	0.07	4.6	9.2
43.80	5.0E-06	0.35	5.1	2.54	4	9.6	38.2	47.8	73.2	UnDef	UnDef	1.5	UnDef	4.7	9.3
44.78	5.0E-05	0.37	5.3	2.07	4	9.9	39.4	49.3	69.1	30	30.0	1.5	0.10	3.9	7.7
45.77	5.0E-04	0.08	21.6	1.74	6	36.0	139.5	175.5	34.8	34	38.0	1.0	-0.08	11.6	23.4
46.75	5.0E-02	0.00	98.9	0.55	9	161.0	10.3	171.4	7.3	42	80.9	1.0	-0.13	1.2	32.8
47.74	5.0E-02	0.00	104.2	0.93	9	170.7	25.3	196.0	9.8	42	82.6	1.0	-0.18	2.9	36.3
48.72	5.0E-02	0.00	88.6	1.03	9	146.3	33.0	179.3	11.9	42	78.2	1.0	-0.18	3.7	32.4

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
49.70	5.0E-04	0.01	47.8	1.84	7	80.2	78.3	158.5	23.5	38	60.9	1.0	-0.17	11.7	37.9
50.69	5.0E-02	0.00	83.6	0.86	9	139.6	27.6	167.2	11.2	42	76.8	1.0	-0.16	3.1	30.5
51.67	5.0E-02	0.00	72.5	1.06	9	122.0	38.1	160.1	13.9	40	73.0	1.0	-0.16	4.2	28.1
52.66	5.0E-03	0.00	72.4	1.54	7	122.4	57.6	180.0	17.0	40	73.1	1.0	-0.20	7.5	37.4
53.64	5.0E-05	0.02	17.3	2.93	6	30.8	123.3	154.1	45.8	32	33.5	6.0	-0.11	12.1	24.1
54.63	5.0E-04	0.01	39.0	1.90	7	67.5	91.5	159.0	26.6	38	56.0	1.0	-0.16	12.4	34.4
55.61	5.0E-04	0.00	35.7	2.70	6	62.1	161.7	223.8	32.1	38	53.6	1.0	-0.19	16.7	37.0
56.59	5.0E-03	0.00	73.5	2.00	7	126.7	78.7	205.4	19.4	40	74.0	1.0	-0.23	9.8	40.8
57.58	5.0E-04	0.00	41.7	2.85	6	73.0	155.6	228.6	30.5	38	58.3	1.0	-0.22	17.7	41.5
58.56	5.0E-04	0.01	37.3	2.72	6	65.8	159.4	225.2	31.5	38	55.3	1.0	-0.20	17.1	38.5
59.55	5.0E-04	0.00	42.2	2.55	7	74.6	131.4	206.0	28.9	38	58.9	1.0	-0.20	16.2	40.5
60.53	5.0E-05	0.06	26.4	3.26	6	47.6	190.3	237.9	39.6	36	46.0	6.0	-0.17	18.6	37.2
61.52	5.0E-05	0.08	10.0	3.06	4	19.2	77.0	96.2	58.7	30	30.0	3.0	-0.04	7.5	15.1
62.42	5.0E-05	0.23	6.7	2.18	4	13.6	54.5	68.1	63.4	30	30.0	3.0	0.05	5.3	10.7
63.32	5.0E-05	0.27	5.9	2.30	4	12.3	49.1	61.3	67.7	30	30.0	1.5	0.07	4.8	9.6
64.30	5.0E-05	0.28	6.5	2.60	4	13.5	54.1	67.7	66.7	30	30.0	3.0	0.05	5.3	10.6
65.29	5.0E-06	0.29	7.6	3.08	4	15.5	62.1	77.7	65.5	UnDef	UnDef	3.0	UnDef	7.6	15.2
66.27	5.0E-05	0.33	9.1	2.85	4	18.3	73.0	91.3	59.7	30	30.0	3.0	0.02	7.1	14.3
67.26	5.0E-05	0.36	10.2	2.37	4	20.3	81.1	101.3	54.0	30	30.0	3.0	0.02	7.9	15.9
68.24	5.0E-05	0.34	10.1	2.81	4	20.2	80.8	101.0	56.9	30	30.0	3.0	0.01	7.9	15.8
69.22	5.0E-06	0.32	8.9	3.21	4	18.1	72.5	90.6	62.2	UnDef	UnDef	3.0	UnDef	8.9	17.7
70.21	5.0E-06	0.31	6.4	3.10	1	13.7	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
71.19	5.0E-06	0.33	5.6	3.10	1	12.4	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDef
72.18	5.0E-05	0.36	5.7	2.41	4	12.6	50.5	63.1	69.1	30	30.0	1.5	0.09	4.9	9.9
73.16	5.0E-05	0.47	5.0	2.53	4	11.4	45.5	56.9	73.7	30	30.0	1.5	0.12	4.5	8.9
74.15	5.0E-05	0.41	6.8	2.37	4	14.7	58.9	73.6	64.1	30	30.0	3.0	0.08	5.8	11.5
75.13	5.0E-05	0.43	6.3	2.47	4	13.8	55.3	69.1	67.0	30	30.0	3.0	0.09	5.4	10.8
76.11	5.0E-05	0.42	6.1	3.12	1	13.5	UnDef	UnDef	100.0	30	30.0	1.5	0.09	UnDef	UnDef
77.10	5.0E-05	0.09	25.4	3.40	6	49.1	196.5	245.6	40.9	34	46.9	6.0	-0.17	19.2	38.5
78.08	5.0E-05	0.04	33.3	3.73	6	64.0	255.8	319.8	37.7	36	54.5	6.0	-0.23	25.0	50.1
79.07	5.0E-05	0.15	12.3	2.99	4	25.3	101.2	126.5	53.3	30	30.0	3.0	-0.05	9.9	19.8
80.05	5.0E-05	0.13	13.9	3.06	4	28.3	113.3	141.6	51.0	32	31.1	6.0	-0.07	11.1	22.2
81.04	5.0E-06	0.11	9.4	3.62	1	20.0	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
82.02	5.0E-05	0.25	6.1	3.08	1	13.9	UnDef	UnDef	100.0	30	30.0	1.5	0.05	UnDef	UnDef
83.00	5.0E-05	0.32	6.5	2.47	4	14.7	58.8	73.5	66.1	30	30.0	3.0	0.06	5.8	11.5
83.99	5.0E-05	0.32	6.6	2.76	4	15.0	59.8	74.8	67.5	30	30.0	3.0	0.06	5.9	11.7

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
84.97	5.0E-05	0.34	7.9	2.72	4	17.5	70.2	87.7	62.4	30	30.0	3.0	0.04	6.9	13.7
85.96	5.0E-06	0.27	7.2	3.59	1	16.2	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
86.94	5.0E-06	0.25	8.2	3.66	1	18.3	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
87.93	5.0E-05	0.24	9.1	2.25	4	20.1	80.3	100.3	55.9	30	30.0	3.0	0.02	7.9	15.7
88.91	5.0E-05	0.28	8.6	2.91	4	19.1	76.5	95.6	61.5	30	30.0	3.0	0.02	7.5	15.0
89.89	5.0E-05	0.27	9.5	3.15	4	20.9	83.5	104.4	60.4	30	30.0	3.0	0.00	8.2	16.3
90.88	5.0E-05	0.32	8.4	2.50	4	18.8	75.1	93.9	59.7	30	30.0	3.0	0.04	7.4	14.7
91.86	5.0E-05	0.35	8.8	2.52	4	19.8	79.2	99.0	58.5	30	30.0	3.0	0.03	7.7	15.5
92.85	5.0E-05	0.35	8.4	2.58	4	18.9	75.7	94.6	60.2	30	30.0	3.0	0.04	7.4	14.8
93.83	5.0E-05	0.22	10.4	3.01	4	23.0	91.9	114.9	57.4	30	30.0	3.0	-0.02	9.0	18.0
94.82	5.0E-05	0.39	6.9	2.78	4	16.3	65.2	81.5	66.3	30	30.0	3.0	0.07	6.4	12.8
95.80	5.0E-05	0.38	6.8	3.06	1	16.1	UnDef	UnDef	100.0	30	30.0	3.0	0.06	UnDef	UnDef
96.78	5.0E-05	0.24	14.5	3.34	4	31.3	125.0	156.3	51.6	32	33.9	6.0	-0.07	12.3	24.7
97.77	5.0E-03	-0.01	65.1	1.56	7	131.5	72.1	203.6	18.3	40	75.1	1.0	-0.19	9.3	41.8
98.75	1.0E-15	-0.01	30.4	4.25	6	63.1	252.5	315.6	41.2	36	54.1	1.0	-0.26	62.7	125.4
99.74	5.0E-05	0.09	11.5	3.25	4	25.7	102.9	128.6	56.3	30	30.0	3.0	-0.06	10.3	20.5
100.72	5.0E-05	0.16	8.8	2.21	4	20.4	81.4	101.8	56.6	30	30.0	3.0	0.01	8.1	16.3
101.70	5.0E-05	0.25	8.0	2.55	4	18.8	75.1	93.9	61.3	30	30.0	3.0	0.03	7.5	15.1
102.69	5.0E-05	0.31	7.5	2.32	4	18.0	71.9	89.9	61.2	30	30.0	3.0	0.05	7.2	14.5

Gregg In Situ CPT Interpretations as of January 7, 1999 (Release 1.00.19)

Gregg In Situ's interpretation routine should be considered a calculator of current published CPT correlations and is subject to change to reflect the current state of practice. The interpreted values are not considered valid for all soil types. The interpretations are presented only as a guide for geotechnical use and should be carefully scrutinized for consideration in any geotechnical design. Reference to current literature is strongly recommended.

The CPT interpretations are based on values of tip, sleeve friction and pore pressure averaged over a user specified interval (typically 0.25m). Note that Qt is the recorded tip value, Qc, corrected for pore pressure effects. Since all Gregg In Situ cones have equal end area friction sleeves, pore pressure corrections to sleeve friction, Fs, are not required.

The tip correction is: $Qt = Qc + (1-a) \bullet Ud$

where: *Qt* is the corrected tip load
Qc is the recorded tip load
Ud is the recorded dynamic pore pressure
a is the Net Area Ratio for the cone (typically 0.85 for Gregg In Situ cones)

Effective vertical overburden stresses are calculated based on a hydrostatic distribution of equilibrium pore pressures below the water table or from a user defined equilibrium pore pressure profile (this can be obtained from CPT dissipation tests). The stress calculations use unit weights assigned to the Soil Behavior Type zones or from a user defined unit weight profile.

Details regarding the interpretation methods for all of the interpreted parameters is given in table 1. The appropriate references referred to in table 1 are listed in table 2.

The estimated Soil Behavior Type is based on the charts developed by Robertson and Campanella shown in figure 1.

Table 1 CPT Interpretation Methods

Interpreted Parameter	Description	Equation	Ref
Depth	mid layer depth		
AvgQt	Averaged corrected tip (Qt)	$AvgQt = \frac{1}{n}\sum_{i=1}^{n} Qt_i$	
AvgFs	Averaged sleeve friction (Fs)	$AvgFs = \frac{1}{n}\sum_{i=1}^{n} Fs_i$	
AvgRf	Averaged friction ratio (Rf)	$AvgRf = 100\% \bullet \frac{AvgFs}{AvgQt}$	
AvgUd	Averaged dynamic pore pressure (Ud)	$AvgUd = \frac{1}{n}\sum_{i=1}^{n} Ud_i$	
SBT	Soil Behavior Type as defined by Robertson and Campanella		1

U.Wt.	Unit Weight of soil determined from: 1) uniform value or 2) value assigned to each SBT zone 3) user supplied unit weight profile		
TStress	Total vertical overburden stress at mid layer depth	$TStress = \sum_{i=1}^{n} \gamma_i h_i$ where γ_i is layer unit weight h_i is layer thickness	
EStress	Effective vertical overburden stress at mid layer depth	$EStress = TStress - Ueq$	
Ueq	Equilibrium pore pressure determined from: 1) hydrostatic from water table depth 2) user supplied profile		
Cn	SPT N_{60} overburden correction factor	$Cn=(\sigma_v')^{-0.5}$ where σ_v' is in tsf $0.5 < C_n < 2.0$	
N_{60}	SPT N value at 60% energy calculated from Qt/N ratios assigned to each SBT zone		3
$(N1)_{60}$	SPT N_{60} value corrected for overburden pressure	$N1_{60} = Cn \bullet N_{60}$	3
$\Delta(N1)_{60}$	Equivalent Clean Sand Correction to $(N1)_{60}$	$\Delta(N1)_{60} = \frac{K_{SPT}}{1 - K_{SPT}} \bullet (N1)_{60}$ Where: K_{SPT} is defined as: 0.0 for FC < 5% 0.0167 • (FC - 5) for 5% < FC < 35% 0.5 for FC > 35% FC - Fines Content in %	7
$(N1)_{60cs}$	Equivalent Clean Sand $(N1)_{60}$	$(N1)_{60cs} = (N1)_{60} + \Delta(N1)_{60}$	7
Su	Undrained shear strength - Nkt is use selectable	$Su = \frac{Qt - \sigma_v}{N_{kt}}$	2
k	Coefficient of permeability (assigned to each SBT zone)		6
Bq	Pore pressure parameter	$Bq = \frac{\Delta u}{Qt - \sigma_v}$	2
Qtn	Normalized Qt for Soil Behavior Type classification as defined by Robertson, 1990	$Qtn = \frac{Qt - \sigma_v}{\sigma'_v}$	4
Rfn	Normalized Rf for Soil Behavior Type classification as defined by Robertson, 1990	$Rfn = 100\% \bullet \frac{f_s}{Qt - \sigma_v}$	4
SBTn	Normalized Soil Behavior Type (slightly modified from that published by Robertson, 1990. This version includes all the soil zones of the original non-normalized SBT chart - see figure 1)		4
Qc1	Normalized Qt for seismic analysis	$qc1 = qc \bullet (Pa/\sigma_v')^{0.5}$ where: Pa = atm. pressure	5
Qc1N	Dimensionless Normalized Qt1	qc1N = qc1 / Pa where: Pa = atm. pressure	

ΔQc1N1	Equivalent clean sand correction	$\Delta qc1N = \frac{K_{CPT}}{1 - K_{CPT}} \bullet qc1N$ Where: K_{CPT} is defined as: 0.0 for FC < 5% 0.0267 • (FC - 5) for 5% < FC < 35% 0.5 for FC > 35% FC - Fines Content in %	5
Qc1Ncs	Clean Sand equivalent Qc1N	$qc1Ncs = qc1N + \Delta qc1N$	5
Ic	Soil index for estimating grain characteristics	$Ic = [(3.47 - logQ)^2 + (log F + 1.22)^2]^{0.5}$	5
FC	Fines content (%)	$FC=1.75(Ic^{3.25}) - 3.7$ $FC=100$ for $Ic > 3.5$ $FC=0$ for $Ic < 1.26$ $FC = 5\%$ if $1.64 < Ic < 2.6$ AND $Rfn<0.5$	8
PHI	Friction Angle	Campanella and Robertson Durunoglu and Mitchel Janbu	1
Dr	Relative Density	Ticino Sand Hokksund Sand Schmertmann 1976 Jamiolkowski - All Sands	1
OCR	Over Consolidation Ratio		1
State Parameter			9
CRR	Cyclic Resistance Ratio		7

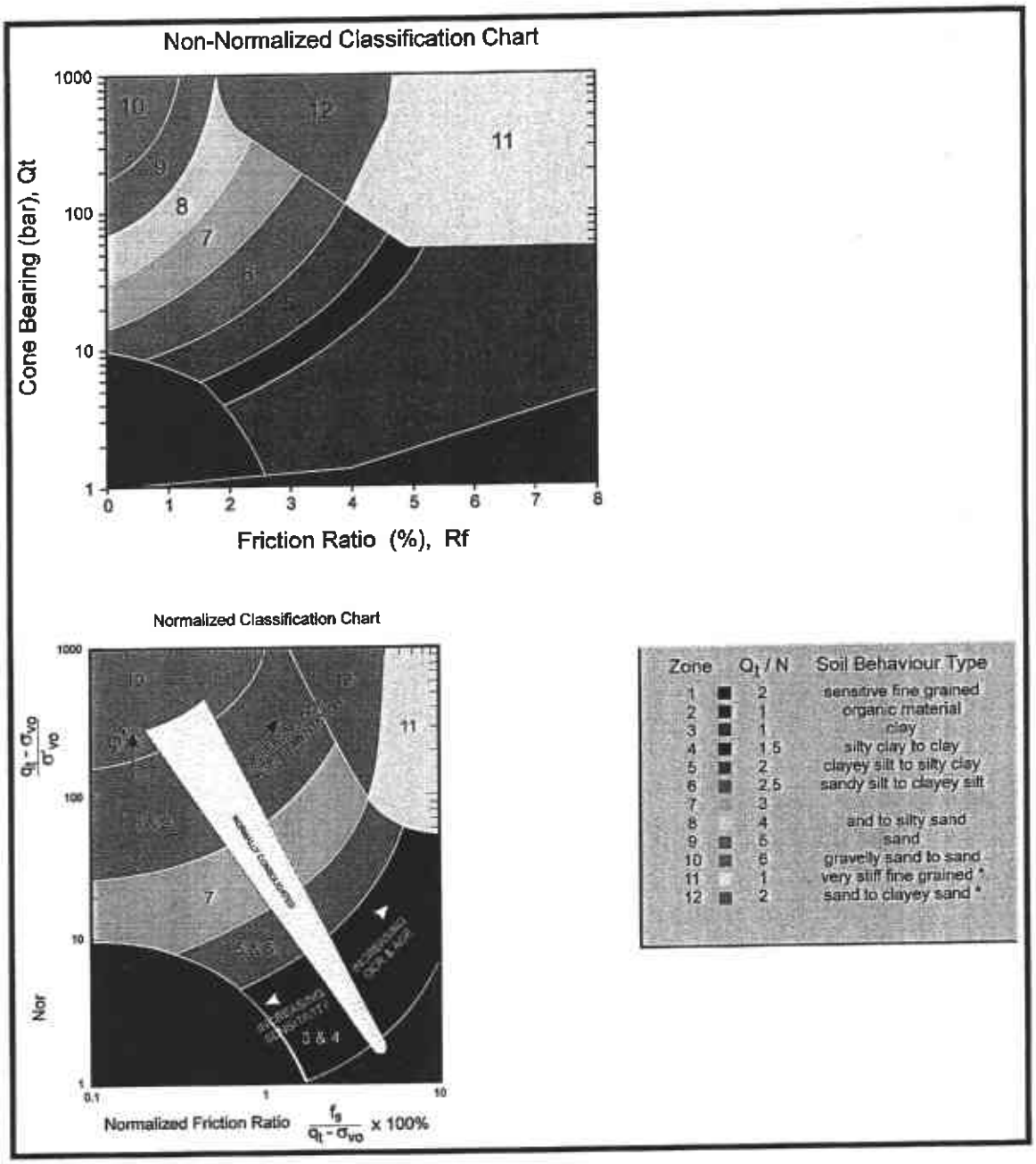


Figure 1 Non-Normalized and Normalized Soil Behavior Type Classification Charts

Table 2 References

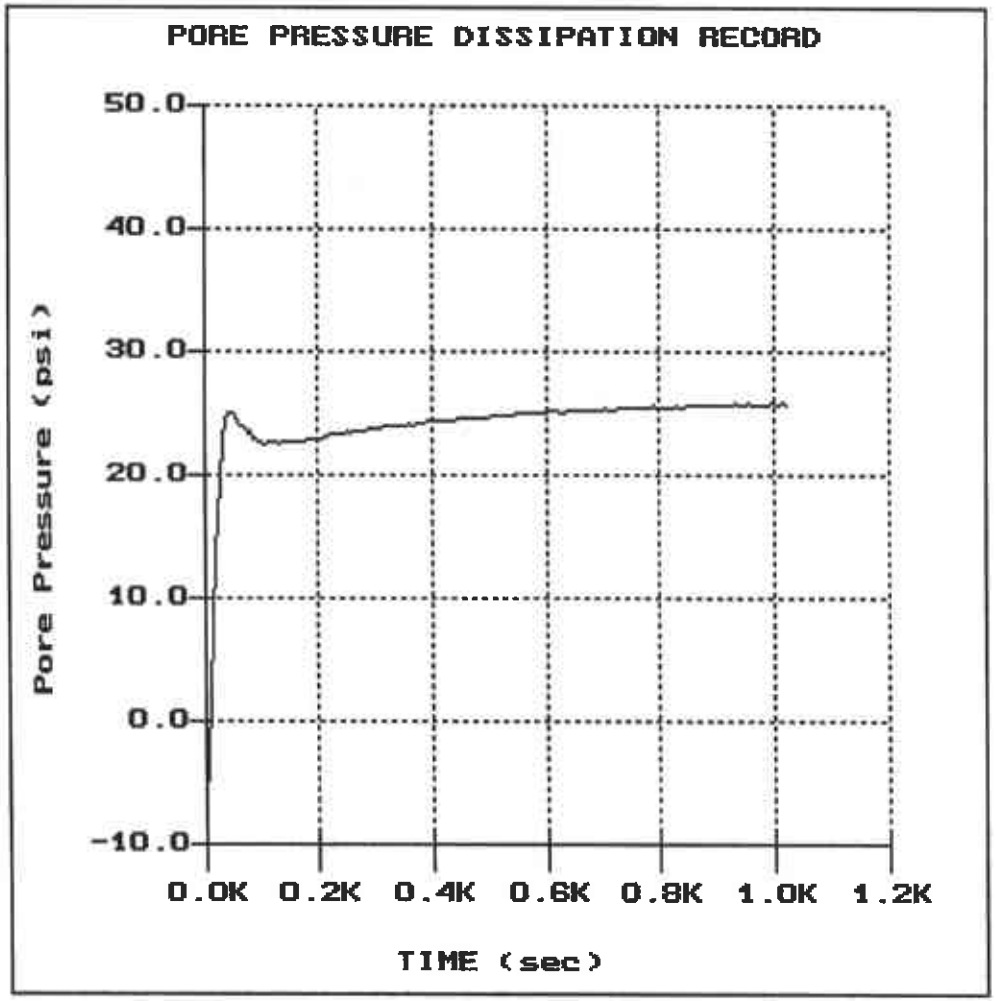
No.	Reference
1	Robertson, P.K. and Campanella, R.G., 1986, "Guidelines for Use, Interpretation and Application of the CPT and CPTU", UBC, Soil Mechanics Series No. 105, Civil Eng. Dept., Vancouver, B.C., Canada
2	Robertson, P.K., Campanella, R.G., Gillespie, D. and Greig, J., 1986, "Use of Piezometer Cone Data", Proceedings of InSitu 86, ASCE Specialty Conference, Blacksburg, Virginia.
3	Robertson, P.K. and Campanella, R.G., 1989, "Guidelines for Geotechnical Design Using CPT and CPTU", UBC, Soil Mechanics Series No. 120, Civil Eng. Dept., Vancouver, B.C., Canada
4	Robertson, P.K., 1990, "Soil Classification Using the Cone Penetration Test", Canadian Geotechnical Journal, Volume 27.
5	Robertson, P.K. and Fear, C.E., 1995, "Liquefaction of Sands and its Evaluation", Keynote Lecture, First International Conference on Earthquake Geotechnical Engineering, Tokyo, Japan.
6	Gregg In Situ Internal Report
7	Robertson, P.K. and Wride, C.E., 1997, "Cyclic Liquefaction and its Evaluation Based on SPT and CPT", NCEER Workshop Paper, January 22, 1997
8	Wride, C.E. and Robertson, P.K., 1997, "Phase II Data Review Report (Massey and Kidd Sites, Fraser River Delta)", Volume 1 - Data Report (June 1997), University of Alberta.
9	Plewes, H.D., Davies, M.P. and Jefferies, M.G., 1992, "CPT Based Screening Procedure for Evaluating Liquefaction Susceptibility", 45th Canadian Geotechnical Conference, Toronto, Ontario, October 1992.

3.3 PORE PRESSURE DISSIPATION PLOTS

DELTA

Site: 6750 SANTA RITA
Location: CPT-03

Geologist: D. ARNOLD
Date:12:18:03 14:13

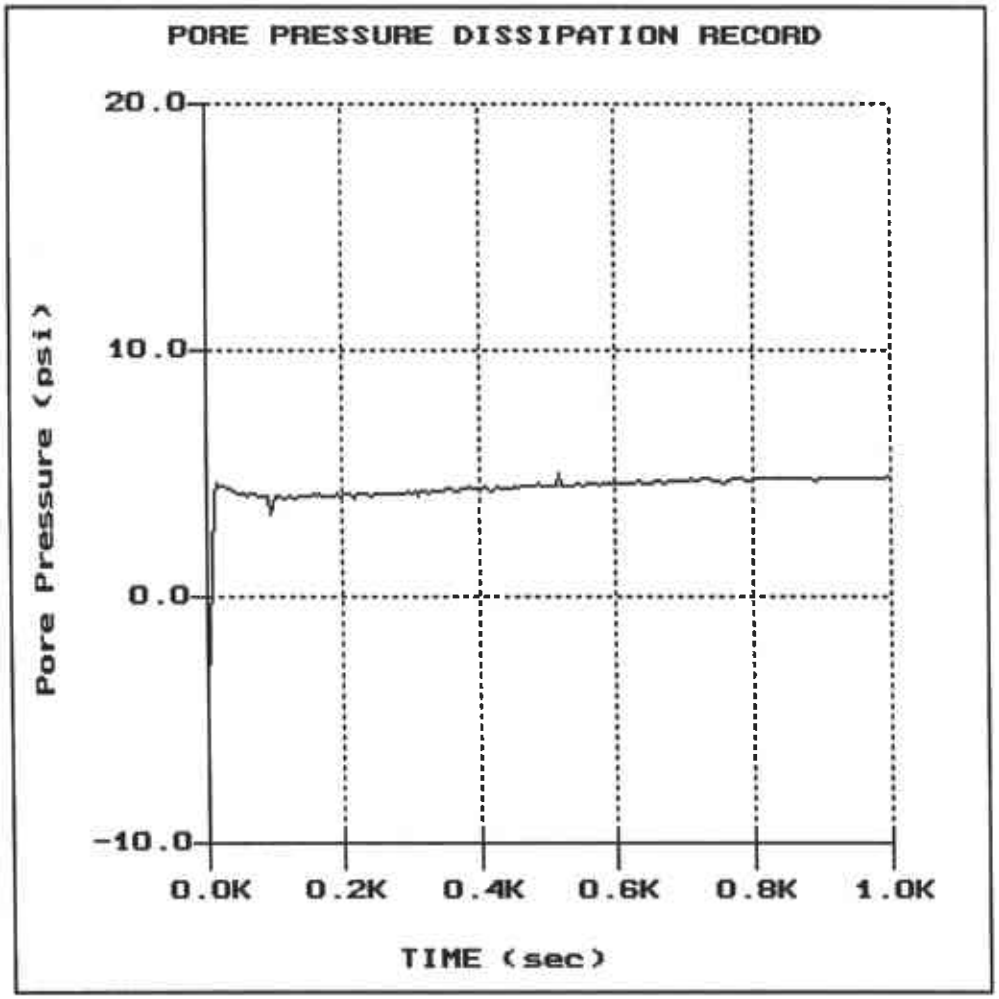


File: 399C03.PPC
Depth (m): 30.15
(ft): 98.92
Duration : 1020.0s
U-min: -6.90 0.0s
U-max: 25.84 1015.0s

DELTA

Site: 6750 SANTA RITA
Location: CPT-03

Geologist: D. ARNOLD
Date: 12:18:03 14:13

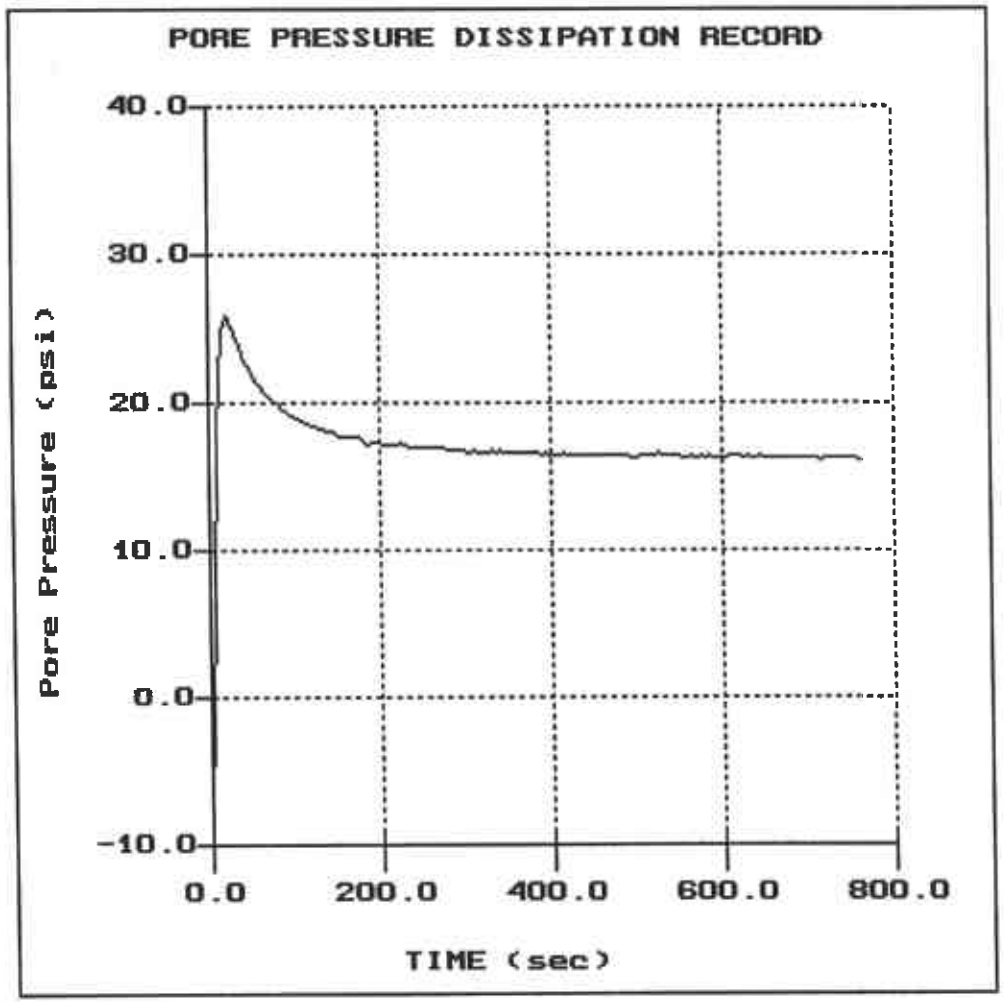


File: 399C03.PPC
Depth (m): 14.35
(ft): 47.08
Duration : 1000.0s
U-min: -3.85 0.0s
U-max: 5.00 515.0s

DELTA

Site: 6750 SANTA RITA
Location: CPT-02

Geologist: D. ARNOLD
Date:12:19:03 09:54

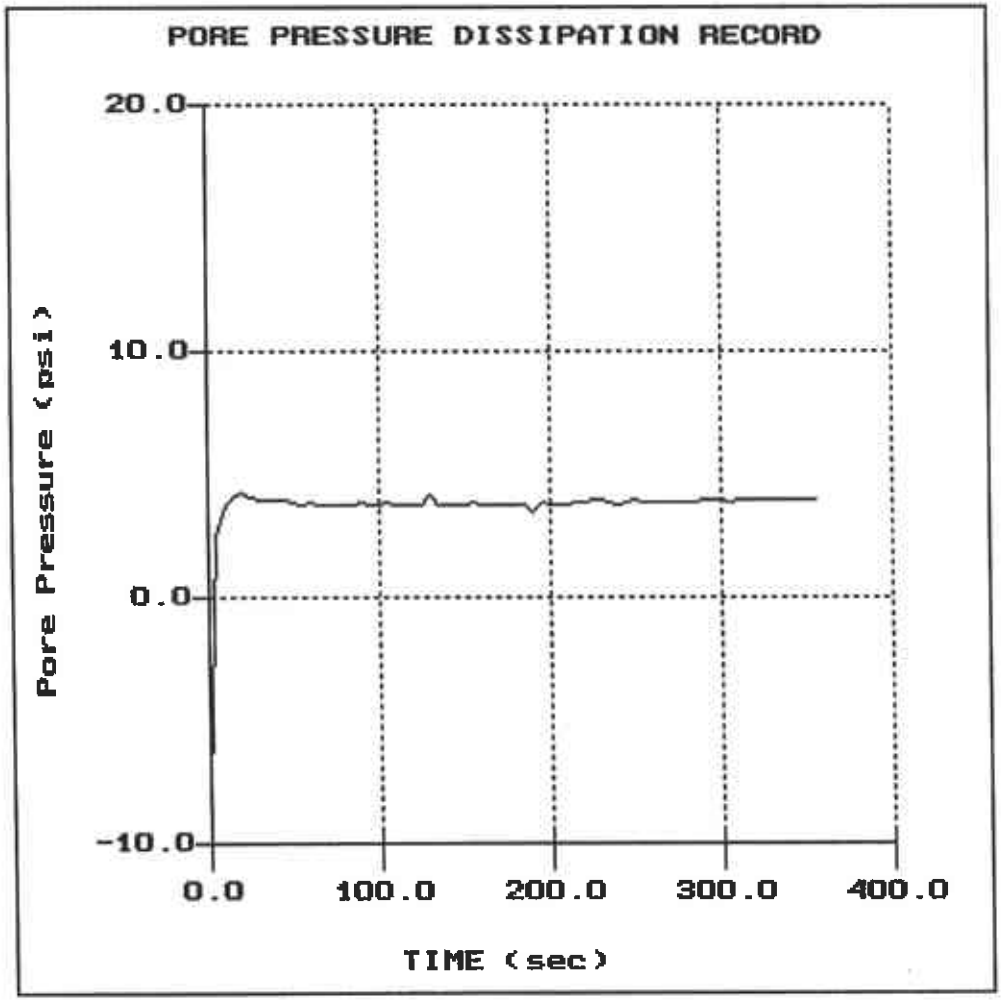


File: 399C02.PPC
Depth (m): 23.50
(ft): 77.10
Duration : 760.0s
U-min: -8.22 0.0s
U-max: 25.82 20.0s

DELTA

Site: 6750 SANTA RITA
Location: CPT-02

Geologist: D. ARNOLD
Date:12:19:03 09:54

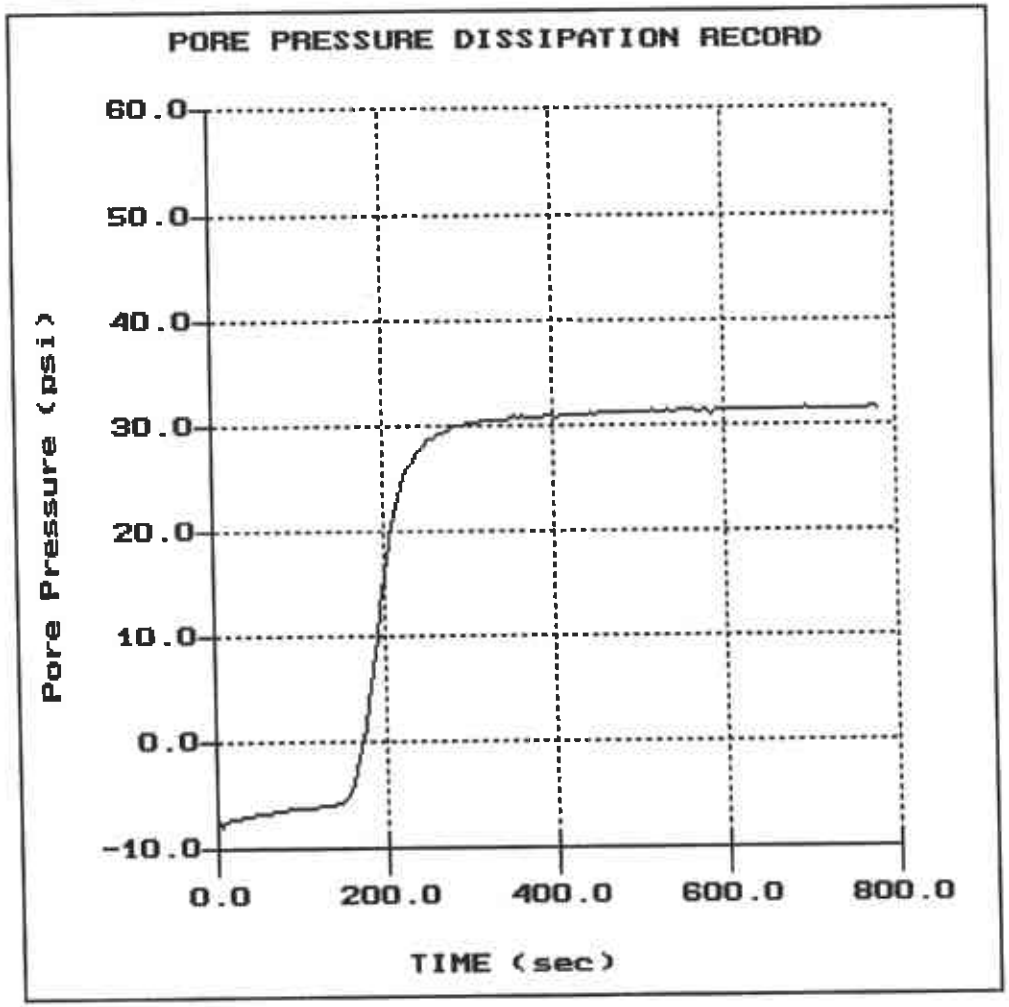


File: 399C02.PPC
Depth (m): 15.00
(ft): 49.21
Duration : 355.0s
U-min: -8.16 0.0s
U-max: 4.23 20.0s

DELTA

Site: 6750 SANTA RITA
Location: CPT-01

Geologist: D. ARNOLD
Date:12:18:03 08:33

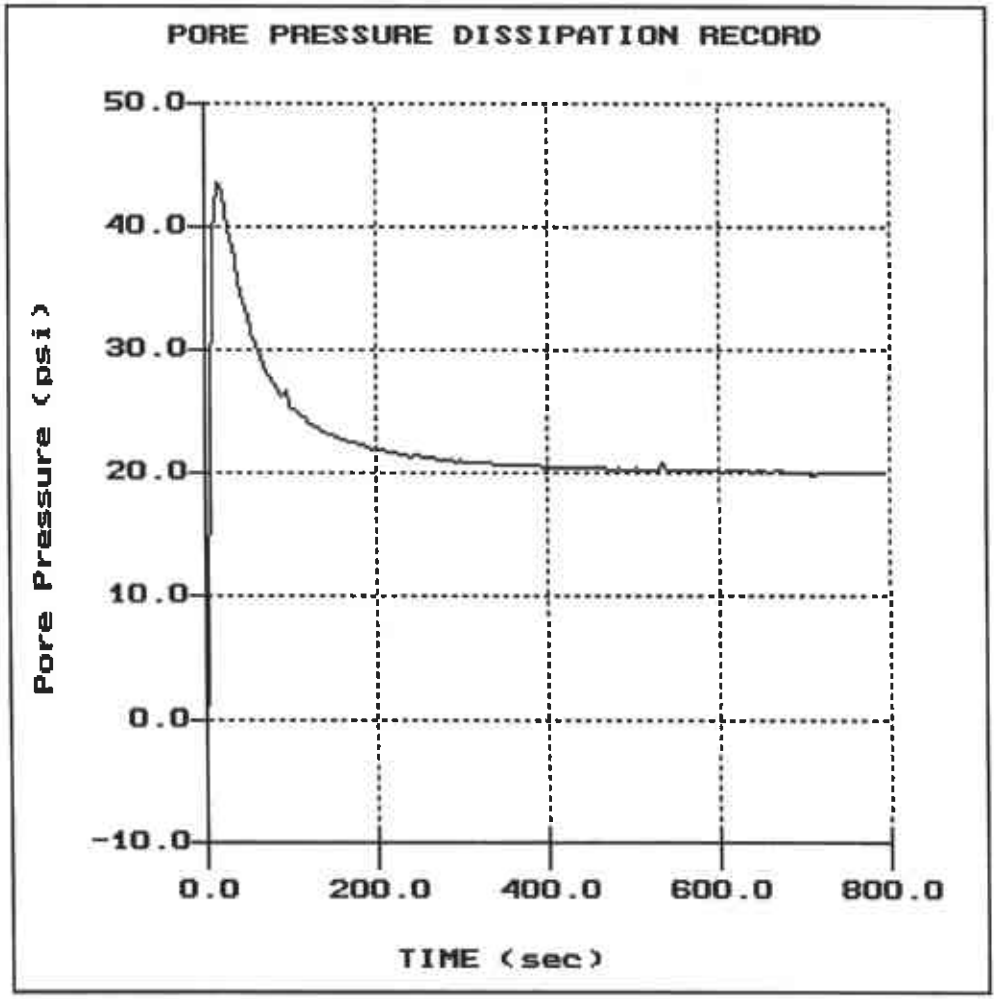


File: 399C01.PPC
Depth (m): 35.65
(ft): 116.96
Duration : 780.0s
U-min: -8.14 5.0s
U-max: 31.47 695.0s

DELTA

Site: 6750 SANTA RITA
Location: CPT-01

Geologist: D. ARNOLD
Date:12:18:03 08:33

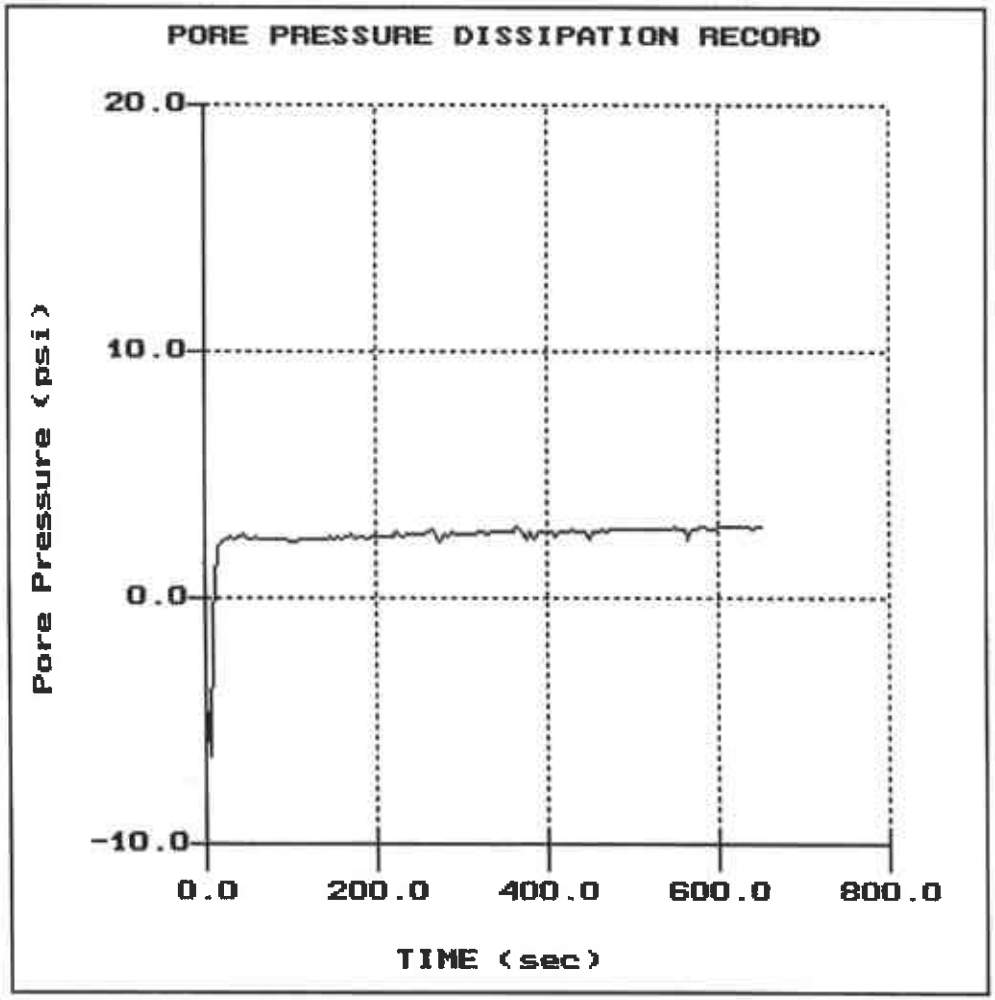


File: 399C01.PPC
Depth (m): 26.15
(ft): 85.79
Duration : 795.0s
U-min: -5.92 0.0s
U-max: 43.50 15.0s

DELTA

Site: 6750 SANTA RITA
Location: CPT-01

Geologist: D. ARNOLD
Date:12:18:03 08:33



File: 399C01.PPC
Depth (m): 13.50
(ft): 44.29
Duration : 650.0s
U-min: -6.51 5.0s
U-max: 2.95 645.0s

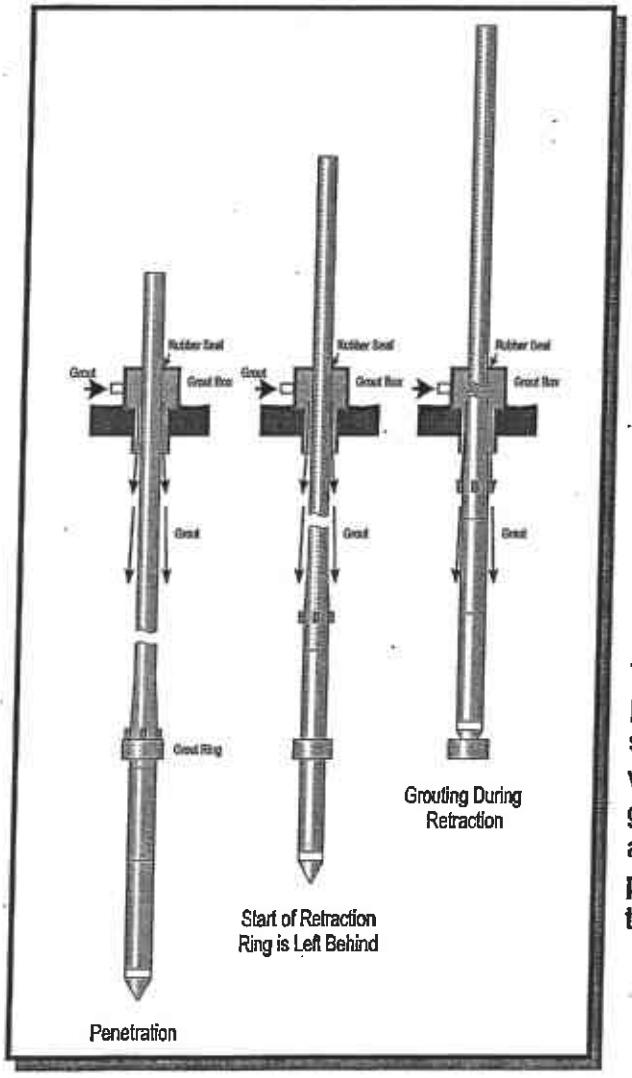
Attachment C

RETRACTION GROUTING

GREGG IN SITU, INC.

Geotechnical and Environmental In Situ Testing Contractors

RETRACTION GROUTING



Retraction Grouting requires the use of a casing through which the cone and rods can pass. Prior to the start of the cone test, the casing is filled with grout under pressure. The pressure and supply of grout is maintained from the start of the CPT sounding to the end of the sealing process. Upon completion of the cone test, the cone is slowly retracted causing the sacrificial friction reducer to drop off. Grout then fills the hole left by the cone as it is retracted from the ground.

Retraction grouting is typically suggested when cone testing in soils known to contain liquid form contaminates. This method is used because the friction reducer displaces soil as it passes trough the soil. The annular space may provide a conduit through which contaminates may flow. By grouting on advance and retraction, the annular space is filled at all times thus preventing migration of contaminates through the profile.

Los Angeles (corporate) • San Francisco • Houston • Charlston
Vancouver • Salt Lake City • New Jersey
Tel: (562) 427-6899 • Fax (562) 424-2329 • Website: www.greggdrilling.com

Attachment D

CERTIFIED GROUNDWATER ANALYTICAL REPORT

AND

CHAIN-OF-CUSTODY DOCUMENTATION

SEVERN TRENT STL

Submission#: 2003-12-0890

Delta Env. Consultants San Jose

January 06, 2004

175 Bernal Road
San Jose, CA 95119
Attn.: Debbie Arnold

Project#: SJ67-50S-1
Project: 97464711
Site: 6750 Santa Rita Rd., Pleasanton

Dear Ms. Arnold:

Attached is our report for your samples received on 12/29/2003 10:28
This report has been reviewed and approved for release. Reproduction of this report is permitted only in its entirety.

Please note that any unused portion of the samples will be discarded after 02/12/2004 unless you have requested otherwise.
We appreciate the opportunity to be of service to you. If you have any questions, please call me at (925) 484-1919.
You can also contact me via email. My email address is: vvancil@stl-inc.com

Sincerely,

Vincent Vancil
Project Manager

SEVERN TRENT STL

Submission #: 2003-12-0890

Gas/BTEX Fuel Oxygenates by 8260B (C6-C12)

Delta Env. Consultants San Jose
Attn.: Debbie Arnold

175 Bernal Road
Suite 200
San Jose, CA 95119
Phone: (408) 224-4724 Fax: (408) 224-4518

Project: SJ67-50S-1
97464711

Received: 12/29/2003 10:28

Site: 6750 Santa Rita Rd., Pleasanton

Samples Reported

Sample Name	Date Sampled	Matrix	Lab #
CPT-1 @ 56	12/18/2003 11:15	Water	1
CPT-1 @ 70	12/18/2003 12:00	Water	2
CPT-2 @ 47	12/19/2003 11:30	Water	3
CPT-2 @ 80	12/19/2003 12:00	Water	4
CPT-2 @ 98	12/19/2003 13:00	Water	5
CPT-3 @ 46	12/18/2003 15:30	Water	6
CPT-3 @ 72	12/18/2003 16:30	Water	7
CPT-3 @ 97	12/19/2003 08:30	Water	8

Gas/BTEX Fuel Oxygenates by 8260B (C6-C12)

Delta Env. Consultants San Jose

Attn.: Debbie Arnold

175 Bernal Road
Suite 200
San Jose, CA 95119
Phone: (408) 224-4724 Fax: (408) 224-4518

Project: SJ67-50S-1
97464711

Received: 12/29/2003 10:28

Site: 6750 Santa Rita Rd., Pleasanton

Prep(s): 5030B
Sample ID: **CPT-1 @ 56**
Sampled: 12/18/2003 11:15
Matrix: Water

Test(s): 8260B
Lab ID: 2003-12-0890 - 1
Extracted: 12/29/2003 23:47
QC Batch#: 2003/12/29-2B.66

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Gasoline	ND	50	ug/L	1.00	12/29/2003 23:47	
Benzene	ND	0.50	ug/L	1.00	12/29/2003 23:47	
Toluene	ND	0.50	ug/L	1.00	12/29/2003 23:47	
Ethylbenzene	ND	0.50	ug/L	1.00	12/29/2003 23:47	
Total xylenes	ND	1.0	ug/L	1.00	12/29/2003 23:47	
tert-Butyl alcohol (TBA)	ND	5.0	ug/L	1.00	12/29/2003 23:47	
Methyl tert-butyl ether (MTBE)	ND	0.50	ug/L	1.00	12/29/2003 23:47	
Di-isopropyl Ether (DIPE)	ND	2.0	ug/L	1.00	12/29/2003 23:47	
Ethyl tert-butyl ether (ETBE)	ND	2.0	ug/L	1.00	12/29/2003 23:47	
tert-Amyl methyl ether (TAME)	ND	2.0	ug/L	1.00	12/29/2003 23:47	
Surrogate(s)						
1,2-Dichloroethane-d4	105.7	76-130	%	1.00	12/29/2003 23:47	
Toluene-d8	98.2	78-115	%	1.00	12/29/2003 23:47	

Gas/BTEX Fuel Oxygenates by 8260B (C6-C12)

Delta Env. Consultants San Jose
Attn.: Debbie Arnold

175 Bernal Road
Suite 200
San Jose, CA 95119
Phone: (408) 224-4724 Fax: (408) 224-4518

Project: SJ67-50S-1
97464711

Received: 12/29/2003 10:28

Site: 6750 Santa Rita Rd., Pleasanton

Prep(s): 5030B
Sample ID: **CPT-1 @ 70**
Sampled: 12/18/2003 12:00
Matrix: Water

Test(s): 8260B
Lab ID: 2003-12-0890 - 2
Extracted: 12/30/2003 00:12
QC Batch#: 2003/12/29-2B.66

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Gasoline	ND	50	ug/L	1.00	12/30/2003 00:12	
Benzene	ND	0.50	ug/L	1.00	12/30/2003 00:12	
Toluene	ND	0.50	ug/L	1.00	12/30/2003 00:12	
Ethylbenzene	ND	0.50	ug/L	1.00	12/30/2003 00:12	
Total xylenes	ND	1.0	ug/L	1.00	12/30/2003 00:12	
tert-Butyl alcohol (TBA)	ND	5.0	ug/L	1.00	12/30/2003 00:12	
Methyl tert-butyl ether (MTBE)	ND	0.50	ug/L	1.00	12/30/2003 00:12	
Di-isopropyl Ether (DIPE)	ND	2.0	ug/L	1.00	12/30/2003 00:12	
Ethyl tert-butyl ether (ETBE)	ND	2.0	ug/L	1.00	12/30/2003 00:12	
tert-Amyl methyl ether (TAME)	ND	2.0	ug/L	1.00	12/30/2003 00:12	
Surrogate(s)						
1,2-Dichloroethane-d4	104.9	76-130	%	1.00	12/30/2003 00:12	
Toluene-d8	96.3	78-115	%	1.00	12/30/2003 00:12	

Gas/BTEX Fuel Oxygenates by 8260B (C6-C12)

Delta Env. Consultants San Jose
Attn.: Debbie Arnold

175 Bernal Road
Suite 200
San Jose, CA 95119
Phone: (408) 224-4724 Fax: (408) 224-4518

Project: SJ67-50S-1
97464711

Received: 12/29/2003 10:28

Site: 6750 Santa Rita Rd., Pleasanton

Prep(s): 5030B
Sample ID: **CPT-2 @ 47**
Sampled: 12/19/2003 11:30
Matrix: Water

Test(s): 8260B
Lab ID: 2003-12-0890 - 3
Extracted: 12/30/2003 00:36
QC Batch#: 2003/12/29-2B.66

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Gasoline	ND	50	ug/L	1.00	12/30/2003 00:36	
Benzene	ND	0.50	ug/L	1.00	12/30/2003 00:36	
Toluene	ND	0.50	ug/L	1.00	12/30/2003 00:36	
Ethylbenzene	ND	0.50	ug/L	1.00	12/30/2003 00:36	
Total xylenes	ND	1.0	ug/L	1.00	12/30/2003 00:36	
tert-Butyl alcohol (TBA)	ND	5.0	ug/L	1.00	12/30/2003 00:36	
Methyl tert-butyl ether (MTBE)	ND	0.50	ug/L	1.00	12/30/2003 00:36	
Di-isopropyl Ether (DIPE)	ND	2.0	ug/L	1.00	12/30/2003 00:36	
Ethyl tert-butyl ether (ETBE)	ND	2.0	ug/L	1.00	12/30/2003 00:36	
tert-Amyl methyl ether (TAME)	ND	2.0	ug/L	1.00	12/30/2003 00:36	
Surrogate(s)						
1,2-Dichloroethane-d4	102.8	76-130	%	1.00	12/30/2003 00:36	
Toluene-d8	98.6	78-115	%	1.00	12/30/2003 00:36	

Gas/BTEX Fuel Oxygenates by 8260B (C6-C12)

Delta Env. Consultants San Jose

Attn.: Debbie Arnold

175 Bernal Road
Suite 200
San Jose, CA 95119
Phone: (408) 224-4724 Fax: (408) 224-4518

Project: SJ67-50S-1
97464711

Received: 12/29/2003 10:28

Site: 6750 Santa Rita Rd., Pleasanton

Prep(s): 5030B
Sample ID: **CPT-2 @ 80**
Sampled: 12/19/2003 12:00
Matrix: Water

Test(s): 8260B
Lab ID: 2003-12-0890 - 4
Extracted: 12/30/2003 01:00
QC Batch#: 2003/12/29-2B.66

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Gasoline	ND	50	ug/L	1.00	12/30/2003 01:00	
Benzene	ND	0.50	ug/L	1.00	12/30/2003 01:00	
Toluene	ND	0.50	ug/L	1.00	12/30/2003 01:00	
Ethylbenzene	ND	0.50	ug/L	1.00	12/30/2003 01:00	
Total xylenes	ND	1.0	ug/L	1.00	12/30/2003 01:00	
tert-Butyl alcohol (TBA)	ND	5.0	ug/L	1.00	12/30/2003 01:00	
Methyl tert-butyl ether (MTBE)	ND	0.50	ug/L	1.00	12/30/2003 01:00	
Di-isopropyl Ether (DIPE)	ND	2.0	ug/L	1.00	12/30/2003 01:00	
Ethyl tert-butyl ether (ETBE)	ND	2.0	ug/L	1.00	12/30/2003 01:00	
tert-Amyl methyl ether (TAME)	ND	2.0	ug/L	1.00	12/30/2003 01:00	
Surrogate(s)						
1,2-Dichloroethane-d4	102.1	76-130	%	1.00	12/30/2003 01:00	
Toluene-d8	100.6	78-115	%	1.00	12/30/2003 01:00	

Gas/BTEX Fuel Oxygenates by 8260B (C6-C12)

Delta Env. Consultants San Jose

Attn.: Debbie Arnold

175 Bernal Road
Suite 200
San Jose, CA 95119
Phone: (408) 224-4724 Fax: (408) 224-4518

Project: SJ67-50S-1
97464711

Received: 12/29/2003 10:28

Site: 6750 Santa Rita Rd., Pleasanton

Prep(s): 5030B
Test(s): 8260B

Sample ID: **CPT-2 @ 98**
Lab ID: 2003-12-0890 - 5

Sampled: 12/19/2003 13:00
Extracted: 12/30/2003 01:24

Matrix: Water
QC Batch#: 2003/12/29-2B.66

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Gasoline	ND	50	ug/L	1.00	12/30/2003 01:24	
Benzene	ND	0.50	ug/L	1.00	12/30/2003 01:24	
Toluene	ND	0.50	ug/L	1.00	12/30/2003 01:24	
Ethylbenzene	ND	0.50	ug/L	1.00	12/30/2003 01:24	
Total xylenes	ND	1.0	ug/L	1.00	12/30/2003 01:24	
tert-Butyl alcohol (TBA)	ND	5.0	ug/L	1.00	12/30/2003 01:24	
Methyl tert-butyl ether (MTBE)	ND	0.50	ug/L	1.00	12/30/2003 01:24	
Di-isopropyl Ether (DIPE)	ND	2.0	ug/L	1.00	12/30/2003 01:24	
Ethyl tert-butyl ether (ETBE)	ND	2.0	ug/L	1.00	12/30/2003 01:24	
tert-Amyl methyl ether (TAME)	ND	2.0	ug/L	1.00	12/30/2003 01:24	
Surrogate(s)						
1,2-Dichloroethane-d4	100.3	76-130	%	1.00	12/30/2003 01:24	
Toluene-d8	99.2	78-115	%	1.00	12/30/2003 01:24	

Gas/BTEX Fuel Oxygenates by 8260B (C6-C12)

Delta Env. Consultants San Jose

Attn.: Debbie Arnold

175 Bernal Road
Suite 200
San Jose, CA 95119
Phone: (408) 224-4724 Fax: (408) 224-4518

Project: SJ67-50S-1
97464711

Received: 12/29/2003 10:28

Site: 6750 Santa Rita Rd., Pleasanton

Prep(s): 5030B
Sample ID: **CPT-3 @ 46**
Sampled: 12/18/2003 15:30
Matrix: Water

Test(s): 8260B
Lab ID: 2003-12-0890 - 6
Extracted: 12/30/2003 01:48
QC Batch#: 2003/12/29-2B.66

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Gasoline	ND	50	ug/L	1.00	12/30/2003 01:48	
Benzene	ND	0.50	ug/L	1.00	12/30/2003 01:48	
Toluene	ND	0.50	ug/L	1.00	12/30/2003 01:48	
Ethylbenzene	ND	0.50	ug/L	1.00	12/30/2003 01:48	
Total xylenes	ND	1.0	ug/L	1.00	12/30/2003 01:48	
tert-Butyl alcohol (TBA)	ND	5.0	ug/L	1.00	12/30/2003 01:48	
Methyl tert-butyl ether (MTBE)	18	0.50	ug/L	1.00	12/30/2003 01:48	
Di-isopropyl Ether (DIPE)	ND	2.0	ug/L	1.00	12/30/2003 01:48	
Ethyl tert-butyl ether (ETBE)	ND	2.0	ug/L	1.00	12/30/2003 01:48	
tert-Amyl methyl ether (TAME)	ND	2.0	ug/L	1.00	12/30/2003 01:48	
Surrogate(s)						
1,2-Dichloroethane-d4	103.3	76-130	%	1.00	12/30/2003 01:48	
Toluene-d8	94.9	78-115	%	1.00	12/30/2003 01:48	

Gas/BTEX Fuel Oxygenates by 8260B (C6-C12)

Delta Env. Consultants San Jose

Attn.: Debbie Arnold

175 Bernal Road
Suite 200
San Jose, CA 95119
Phone: (408) 224-4724 Fax: (408) 224-4518

Project: SJ67-50S-1
97464711

Received: 12/29/2003 10:28

Site: 6750 Santa Rita Rd., Pleasanton

Prep(s): 5030B
Sample ID: **CPT-3 @ 72**
Sampled: 12/18/2003 16:30
Matrix: Water

Test(s): 8260B
Lab ID: 2003-12-0890 - 7
Extracted: 12/30/2003 02:12
QC Batch#: 2003/12/29-2B.66

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Gasoline	ND	50	ug/L	1.00	12/30/2003 02:12	
Benzene	ND	0.50	ug/L	1.00	12/30/2003 02:12	
Toluene	ND	0.50	ug/L	1.00	12/30/2003 02:12	
Ethylbenzene	ND	0.50	ug/L	1.00	12/30/2003 02:12	
Total xylenes	ND	1.0	ug/L	1.00	12/30/2003 02:12	
tert-Butyl alcohol (TBA)	ND	5.0	ug/L	1.00	12/30/2003 02:12	
Methyl tert-butyl ether (MTBE)	ND	0.50	ug/L	1.00	12/30/2003 02:12	
Di-isopropyl Ether (DIPE)	ND	2.0	ug/L	1.00	12/30/2003 02:12	
Ethyl tert-butyl ether (ETBE)	ND	2.0	ug/L	1.00	12/30/2003 02:12	
tert-Amyl methyl ether (TAME)	ND	2.0	ug/L	1.00	12/30/2003 02:12	
Surrogate(s)						
1,2-Dichloroethane-d4	110.7	76-130	%	1.00	12/30/2003 02:12	
Toluene-d8	102.1	78-115	%	1.00	12/30/2003 02:12	

Gas/BTEX Fuel Oxygenates by 8260B (C6-C12)

Delta Env. Consultants San Jose
Attn.: Debbie Arnold

175 Bernal Road
Suite 200
San Jose, CA 95119
Phone: (408) 224-4724 Fax: (408) 224-4518

Project: SJ67-50S-1
97464711

Received: 12/29/2003 10:28

Site: 6750 Santa Rita Rd., Pleasanton

Prep(s): 5030B
Sample ID: **CPT-3 @ 97**
Sampled: 12/19/2003 08:30
Matrix: Water

Test(s): 8260B
Lab ID: 2003-12-0890 - 8
Extracted: 12/30/2003 02:36
QC Batch#: 2003/12/29-2B.66

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Gasoline	ND	50	ug/L	1.00	12/30/2003 02:36	
Benzene	ND	0.50	ug/L	1.00	12/30/2003 02:36	
Toluene	ND	0.50	ug/L	1.00	12/30/2003 02:36	
Ethylbenzene	ND	0.50	ug/L	1.00	12/30/2003 02:36	
Total xylenes	ND	1.0	ug/L	1.00	12/30/2003 02:36	
tert-Butyl alcohol (TBA)	ND	5.0	ug/L	1.00	12/30/2003 02:36	
Methyl tert-butyl ether (MTBE)	ND	0.50	ug/L	1.00	12/30/2003 02:36	
Di-isopropyl Ether (DIPE)	ND	2.0	ug/L	1.00	12/30/2003 02:36	
Ethyl tert-butyl ether (ETBE)	ND	2.0	ug/L	1.00	12/30/2003 02:36	
tert-Amyl methyl ether (TAME)	ND	2.0	ug/L	1.00	12/30/2003 02:36	
Surrogate(s)						
1,2-Dichloroethane-d4	108.9	76-130	%	1.00	12/30/2003 02:36	
Toluene-d8	97.3	78-115	%	1.00	12/30/2003 02:36	

Gas/BTEX Fuel Oxygenates by 8260B (C6-C12)

Delta Env. Consultants San Jose

Attn.: Debbie Arnold

175 Bernal Road
Suite 200
San Jose, CA 95119
Phone: (408) 224-4724 Fax: (408) 224-4518

Project: SJ67-50S-1
97464711

Received: 12/29/2003 10:28

Site: 6750 Santa Rita Rd., Pleasanton

Batch QC Report

Prep(s): 5030B
Method Blank
MB: 2003/12/29-2B.66-055

Water

Test(s): 8260B
QC Batch # 2003/12/29-2B.66
Date Extracted: 12/29/2003 18:55

Compound	Conc.	RL	Unit	Analyzed	Flag
Gasoline	ND	50	ug/L	12/29/2003 18:55	
tert-Butyl alcohol (TBA)	ND	5.0	ug/L	12/29/2003 18:55	
Methyl tert-butyl ether (MTBE)	ND	0.5	ug/L	12/29/2003 18:55	
Di-isopropyl Ether (DIPE)	ND	2.0	ug/L	12/29/2003 18:55	
Ethyl tert-butyl ether (ETBE)	ND	2.0	ug/L	12/29/2003 18:55	
tert-Amyl methyl ether (TAME)	ND	2.0	ug/L	12/29/2003 18:55	
Benzene	ND	0.5	ug/L	12/29/2003 18:55	
Toluene	ND	0.5	ug/L	12/29/2003 18:55	
Ethylbenzene	ND	0.5	ug/L	12/29/2003 18:55	
Total xylenes	ND	1.0	ug/L	12/29/2003 18:55	
Surrogates(s)					
1,2-Dichloroethane-d4	98.9	76-130	%	12/29/2003 18:55	
Toluene-d8	99.7	78-115	%	12/29/2003 18:55	

Gas/BTEX Fuel Oxygenates by 8260B (C6-C12)

Delta Env. Consultants San Jose

Attn.: Debbie Arnold

175 Bernal Road
Suite 200
San Jose, CA 95119
Phone: (408) 224-4724 Fax: (408) 224-4518

Project: SJ67-50S-1
97464711

Received: 12/29/2003 10:28

Site: 6750 Santa Rita Rd., Pleasanton

Batch QC Report

Prep(s): 5030B

Test(s): 8260B

Laboratory Control Spike **Water** **QC Batch # 2003/12/29-2B.66**

LCS 2003/12/29-2B.66-007 Extracted: 12/29/2003 Analyzed: 12/29/2003 18:07

LCSD 2003/12/29-2B.66-031 Extracted: 12/29/2003 Analyzed: 12/29/2003 18:31

Compound	Conc. ug/L		Exp.Conc.	Recovery %		RPD	Ctrl.Limits %		Flags	
	LCS	LCSD		LCS	LCSD	%	Rec.	RPD	LCS	LCSD
Methyl tert-butyl ether (MTBE)	21.5	20.8	25	86.0	83.2	3.3	65-165	20		
Benzene	19.6	20.3	25	78.4	81.2	3.5	69-129	20		
Toluene	21.3	21.7	25	85.2	86.8	1.9	70-130	20		
Surrogates(s)										
1,2-Dichloroethane-d4	504	494	500	100.8	98.8		76-130			
Toluene-d8	493	500	500	98.6	100.0		78-115			

SEVERN TRENT STL

Submission #: 2003-12-0890

Diesel (C10-C24)

Delta Env. Consultants San Jose
Attn.: Debbie Arnold

175 Bernal Road
Suite 200
San Jose, CA 95119
Phone: (408) 224-4724 Fax: (408) 224-4518

Project: SJ67-50S-1
97464711

Received: 12/29/2003 10:28

Site: 6750 Santa Rita Rd., Pleasanton

Samples Reported

Sample Name	Date Sampled	Matrix	Lab #
CPT-1 @ 56	12/18/2003 11:15	Water	1
CPT-1 @ 70	12/18/2003 12:00	Water	2
CPT-2 @ 47	12/19/2003 11:30	Water	3
CPT-2 @ 80	12/19/2003 12:00	Water	4
CPT-2 @ 98	12/19/2003 13:00	Water	5
CPT-3 @ 46	12/18/2003 15:30	Water	6
CPT-3 @ 72	12/18/2003 16:30	Water	7
CPT-3 @ 97	12/19/2003 08:30	Water	8

Diesel (C10-C24)

Delta Env. Consultants San Jose
Attn.: Debbie Arnold

175 Bernal Road
Suite 200
San Jose, CA 95119
Phone: (408) 224-4724 Fax: (408) 224-4518

Project: SJ67-50S-1
97464711

Received: 12/29/2003 10:28

Site: 6750 Santa Rita Rd., Pleasanton

Prep(s): 3511
Sample ID: **CPT-1 @ 56**
Sampled: 12/18/2003 11:15
Matrix: Water

Test(s): 8015M
Lab ID: 2003-12-0890 - 1
Extracted: 12/31/2003 18:47
QC Batch#: 2003/12/31-05.10

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Diesel	130	50	ug/L	1.00	01/02/2004 16:36	edr
Surrogate(s)						
o-Terphenyl	128.3	50-150	%	1.00	01/02/2004 16:36	

Diesel (C10-C24)

Delta Env. Consultants San Jose
Attn.: Debbie Arnold

175 Bernal Road
Suite 200
San Jose, CA 95119
Phone: (408) 224-4724 Fax: (408) 224-4518

Project: SJ67-50S-1
97464711

Received: 12/29/2003 10:28

Site: 6750 Santa Rita Rd., Pleasanton

Prep(s): 3511
Sample ID: **CPT-1 @ 70**
Sampled: 12/18/2003 12:00
Matrix: Water

Test(s): 8015M
Lab ID: 2003-12-0890 - 2
Extracted: 12/31/2003 18:47
QC Batch#: 2003/12/31-05.10

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Diesel	300	50	ug/L	1.00	01/02/2004 17:03	edr
Surrogate(s)						
o-Terphenyl	132.0	50-150	%	1.00	01/02/2004 17:03	

Diesel (C10-C24)

Delta Env. Consultants San Jose
Attn.: Debbie Arnold

175 Bernal Road
Suite 200
San Jose, CA 95119
Phone: (408) 224-4724 Fax: (408) 224-4518

Project: SJ67-50S-1
97464711

Received: 12/29/2003 10:28

Site: 6750 Santa Rita Rd., Pleasanton

Prep(s): 3511
Sample ID: **CPT-2 @ 47**
Sampled: 12/19/2003 11:30
Matrix: Water

Test(s): 8015M
Lab ID: 2003-12-0890 - 3
Extracted: 12/31/2003 18:47
QC Batch#: 2003/12/31-05.10

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Diesel	90	50	ug/L	1.00	01/02/2004 17:31	edr
Surrogate(s)						
o-Terphenyl	127.4	50-150	%	1.00	01/02/2004 17:31	

Diesel (C10-C24)

Delta Env. Consultants San Jose
Attn.: Debbie Arnold

175 Bernal Road
Suite 200
San Jose, CA 95119
Phone: (408) 224-4724 Fax: (408) 224-4518

Project: SJ67-50S-1
97464711

Received: 12/29/2003 10:28

Site: 6750 Santa Rita Rd., Pleasanton

Prep(s): 3511
Sample ID: **CPT-2 @ 80**
Sampled: 12/19/2003 12:00
Matrix: Water
Analysis Flag: rl (See Legend and Note Section)

Test(s): 8015M
Lab ID: 2003-12-0890 - 4
Extracted: 12/31/2003 18:47
QC Batch#: 2003/12/31-05.10

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Diesel	ND	260	ug/L	5.26	01/02/2004 15:42	
Surrogate(s)						
o-Terphenyl	99.3	50-150	%	5.26	01/02/2004 15:42	

Diesel (C10-C24)

Delta Env. Consultants San Jose
Attn.: Debbie Arnold

175 Bernal Road
Suite 200
San Jose, CA 95119
Phone: (408) 224-4724 Fax: (408) 224-4518

Project: SJ67-50S-1
97464711

Received: 12/29/2003 10:28

Site: 6750 Santa Rita Rd., Pleasanton

Prep(s): 3511
Sample ID: **CPT-2 @ 98**
Sampled: 12/19/2003 13:00
Matrix: Water
Analysis Flag: rl (See Legend and Note Section)

Test(s): 8015M
Lab ID: 2003-12-0890 - 5
Extracted: 12/31/2003 18:47
QC Batch#: 2003/12/31-05.10

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Diesel	ND	50	ug/L	1.00	01/02/2004 15:15	
Surrogate(s)						
o-Terphenyl	120.1	50-150	%	1.00	01/02/2004 15:15	

Diesel (C10-C24)

Delta Env. Consultants San Jose
Attn.: Debbie Arnold

175 Bernal Road
Suite 200
San Jose, CA 95119
Phone: (408) 224-4724 Fax: (408) 224-4518

Project: SJ67-50S-1
97464711

Received: 12/29/2003 10:28

Site: 6750 Santa Rita Rd., Pleasanton

Prep(s): 3511
Sample ID: **CPT-3 @ 46**
Sampled: 12/18/2003 15:30
Matrix: Water

Test(s): 8015M
Lab ID: 2003-12-0890 - 6
Extracted: 12/31/2003 18:47
QC Batch#: 2003/12/31-05.10

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Diesel	ND	50	ug/L	1.00	01/02/2004 16:09	
Surrogate(s)						
o-Terphenyl	118.8	50-150	%	1.00	01/02/2004 16:09	

Diesel (C10-C24)

Delta Env. Consultants San Jose
Attn.: Debbie Arnold

175 Bernal Road
Suite 200
San Jose, CA 95119
Phone: (408) 224-4724 Fax: (408) 224-4518

Project: SJ67-50S-1
97464711

Received: 12/29/2003 10:28

Site: 6750 Santa Rita Rd., Pleasanton

Prep(s): 3511
Sample ID: **CPT-3 @ 72**
Sampled: 12/18/2003 16:30
Matrix: Water

Test(s): 8015M
Lab ID: 2003-12-0890 - 7
Extracted: 12/31/2003 18:47
QC Batch#: 2003/12/31-05.10

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Diesel	ND	50	ug/L	1.00	01/02/2004 16:36	
Surrogate(s)						
o-Terphenyl	119.0	50-150	%	1.00	01/02/2004 16:36	

Diesel (C10-C24)

Delta Env. Consultants San Jose
Attn.: Debbie Arnold

175 Bernal Road
Suite 200
San Jose, CA 95119
Phone: (408) 224-4724 Fax: (408) 224-4518

Project: SJ67-50S-1
97464711

Received: 12/29/2003 10:28

Site: 6750 Santa Rita Rd., Pleasanton

Prep(s): 3511
Sample ID: **CPT-3 @ 97**
Sampled: 12/19/2003 08:30
Matrix: Water

Test(s): 8015M
Lab ID: 2003-12-0890 - 8
Extracted: 12/31/2003 18:47
QC Batch#: 2003/12/31-05.10

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Diesel	73	50	ug/L	1.00	01/02/2004 17:03	edr
Surrogate(s)						
o-Terphenyl	121.1	50-150	%	1.00	01/02/2004 17:03	

Diesel (C10-C24)

Delta Env. Consultants San Jose
Attn.: Debbie Arnold

175 Bernal Road
Suite 200
San Jose, CA 95119
Phone: (408) 224-4724 Fax: (408) 224-4518

Project: SJ67-50S-1
97464711

Received: 12/29/2003 10:28

Site: 6750 Santa Rita Rd., Pleasanton

Batch QC Report

Prep(s): 3511 Test(s): 8015M

Method Blank **Water** **QC Batch # 2003/12/31-05.10**

MB: 2003/12/31-05.10-001 Date Extracted: 12/31/2003 18:47

Compound	Conc.	RL	Unit	Analyzed	Flag
Diesel	ND	50	ug/L	01/02/2004 15:15	
Surrogates(s)					
o-Terphenyl	136.9	50-150	%	01/02/2004 15:15	

Diesel (C10-C24)

Delta Env. Consultants San Jose
Attn.: Debbie Arnold

175 Bernal Road
Suite 200
San Jose, CA 95119
Phone: (408) 224-4724 Fax: (408) 224-4518

Project: SJ67-50S-1
97464711

Received: 12/29/2003 10:28

Site: 6750 Santa Rita Rd., Pleasanton

Batch QC Report

Prep(s): 3511

Test(s): 8015M

Laboratory Control Spike **Water** **QC Batch # 2003/12/31-05.10**

LCS 2003/12/31-05.10-002 Extracted: 12/31/2003 Analyzed: 01/02/2004 15:42

LCSD 2003/12/31-05.10-003 Extracted: 12/31/2003 Analyzed: 01/02/2004 16:09

Compound	Conc. ug/L		Exp.Conc.	Recovery %		RPD	Ctrl.Limits %		Flags	
	LCS	LCSD		LCS	LCSD	%	Rec.	RPD	LCS	LCSD
Diesel	588	533	753	78.1	70.5	10.2	60-150	25		
Surrogates(s)										
o-Terphenyl	1.49	1.51	1.25	119.6	120.6		50-150	0		

Diesel (C10-C24)

Delta Env. Consultants San Jose
Attn.: Debbie Arnold

175 Bernal Road
Suite 200
San Jose, CA 95119
Phone: (408) 224-4724 Fax: (408) 224-4518

Project: SJ67-50S-1
97464711

Received: 12/29/2003 10:28

Site: 6750 Santa Rita Rd., Pleasanton

Legend and Notes

Analysis Flag

rl

Reporting limits raised due to reduced sample size.

Result Flag

edr

Hydrocarbon reported is in the early Diesel range, and does not match our Diesel standard

STL-San Francisco

1220 Quarry Lane

Pleasanton, CA 94566

(925) 484-1919 (925) 484-1096 fax

SHELL Chain Of Custody Record

81554

Shell Project Manager to be invoiced:

☑ SCIENCE & ENGINEERING
☐ TECHNICAL SERVICES
☐ CRMT HOUSTON

Karen Petryna

2003-12-0890

INCIDENT NUMBER (S&E ONLY): 9 7 4 6 4 7 1 1

SAP or CRMT NUMBER (TS/CRMT):

DATE: 12/29/03

PAGE: 1 of 1

SAMPLING COMPANY: Delta Environmental Consultants, Inc.	LOG CODE:
ADDRESS: 175 Bernal Rd, Suite 200, San Jose CA, 95119	
PROJECT CONTACT (Hardcopy or PDF Report to): Debbie Arnold	
TELEPHONE: (408) 224-4724	FAX: (408) 225-8506
E-MAIL: darnold@deltaenv.com	
SITE ADDRESS (Street and City): 6750 Santa Rita Rd, Pleasanton	GLOBAL ID NO.:
EDF DELIVERABLE TO (Responsible Party or Designee): Rebecca Wolff	PHONE NO.: (408) 224-4724
E-MAIL: rwolff@deltaenv.com	CONSULTANT PROJECT NO.: SJ67-50S-1
SAMPLER NAME(S) (Print): Rebecca Wolff & Debbie Arnold	LAB USE ONLY

TURNAROUND TIME (BUSINESS DAYS): ☐ 10 DAYS ☐ 5 DAYS ☐ 72 HOURS ☑ 48 HOURS ☐ 24 HOURS ☐ LESS THAN 24 HOURS

☐ LA - RWQCB REPORT FORMAT ☑ UST AGENCY: ______

GC/MS MTBE CONFIRMATION: HIGHEST ______ HIGHEST per BORING ______ ALL ______

SPECIAL INSTRUCTIONS OR NOTES: CHECK BOX IF EDD IS NOT NEEDED ☐

48 hr. Turnaround

REQUESTED ANALYSIS

LAB USE ONLY	Field Sample Identification	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	TPH - Purgeable	TPH - Extractable (8015m)	BTEX	MTBE	TBA	5 Oxygenates	1,2 DCA and EDB	Ethanol	Methanol	VOCs by 8260B	Semi-Volatiles by 8270C	Lead ☐ Total ☐ STLC ☐ TCLP	LUFT5 ☐ Total ☐ STLC ☐ TCLP	CAM17 ☐ Total ☐ STLC ☐ TCLP	Test for Disposal					FIELD NOTES: Container/Preservative or PID Readings or Laboratory Notes
	CPT-1 @ 56	12/18/03	11:15 a	water	3	X	X	X			X														3.5
	CPT-1 @ 70	12/18/03	12:00 p	water	3	X	X	X			X														
	CPT-2 @ 47	12/19/03	11:30 a	water	3	X	X	X			X														
	CPT-2 @ 80	12/19/03	12:00 p	water	3	X	X	X			X														
	CPT-2 @ 98	12/19/03	13:00 p	water	3	X	X	X			X														
	CPT-3 @ 46	12/18/03	3:30 p	water	3	X	X	X			X														
	CPT-3 @ 72	12/18/03	4:30 p	water	3	X	X	X			X														
	CPT-3 @ 97	12/19/03	8:30 a	water	3	X	X	X			X														

TEMPERATURE ON RECEIPT C°:

RUSH

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Rebecca Wolff 1505	[signature]	12/29/03	1028
[signature] 12/29/03			
	[signature]	12/29/03	1505

DISTRIBUTION: White with final report, Green to File, Yellow and Pink to Client.

10/16/00 Revision

C&O Graphics (714) 882-9732