



Earth Systems

Southern California

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Ventura, CA 93003
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December 14, 2012

Project No.: VT-24086-02
Report No.: 12-12-34

Mike Hollebrands
Meiners Oaks Water District
202 W. El Roblar Drive
Meiners Oaks, California 93023

Project: Proposed Replacement Water Tanks
Meiners Oaks Water District

Meiners Oaks Area of Ventura County, California

Subject: Second Addendum to Geotechnical Engineering Report

References: 1. Geotechnical Engineering Report, Two Proposed Water Tanks, Meiners Oaks Water District, Meiners Oaks area of Ventura County, California. File VT-24086-01, Report 09-2-6, February 6, 2009, Earth Systems Southern California
2. Addendum to Geotechnical Engineering Report, Proposed Replacement Water Tanks, Meiners Oaks Water District, Meiners Oaks area of Ventura County, California. File VT-24086-01, Report 12-6-23, June 20, 2012, Earth Systems Southern California

Introduction

As authorized we have performed additional field studies and laboratory testing for the proposed replacement water tanks. The additional field studies were based on recommended testing by the construction contractor Hayward Baker. The following letter summarizes our field study and laboratory testing.

Field Study

On October 30, 2012, two additional test pits (TP-13 and TP-14) were excavated near the proposed limits of the new tank diameters (see attached Site Plan) to obtain bulk samples of the soils from the ground surface to the bottoms of the test pits. The bulk samples will be transported to Hayward Baker for soil-cement testing. The depths of the test pits were about 6.5 to 7 feet, respectively, below the existing grade. The test pits were excavated with a backhoe. The final logs of the test pits represent our interpretation of the contents of the field logs and the results of laboratory testing performed on the samples obtained during the subsurface study. The final logs are attached.

On October 30, 2012, ten cone penetrometer tests (CPT's) were performed to depths of refusal. The CPT exploration was conducted by Kehoe Testing and Engineering by hydraulically advancing a 15 cm² conical probe into the ground using an approximately 30-ton truck as a reaction mass. An electronic data acquisition system recorded a near-continuous log of the

resistance of the soil against the cone tip (Q_c) and soil friction against the cone sleeve (f_s) as the probe was advanced. Resistance readings were recorded for every 2.5 cm (about 1 inch) of depth. Empirical relationships (Robertson et al, 1990) were applied to the data to give a near-continuous profile of soil stratigraphy. Interpretation of CPT data provides correlations for SPT blow count, internal friction angle, undrained strength (S_u) of clays, and soil type. Logs of the CPT soundings are attached to this letter. The approximate locations of the CPT's were determined in the field by pacing and sighting, and are shown on the attached Site Plan.

Laboratory Testing

The results of the following laboratory testing are attached to this letter.

Plasticity index testing was performed on the two bulk samples in general accordance with ASTM 4318.

The gradation characteristics of the two bulk samples were made by hydrometer (in accordance with ASTM D 422) and sieve analysis procedures. The samples were soaked in water until individual soil particles were separated and then washed on the No. 200 mesh sieve, oven dried, weighed to calculate the percent passing the No. 200 sieve and then mechanically sieved.

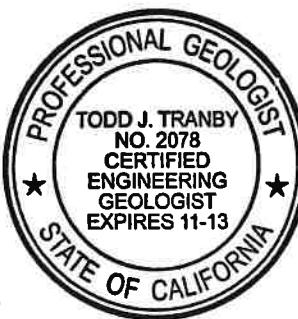
The testing of pH was performed for both of the bulk samples by Capco Analytical.

Please call if you have any questions, or if we can be of further service.

Respectfully submitted,

EARTH SYSTEMS SOUTHERN CALIFORNIA

Todd J. Tranby
Engineering Geologist



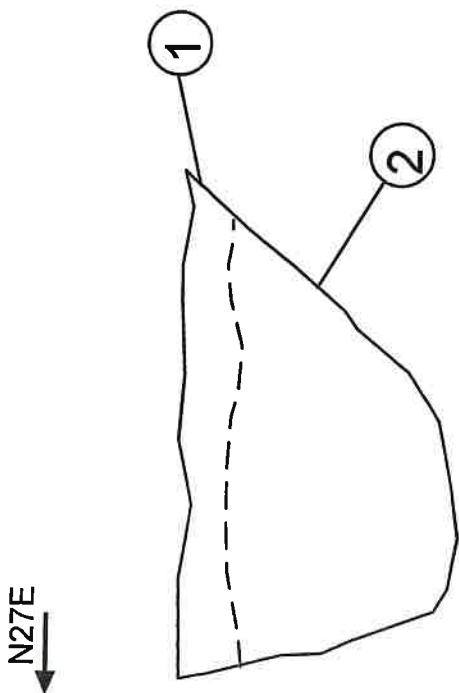
Attached: Test Pit Logs
CPT Logs
Site Plan
Laboratory Data

Copies: 1 - Meiners Oaks County Water District; Attention: Mike Hollebrands
1 - WREA; Attention: Barney Caudill
1 - Hayward Baker; Attention: Lisheng Shao
1 - Project File

DESCRIPTIONS

1. ARTIFICIAL FILL (SM): Silty gravelly sand; slightly moist to moist; loose to medium dense; yellow brown.

2. ARTIFICIAL FILL (ML): Sandy clayey silt; moist; medium stiff; dark brown to dark yellow brown; organics.



FINAL DEPTH: 7.0 FEET
BULK SAMPLE @ 2-7 FEET
NO GROUNDWATER ENCOUNTERED

TEST PIT #14

Meiners Oaks Water District
Ventura County, CA



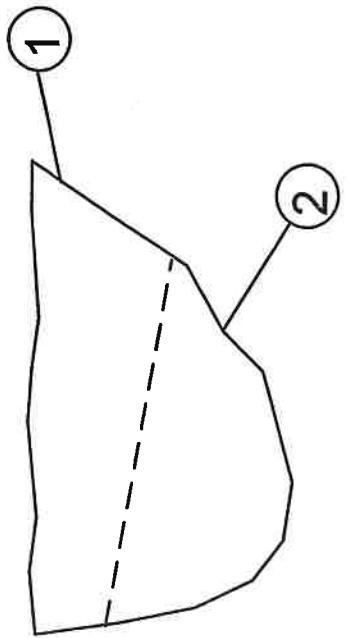
SCALE: 1" = 5' (VERTICAL & HORIZONTAL)

NOVEMBER 2012 | VT-24086-02

N10W
→

DESCRIPTIONS

- 1. ARTIFICIAL FILL (SM):** Silty sand with metal, concrete, asphalt, and wood debris; dry to slightly moist, loose; brown.
- 2. SOIL (SM):** Clayey silty sand; moist; medium dense; dark red brown.



FINAL DEPTH: 6.5 FEET
BULK SAMPLE @ 3-6 FEET
NO GROUNDWATER ENCOUNTERED

SCALE: 1" = 5' (VERTICAL & HORIZONTAL)

TEST PIT #13

Meiners Oaks Water District
Ventura County, CA



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Southern California

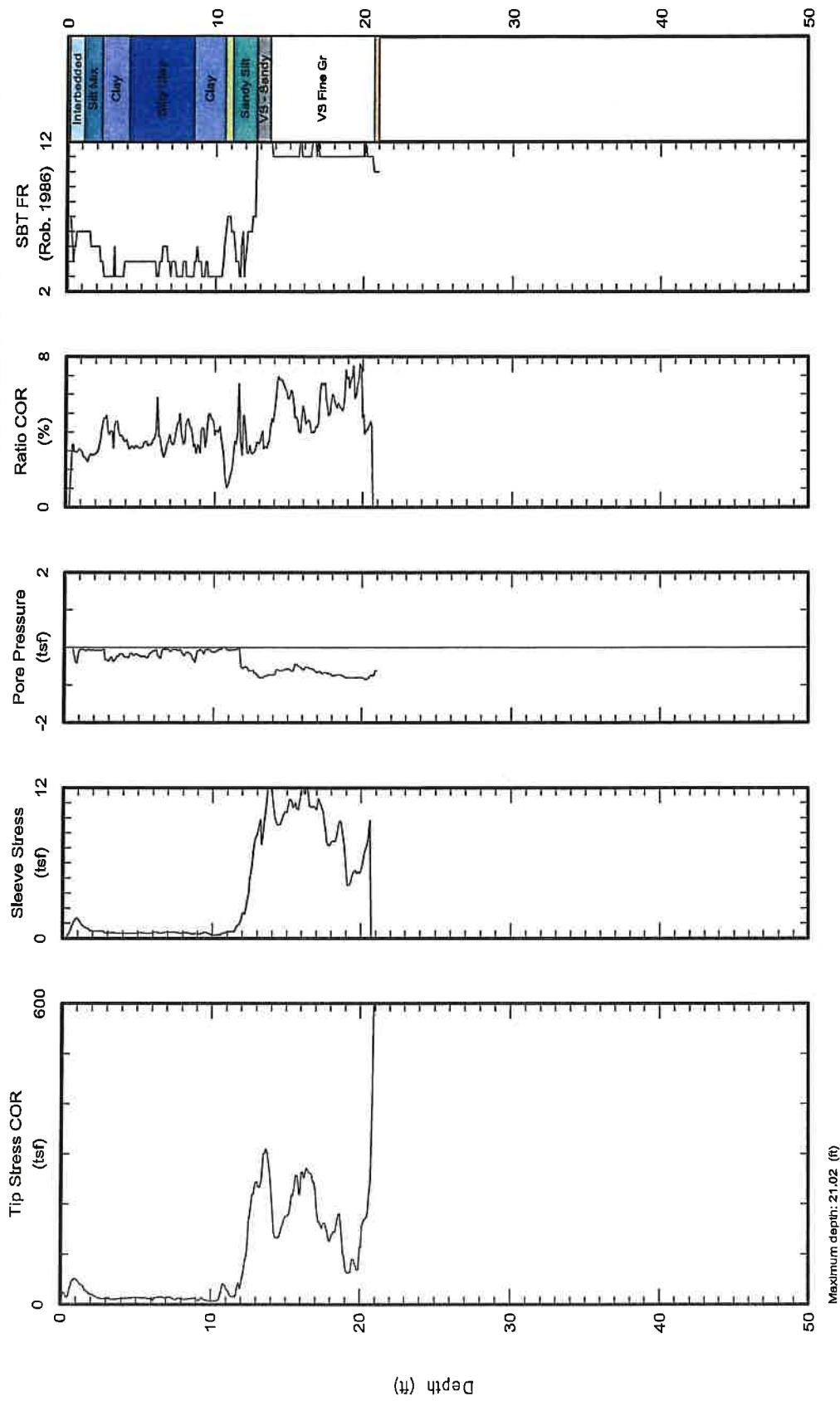


Kehoe Testing & Engineering
Office: (714) 901-7270
Fax: (714) 901-7289
rich@kehooetesting.com
www.kehooetesting.com

CPT Data
30 ton rig

Customer: Earth Systems Southern California
Job Site: Water District Tank

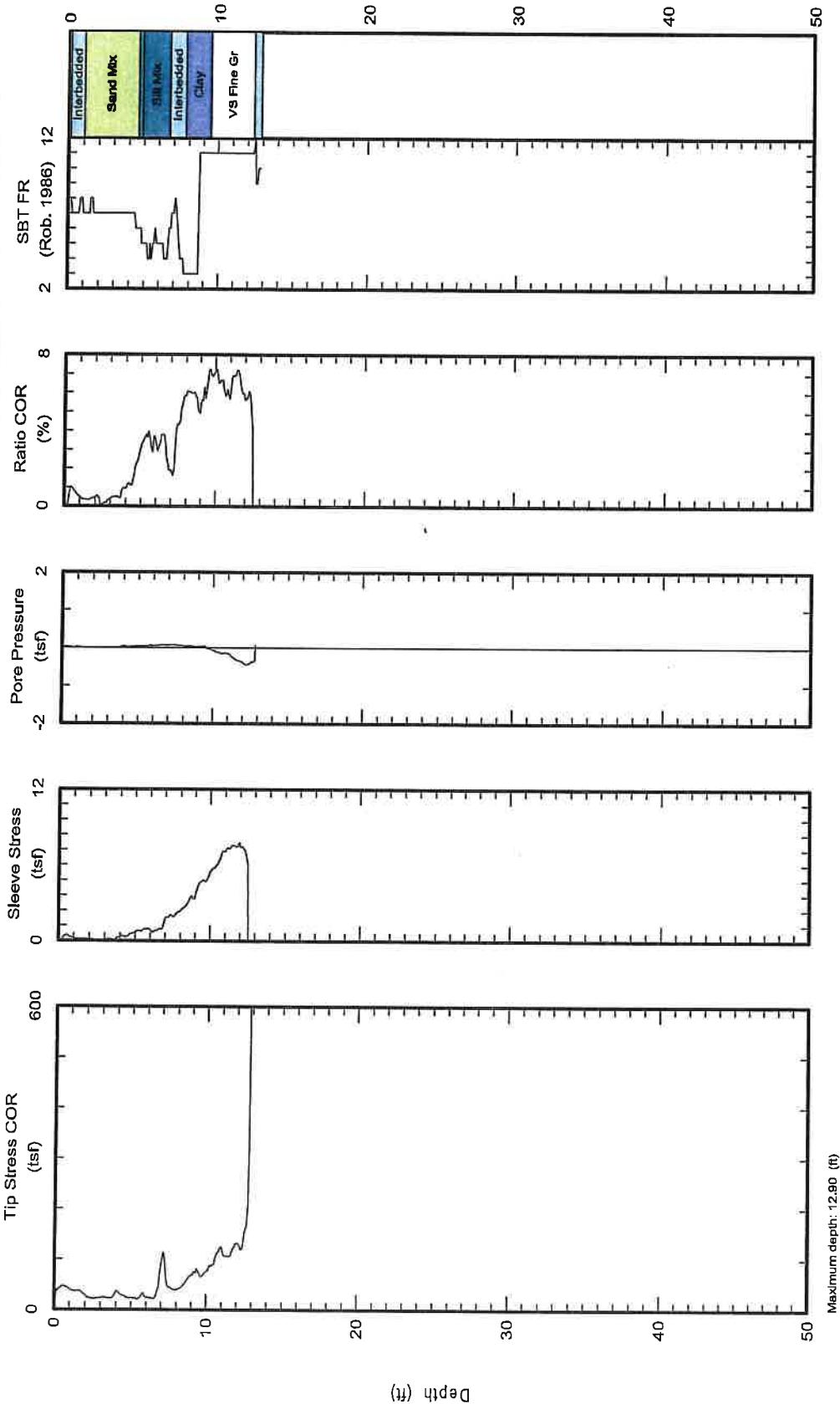
Date: 30/Oct/2012
Test ID: CPT-1
Project: Olai





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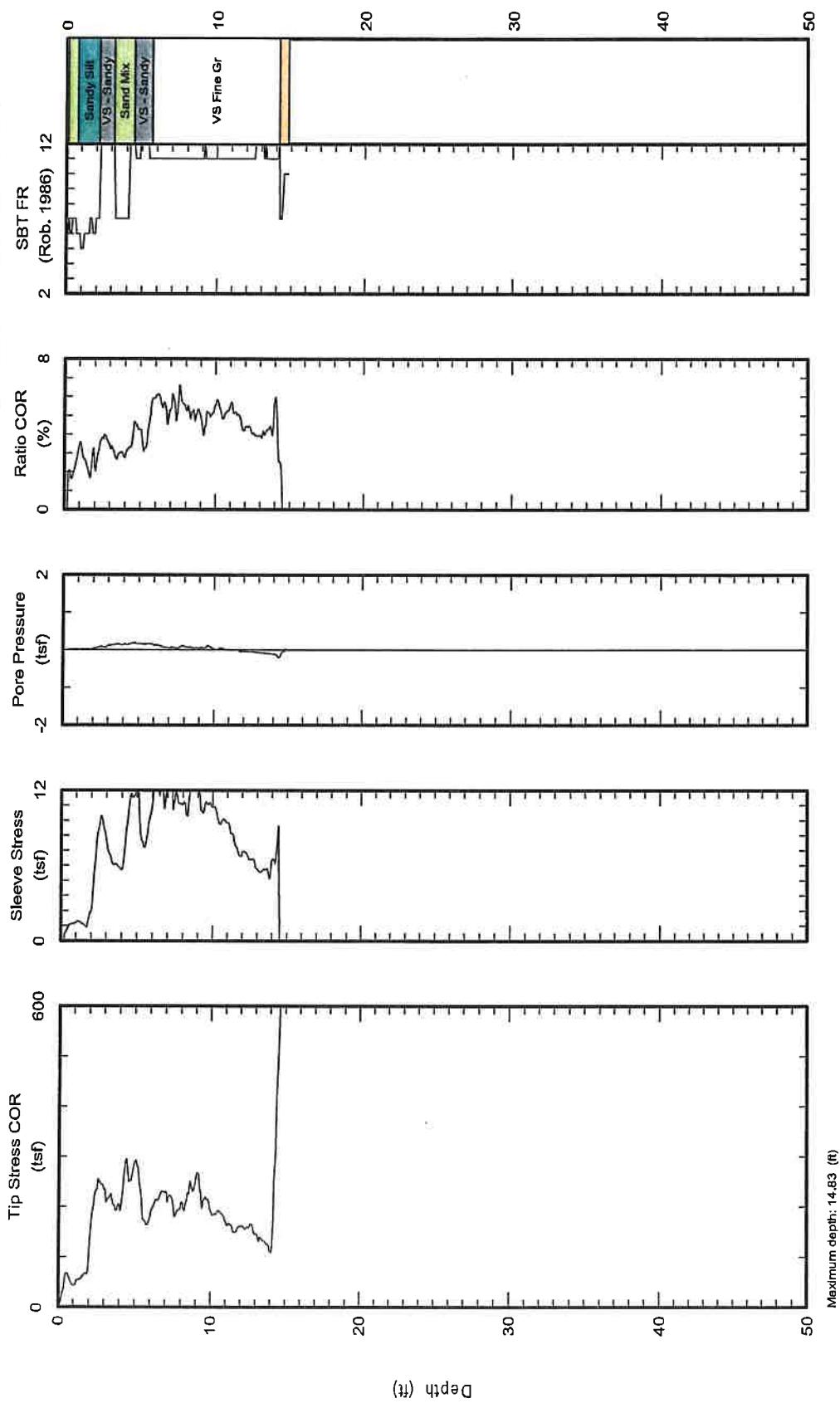
CPT Data 30 ton rig	Date: 30/Oct/2012 Test ID: CPT-2 Project: Olai
Customer: Earth Systems Southern California Job Site: Water District Tank	





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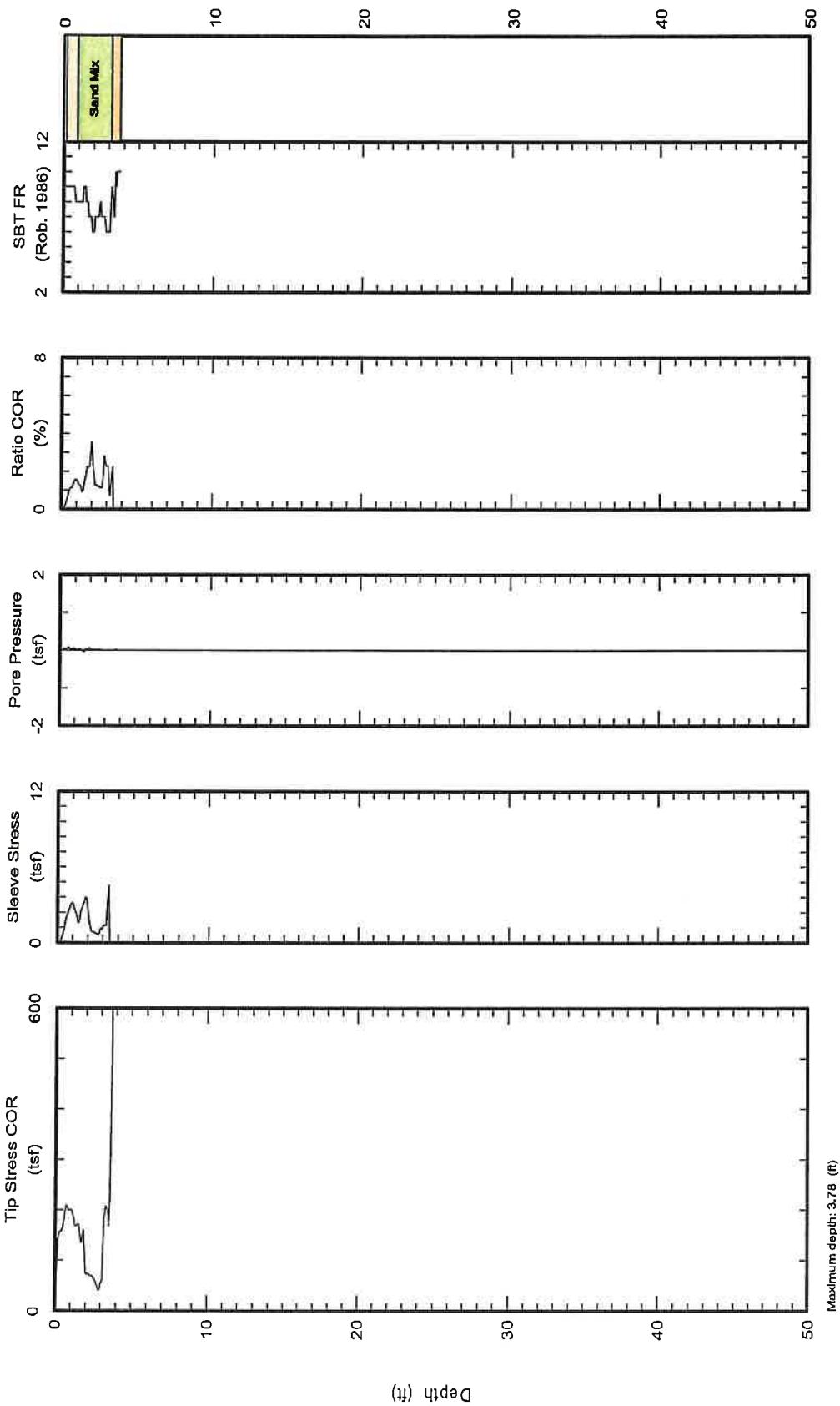
CPT Data 30 ton rig	Date: 30/Oct/2012 Test ID: CPT-3 Project: Olai
Customer: Earth Systems Southern California Job Site: Water District Tank	





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CPT Data 30 ton rig	Date: 30/Oct/2012 Test ID: CPT-4 Project: Oiai
Customer: Earth Systems Southern California Job Site: Water District Tank	



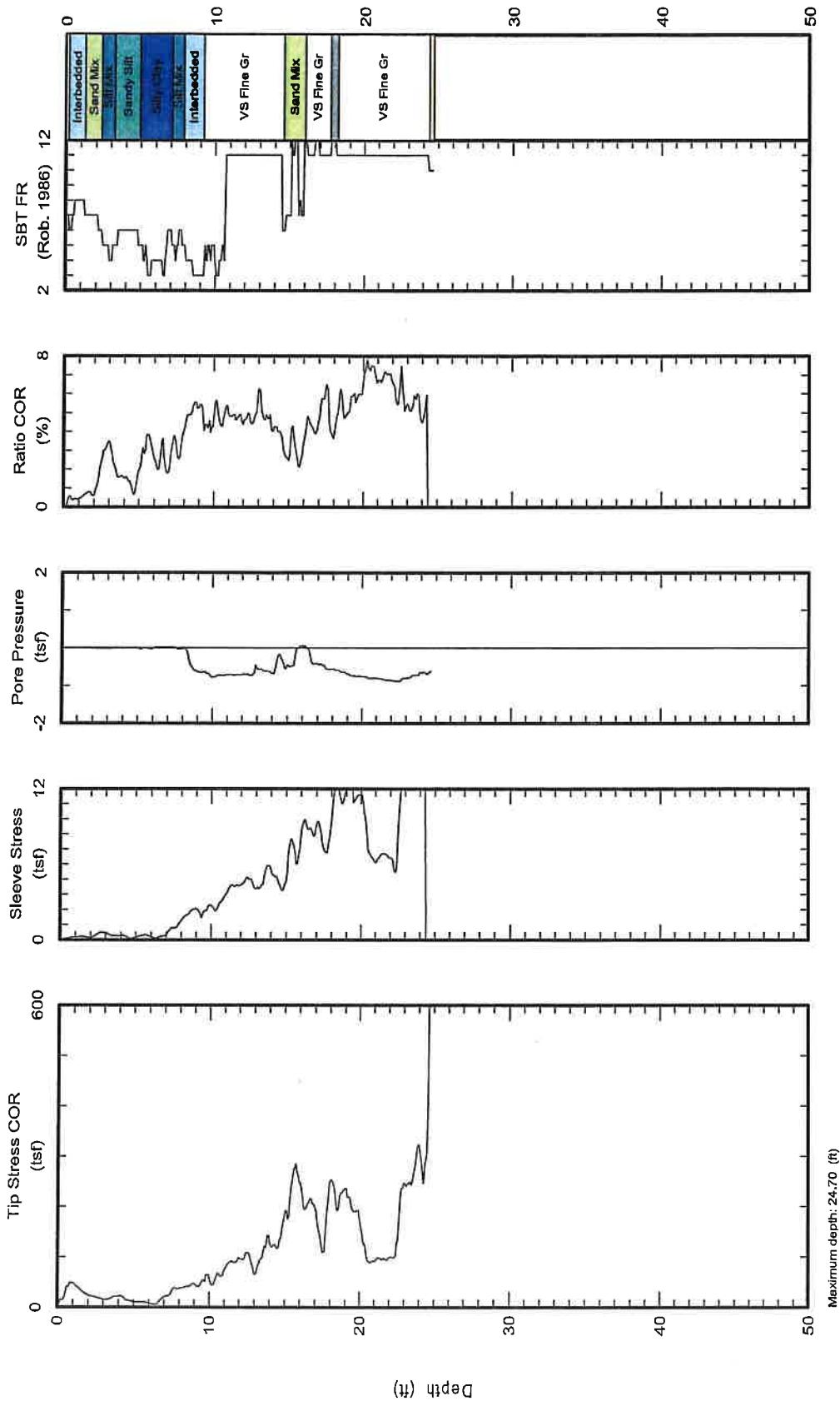


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CPT Data
30 ton rig

Date: 30/Oct/2012
Test ID: CPT-5
Project: Ojai

Customer: Earth Systems Southern California
Job Site: Water District Tank

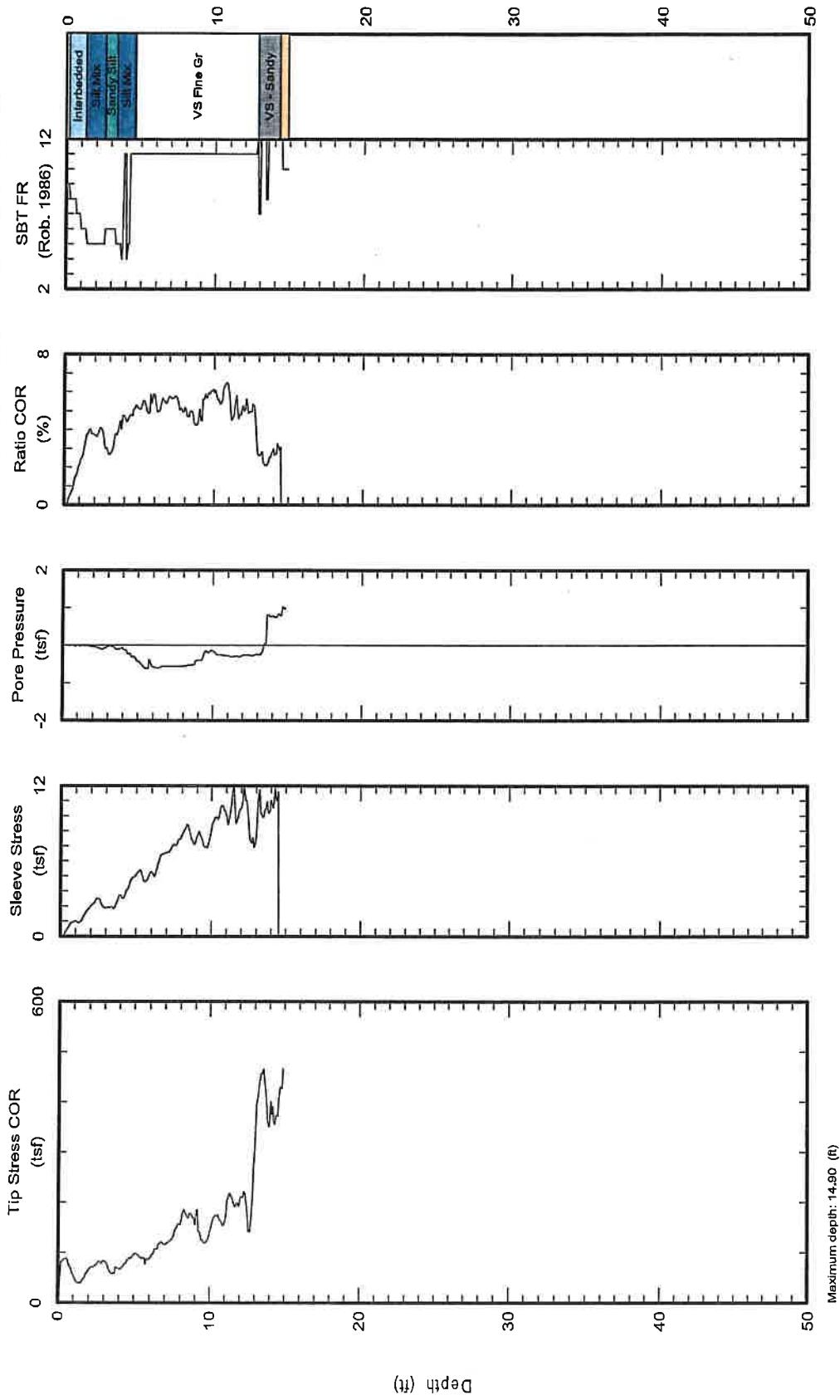




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CPT Data
30 ton rig

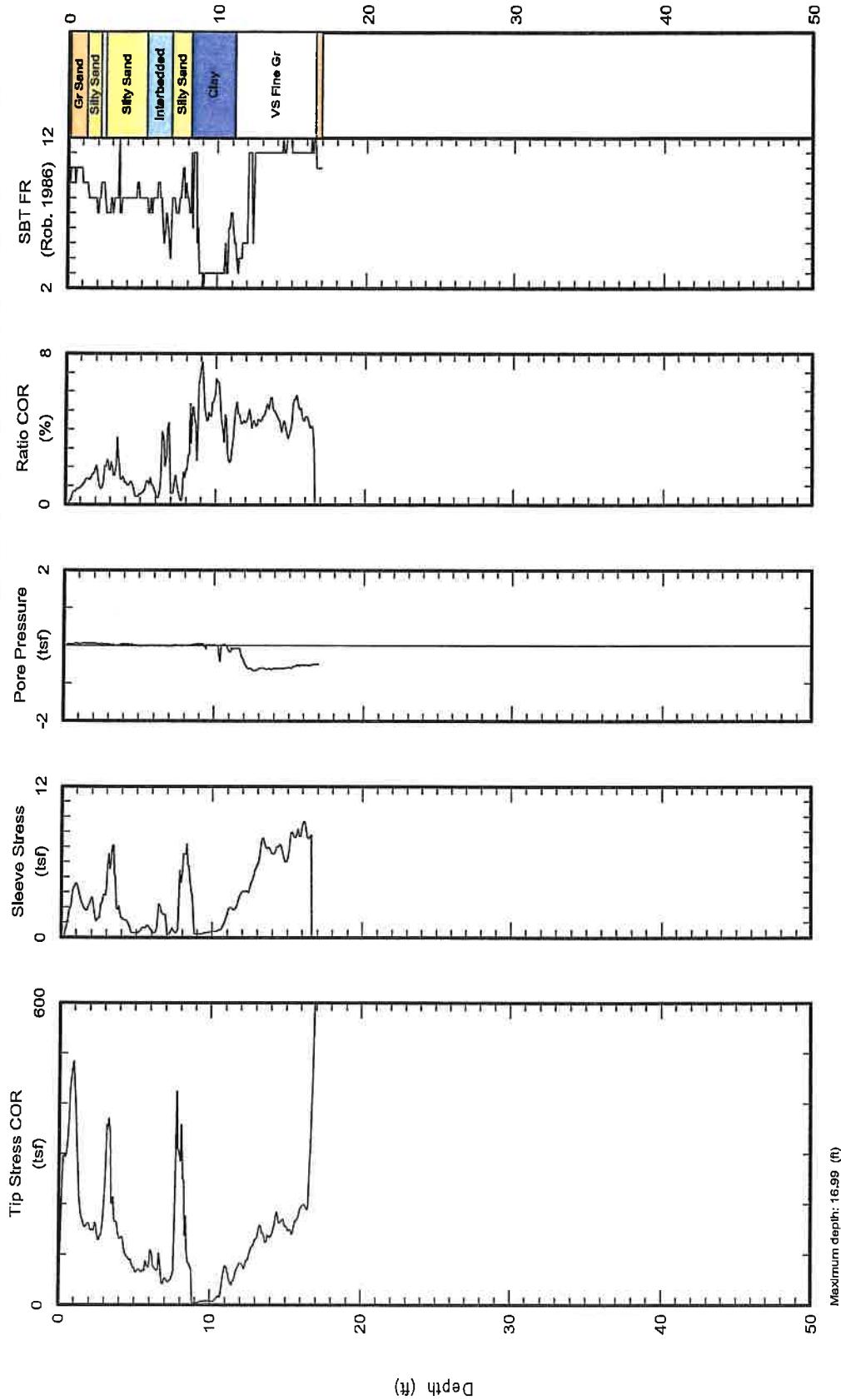
Date: 30/Oct/2012
Test ID: CPT-6
Project: Olai
Customer: Earth Systems Southern California
Job Site: Water District Tank

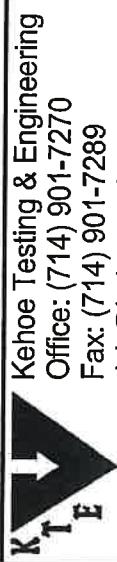




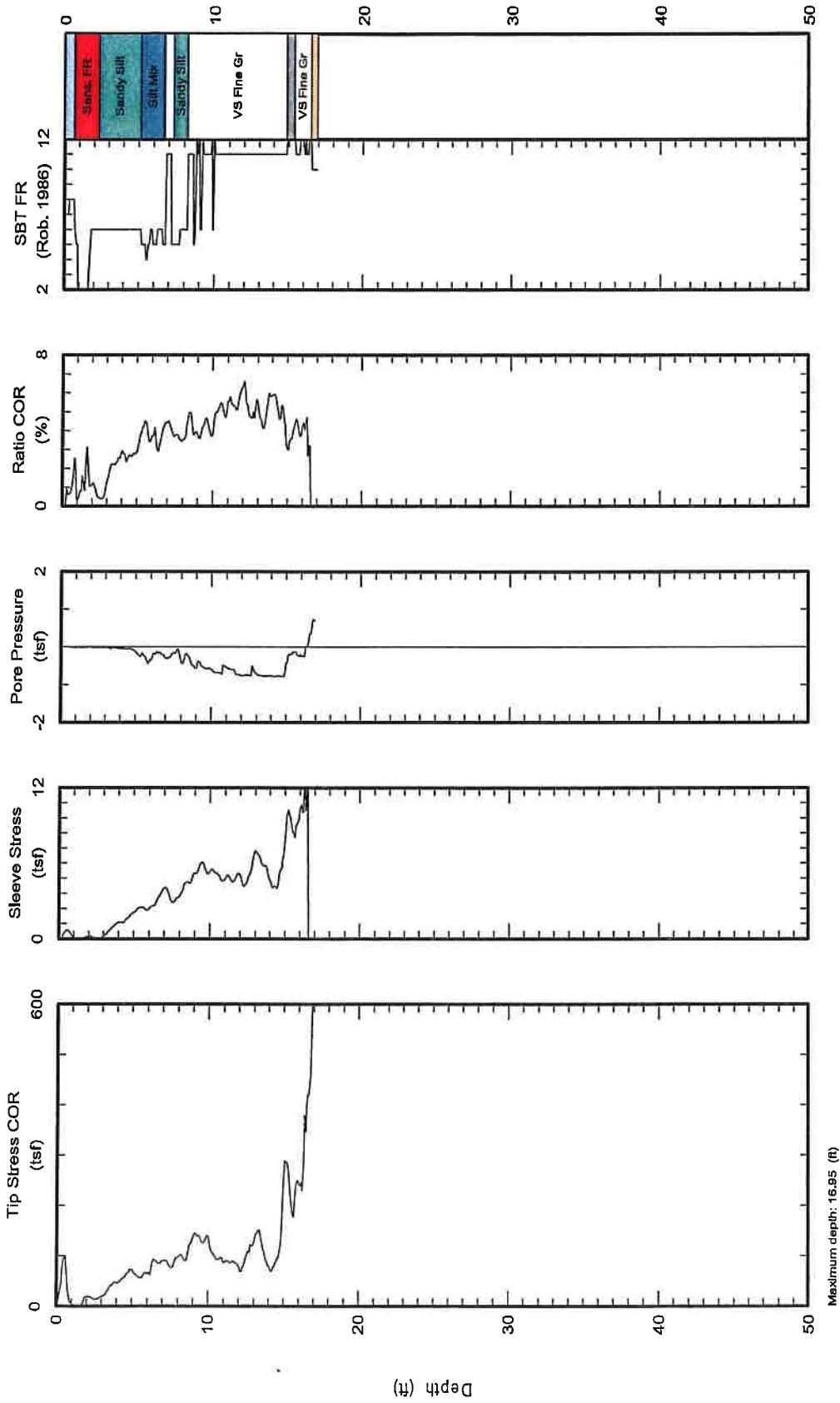
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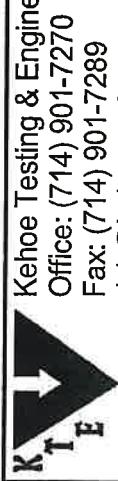
CPT Data 30 ton rig	Date: 30/Oct/2012 Test ID: CPT-7
Customer: Earth Systems Southern California Job Site: Water District Tank	





Kehoe Testing & Engineering Office: (714) 901-7270 Fax: (714) 901-7289 rich@kehooetesting.com www.kehooetesting.com	CPT Data 30 ton rig	Date: 30/Oct/2012 Test ID: CPT-8 Project: Ojai
Customer: Earth Systems Southern California Job Site: Water District Tank		

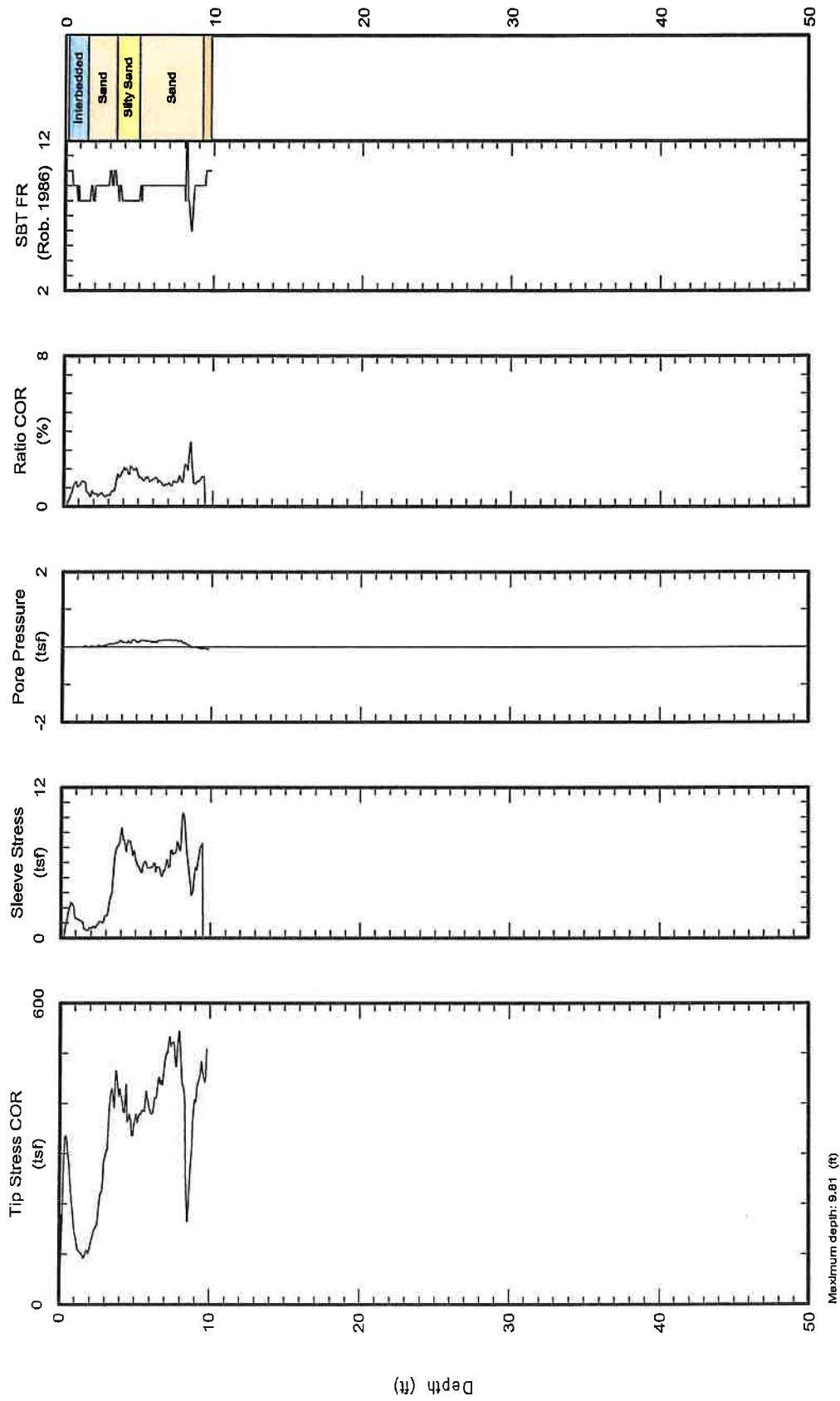


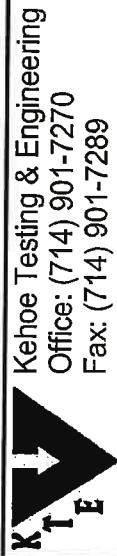


CPT Data
30 ton rig

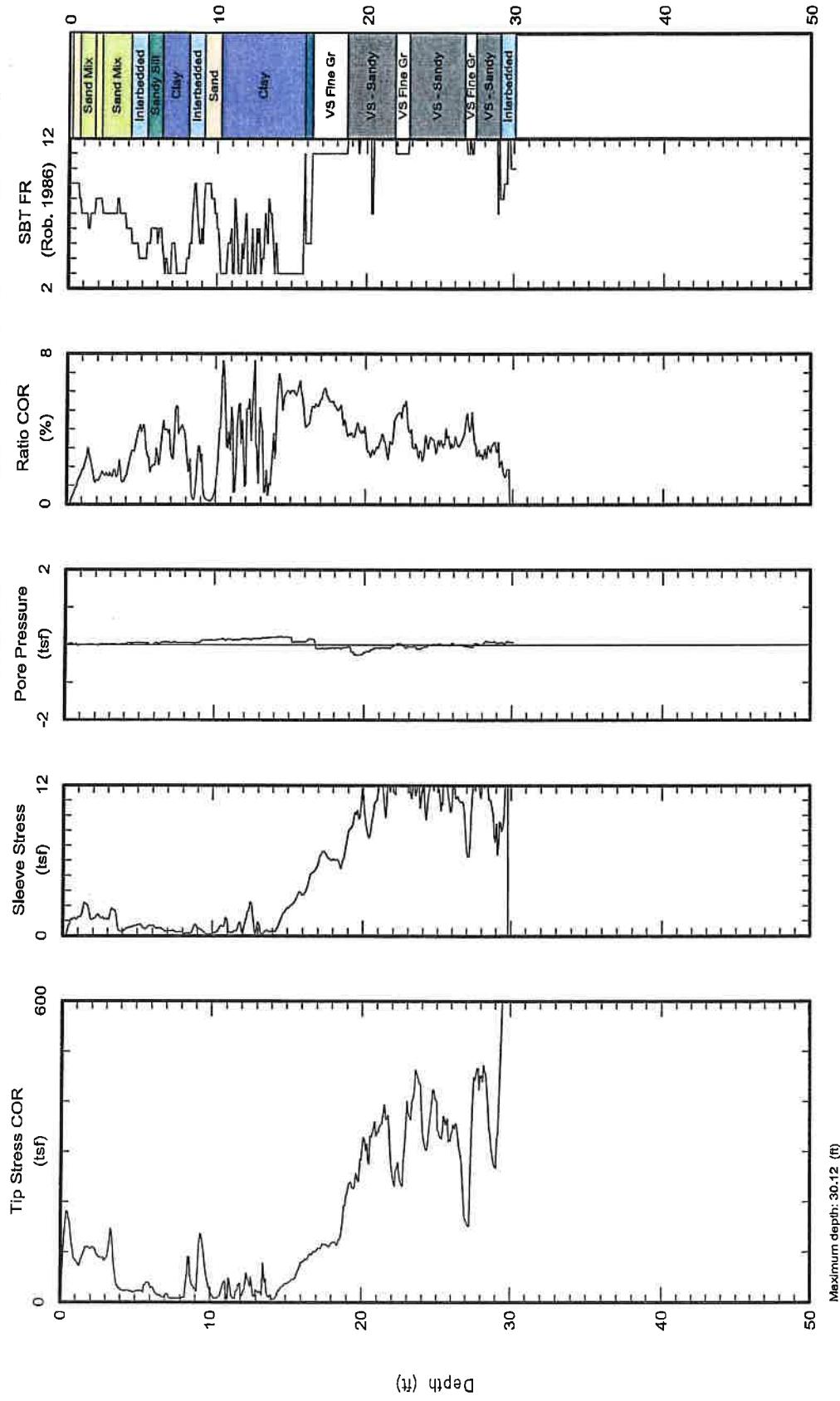
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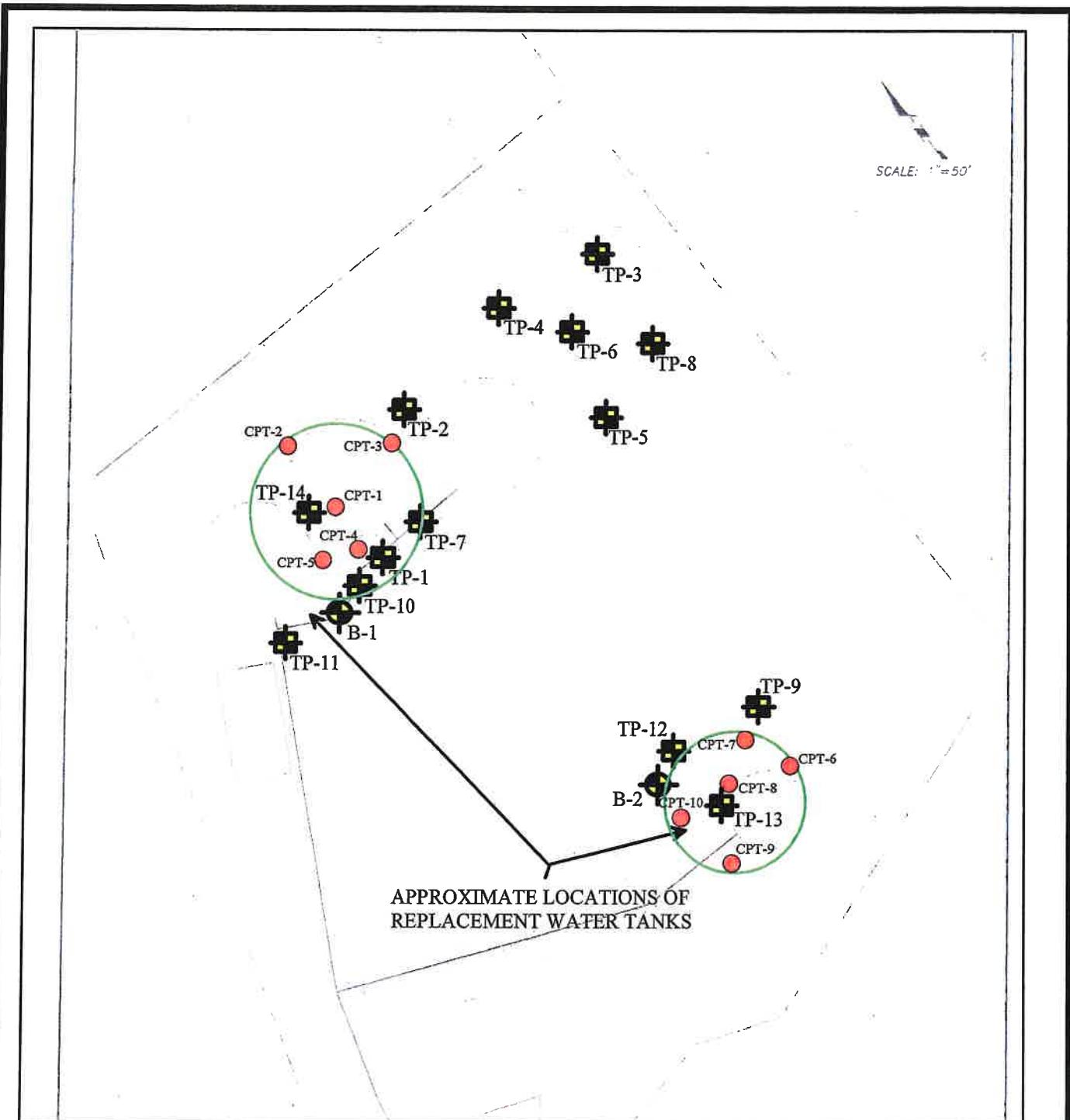
Date: 30/Oct/2012
Test ID: CPT-9
Project: Ojai
Customer: Earth Systems Southern California
Job Site: Water District Tank





Kehoe Testing & Engineering Office: (714) 901-7270 Fax: (714) 901-7289 rich@kehoetesting.com www.kehoetesting.com	CPT Data 30 ton rig	Date: 30/Oct/2012 Test ID: CPT-10 Project: Ojai
Customer: Earth Systems Southern California Job Site: Water District Tank		





TP-1

TEST PIT LOCATIONS



B-1

BORING LOCATIONS



CPT-1

CPT BORING LOCATIONS

SITE PLAN

Meiners Oaks Water District
Ventura County, California



Earth Systems

Southern California

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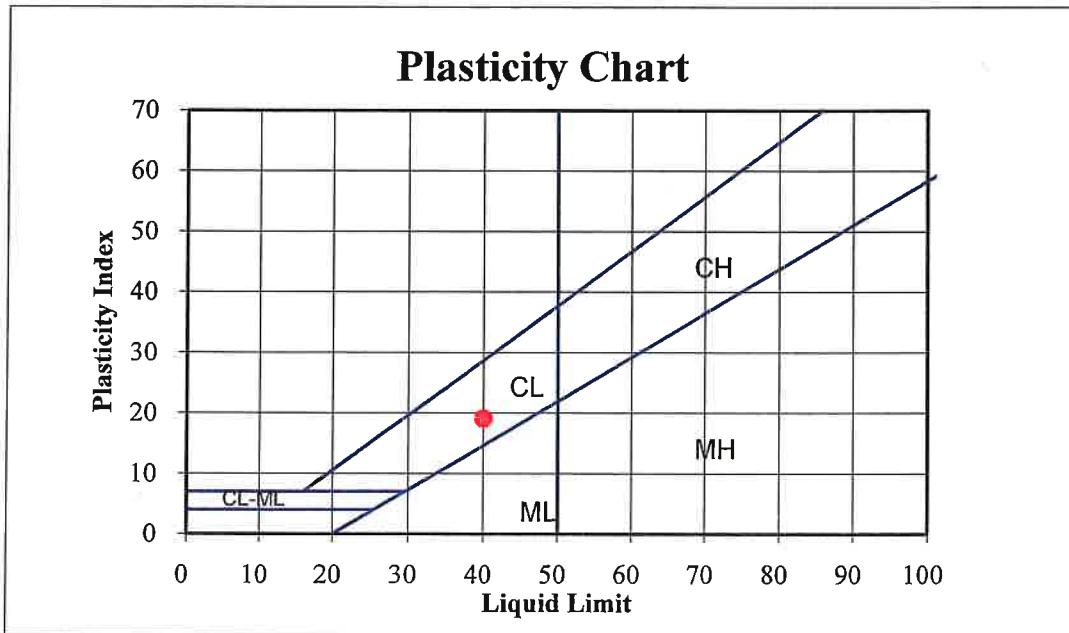
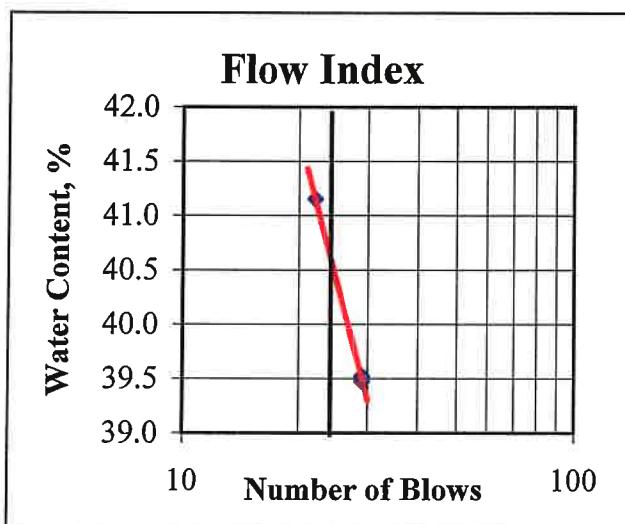
PLASTICITY INDEX

ASTM D-4318

Job Name: Meiners Oaks Water District
 Sample ID: TP 13
 Soil Description: CL

DATA SUMMARY

	22	29	29	LIQUID LIMIT	40
Water Content, %	41.2	39.5	39.5	PLASTIC LIMIT	21
Plastic Limit:	21.0	21.2	PLASTICITY INDEX	19	



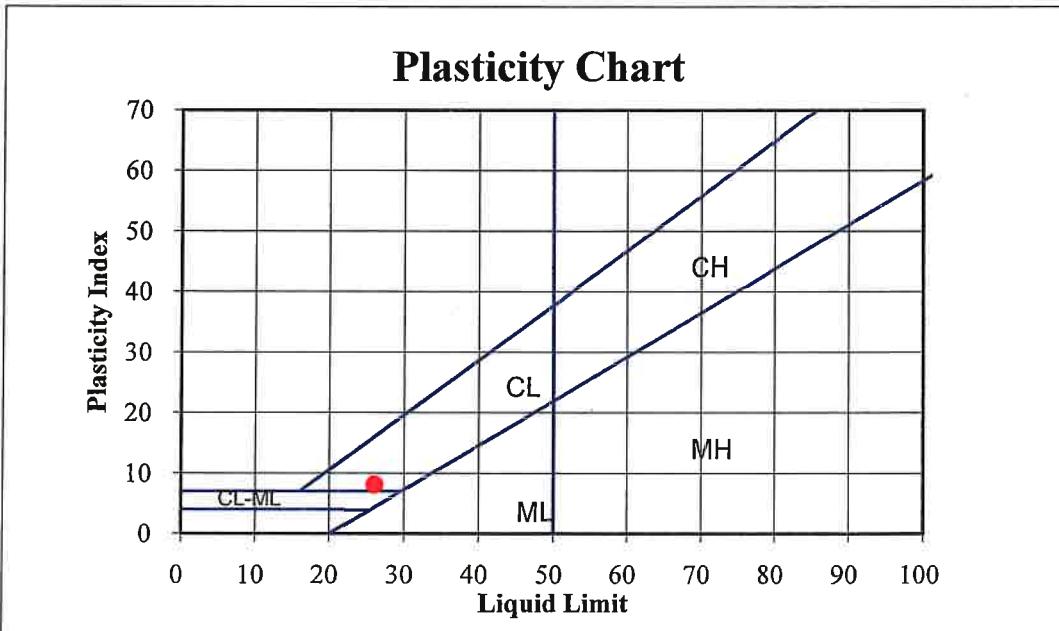
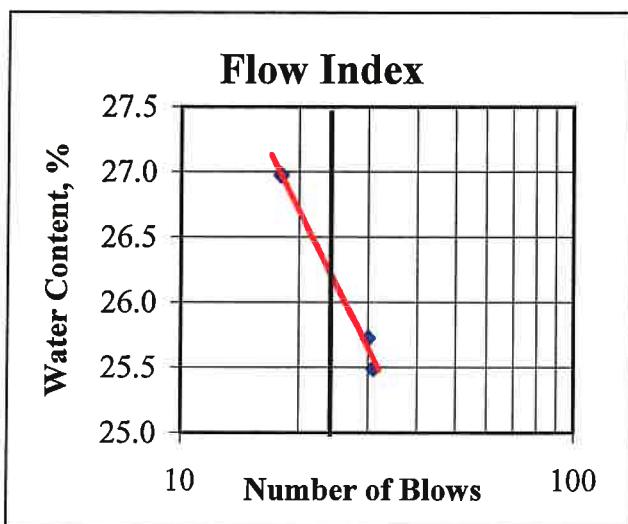
PLASTICITY INDEX

ASTM D-4318

Job Name: Meiners Oaks Water District
Sample ID: TP 14
Soil Description: CL-ML

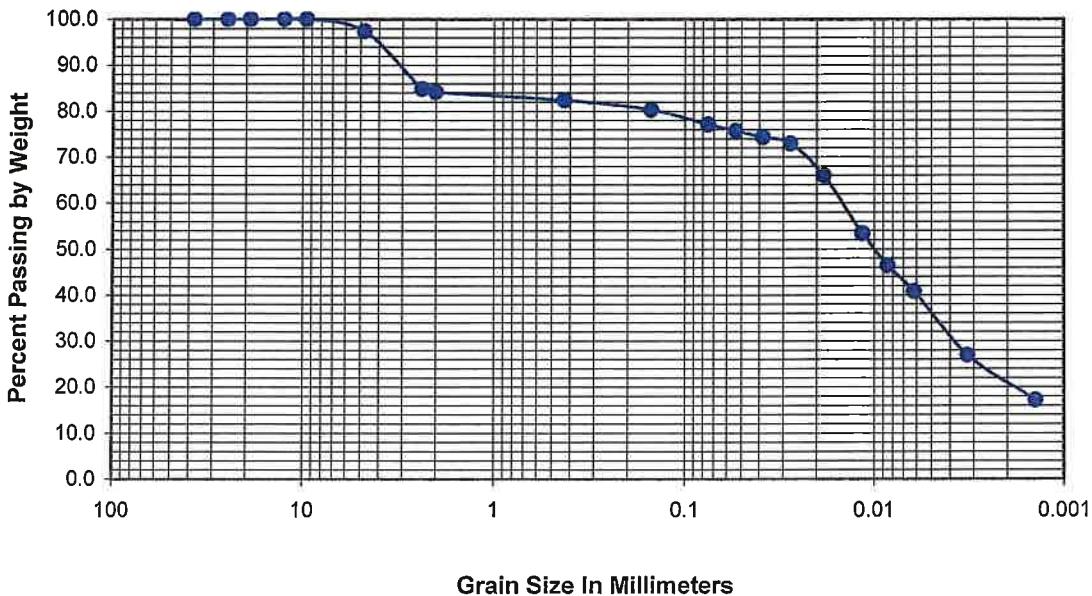
DATA SUMMARY

Number of Blows:	18	30	31	LIQUID LIMIT	26
Water Content, %	27.0	25.7	25.5	PLASTIC LIMIT	18
Plastic Limit:	17.8	17.5	PLASTICITY INDEX	8	



Sample Number TP 13
Date: 11/14/2012
Tech. SD

Mechanical Analysis Graph



Summary of Sieve Results					
Mechanical Analysis		Hydrometer Analysis		Particle Distribution	
Sieve Size	Percent Passing	Particle Diameter	Percent Passing	Particle Name	Percent of Sample
1 1/2	100.0	0.0745	77.1	Gravel	2.6
1	100.0	0.0533	75.7	Sand	20.3
3/4	100.0	0.0381	74.3	Silt	46.8
1/2	100.0	0.0273	72.9	Clay	30.3
3/8	100.0	0.0182	65.9		
#4	97.4	0.0115	53.4		
#8	84.8	0.0084	46.4		
#10	84.1	0.0062	40.8		
#40	82.3	0.0032	26.9		
#100	80.2	0.0014	17.1		
#200	77.1				

Mieners Oaks Water District



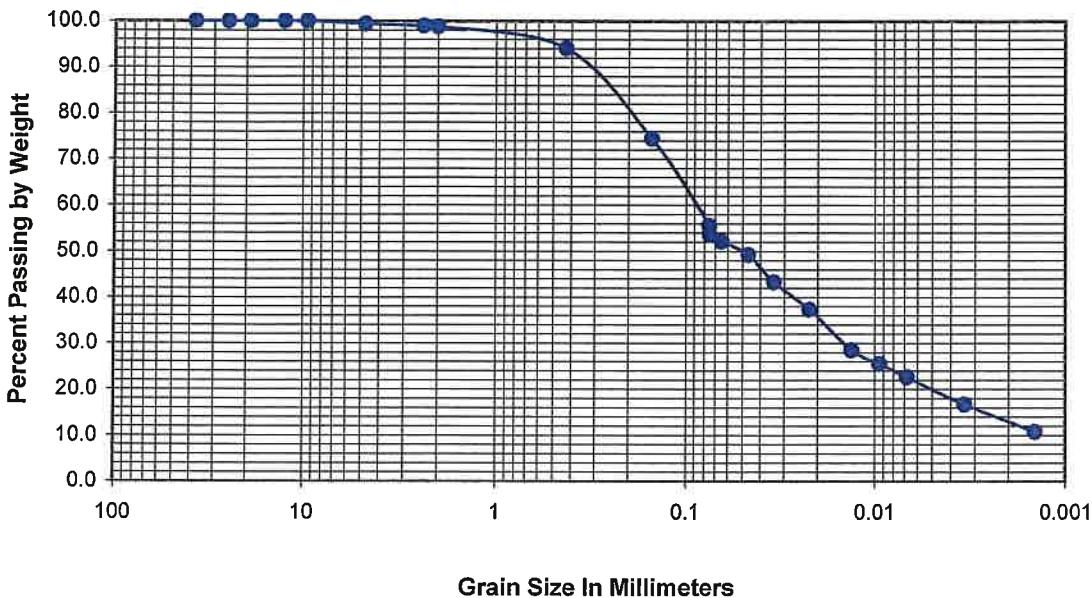
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11/14/2012

VT-24086-01

Sample Number TP 14
Date: 11/14/2012
Tech. SD

Mechanical Analysis Graph



Summary of Sieve Results					
Mechanical Analysis		Hydrometer Analysis		Particle Distribution	
Sieve Size	Percent Passing	Particle Diameter	Percent Passing	Particle Name	Percent of Sample
1 1/2	100.0	0.0746	53.6	Gravel	0.6
1	100.0	0.0644	52.1	Sand	43.8
3/4	100.0	0.0463	49.2	Silt	37.5
1/2	100.0	0.0337	43.3	Clay	18.1
3/8	100.0	0.0220	37.4		
#4	99.4	0.0132	28.5		
#8	99.0	0.0095	25.5		
#10	98.8	0.0068	22.6		
#40	94.1	0.0034	16.7		
#100	74.5	0.0015	10.8		
#200	55.5				

Mieners Oaks Water District



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11/14/2012

VT-24086-01

CERTIFICATE OF ANALYSIS

Client: Earth Systems Southern California Date Sampled: 11/07/12
CAS LAB NO: 123321 Date Received: 11/07/12
Analyst: AN Sample Matrix: Soil

WET CHEMISTRY SUMMARY

COMPOUND	RESULT	UNITS	DF	PQL	METHOD	ANALYZED
<hr/>						
CAS Lab #: 123321-01						
Sample ID: TP13						
pH (Corrosivity)	7.3	S.U.	1	---	9045	11/08/12
<hr/>						
CAS Lab #: 123321-02						
Sample ID: TP14						
pH (Corrosivity)	7.2	S.U.	1	---	9045	11/08/12
Organic Matter	2.8	%	1	0.05	ASTM D2974	11/08/12