

Geotechnical Feasibility Report
Proposed High-Rise Residential Development
6220 West Yucca Street
Hollywood District
Los Angeles, California

For Champion Real Estate Company

March 6, 2015 GDC Project No. LA-1183G

73718



Champion Real Estate Company 11601 Wilshire Boulevard, Suite 1650 Los Angeles, CA 90025 March 6, 2015 GDC Project No. LA-1183G

Attention:

Mr. Greg Beck

Subject:

Geotechnical Feasibility Report

Proposed High-Rise Residential Development

6220 West Yucca Street, Hollywood District, Los Angeles, California

Dear Mr. Beck, Vice President

Group Delta Consultants (GDC) is pleased to submit this geotechnical feasibility report for the proposed high-rise residential development planned at 6220 West Yucca Street in the Hollywood District, Los Angeles, California. Our scope of work was conducted in general accordance with our proposal dated January 29, 2015.

We appreciate the opportunity to provide geotechnical services for this significant project. If you have any questions pertaining to this report, or if we can be of further service, please do not hesitate to contact us.

Sincerely,

Group Delta Consultants

Thomas D. Swantko, G.E 813

Distribution: Addressee (6)

Principal Geotechnical Engineer

Ethan Tsai, G.E. 3004

Senior Engineer

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GEOTECHNICAL FEASIBILITY REPORT PROPOSED HIGH-RISE RESIDENTIAL DEVELOPMENT 6220 WEST YUCCA STREET LOS ANGELES, CALIFORNIA

1.0 INTRODUCTION

1.1 Background

This report was prepared to address the feasibility of the proposed high-rise residential development from a geotechnical standpoint and to provide preliminary geotechnical recommendations for planning purposes. The project site is located at 6220 West Yucca Street in the Hollywood District of Los Angeles City, California. A Vicinity Map is presented in Figure 1.

1.2 Project Description

It is proposed to demolish the existing apartment buildings that currently occupy the site and construct two new, type 1, residential high-rise towers over four levels of common subterranean parking. Conceptual plans show the towers may be on the order of 20–stories, with each high-rise building having a footprint of approximately 12,000 square feet. A 2-level podium structure will be located at the base of the towers. The footprint of the podium structure will be approximately 43,000 square feet. The lowest basement floor in the 4-level parking structure will be about 30 to 40 feet below the lowest adjacent grade, at approximately Elevation 385 feet.

1.3 Purposes and Scope of Work

The purposes of this report are to address the primary geotechnical factors affecting the project and provide preliminary geotechnical recommendations for project planning. The recommendations were developed based on review of the conceptual drawings of the proposed development and the data previously collected from our fault investigations conducted for the site. Our scope of work included the following:

- Review the available data for the project, including previous subsurface data and conceptual plans.
- Performing limited geotechnical laboratory tests on selected soil samples obtained from the fault investigations.
- Performing preliminary analyses to provide preliminary recommendations for excavation, shoring, foundation design, floor slab support, basement walls, resistance to lateral loads, and construction-related issues.
- Prepare and submit six copies of our report.



1.4 Previous Reports

We previously performed a Fault Activity Investigation at the site and presented the results in a report dated September 7, 2014. The report was reviewed by the Grading Division of the City of Los Angeles and the City provided comments in their Geology Report Correction Letter, dated September 17, 2014. We subsequently conducted a supplemental fault investigation and provided the results in a response report dated February 12, 2015. The fault activity report was approved by the City in their approval letter dated February 20, 2015. The results of the fault activity investigation indicate that no active faults are present beneath the site. A copy of the City's Geologic Report Approval Letter is provided in Appendix A.

2.0 GEOTECHNICAL INVESTIGATION AND LABORATORY TESTING

2.1 Field Investigation

The soil conditions beneath the site were previously investigated during the fault investigations, by drilling 11 borings to depths of 25 to 60 feet below the existing grade and performing 13 Cone Penetration Tests (CPTs) to depths of up to 55 feet below the existing grade. In addition two 10 to 15-foot deep trenches were excavated in the east and west areas of the site. The locations of previous explorations are shown on Figure 2, Exploration Plan. The logs of the prior borings and CPTs results are presented in Appendix B.

2.2 Laboratory Testing Program

Limited laboratory testing was performed on representative samples of the cores obtained during the fault investigation, to further evaluate and correlate the physical properties and engineering characteristics of the soils encountered. The following tests were performed as part of this study:

- Corrosivity (pH, sulfate, chloride, electrical resistivity)
- Expansion index

All testing was done in general accordance with applicable ASTM specifications. Details of the limit laboratory testing program and test results are presented in Appendix C.



3.0 SITE CONDITIONS

3.1 Site Conditions

The site is located at southeast corner of West Yucca Street and North Argyle Avenue and is approximately 1.06 acre in size. The site is currently occupied by three existing 2-story apartment buildings and covered garages. A small parking lot is located at the northeast corner of the site. The topography of the site generally is ascending from southeast to northeast with elevation change of approximately 20 feet. Various service utilities are located on the site.

Topographically, the site is located on a ridge, oriented north-south and parallel to Argyle Avenue. The existing site grades range from a high of about Elevation 432 feet in the northeast corner to roughly Elevation 420 feet along the south end of the pad. The existing grade along Yucca Street slopes up from about Elevation 416 feet at Argyle Avenue to Elevation 430 feet adjacent to the northeast corner of the site. The grade along Argyle Avenue slopes down from about Elevation 416 at Yucca Street to 408 feet at the south edge of the site,

The site is located within the Alquist-Priolo Special Study Seismic Zone designated for the Hollywood Fault. As previously stated, the results of the fault investigation conducted at the site indicated that no active faults underlies the site. The results of the fault investigation was approved by the City in an approval letter dated February 20, 2015.

3.2 Subsurface Conditions

Based on the field explorations, subsurface conditions at the site are depicted in Figures 3.1 through 3.3. Fill soils, approximately 2 to 5 feet thick, were encountered below existing pavements. The fills soils consist of silty sand, clayey sand and lean clay and are medium dense to stiff. The fills soils will be removed during the basement excavation planned. The fill soils are underlain by older alluvium.

The older alluvium consists of dense, very stiff to hard, clayey sand, silty sand, and sandy clay. The alluvium is underlain by Modelo bedrock, consisting of claystone, siltstone and sandstone. As shown on the cross-sections, the contact between the old alluvium and bedrock occurs at a depth of about 15 feet (Elevation 410 feet) near the northwest corner of the site and slopes down to a depth of 50 to 60 feet (Elevation 360 feet to 365 feet) at the east and south edges of the site.

A laboratory test on a representative sample of the clayier portion of the alluvium indicated an Expansive Index (EI) of over 100, which corresponds to a highly expansive characteristic.

3.3 Groundwater

Groundwater was encountered at depths between 27 to 36 feet below existing grade, corresponding to an Elevation of 376 to 394 feet. The Seismic Hazard Zone Report for the Hollywood Quadrangle (CGS 1998) indicates that the historically highest groundwater level in the site area is deeper than 80 feet. The ground water encountered at the site appears to be sitting



on top of the bedrock or is within sandstone layers. There is also the potential for shallow ground water to be perched anywhere on the site.

4.0 DISCUSSION AND RECOMMENDATIONS

4.1 General

Based on a review of existing subsurface information and the conceptual plans, it is our opinion that the proposed project is feasible from a geotechnical standpoint. Following proper site development grading, the proposed construction can be supported on conventional spread footings or mat foundations founded in dense, old, alluvial soils. Preliminary geotechnical recommendations for design planning are discussed in the following sections. However, the previous borings and trenches at the site were performed for the fault investigations, and there was no laboratory testing. Therefore, a design-level geotechnical report will be required to develop geotechnical recommendations for final design, including drilling and sampling geotechnical borings, performing laboratory testing to confirm engineering parameters and detailed engineering analyses.

We anticipate that static design will be performed in accordance with 2014 Edition of the Los Angeles Building Code (2014 LABC). However, a performance-based seismic design may be considered for design of the proposed high-rise development, in accordance with "An Alternative Procedure for Seismic Analyses and Design of Tall Building in the Los Angeles Region" by the Los Angeles Tall Building Structural Design Council (LATBSDC), 2014 Edition. If a performance-based seismic design is selected, it is anticipated that construction cost will be significantly reduced. However, the overall design period will be longer than if the 2014 LABC is followed.

The sides of the excavation for the basement will require shoring consisting of soldier pile and tie-back anchors. During the previous explorations, groundwater was encountered at an Elevation of 376 to 394 feet. The lowest basement level is planned at Elevation 385 feet. Therefore, dewatering will be needed during basement construction and ground water is a consideration in the basement design.

4.2 Demolition

Prior to the start of earthwork, the existing buildings and improvements on the site will require demolition and removal, including the existing foundations, slabs, pavements, walls and utilities. It should be anticipated that the remnants of previous construction could be encountered anywhere on the site. The civil engineer should identify the presence and location of all existing utilities on and adjacent to the site. Precautions will be required to remove, relocate or protect existing utilities, as appropriate.



4.3 Temporary Excavation and Shoring

Excavation for the basement will be made to depth of approximately 30 to 40 feet below existing grade. The excavation will be made primarily in old alluvial soils consisting of clay, sandy clay, clayey sand and silty sand, that is dense to very stiff and hard. We anticipate that the excavation can be readily accomplished using conventional heavy construction equipment.

Restrained temporary shoring, consisting of tied-back or internal bracing will be required to support the walls of the excavation. The shoring will likely involve soldier piles spaced at about 8 feet on center. For the deep excavation, two levels of tied-back anchors / internal bracing will be required. Slurry should be used to backfill any voids behind lagging. The contractor will be responsible for the design of the shoring. The shoring designer should verify the depth and location of the existing utilities to select the appropriate tieback depth and inclination. City approval will be required to install anchors under streets, and the anchors will need to be detentioned when no longer needed. If anchors are to be installed under private property to the east and south, permission will also be required from the property owners.

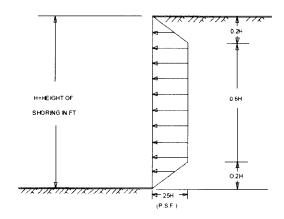
If the excavation is exposed during periods of rainfall, provisions for collection of the runoff should be made. All surface drainage should be controlled and prevented from running down into the excavation. Ponding water should not be allowed within the excavation. Any collected water should be pumped out. Soils softened by wetting should be removed and backfilled as directed by the geotechnical engineer.

All excavation slopes and shoring systems should meet minimum requirements of the Occupational Safety and Health (OSHA) Standards. Maintaining safe and stable slopes on excavations is the responsibility of the contractor and will depend on the nature of the soils and groundwater conditions encountered and his method of excavation. Excavations during construction should be carried out in such a manner that failure or ground movement will not occur. The short-term stability of excavation depends on many factors, including slope angle, engineering characteristics of the subsurface materials, height of the excavation, and length of time the excavation remains unsupported and exposed to equipment vibrations, rainfall, and desiccation. The contractor should perform any additional studies deemed necessary to supplement the information contained in this report for the purpose of planning and executing his excavation plan. Recommendations regarding sloped temporary excavations and shoring are provided in the sections below.

4.3.1 Shoring Design

For the design of temporary tied-back or braced shoring, we recommend the use of a trapezoidal distribution of earth pressure. The recommended pressure distribution, for the case where the grade is level behind the shoring, is illustrated in the following diagram with the maximum pressure equal to 25H in pounds per square foot, where H is the height of the shoring in feet.





The recommended earth pressure provided above is a preliminary value. The final earth pressure for design of soldier piles and anchors will be provided in the during the design-level geotechnical investigation. Surcharge loads from equipment or stockpiled material should be kept behind the top of the temporary excavations a horizontal distance of at least twice the depth of the excavation.

Surcharge loads from equipment or stockpiled material should be kept behind the top of the shoring a horizontal distance of at least twice the depth of the excavation, or the shoring should be designed for the additional pressure. Foundation and traffic loads from adjacent areas should also be added to the lateral earth pressures. If traffic loading can occur near the top of the shoring, the design height of the shoring should be increased by 2 feet to account for the traffic surcharge. Surface drainage should be controlled and prevented from running down the temporary excavations or down the face of the shoring. Ponding water should not be allowed within the excavation.

Resistance to lateral loading of the shoring piles may be provided by passive pressure of the native soils below the bottom of the excavation. The allowable passive pressure of the native soils may be taken as the pressure developed from an equivalent fluid weight of 300 pcf. To account for the rounded shape of the soldier piles, when calculating the passive pressure on individual piles, the equivalent fluid pressure may be multiplied by a factor of 2.

The tieback contractor should select the design bond stress, drill hole diameter, and length of bonded zone in order to provide the design capacity specified by the structural engineers. All tiebacks should be load tested in accordance with the City of Los Angeles requirements.

4.3.2 Shoring Monitoring

A survey-monitoring program should be implemented to monitor shoring displacements during construction. In addition, prior to the start of construction, nearby improvements should also be surveyed and photographs and/or video taken to document baseline conditions. The deflection at the top of the shoring should be limited to a maximum of 1 inch, or a maximum of 1/2-inch if a structure or utility is located nearby. If the deflection of the shoring exceeds these criteria, or if distress or settlement is noted adjacent to the top of shoring, the excavation should be stopped



and an evaluation should be performed by the structural and geotechnical engineers and any appropriate corrective measures taken, as deemed necessary. The shoring should be monitored once a week until the excavation reaches full depth and further movement has stopped.

4.4 Foundations

4.4.1 Bearing Value

Following proper site development grading/excavation, the proposed structure may be supported on conventional spread footings, established in undisturbed bedrock or older alluvium. For preliminary design, footings may be designed for an allowable dead-plus-live load pressure of 6,000 psf. The allowable bearing pressure may be increased by one-third when considering temporary loads associated with wind and seismic loading. Alternatively, the proposed structure may be supported on mat foundations. The final bearing capacity of footings and mat should be based on an evaluation of settlement performance during the design-level geotechnical investigation.

Footing excavations should be observed by the project geotechnical engineer before placement of concrete to verify that the foundation conditions meet the requirements of the geotechnical report. The project geotechnical engineer may perform compaction tests, probing, or use other methods, to verify that the foundations will be supported in competent soils. If disturbed, wet, or otherwise unsuitable soils are encountered, or if water saturates the soils, the soils shall be excavated or stabilized as recommended by the project geotechnical engineer.

4.4.2 Settlement

The anticipated structural loads are not currently known. Specific sampling and consolidation tests of foundation soils will be performed and settlement performance evaluated for footings and mats during our design-level geotechnical investigation.

4.4.3 Lateral Capacity

Resistance to lateral loads can be provided by friction developed between the bottom of footings and the supporting soil, and by the passive soil pressure developed on the face of the footing. For preliminary design purposes, an allowable passive fluid pressure of 300 pcf and a coefficient of friction of 0.4 may be used for lateral sliding resistance of footings

4.5 Floor Slab

The basement floor slab may be placed on a properly prepared subgrade. To reduce the potential for moisture transmission through slabs where moisture sensitive covering will be installed, we recommend that a vapor retarder shall be used. In accordance with ACI 302.2R-06, the material must comply with the requirements of ASTM E 1745, "Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs," and have a permeance of less than 0.01 perms per ASTM E96. The installation of the moisture barrier should comply



with ASTM E 1643-09. Reference is made to ACI 302.2R, Section 7.2 concerning whether to place 2 inches of sand over the barrier. The design of floor slabs for the expansion potential of the supporting soils or bedrock will be evaluated during the design-level investigation.

4.6 Seismic Considerations

If performance based seismic design is selected for the structural design, the seismic provisions provided in "An Alternative Procedure for Seismic Analyses and Design of Tall Building in the Los Angeles Region" should be followed. Otherwise, the seismic design parameters in accordance with 2014 LABC should be used for seismic design.

The seismic design parameters were calculated using the USGS Seismic Design Maps Web Application (http://earthquake.usgs.gov/designmaps/us/application.php). The site coordinates used are:

Latitude: 34.1034 Longitude: -118.3246

Site Class C is preliminarily assumed for the site. The mapped and design spectral acceleration parameters, i.e., S_s, S₁ and S_{Ds}, S_{D1}, are provided below.

Mapped

$$S_s = 2.57g$$
 $S_1 = 0.95 g$

Design

$$S_{DS} = 1.72g$$
 $S_{D1} = 0.83g$

4.7 Basement Walls

As required by the 2014 LABC, braced basement walls must be designed to resist at-rest earth pressures. Accordingly, for the case where the grade is level behind the walls, a triangular distribution of lateral earth pressure equivalent to that developed by a fluid with a density of 60 pounds per cubic foot. This earth pressure assumes that all walls are constructed with a properly designed drainage system to prevent buildup of hydrostatic pressures behind the wall. Any surcharge loadings occurring as a result of heavy crane loads, stockpiled materials or traffic should be added to this pressure. The recommended pressure should also be confirmed during the design-level geotechnical investigation and should consider the presence of expansive soils, which could require the use of higher design earth pressures.

Basement walls should also be designed for seismic earth pressure. The basement walls should be designed to resist, an active pressure combined with a seismic increment of lateral active earth pressure. Based on a peak acceleration of 0.69g, equal to $S_{DS}/2.5$, the adopted horizontal acceleration is 0.35g. The equivalent seismic pressure may be taken as the pressure developed from an equivalent fluid weight of 25 pcf. The recommended value should be confirmed in the design geotechnical report.



4.8 Subdrain

If the lowest basement floor will extend near the water table, either the floor and walls should be designed for hydrostatic pressures, or an underfloor drain system should be provided below the basement floor slab. The drainage system should consist of a minimum 12-inch thick layer of permeable gravel (such as Caltrans Permeable Material), which should be sloped to carry water to perforated pipes. The pipes should carry flow by gravity to sumps equipped with a float-activated pump to raise and pump the water to proper disposal. The pipes should be installed with the perforations down and should be wrapped with geotextile filter fabric, such as Mirafi 140, or equivalent. The basement wall drainage system should also connect to the sumps.

4.9 Soil Corrosivity

A representative sample was tested to evaluate corrosion characteristics. The results indicate the tested sample had a pH of 7.22, water-soluble sulfate content and soluble chloride content were negligible.

Results of laboratory electrical resistivity tests indicate a minimum resistivity value of 495 ohmom for the near-surface soils. To evaluate the corrosion potential of on-site soils, we used the following correlation between electrical resistivity and corrosion potential:

Electrical Resistivity (Ohm-cm)	Corrosion Potential
Less than 1,000	Severe
1,000 – 2,000	Corrosive
2,000 – 10,000	Moderate
Greater than 10,000	Mild

Based on this correlation, the tested soil has a severe corrosion potential for buried metal. All underground metal pipes/clamps/structures should consider this corrosion potential. A corrosion expert should be consulted regarding the need for further testing and to evaluate options for protection.



5.0 LIMITATIONS

This consultation was performed in accordance with generally accepted Geotechnical Engineering principles and practice. The professional engineering work and judgments presented in this report meet the standard of care of our profession at this time. No other warranty, expressed or implied, is made. This report has been prepared for Champion Real Estate Company, and their design consultants. It may not contain sufficient information for other parties or other purposes, and should not be used for other projects or other purposes without review and approval by GDC.

The recommendations for this project, to a high degree, are dependent upon proper quality control of site grading, shoring installation, fill and backfill placement, and foundation installation. The recommendations are made contingent on the opportunity for GDC to observe the earthwork operations. This firm should be notified of any pertinent changes in the project, or if conditions are encountered in the field, which differ from those described herein. If parties other than GDC are engaged to provide such services, they must be notified that they will be required to assume complete responsibility for the geotechnical phase of the project, and must either concur with the recommendations in this report or provide alternate recommendations.

6.0 REFERENCES

California Department of Conservation, Division of Mines and Geology, (1999), State of California Seismic Hazard Zones Map, Hollywood Quadrangle, Los Angeles County, California.

City of Los Angeles, "Geology Report Approval Letter," Log #85579-01, Tentative Tract Map 10149, Lot 1 and 3; 1756 and 1760 Argyle Avenue, dated February 20, 2015.

City of Los Angeles, "Geology Report Correction Letter," Log #85579, Tentative Tract Map 10149, Lot 1 and 3; 1756 and 1760 Argyle Avenue, dated September 17, 2014.

Group Delta Consultants, Inc., "Fault Activity Investigation for Yucca-Argyle Apartments, Champion Site, 1756 and 1760 Argyle Avenue, Los Angeles, California," dated September 7, 2014.

Group Delta Consultants, Inc., "Response to City of Los Angeles Geology Correction Letter #85579, 1756 and 1760 Argyle Avenue, Los Angeles, California," dated February 12, 2015.

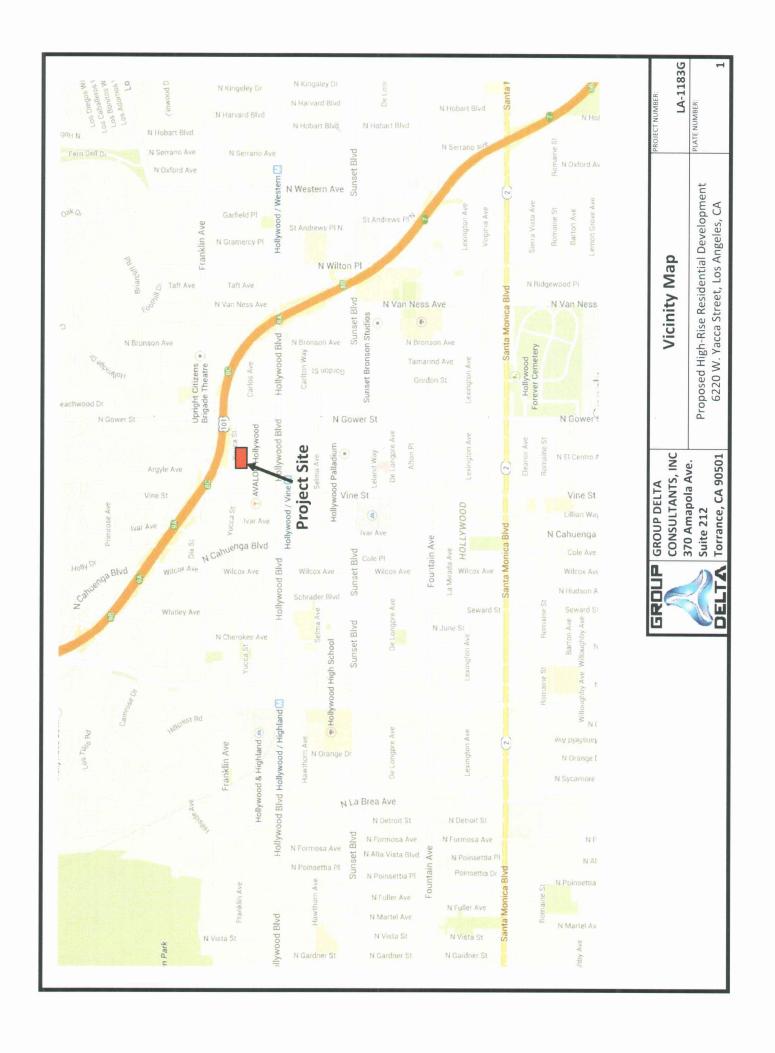
Los Angeles Tall Buildings Structural Design Council, "An Alternative Procedure for Seismic Analysis and Design of Tall Buildings Located in the Los Angeles Region, 2014 Edition"

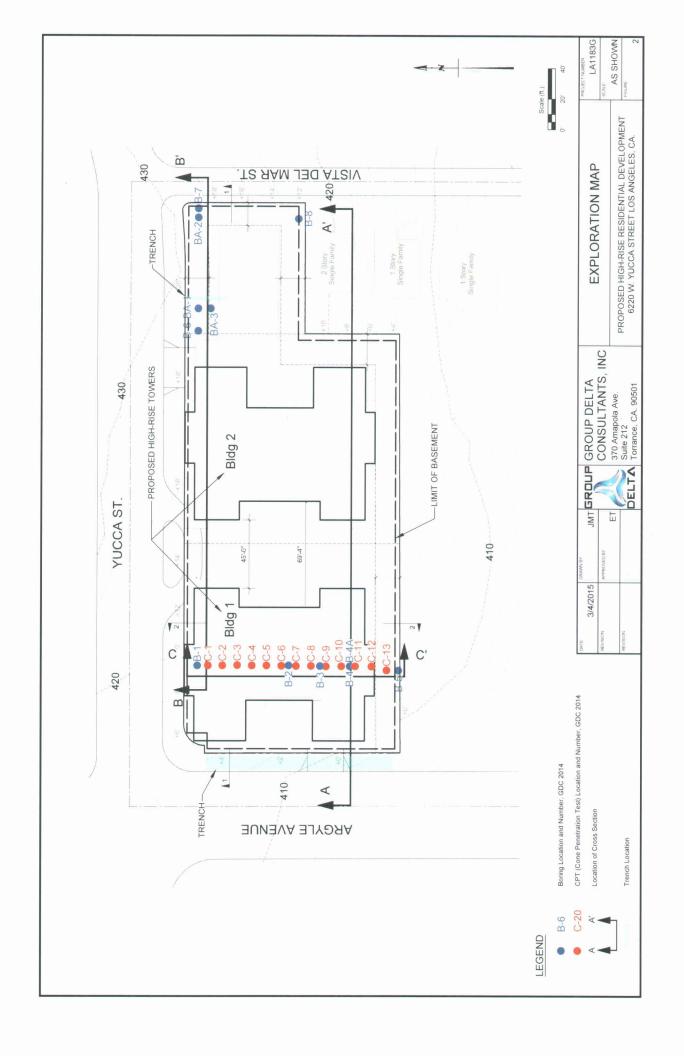


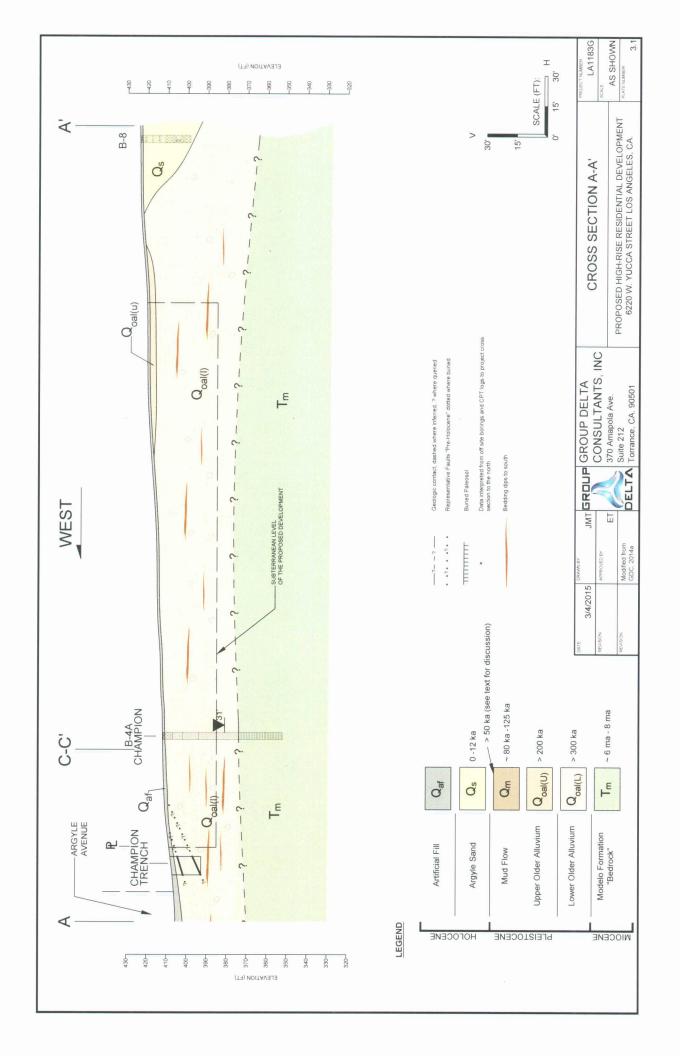
Geotechnical Feasibility Report 6200 West Yucca Street, Los Angeles, CA GDC Project No. LA-1183G

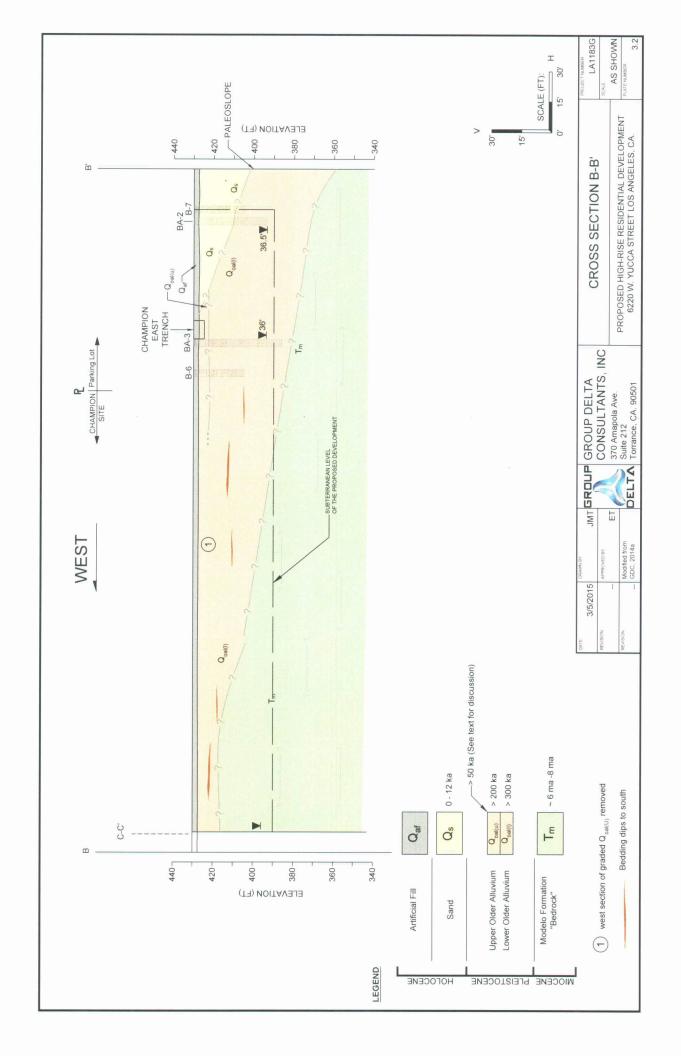
March 6, 2015

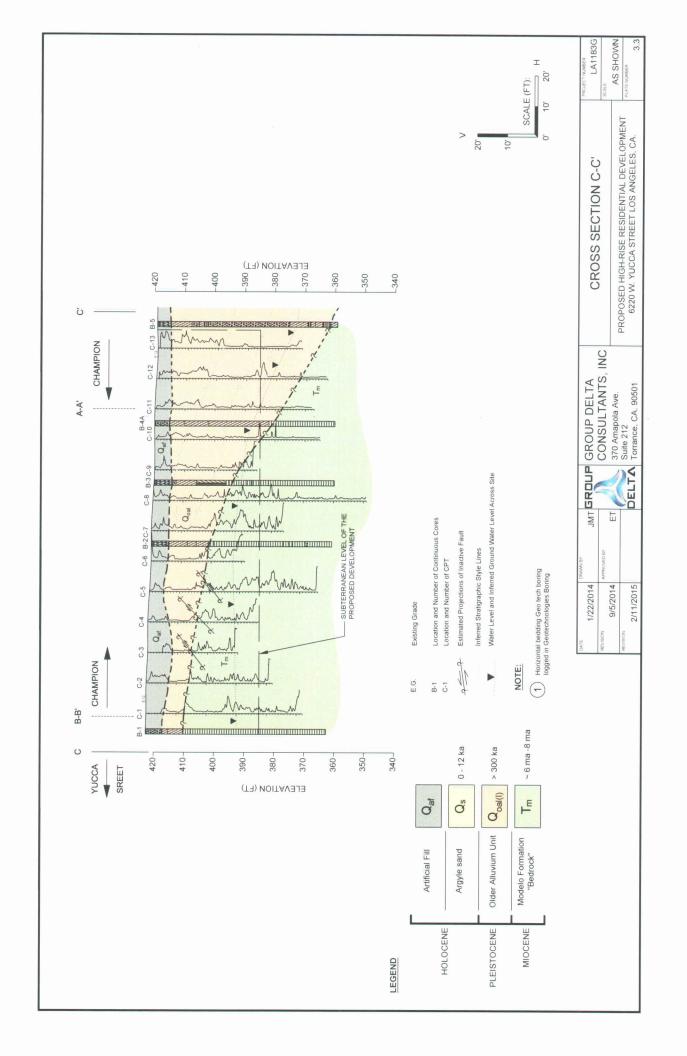
FIGURES











Geotechnical Feasibility Report 6200 West Yucca Street, Los Angeles, CA GDC Project No. LA-1183G March 6, 2015

APPENDIX A
GEOLOGIC REPORT APPROVAL LETTER

BOARD OF BUILDING AND SAFETY COMMISSIONERS

VAN AMBATIELOS PRESIDENT

E. FELICIA BRANNON VICE-PRESIDENT

JOSELYN GEAGA-ROSENTHAL GEORGE HOVAGUIMIAN JAVIER NUNEZ

CITY OF LOS ANGELES

ERIC GARCETTI MAYOR DEPARTMENT OF BUILDING AND SAFETY 201 NORTH FIGUEROA STREET LOS ANGELES, CA 90012

RAYMOND S. CHAN, C.E., S.E. GENERAL MANAGER

FRANK BUSH EXECUTIVE OFFICER

GEOLOGY REPORT APPROVAL LETTER

February 20, 2015

LOG # 85579-01 SOILS/GEOLOGY FILE - 2 AP

Greg Beck 11601 Wilshire Boulevard, Suite 1650 Los Angeles, CA 90025

TRACT: 10149 LOT(S): 1 and 3

LOCATION: 1756 and 1760 Argyle Avenue

CURRENT REFERENCE	REPORT	DATE(S) OF	
REPORT/LETTER(S)	<u>No.</u>	DOCUMENT	PREPARED BY
Addendum Report	LA-1183E	02/12/2015	Group Delta
Oversized Docs.	**	**	**

PREVIOUS REFERENCE	REPORT	DATE(S) OF	
REPORT/LETTER(S)	<u>No.</u>	DOCUMENT	PREPARED BY
Dept. Correction Letter	85579	09/17/2014	LADBS
Geology Report	LA-1183A	09/07/2014	Group Delta

The Grading Division of the Department of Building and Safety has reviewed the referenced reports that present a fault rupture investigation at 1756 and 1760 Argyle Avenue for the future devolvement of the property. The site is currently occupied by 2-story apartment buildings.

The property is located within an Official Earthquake Fault Zone that was established (November 6, 2014) by the California Geological Survey for the Hollywood fault (on the USGS 7.5 minute Hollywood Quadrangle). The investigation included a transect of CPT soundings and continuous core borings in the west portion of the site and an exploration trench along the western edge. Additional exploration was conducted to address the Department correction letter dated 09/17/2014, which included three continuous core borings, three bucket auger borings and a trench just east of the site. Dr. Roy Shlemon (a well-known expert in soil stratigraphy, age-dating of soils and assessment of geologic hazards) provided a detailed soil stratigraphic/pedological analysis by to estimate the age of the soil horizons encountered in the recent trench. Data from offsite projects investigated by Group Delta were also used for the geologic analysis of the site.

The investigation documents folding and faulting of Pleistocene "older" alluvium (designated Qoal in the report). The age of the folding and faulting is estimated to be greater than 135,000 to 150,000

years. No active (Holocene) faults were observed on the site or nearby the site. Therefore, no building restrictions were recommended by Group Delta.

The referenced reports are acceptable, provided the following conditions are complied with during site development:

(Note: Numbers in parenthesis () refer to applicable sections of the 2014 City of LA Building Code. P/BC numbers refer the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.)

- 1. Prior to issuance of any permit, a soil engineering report shall be submitted to the Grading Division to provide design recommendations for the proposed grading/construction.
- 2. During construction, the project engineering geologist shall observe all excavations that expose the natural alluvial soils to verify the conclusions of the fault investigation and that no Holocene faults are exposed. The project engineering geologist shall post a notice on the job site for the City Grading Inspector and the Contractor stating that the excavation (or portion thereof) has been observed and documented and meets the conditions of the report. No fill or lagging shall be placed until the LADBS Grading Inspector has verified the documentation.
- 3. A supplemental report that summarizes the geologist's observations (including photographs and simple logs of excavations) shall be submitted to the Grading Division of the Department upon completion of the excavations. If evidence of active faulting is observed, the Grading Division shall be notified immediately. (7009)

DANIEL C. SCHNEIDEREIT

Engineering Geologist I

DCS/dcs Log No. 85579-01 213-482-0480

cc: Group Delta, Project Consultant LA District Office

APPENDIX B PRIOR EXPORATIONS

	E LOC			UR	E	RC	RIN	اق	PROJECT NAME Yucca & Agryle Fault Investigat DATE(S) DRILLED 1/31/14		T NUMBER D BY		S	ORING B-1 HEET N of 4	0.
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ОЕРТН (ft)	ELEVATION (ft)	RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DES	CRIPTION		PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
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	420								coarse gravel with cobbles.						
	-														
5		1	1	30/30					Older Alluvium (Qoal)	··· •					
									Clayey SAND, 7.5 YR 5/6 (Stromoist, fine to medium grained sand, trace fine gravel and cobb	ımid to arse					
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10		3	2	30/30											
														į	
	<u>4</u> 10	4		30/30					Modelo Formation (TM) Sandstone, Siltstone, Claysto	no 10VP 6/1	Strong				
									brown) to 7.5YR 7/1 (light gray), oxidation, some caliche.	thinly bedded	i, some				
15	_	5	3	30/30	-				Poorly Graded Sand, Silt and (Yellowish Brown) to 10 YR 6/1 mostly sand, cobbles and grave	(Light Gray) n	oist,				
	_														
	405	6		30/30											
RO	UP (GRO	32		chl	y, S	uite B	ΓAN	THIS SUMMARY APPL OF THIS BORING AND SUBSURFACE CONDI LOCATIONS AND MAY WITH THE PASSAGE O PRESENTED IS A SIM CONDITIONS ENCOU	AT THE TIME TIONS MAY DI CHANGE AT OF TIME. THE PLIFICATION (OF DRILLING. FFER AT OTHE THIS LOCATIOI DATA	ER N	FI	GURE	a

LO	G	OF	C	OF	RE	BC	RIN	G	PROJECT N Yucca & Ag	AME pryle Fault Investigation		NUMBER			B-1	•
SITI	E LOC	ATIO	NC						DATE(S) DR 1/31/14	RILLED	LOGGED TO	BY		-	HEET N	NO.
1	LLING)					DRILL BIT S	SIZE/TYPE		CHECKED	BY			EPTH DRILLED
1	ow Ste								6"			SK	ON E	'	eet)	60 AL/BEARING
	LL RIG 1 M12	GTY	PE						DRILLED B' Gregg In-Sit			INCLINATIO	OM F 0	RUN	VERTIC	AL/BEARING
	PAREI	NT G	ROUI	NDW/	ATER	DEP	ТН		Oregg In-Oil	a Diming		APPROXIM		PII F	TOP FI	EVATION
	e enco		ered									(feet)	4	23		LVAHON
COM	MEN	TS										BOREHOLE Soil Cutting		CKFIL	.L	
	(#)			RO	ск	ORE	•	>					13	≿.	ie	
DЕРТН (ft)	ELEVATION (#)			% '×	Ö.	%	3,9.K	LITHOLOGY		MATERIAL DESC	PIPTION		PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD
DEP	EVA.	RUN NO.	BOX NO.	RECOVERY,	FRAC. FREQ	R.Q.D.,	FRACTURE DRAWING/ NUMBER	F		WATERIAL DESC	RIF HON		CKEF	BOR	RILL EET/	NOTES
	🗇	3	B	SECC.	FRAC	S. 0.	FRA DR/ NU	-					Αď	3	מיי	
		7	4	60/60)				-				-			
_	-															
_																
	400								1							
_																
_																
_25	-	8	5	33/60	}											
_																
									1							
_	205								-							
_	395															
_	-															
_30		9	6	EAICO					0	0.114.1	7.575.74	n				Water @ 30 Ft.
		9	0	54/60					gray), we	ne, Siltstone, Claystone t, thinly bedded, some ox	7.5YR 7/1 (idation.	light				, , , , , , , , , , , , , , , , , , ,
_																
_																
_	390								-							
_									-							
<u>35</u>									-							
		10	7	36/60	•											
_																
_	<u> </u>								-							
_	<u>3</u> 85								1							
							i		<u> </u> 							
_																
	 	<u></u>			—— • — •					THIS SUMMARY APPLIES			1	Ī		
GRO	NP (R(ΙAΙ	NTS, INC.	OF THIS BORING AND AT SUBSURFACE CONDITIONS AND MAY CO	NS MAY DIF	FER AT OTHE				
	P					_	uite B			LOCATIONS AND MAY C WITH THE PASSAGE OF PRESENTED IS A SIMPLI	TIME. THE	DATA		FI	GUR	E b
DEL	TA		lrv	ine,	CA	92	618			CONDITIONS ENCOUNTE		. THE ACTUA	-			

LO	G ()F	C	OR	ĽΕ	BC	RIN	G	PROJECT NA Yucca & Ag	AME ryle Fault Investigation		NUMBER			ORING B-1	
SITE	LOC	ATIC	ON						DATE(S) DR 1/31/14	RILLED	LOGGED TO	ВҮ	_ ,,	- 1	HEET N	10.
DRIL	LING	ME	THOD)				_	DRILL BIT S	SIZE/TYPE	1.0	CHECKED	BY			EPTH DRILLED
Hollo	w Ste	m Aı	uger						6"			sĸ		1 -	eet)	60
	L RIC	3 TYI	PE						DRILLED B			INCLINATION	ON F	ROM	VERTIC	AL/BEARING
	M12								Gregg In-Sit	u Drilling			0			
	e enco	_		NDWA	ATER	DEP'	тн					APPROXIM (feet)		PILE 23	TOP EL	EVATION
COM	IMEN	TS			,							BOREHOLI Soil Cutting	ЕВА		.L	<u>/</u>
				RO	CK (CORE						Oon Cutting				
£	ELEVATION (ft)			1				\ 06 06					PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	EIEI D
БЕРТН (#)	ATIC	ğ	ò	۲. ۲.	FREQ	% :	URE ING/	LITHOLOGY		MATERIAL DESC	CRIPTION		ER	PRA]	7.F.	FIELD NOTES
8	EV.	RUN NO.	BOX NO.	RECOVERY, %	FRAC. F	R.Q.D., %	FRACTURE DRAWING/ NUMBER	5					ACK	LABC	PEE FEE	
		"	ш	REC	5	~	E.P. 5						<u> </u>	_		
		11	8	36/60												
-	-								-							
	380															
	360								<u> </u>							
	_															
45								-								
40		12	9	40/60				_	-							
-	-								1							
	275								Interhed	ded Sandstone, Siltsto	ne and Clay	etono7 5				
	<u>3</u> 75								YR 7/1 (S	Strong Brown) to 7.5 YR	7/1 (Light Gr	ay), wet,				
	_								Tine grain	ed sand, some oxidation	n.					
50									-							
50	_	13	10	11/60												
	_															
	370															
-	3/0															
-	_								-							
-55																
-55		14	11	58/60	}								İ			
	- 1								-							
	205															
-	<u>3</u> 65															
_	_															
							I									
iRO	UP (NSUL Suite B		NTS, INC.	THIS SUMMARY APPLII OF THIS BORING AND SUBSURFACE CONDIT LOCATIONS AND MAY	AT THE TIME I IONS MAY DIF CHANGE AT T	OF DRILLING. FER AT OTHE HIS LOCATIO	ΞR	FI	GUR	Fc
DEL	řΑ					-				PRESENTED IS A SIMP	LIFICATION O		L	`		_ •
EL.	ra					-	Suite B !618			WITH THE PASSAGE O	F TIME. THE LIFICATION O	DATA		FI 	GUR	E c

	G (OR	RΕ	BC	RIN	G	PROJECT N Yucca & Ag DATE(S) DR	ıryle Fault Investigat		T NUMBER			ORING B-1 HEET N	0.
	LLING)					1/31/14 DRILL BIT \$		то	CHECKED	BY	TC	of 4 OTAL DE	PTH DRILLE
DRII	LL RIG I M12								DRILLED B Gregg In-Sit		·	SK	ON F I	ROM	/ERTIC	60 AL/BEARING
	AREN e enco			NDW/	ATER	DEP	ТН	- 1	0.0gg o			APPROXIM		PILE	TOP ELI	EVATION
	MEN							_				(feet)	ВА	23 CKFIL	L	
				P ∩	CK (CORE		_				Soil Cutting				
Œ H	ON (ft)			_	Τ.		1	},06					TESTS	TORY	ATE, OUR	FIELD
DEPTH (ft)	ELEVATION (ft)	RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY		MATERIAL DES	CRIPTION		PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	NOTES
-	360								Groundw	pth: 60 Ft /ater: Encountered at 3 ackfilled with tamped s	0 Ft oil cuttings and	asphalt				
-	-													į		
65																
-																
-	-											!				
-	<u>3</u> 55															
-	_															
-70	_															
-																
-	-															
-	<u>3</u> 50															
-																
75																
	345															
-																
										F						
SRO		GRO	32	Маι	ıchl	y, S	NSUL uite B 618		NTS, INC.	THIS SUMMARY APPL OF THIS BORING AND SUBSURFACE CONDI LOCATIONS AND MAY WITH THE PASSAGE OF PRESENTED IS A SIM CONDITIONS ENCOU	OAT THE TIME OF TIONS MAY DIF OF CHANGE AT TO OF TIME. THE OP PLIFICATION O	OF DRILLING. FFER AT OTHE THIS LOCATION DATA	R N	FI	GURE	Ēd

LO	G	OF	C	OR	E	ВО	RIN	G	PROJECT NAME Yucca & Agryle Fault Investigation		T NUMBER	<u> </u>		ORING B-2	
SITE	LOC	ATIO	ON						DATE(S) DRILLED 1/30/14	LOGGED TO	BY		- 1	HEET N	Ю.
	L LING ow Ste)					DRILL BIT SIZE/TYPE 6"	•	CHECKED	BY		OTAL DE	PTH DRILLE
DRII	LL RI					•••			DRILLED BY		INCLINATION	ON F	ROM	VERTICA	AL/BEARING
	M12	UT C	BOU	NDWA	TED	DED	TLI		Gregg In-Situ Drilling			0			
	e ence			NDVVA	IIEK	DEP	117				APPROXIM (feet)		PILE 21	TOP ELI	EVATION
CON	MEN	TS									BOREHOLI Soil Cutting	ЕВА		.L	
_	(£)			RO	CK C	ORE	•	>			-	TS	≿	uī ec	
DEPTH (ft)	ELEVATION (ft)	RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESC	CRIPTION		PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
	420							\$	Asphalt Artificial Fill (Qaf)						
_	420								Silty SAND, 7.5 YR 5/8 (Strong mostly medium to coarse sand, s	Brown) , moi	ist, id, some				
_								2	fines, little fine to coarse gravel, t	race cobbles					
-	-							1							
_	-							. 4							
_ 5	F	1	1	25/30	.			Ž,							
_	415	'		20,00				5							
_	L								Older Alluvium (Qoal) Clayey SAND, 7.5 YR 5/6 (Stron	er Dearres with	_				
		2		20/30	-				grayish mottling, moist, fine sand	y Brown, will					
_															
_									-Trace fine gravel						
-10		3	2	18/30	ł										
-	<u>4</u> 10								-Polished surfaces						
-	-							\\.\.\.\.\.\.\.\.\.\.\.\.\.\.\.\.\.\.\	Sandy CLAY, 5 YR 4/6 (Yellowis	hRed) dryt	o moist				
_		4		25/30	-			<i>:</i> ;;	fine sand.	,,	o moiot,				
_								<i>\\\</i>							
-15								<i>[;</i>						i	
-10	405	5	3	30/30				\.\.\.\.\.\.\.\.\.\.\.\.\.\.\.\.\.\.\.	Caliche, 10 YR 7/6 (Yellow), laye carbonate.	rs of well dev	reoped				
+	-30							<u> ;</u> ;							
-	\vdash			00,00											
-	<u> </u>	6		29/30				1.							
-	-							 - -	Modelo Formation (Tm)						
															<u> </u>
GRO	UP (GRO	32		chly	, S	uite B	ΙΑΊ	NTS, INC. THIS SUMMARY APPLIE OF THIS BORING AND A SUBSURFACE CONDITIONS AND MAY WITH THE PASSAGE OF PRESENTED IS A SIMP CONDITIONS ENCOUNTED.	AT THE TIME ONS MAY DIF CHANGE AT T F TIME. THE LIFICATION C	OF DRILLING. FER AT OTHE THIS LOCATION DATA	ER N	 FI	GURE	Ē a

	ELOC			UR		DC	RIN	J	Yucca & Agryle Fault Investigati DATE(S) DRILLED 1/30/14		T NUMBER D BY		S	BORING B-2 SHEET I	
	LLING ow Sto)					DRILL BIT SIZE/TYPE 6"		CHECKED	BY		OTAL D	EPTH DRILLE
Marl	LL RIO						-		DRILLED BY Gregg In-Situ Drilling		INCLINATIO	ON F	ROM	VERTIC	AL/BEARING
None	PAREI e enc	ounte		NDWA	TER	DEP	TH 				APPROXIMA (feet)	4	21		EVATION
	1	1				···					Soil Cuttings		1	. -	
£	Ê Z		I			ORE	:	_ გ				STS	NRY	后民	
DEPTH (ft)	ELEVATION	RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DES	CRIPTION		PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
_	<u>4</u> 00	7	4	30/30					Sandstone, 10YR 7/8 (Yellow), fine to medium sand, abundant Modelo Formation (TM) cont	dry to moist, carbonate infil	mostly ling.	-			
-		8		30/30					Clayey Sandstone, 7.5 YR 8/1 6/8 (Reddish Yellow), dry to moi medium sand, abundant carbon	st, mostly fine	5 YR to				
- -25									Sandstone , 7.5 YR 6/8 (Reddis wet, mostly fine to medium sand infilling in joints.	h Yellow), mo I, with some ca	ist to arbonate				
-	395	9	5	22/30					Lover of Clause Sandstone 7.5	VD 5/0					Ground wate @ 27'
-		10		25/30					-Layer of Clayey Sandstone, 7.5 infilling -Wet, 7.5 YR 5/6 (Strong Brown		arbonate				
- -30		11		AE/GO					-Mottled 10 YR 6/8 (Brownish Yo (White)	,					
-	<u>3</u> 90	11	6	45/60					Clayey Sandstone, 7.5 YR 5/8 fine to medium sand, minor whit	(Strong Browr e mottling,	i), wet,				
-					į				Sandstone, mottled 7.5 YR 8/1 5/8 (Strong Brown), wet, fine to		.5 YR				
-35		12	7	38/60											
-	<u>3</u> 85								-Becomes 10 YR 6/6 (Brownish -Layer of Clayey Sandstone, 7.5 Yellow), carbonate infilling of fra	YR 6/8 (Redd	lish				
-															
iRD	UP (GRO	32		chi	y, S	uite B	TAN	THIS SUMMARY APPL OF THIS BORING AND SUBSURFACE CONDIT LOCATIONS AND MAY WITH THE PASSAGE O PRESENTED IS A SIME CONDITIONS ENCOUN	AT THE TIME FIONS MAY DIF CHANGE AT TO OF TIME. THE PLIFICATION O	OF DRILLING. FFER AT OTHE THIS LOCATION DATA	R N	FI	GUR	E b

LO	G (ЭF	C	OR	RE	BC	RIN	G	PROJECT NAME Yucca & Agryle Fault Investigati		TNUMBER		E	BORING	
SITE	LOC	ATIC	N						DATE(S) DRILLED	LOGGE	BY			HEET N	10.
DDU			TUOT						1/30/14	то	T			3 of 4	
	LING ow Ste)					DRILL BIT SIZE/TYPE 6"		CHECKED	BY		OTAL DI eet)	EPTH DRILLE
	L RIC							\dashv	DRILLED BY		SK INCLINATION	ON F	ROM	VERTIC	60 AL/BEARING
	M12		_						Gregg In-Situ Drilling			0			
				NDW/	ATER	DEP	TH				APPROXIM	ATE	PILE	TOP EL	EVATION
	e enco		red								(feet)		21		
CON	MEN	TS									BOREHOLI Soil Cutting		CKFIL	.L	
	(#)			RO	CK C	ORE	:				,	હ	>		
ЕРТН (#)	NOI.			%,	g	\o	ш,ж.	LITHOLOGY	MATERIAL REG	ODIDTION		PACKER TEST	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD
DEPT	ELEVATION	RUN NO.	BOX NO.	RECOVERY,	FRAC. FREQ	R.Q.D., %	FRACTURE DRAWING/ NUMBER	문	MATERIAL DES	CRIPTION		XER	ORA TES	ETA	NOTES
٥	H	2	BÔ	000	RAC.	S. O.	RAC SRAN	=				PAC	Ž	RH.	
		13	8	60/60	_		<u> </u>	_				<u> </u>			
	380	13	0	DU/DL											
-															
-	-														
_	_														
-									Sandy Claystone, mottled 7.5 Y	'R 8/1 (White)	and 7.5				
45	_	14	9	44/60)			-	YR 5/8 (Strong Brown), wet, fine	sand.					
_	<u>3</u> 75														
									Sandstone, 7.5 YR 5/6 (Strong sand.	Brown), wet,	fine				
•									Sandy Claystone to Clayey Sa	ndstone mott	led 7.5				
	_								YR 8/1 (White) to 7.5 YR 5/8 (St to medium sand.	rong Brown),	wet, fine				
50		15	10	30/60	Ì										•
	<u>3</u> 70							5	Conglomerate Bed		, n				
									Congromerate Det						
									Sandy Claystone to Clayey Sa YR 4/1 (Dark Gray) and 7.5 YR 5						
-									wet, mostly fine sand.	(009 2	· · · · · · · · · · · · · · · · · · ·				
	<u> </u>														
55								_							
55		16	11	30/60	' Î										
	365														
-	_	- 1													
-					ĺ										
-	-								-Sand lense with carbonate infille	ed fracture					
									Cana ionio with carbonate while	a nacture					
:pn	пь С	:RC	UP	DE	—- 4T ∣	CO	NSIII '	TAN	NTS, INC. THIS SUMMARY APPLI	ES ONLY AT T	HE LOCATION	1			
Ĭ	. l								SUBSURFACE CONDIT LOCATIONS AND MAY	TONS MAY DIF	FER AT OTHE			. ==	_
							uite B		WITH THE PASSAGE C PRESENTED IS A SIMP	F TIME. THE	DATA		FI	GURI	= C
DELT	Λ		Irvi	ine,	CA	92	618		CONDITIONS ENCOUN	TERED.		-			

_O	G (JF	C	OR	ĽΕ	BC	RIN	G	PROJECT NAME Yucca & Agryle Fault Investiga	tion LA-1183	T NUMBER			ORING B-2	
SITE	LOC	ATIC	N						DATE(S) DRILLED	LOGGE	BY		1	HEET N	10.
	LING)			<u> </u>		1/30/14 DRILL BIT SIZE/TYPE	ТО	CHECKED	BY	TC		PTH DRILLI
	w Ste								6"		SK			et)	60
	L RIC M12	3 TY	PE						DRILLED BY Gregg In-Situ Drilling		INCLINATIO	ON F	ROM \	/ERTIC	AL/BEARING
	AREN e enco			IDWA	TER	DEP	тн				APPROXIM.			TOP EL	EVATION
CON	IMEN	TS				*					BOREHOLE		21 CKFIL	L	
		1									Soil Cutting	s			
	æ			RO	CK (ORE	E					S			
£	ON (\$			8	ď		uı~	 }5				TEST	TOR	ATE, OUR	FIELD
DEPTH (ft)	ELEVATION (ft)	RUN NO.	BOX NO.	RECOVERY,	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	ПТНОГОСУ	MATERIAL DES	SCRIPTION		PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	NOTES
	<u>3</u> 60								Total Depth: 60 Ft Groundwater: Encountered at 2 Boring backfilled with tamped of patched.	27 Ft cuttigns and as	phalt				
	_														
	_														
35															
	<u>3</u> 55														
	_														
70													Ì		
	350														
75															
	<u>3</u> 45														
	_														
	_														
	L														
ROI	UP G						NSUL uite B		THIS SUMMARY APPI OF THIS BORING AND SUBSURFACE COND LOCATIONS AND MA WITH THE PASSAGE	DAT THE TIME ITIONS MAY DI Y CHANGE AT	OF DRILLING. FFER AT OTHE THIS LOCATION	R	FI	GURE	
ELT			Irvi	ne,	CA	92	618		PRESENTED IS A SIM CONDITIONS ENCOU	IPLIFICATION (F THE ACTUAL	L			

LOG OF CORE BORING SITE LOCATION DRILLING METHOD Hollow Stem Auger									PROJECT NAME Yucca & Agryle Fault Investigation DATE(S) DRILLED 1/30/14	ECT NUMBER 83 GED BY			BORING B-3 SHEET NO. 1 of 4			
									DRILL BIT SIZE/TYPE 6"	ТО	CHECKED SK	TOTAL DEPTH DRILLED				
DRIL	LL RIC						 .		DRILLED BY Gregg In-Situ Drilling			ON F	ROM	/ERTIC	L/BEARING	
	AREN e enco			NDWA	TER	DEP	TH	·'			APPROXIM (feet)		PILE 20.5	TOP ELE	VATION	
CON	MEN	TS									BOREHOLE Soil Cutting	ВА		L		
a a	(£)			RO	CK (ORE		\ 		'				uir		
DEPTH (ft)	ELEVATION (ft)	RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESC	CRIPTION		PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES	
	420								Asphalt Artificial Fill (Qaf)						-	
-	-							4	Silty SAND, 7.5 YR (Strong Bromedium to coarse sand, some fir gravel, trace cobbles.	wn), moist, m ne sand, few	nostly fine					
	_							12								
5	<u>4</u> 15	1	1	32/30				4			,					
									Older Alluvium (Qoal)							
	_	2		19/30					Silty SAND, 7.5 YR 5/8 (Strong fine sand. Clayey SAND, 7.5 YR 5/8 (Strong	a Brown), m		!				
	-							<i>!!</i>	mostly fine sand, trace fine grave	l.						
10	<u>4</u> 10	3		19/30												
	-															
	_	4		29/30					-Few medium sand and trace coa	irse sand						
	_								Sandy Clay, mottled 7.5 YR 6/8	(Reddish vel	low) to					
15	<u>4</u> 05	5	3	21/30					 7.5 YR 7/1 (Light Gray), moist, fi staining, polished surface along to weathered. 	ne sand, oxid	de Ó					
		6		30/30					-Carbonate infilled fractures							
iRD	UP (32		chl	y, S	uite B	ΓΑΝ	THIS SUMMARY APPLII OF THIS BORING AND A SUBSURFACE CONDIT LOCATIONS AND MAY WITH THE PASSAGE O PRESENTED IS A SIMP	AT THE TIME ONS MAY DI CHANGE AT F TIME. THE	OF DRILLING FFER AT OTHE THIS LOCATION DATA	R N	FI	GURE	a	

LOG OF CORE BORING SITE LOCATION									PROJECT NAME Yucca & Agryle Fault Investigation DATE(S) DRILLED 1/30/14	PROJEC IN LA-1183 LOGGEI TO	T NUMBER		BORING B-3 SHEET NO. 2 of 4				
Hollo	LLING ow Ste	em A	uger)					DRILL BIT SIZE/TYPE 6"		SK		TOTAL DEPTH DRILLED (feet) 60 ROM VERTICAL/BEARING				
	LL R I0 I M12	G TY	PE						DRILLED BY Gregg In-Situ Drilling		INCLINATIO	ON F	KOM (ERTICA	AL/BEARING		
	AREI e enc			NDWA	TER	DEP	TH				APPROXIM (feet)	IATE PILE TOP ELEVATION					
CON	MEN	TS		-10							BOREHOLE Soil Cutting	ΞВΑ	20.5 CKFIL	L			
Œ	(£)					ORE	.	\ \ \ \ \ \ \ \ \ \									
DEPTH (ft)	ELEVATION	RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESC		PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES			
-	400	7	4	29/30					-Coarsening sand, carbonate infi	ling fractures	6						
		8		22/30					Modelo Formation (Tm)					,			
-23	<u>3</u> 95	9	5	30/30					Sandstone, mottled 7.5 YR 8/2 (7.5 YR 6/8 (Reddish Yellow), motor medium sand. Clayey Sandstone, mottled 7.5 YB Brown) with 7.5 YR 7/1 (Light Gramostly fine sand with some medium	st to wet, mo R 5/6 (Stronay), moist to	ostly fine / ng wet,						
-		10		25/30					oxide staining. Sandstone mottled 7.5 YR 5/6 (S 7.5 YR 7.1 (Light Gray), wet, mos	trong Brown) and edium						
-30	390	11	6	29/30		_			sand, few fine to coarse gravel, tr black peat. Clayey Sandstone, 7.5 YR 5/8 (
-	_	12		30/30					mostly fine to medium sand with a cobble layer and lamination of sa Clayey Sandstone, mottled 7.5 YR 8/1 (Gray), we medium sand, abundant carbona	a minor grave ndstone. /R 5/8 (Stronet, mostly fine	el and						
35		13	- 7	29/30													
	_	14		30/30					-Sandstone Layer								
_									Clayey Sandstone to Sandy Cl YR 5/8 (Strong Brown) and 7.5 Yl wet, mostly fine to medium sands infilling of fractures.	R 7/1 (Light (Gray),						
SRO	UP (32		chl	y, S	uite B	ΓAN	THIS SUMMARY APPLIE OF THIS BORING AND A SUBSURFACE CONDITI LOCATIONS AND MAY (WITH THE PASSAGE OI PRESENTED IS A SIMP CONDITIONS ENCOUNT	AT THE TIME ONS MAY DII CHANGE AT T F TIME. THE LIFICATION O	OF DRILLING. FFER AT OTHE FHIS LOCATION DATA	R N	FI	GURE	b		

LOG OF CORE BORING									PROJECT NAME Yucca & Agryle Fault Investigation LA-1183			NUMBER			BORING B-3				
SITE	LOC	ATIC	ON						DATE(S) DR		ВҮ		SHEET NO.						
ייפת	LINIC	. ME.	THOE	,					1/30/14 TO DRILL BIT SIZE/TYPE CHECKED B					3 of 4 Y TOTAL DEPTH DRILLED					
	ow Ste			,					6")/C(SK	۵Y		DIAL DE eet)	60			
	L RIC							1	DRILLED B	Y			ON F	ROM	VERTICA	AL/BEARING			
	M12								Gregg In-Sit	tu Drilling			0						
	AREN e enco			NDW/	ATER	DEP	TH					APPROXIM (feet)			TOP ELI	EVATION			
CON	MEN	TS										BOREHOLE		20.5 CKFIL					
	- -	T							1			Soil Cutting	s						
	(#)			RO	CK (CORE	.	>					TS		uin				
DEРТН (ft)	ELEVATION (ft)	ر ا		×, %	FREQ.	%	R.G.	LITHOLOGY		MATERIAL DESC	RIPTION		PACKER TEST	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD			
DEP	EVA	RUN NO.	BOX NO.	RECOVERY,	F. F.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	ΙĔ		WATERIAL DESC	IXIF HON		SKE	BOR	RILL EET/	NOTES			
	<u>च</u>	₽	8	SECC.	FRAC.	R.	PRA DR/	-					ď	۵	۵۳				
	380	15	8	12/30					+					<u> </u>					
-									-Well cen	nented zone									
_		16		22/30	5														
	_																		
~	L																		
4 5	375	17	9	54/60	3	<u> </u>													
									-										
-																			
									1										
	_								1										
	_								1										
50	370	18	10	59/60	5		ļ		1										
									1										
	-																		
	L							_											
-																			
55	365	19	11	60/60))														
	<u> </u>																		
	-																		
	<u> </u>								-Gravel a	nd Cobble Layer									
-																			
iRD	UP (GRO	OUP	DE	LTA	CO	NSUL.	ΤΑΙ	NTS, INC.	THIS SUMMARY APPLIE OF THIS BORING AND A	T THE TIME (OF DRILLING.							
							uite B		, 1	SUBSURFACE CONDITIONS AND MAY C	ONS MAY DIF CHANGE AT T	FER AT OTHE	R N	 _,	CHE	= 0			
DEL						_				WITH THE PASSAGE OF PRESENTED IS A SIMPL	JFICATION O	DATA F THE ACTUA	L	[GURE	<u> </u>			
			II V	шe,	CA	92	618			CONDITIONS ENCOUNT	EKEU.								

LOG OF CORE BORING									PROJECT NAME Yucca & Agryle Fault Inve	LA-1183	NUMBER		BORING B-3				
DRILLING METHOD Hollow Stem Auger									DATE(S) DRILLED LOGGEI			BY	SHEET NO.				
									DRILL BIT SIZE/TYPE 6"	ТО	CHECKED	4 of 4 TOTAL DEPTH DRILLE (feet)					
DRIL	L RIC								DRILLED BY Gregg In-Situ Drilling			SK	ON F			60 AL/BEARING	
	AREN			IDW/	TER	DEP	ТН		o.ogg o.c o.m.ng			APPROXIM (feet)	ATE		TOP ELI	EVATION	
COM	IMEN	TS										BOREHOLE	BA	20.5 CKFIL	L		
				RO	CK (CORE	:					Soil Cutting					
DEPTH (ft)	ELEVATION (ft)	RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL	_ DESCF	RIPTION	İ	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES	
65	360 								Total Depth: 60 Ft Groundwater: Encounte Boring backfilled with tar patched.	red at 28 F	it ngs and asp	halt					
RO	LIP (32	Maι	ichl	y, S	NSUL uite B		THIS SUMMAR OF THIS BORI SUBSURFACE LOCATIONS A WITH THE PAS PRESENTED IS CONDITIONS	NG AND AT CONDITIO ND MAY CH SSAGE OF S A SIMPLII	THE TIME (NS MAY DIF HANGE AT T TIME. THE I FICATION O	OF DRILLING. FER AT OTHE HIS LOCATION DATA	R N	F	GURE	Ē d	

	G (OR	Œ	BC	RIN	G	PROJECT NAME Yucca & Agryle Fault Investigati DATE(S) DRILLED 1/29/14		T NUMBER		s	ORING B-4 HEET N	0.
Holle	LLING ow Ste	em A	uger)					DRILL BIT SIZE/TYPE 6" DRILLED BY		SK INCLINATION		(fe	eet)	36 AL/BEARING
Mari	M12								Gregg In-Situ Drilling			0			
	PAREI e ence			NDWA	TER	DEP'	TH				APPROXIM (feet)	ATE	PILE	TOP ELI	EVATION
CON	/MEN	TS									BOREHOLE Soil Cutting	E BA	20 CKFIL	L	
£	(£)		Γ	1	CK	CORE	.	_				STS	я	Ē,Ř	
DEPTH (ft)	ELEVATION (#)	RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DES	CRIPTION		PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
								\ <u>\</u>	Asphalt Artificial FIII (Qaf)						
-									Silty SAND, 7.5 YR 5/8 (Strong medium sand, little fine gravel, to	Brown), mois race cobbles.	t, fine to				
-	415										i	-			
-5	415	1	1	21/30				X://://	Clayey SAND7.5 YR 4/6 (Strong medium to coarse sand, some ficoarse gravel, trace cobbles.	g Brown), moi ne sand, few	st, fine to				
-		2		27/30					Older Alluvium (Qoal)						
10	<u>4</u> 10	3	2	27/30			:		Clayey SAND, 7.5 YR 5/8 (Stroi to medium sand, little coarse sar	ng Brown), mo	pist, fine gravel.				
-									trace cobbles. Silty SAND, 7.5 YR 5/8 (Strong medium to coarse sand, some file.)	Brown), mois	t,				
•		4		6/30					gravel. Clayey SAND, 7.5 YR 5/8 (Stroi medium to coarse sand, some fil gravel.						
15	5 3 0/30								-No recovery						
	_	6		0/30											
	400														
SRO DEL		GRO	32		chl	y, S	uite B		THIS SUMMARY APPLI OF THIS BORING AND SUBSURFACE CONDIT LOCATIONS AND MAY WITH THE PASSAGE OF PRESENTED IS A SIMP CONDITIONS ENCOUN	AT THE TIME TONS MAY DII CHANGE AT T OF TIME. THE PLIFICATION O	OF DRILLING. FFER AT OTHE THIS LOCATION DATA	ER N	FI	GURE	E a

	G (OR	RΕ	ВС	RIN	3	PROJECT N Yucca & Ag	ryle Fault Investigation		NUMBER			BORING B-4 SHEET N	0.
			THOE)		<u> </u>			1/29/14 DRILL BIT \$		ТО	CHECKED	BY	T	2 of 2 OTAL DE	PTH DRILLED
DRII	ow Ste LL RI 6 M12	G TY							6" DRILLED B Gregg In-Sit		10000000	SK INCLINATION	ON F			36 AL/BEARING
	AREI e enc			NDWA	TER	DEP	TH					APPROXIM (feet)		PILE 20	TOP ELI	EVATION
CON	MEN	TS										BOREHOLE Soil Cutting		CKFIL	LL	
£	£ 7				CK C	ORE	· !	<u>}</u>					STS	R.≺	된 본	
DEPTH (ft)	ELEVATION (#)	RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY		MATERIAL DESC	RIPTION		PACKER TEST	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
-	_	7	4	30/30					7.5 YR 6	LAY, mottled 7.5 YR 4/6/1 (Gray), moist, fine to mand, trace cobbles.	(Strong Brovedium sand	wn) and trace				
		8		30/30												
25	395	9	5	30/30												
		10		30/30												
30	<u>3</u> 90	11	6	60/60												
									-Thin laye	er of Sandstone, wet, med	dium to coar	se sand				
35	385	12	7	12/12												
									Groundwa	d drilling oth: Refusal at 36 ft ater: Encountered at 31 F ickfilled with tamped cutti		crete				
	380										·-					
ELI	UP (GRO	32		ichi	y, S	uite B	ſΑÌ	ITS, INC.	THIS SUMMARY APPLIES OF THIS BORING AND A' SUBSURFACE CONDITIO LOCATIONS AND MAY CO WITH THE PASSAGE OF PRESENTED IS A SIMPLI CONDITIONS ENCOUNTI	T THE TIME ()NS MAY DIF HANGE AT T TIME. THE [IFICATION O	OF DRILLING. FER AT OTHE HIS LOCATION DATA	:R V	FI	GURE	E b

GDC_ROCK_CORE_ENG LA-1183 CORE LOGS.GPJ ROCK2.GDT 2/13/15

	G (OR	E	ВО	RING	Э	PROJECT N. Yucca & Ag DATE(S) DR 1/31/14	ryle Fault Investigation		BY		s	ORING B-4A HEET N of 4	0.
	LLING ow Ste			!					DRILL BIT S	SIZE/TYPE	10	CHECKED SK		TC (fe	OTAL DE	PTH DRILLE
	L <mark>L RIC</mark> M12	TY	PE						DRILLED BY			INCLINATIO		ROM \	/ERTIC	L/BEARING
	AREN	IT G	ROUN	IDWA	TER	DEP	ГН		Gregg In-Sit	u Drilling		APPROXIM	0	DII E	TOB EL 6	EVATION
	e enco		ered									(feet)		20	IOP ELE	EVATION
CON	MEN'	TS										BOREHOLE Soil Cutting		CKFIL	L	
₽	(#)			RO	ск с	ORE		<u>}</u>					STS	۲	ய் ∝	
DEPTH (ft)	ELEVATION	RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY		MATERIAL DESCI	RIPTION		PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
									Asphalt	Fill (Oct)			111			
- -									Artificial Silty SAN fine to me	ND, 7.5 YR 5/8 (Strong Bigedium sand, little fine grav	rown), moisi rel, trace co	t, mostly bbles.				
- -5 -	415									uvium (Qoal)						
-	_								mostly me	AND7.5 YR 4/6 (Strong E edium to coarse sand, so arse gravel, trace cobbles	me fine san	st, d, few				
-10 - -	<u>4</u> 10	1	_2	19/30					mostly fin	AND, 7.5 YR 5/8 (Strong e to medium sand, few co el, trace cobbles.						
- - -15	405	2		0/30												
- I J		3		30/30					-Becomes	s 7.5 YR 4/4 (Reddish Bro	own)					
-	400	4		30/30					(Strong B mostly fin	and to Sandy Clays, mot rown) and 7.5 YR 7/1 (Lig e grained sand, few medi gravel, some silt.	iht Gray), m	ioist,				
GRO		RC	32 I	Mau	chl	y, S	NSULT uite B 618	ΓAN	ITS, INC.	THIS SUMMARY APPLIES OF THIS BORING AND AT SUBSURFACE CONDITIO LOCATIONS AND MAY CI WITH THE PASSAGE OF PRESENTED IS A SIMPLI CONDITIONS ENCOUNTE	THE TIME (INS MAY DIF HANGE AT T TIME. THE (FICATION O	OF DRILLING. FER AT OTHE HIS LOCATIOI DATA	R	FI	GURE	а

	G (UR	L	RC	RIN	انی	PROJECT N Yucca & Ag DATE(S) DR	gryle Fault Investigation	LOGGED	T NUMBER BY			ORING B-4A HEET N	О.
	L LING ow Ste)					1/31/14 DRILL BIT 8 6"	SIZE/TYPE	ТО	CHECKED SK	BY	TC	OTAL DE	PTH DRILLE
	LL RIC M12	G TY	PE						DRILLED B				ON F	ROM	VERTICA	AL/BEARING
	AREN e enco			NDWA	TER	DEP	ТН					APPROXIM (feet)		PILE	TOP ELE	EVATION
COM	MEN	TS										BOREHOLE Soil Cutting	ВА		.L	
	(ft)			RO	CK (CORE	.	>				·	TS		uir	7.11-3
DEPTH (ft)	ELEVATION (ft)	RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	ПТНОГОСУ		MATERIAL DESC	RIPTION		PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
•		5	4	30/30	<u> </u>			1.								
_		6		30/30												
-									-5 YR 4/4 white car	4 (Reddish Brown) and 5 bonate infilling.	YR 6/1 (Gra	y), with				
-25	<u>3</u> 95		5													
-																
-	_															
_ _30	390															
-			6						Ground V	Vater @ 31 ft.						
-									Orouna v	valor @ 07 n.						
-																
-35	385															
_			•						-Mottled 1 (Light Gra	10 YR 6/6 (Brownish Yello ay), abundant carbonate i	ow) and 10 \nfilling	YR 7/1				
-	380	-							Sandstor	Formation (TM) ne, Siltstone, Claystone o 7.5YR 7/1 (light gray), th	IOYR 6/1 (Sinly bedded	trong , some				
SRO		GRO	32	Mau	chl	y, S	NSUL uite B 618		ITS, INC.	THIS SUMMARY APPLIES OF THIS BORING AND AS SUBSURFACE CONDITIO LOCATIONS AND MAY C WITH THE PASSAGE OF PRESENTED IS A SIMPL CONDITIONS ENCOUNTI	T THE TIME I DNS MAY DIF HANGE AT T TIME. THE I IFICATION O	OF DRILLING. FFER AT OTHE THIS LOCATION DATA	ir N	FI	GURE	b

LO	G	OF	C	OF	RΕ	BC	RIN	G	PROJECT NAME Yucca & Agryle Fault Investiga		T NUMBER		E	B-4A	
SITE	LOC	ATIC	ON						DATE(S) DRILLED	LOGGE	ВУ			HEET N	
D.D.			TUO 5					_	1/31/14	ТО	1			3 of 4	
	ow St		THOE	J					DRILL BIT SIZE/TYPE 6"		CHECKED	BY		OTAL DI eet)	EPTH DRILLED
	LL RI								DRILLED BY	<u> </u>	SK INCLINATION	ON F	ROM	VERTIC	60 AL/BEARING
Marl	M12								Gregg In-Situ Drilling			0			
	AREI e enc		ROUI	NDW	ATER	DEP	TH				APPROXIM	ATE	PILE	TOP EL	EVATION
	MEN		-								(feet) BOREHOLI		20		
								_			Soil Cutting		CRFIL	- L	
	Œ			RO	CK (CORE	.					STS		ni œ	
DEPTH (ft)	ELEVATION (ft)			×, %	Ö	%	₩ ₀ ~	LITHOLOGY	MATERIAL DES	SCRIPTION		PACKER TEST	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD
DEP	EVA	RUN NO.	BOX NO.	RECOVERY,	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	H	WATERIAL DEC	JOINI HON		CKE	BOR	RILL EET/	NOTES
	111	2	8	ZECC	FRA(R.	ARA DR	-				₹	2		
	+	7	8	60/60	d			\vdash	<u> </u>			_			
_	_								1						
	L														
									- - -						
_															
_	-								-						
4 5	375	8	9	57/60					- - -						
			3	37700											
_															
-															
-	-														
_	<u> </u>														
-50	370														
00		9	10	59/60	1										
-															
-	-														
_															
-	205														
<u>-</u> 55	365	10	11	53/60	5										
_	_														
~															
_															
_	-														
	360														
SRO	UP (GRO	OUP	DE	LTA	co	NSUL	ΤΑΙ	NTS, INC. THIS SUMMARY APP	D AT THE TIME	OF DRILLING.				
							uite B		LOCATIONS AND MA	Y CHANGE AT 7	THIS LOCATIO			GURI	= _
DEL.	E TA						618		WITH THE PASSAGE PRESENTED IS A SIN	IPLIFICATION C	DATA OF THE ACTUA	.L	'-'	JUNI	_ 0
	4		II V	#I€,	UA	92	010		CONDITIONS ENCOU	INTERED.			1		

LO	G (OF	C	OR	RE	BC	RIN	G	PROJECT NAME Yucca & Agryle Fault Investigation	PROJECT 1 LA-1183	NUMBER		E	B-4A	
SITE	LOC	ATIO	ON						DATE(S) DRILLED	LOGGED	BY		ſ	SHEET N	О.
ייפת	LINC	- BAE	THOD						1/31/14	ТО	OUFORES	D\/	_	4 of 4	DTU OD:: : =:
	LING ow Ste			,					DRILL BIT SIZE/TYPE 6"		SK SK	ВŢ		OTAL DE eet)	PTH DRILLEC
DRIL	L RIC								DRILLED BY			ON F	ROM	VERTICA	AL/BEARING
	M12		DO!!!	15144					Gregg In-Situ Drilling			0			<u>-</u>
	e enco		ROUN ered	IDWA	ATER	DEP	тн				APPROXIM (feet)			TOP ELI	EVATION
COM	MEN	TS									BOREHOLE Soil Cutting	ВА	20 CKFIL	_L	
				RO	CK C	ORE					Our outling				
Œ	NO (#			%	ď		1115	₹				TEST	TORY	ATE, OUR	FIELD
DEPTH (ft)	ELEVATION (ft)	RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESC	RIPTION		PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	NOTES
-									Total Depth: 60 Ft Groundwater: Encountered at 31 I Boring backfilled with tamped cutti patched.	Ft ings and asp	halt				
-															
-															
65	355														
-	H														
-	<u> </u>														
-															
70	350														
-70															
-															
	_														
75	<u>3</u> 45														
	-														
	L														
-	240														
FLI		GRO	32 I	Маι	ıchl	y, S	NSUL uite B		THIS SUMMARY APPLIES OF THIS BORING AND AS SUBSURFACE CONDITION LOCATIONS AND MAY CO WITH THE PASSAGE OF PRESENTED IS A SIMPL CONDITIONS ENCOUNTS	T THE TIME (DNS MAY DIF HANGE AT T TIME. THE I IFICATION O	OF DRILLING. FER AT OTHE HIS LOCATION DATA	R N	FI	GURE	Ē d

GDC_ROCK_CORE_ENG LA-1183 CORE LOGS.GPJ ROCK2.GDT 2/13/15

				OR	RΕ	BC	RIN	G	PROJECT NAME Yucca & Agryle Fault Investigation	PROJECT Dn LA-1183	T NUMBER			BORING B-5	
SITI	ELOC	CATIO	ON						DATE(S) DRILLED 1/29/14	LOGGED	BY			SHEET N 1 of 4	0.
	LLING ow St		THO)					DRILL BIT SIZE/TYPE 6"	ТО	CHECKED SK	BY	T		PTH DRILLED
DRI	LL RI	G TY							DRILLED BY			ON F	ROM	VERTICA	AL/BEARING
	M12		POUI	NDW/	TEB	DED			Gregg In-Situ Drilling			0		·	
	e enc			NDVV	MER	DEP	ın				APPROXIN (feet)		PILE 21	TOP ELI	EVATION
CON	MEN	ITS		1							BOREHOLI Soil Cutting	E BA		-L	
£	(€		T	1	CK C	ORE		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \				STS	RY	ய்∝	
DEPTH (ft)	ELEVATION (#)	RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESC	CRIPTION		PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
					-			\\$\	Asphalt			-			
	<u>42</u> 0								Artificial Fill (Qaf) Silty SAND, 7.5 YR 4/3 (Brown) sand, few medium sand, some fill trace cobbles.	, moist, mostl ne to coarse (y fine gravel,		000000000000000000000000000000000000000		
-								1.1	Older Alluvium (Qoal)						
_5 _	<u>4</u> 15	1	1	30/30					Clayey SAND 7.5 YR 4/6 (Strong mostly fine to medium sand, som fine gravel.	g Brown), mo ne coarse san	ist, d, some				
		2		28/30											
 _10	410	3	2	29/30											
- -	10	4		25/30					Sandy SILT, mottled 10 YR 7/3 (7.5 YR 5/8 (Strong Brown), moist trace fine gravel.	(Pale Brown), t, mostly fine :	and sand,				
- 15		5	3	26/30					Clayey SAND, 7.5 YR 4/6 (Stron mostly fine to medium sand, som	g Brown), mo e cobbles and	ist, d gravel.				
****	<u>4</u> 05								SAND , 7.5 YR 5/8 (Strong Brown medium to coarse sand, few fine	n), moist, mos gravel, trace	itly cobbles.				
-		6		21/30					Silty SAND, 7.5 YR 4/6 (Yellowis mostly fine sand, trace fine grave	sh Brown), mo I.	pist,				
GRO DEL	UP (GRO	32		ıchl	y, S	uite B	ΓΑΝ	NTS, INC. THIS SUMMARY APPLIE OF THIS BORING AND AND AND AND MAY OF THE PASSAGE OF THE PASSAGE OF THE PASSAGE OF THE PASSAGE OF THE PASSAGE OF THE PASSAGE OF THE PASSAGE OF THE PASSAGE OF THE PASSAGE OF THE PASSAGE OF T	AT THE TIME I IONS MAY DIF CHANGE AT T F TIME. THE I LIFICATION O	OF DRILLING. FER AT OTHE HIS LOCATIO DATA	ER N	FI	GURE	: a

GDC_ROCK_CORE_ENG LA-1183 CORE LOGS.GPJ ROCK2.GDT 2/13/15

LO	G ()F	C	OR	E	BC	RIN	G	PROJECT N Yucca & Ag	AME gryle Fault Investigatio		NUMBER			B-5	
SITE	LOC	ATIC	ON						DATE(S) DR 1/29/14	RILLED	LOGGED TO	ВҮ		S	SHEET N	Ю.
DRIL	LING	ME	THOD)					DRILL BIT S	SIZE/TYPE	10	CHECKED	BY	TO	OTAL DI	EPTH DRILLE
Hollo	ow Ste	m A	uger						6"			SK		1.	et)	60
	L RIG	3 TY	PE					ŀ	DRILLED B			INCLINATION		ROM	VERTIC	AL/BEARING
		IT G	ROUI	NDWA	TFR	DEP	TH		Gregg In-Sit	tu Drilling		4.000.000	0			
	e ence			10117		-	•••					APPROXIM (feet)		PILE 21	IOP EL	EVATION
CON	IMEN	TS										BOREHOLE Soil Cutting	ВА		.L	
	æ			RO	CK (ORE	:					I		 		
DEPTH (ft)	ELEVATION (ft)			%	ď		ш :=	LITHOLOGY					PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD
DEPT	EVAT	RUN NO.	BOX NO.	ÆRY	FRE	R.Q.D., %	MING	THO		MATERIAL DESC	RIPTION		KER	30RA TES	SILL F	NOTES
_	==	ş	BO)	RECOVERY,	-RAC. FREQ.	S. O.	FRACTURE DRAWING/ NUMBER	=					PAC	Š	P.E.	
	-	7	4	28/30	-		<u>u</u> –	0 0								
_	<u>4</u> 00															
									4							
_				00/00					•							
_		8		28/30				.	9							
_																
-25																
~ Z O		9	5	22/30												
-	395							*								
_	L							<i>%</i> .								
		10		30/30					4							
-								د د د مرد								
-	-															
30	_	11	-6	60/60					•							
_	390	••	J	00,00				: ;/,								
_																
-																
-	- .											•				
_																
-35	H	12	7	60/60	'				Buried F	Paleosol, Mottled 5YR 3	/3 (Dark Red	dish				
_	<u>3</u> 85							//	Brown) to	5YR 6/1 (Gray).						
_								:.; ;								
_	_															
_	_															
								مُزُدُ:		*						
zen:	I IP (RC	JUP	DF	` • T	CO	NSIII -	ΓΔΙ	NTS, INC.	THIS SUMMARY APPLIE OF THIS BORING AND A	S ONLY AT T	HE LOCATION	1			
7	` \						uite B			SUBSURFACE CONDITI	ONS MAY DIF CHANGE AT T	FER AT OTHE	R N	 	O. 12.	
										WITH THE PASSAGE OF PRESENTED IS A SIMPLE	TIME. THE I	DATA		[GURI	Ξb
UEL	1 21		Irv	ine,	CA	92	618			CONDITIONS ENCOUNT	ERED.					

	G (OR	E	BC	RIN	G	PROJECT N Yucca & Ag DATE(S) DR 1/29/14	gryle Fault Investigation	LA-1183	T NUMBER		s	ORING B-5 HEET N	0.
	LLING)					DRILL BIT S	SIZE/TYPE	ТО	CHECKED SK		TC (fe	OTAL DE	PTH DRILLE
Marl	LL RIC M12								DRILLED B Gregg In-Sit			INCLINATION	ON F	ROM	VERTICA	AL/BEARING
	AREN e enco			NDWA	TER	DEP	TH					APPROXIM (feet)			TOP ELE	EVATION
CON	MEN	TS										BOREHOLE		21 CKFIL	.L	
								1				Soil Cutting	S	1	l I	
Ð	Œ			RO	CKC	ORE	.	<u> </u>					STS	≿	ய்α∠	
DEPTH (ft)	ELEVATION (ft)	88 ELEVATION 8 BOX NO. 99/24 RECOVERY, % R.Q.D., % FRACTURE FRACTURE DEMANNING/					FRACTURE DRAWING/ NUMBER	LITHOLOGY		MATERIAL DESC	RIPTION		PACKER TEST	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
	290	13	8	47/60												
_	300															
-																
-																
-	_								Clayey S	Sand, 5 YR 5/6 (Yellowish	Brown), m	oist,				
45	-	14	9	30/30					fine grave	ne to medium sand, few c el. vater @ 45 ft.	oarse sand,	trace				
_	375								Oroana v	valer @ 40 %.						
~	-							1.								
_	-							<i>!!!</i>	-Mottled	5YR 5/6 (Yellowish Brow	n) to 5YR 6	/1 (Grav)				
_	-									()	.,	(2.2),				
_50		15	10	22/30					Sand 7 F	5 YR 6/2 (Strong Brown),	wot mostly					
_	<u>3</u> 70		10	2/30				• • • • •		to coarse sand, some fine		îne				
_	L							<i>[</i>]	Clayey S 7.5YR 6/2	Sand , 5YR 4/4 (Reddish E 2 (Pinkish Gray), wet, mo	stly fine to n	ed with nedium				
_									Clayey S	ce coarse sand, trace fine sand, 5YR 4/4 (Reddish E , few medium sand.		mostly				
_									mie sand	, iew meuluifi Sanu.						
-55																
-	<u>3</u> 65	16	11	50/60					Sand 5YF to coarse	R 5/6 (Yellowish Brown), se sand, some fine sand, fe	wet, mostly w fine grave	medium el.				
_																
_									Modelo F	Formation (Tm)						
_									Sandy Cl mostly fin	laystone5YR 4/4 (Reddis ne sand, some fines.	sh Brown), v	et,				
SRO	UP (GRO	32	Mau	chl	y, S	NSUL uite B 618	TAN	NTS, INC.	THIS SUMMARY APPLIES OF THIS BORING AND AS SUBSURFACE CONDITIO LOCATIONS AND MAY COMTH THE PASSAGE OF PRESENTED IS A SIMPL CONDITIONS ENCOUNT	T THE TIME DNS MAY DIF HANGE AT T TIME. THE IFICATION C	OF DRILLING. FFER AT OTHE THIS LOCATION DATA	R N	 Fl	GURE	E c

	G (UR	(E	RC	RIN	G	PROJECT NAME Yucca & Agryle Fault Investigation DATE(S) DRILLED	LOGGED	T NUMBER			ORING B-5 HEET N	Ю.
									1/29/14	TO	. J.		4	of 4	
	LING)					DRILL BIT SIZE/TYPE 6"		CHECKED SK	BY		OTAL DE	EPTH DRILLE
	L RIC	3 TY	PE						DRILLED BY Gregg In-Situ Drilling		INCLINATIO	ON F	ROM V	VERTICA	AL/BEARING
APP None	AREN e enco	NT G	ROUN red	IDWA	ATER	DEP	TH				APPROXIM (feet)		PILE	TOP ELI	EVATION
CON	IMEN [®]	TS									BOREHOLE Soil Cutting	BA		L	
	£			RO	CK (CORE	=						>		
DEPTH (ft)	ELEVATION (ft)	RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESC	CRIPTION		PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
-	<u>3</u> 60		_						Total Depth: 60 Ft Groundwater: Encountered at 45 Boring backfilled with tamped cut patched.	Ft itings and asp	phalt				
	_														
:															
65	355														
-															
-															
-															
-70						•									
-	<u>3</u> 50														
-	_														
	-														
75	345														
-															
-	_														
RDI	UP C						NSUL uite B	TAN	THIS SUMMARY APPLIE OF THIS BORING AND A SUBSURFACE CONDITI LOCATIONS AND MAY	AT THE TIME (ONS MAY DIF CHANGE AT T	OF DRILLING FER AT OTHE HIS LOCATION	:R		01155	
ELT							618		WITH THE PASSAGE OF PRESENTED IS A SIMP CONDITIONS ENCOUNT	F TIME. THE I	DATA			GURE	=

	G			OR	EE	30	RIN	G	PROJECT NA Champion S DATE(S) DR 10/1/2014	Supplemental Fault				s	ORING B-6 HEET N of 2	0.
DRII HSA	LING	ME	THOE)					DRILL BIT S	IZE/TYPE		CHECKED	вү		OTAL DE	PTH DRILLE
DRII	LL RIG	G TY	PE						DRILLED BY	(INCLINATIO	ON F	ROM \	/ERTIC	AL/BEARING
	AREI e ence			NDWA	TER	DEP	ГН			***		APPROXIM.			TOP ELI	EVATION
CON	MEN	TS										BOREHOLE		32 CKFIL	L	
	(ff)				CK C	ORE		<u>}</u>					STS	ΚΥ	п, сс	
DEPTH (ft)	ELEVATION	RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY		MATERIAL DES	SCRIPTION		PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
								4 4	Concrete Artificial	approximatly 6 in thic	k					
-	430								SAND wind medium to trace mice	th SILT 7.5YR 4/4 B o fine SAND, some co as and FE oxides.	oarse to fine Gl	ostly RAVEL,				
-		1	1	24/24						LLUVIUM (Qoal (u)) th SILT 7.5YR 5/6 St		pist.				
- -5	-								mostly mo	ostly fine SAND, few r AND and fine GRAVE	medium SAND,	trace				
-		2		30/30												
-	425			20/22				۵ .	to fine SA	YR 4/6 Strong Brown ND, interbedded clay	, moist, mostly lenses at 7.5ft	medium				
-		3		30/30						led clay lenses LLUVIUM (Qoal (I))						
-						:			SAND with SAND few fining with	th SILT7.5YR 4/4 Bro v medium SAND, trac v denth	own, moist, mos e coarse SANE	stly fine), section				
-10 -		4	_2	30/30					SAND with	th CLAY 7.5 4/6 Stroet to medium SAND, f	ew coarse SAN	D. trace				
_	<u>4</u> 20						ļ	\mathbb{Z}	- _ Gravel Le	fine GRAVELS, interlense 5YR 4/6 Strong Brown	-	,⊢				
-		5		30/30					medium S	AND, some coarse S S, massive bedded, n	SAND, few fine	inic to				
-15		6		30/30					mostly fine	th CLAY 7.5YR 4/6 Se SAND, few medium of fine GRAVELS and	SAND, trace of	noist, oarse				
-	-															
-	<u>4</u> 15	7		34/30					∖-Higher Cl	LAY content, no GRA	VELS or CORF	BLES.				
-		•							Silty SAN	D7.5YR 4/4 Brown, r erbedded clay lenses	noist, mostly fir					
SRO DELI	UP (32		chly	, S	uite B	TAN	ITS, INC.	THIS SUMMARY APP OF THIS BORING ANI SUBSURFACE COND LOCATIONS AND MA WITH THE PASSAGE PRESENTED IS A SIN CONDITIONS ENCOU	D AT THE TIME ITIONS MAY DII Y CHANGE AT 1 OF TIME. THE IPLIFICATION C	OF DRILLING. FFER AT OTHE THIS LOCATION DATA	R N	 FI	GURE	E a

LO	G (ЭF	C	OF	₹E	BC	RIN	IG	PROJECT N Champion	IAME Supplemental Fault Tr	PROJECT entA1B6#Bg	T NUMBER		Е	B-6	
SITE	LOC	ATIC	N						DATE(S) DF	RILLED	LOGGED	BY			HEET N	10.
DRII	LING	ME	ГНОГ)					10/1/2014 DRILL BIT :	SIZE/TYPE	K.Neill	CHECKED	BY		of 2	EPTH DRILLED
HSA									8"	OIZE/TTT E		ONLONED			eet)	25
	L RI	3 TYI	PE						DRILLED B			INCLINATIO		ROM	VERTIC	AL/BEARING
CME		JT GI	2011	J DW/	ATED	DEP			ABC Drilling	3			0			
	e ence			1011	TIEN	DEF	ın					APPROXIM (feet)		PILE 32	TOP EL	EVATION
COM	IMEN	TS						to the same of the				BOREHOLE		-	.L	
	(#)			RO	CK (CORE	-						TS.	≿	nior	
DEPTH (#)	ELEVATION (ft)	RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY		MATERIAL DESC	CRIPTION		PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		8	4	32/30	 			1	SAND w	rith Clay 7.5YR 4/4 Stronedium to fine SAND, cla	ong Brown, m	oist.				
-	-								Silty SA	ND 7.5YR 5/6 Strong Bro	own, moist, n	nostly				
_	410									edium SAND, few coarse BRAVELS.	e SAND, trac	e fine to				
_	_	9		30/30	1]							
_								ببنوا	3							
_25									,							
_25		10		31/30)				Total De	pth: 25 Ft						
_									Groundw	vater: No encountered ackfilled with tamped cut	tings and con	crete				
	405								patch.		go ao oo					
_	_															
_	_															
_30																
_	400															
_	400															
_	H															
_																
_35																
_	395															
_	230															
_	L															
_	_															
						\square		\perp		T						
GRO			32	Маι	uchl	y, S	NSUL uite E 618		NTS, INC.	THIS SUMMARY APPLIE OF THIS BORING AND A SUBSURFACE CONDITI LOCATIONS AND MAY (WITH THE PASSAGE OF PRESENTED IS A SIMPLE CONDITIONS ENCOUNT	AT THE TIME (ONS MAY DIF CHANGE AT T F TIME. THE I LIFICATION O	OF DRILLING. FER AT OTHE HIS LOCATION DATA	ER N	FI	GURI	Ξb

	G			OR	E	BC	RIN	G	PROJECT NA Champion S DATE(S) DR	Supplemental Fault	PROJEC Frent A 18 8 8 8 9 1				ORING B-7 HEET N	0.
DRI	LLING	ME	THOI	ס					10/2/2014 DRILL BIT S 8"		K.Neill	CHECKED	BY	TC	of 2 DTAL DE	PTH DRILL
	LL RI	G TY	PE						DRILLED BY ABC Drilling			INCLINATIO	ON F	ROM \	/ERTIC/	25 AL/BEARING
Non	e ence	ounte		NDWA	TER	DEP	тн					APPROXIM (feet)		PILE 31	TOP ELI	EVATION
CON	MEN	TS						1				BOREHOLE	ВА	CKFIL	L	
£	(£)					ORE	=	\ \{\delta}					STS)RY	삔쯗	
DEPTH (ft)	ELEVATION	RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY		MATERIAL DES	CRIPTION		PACKER TEST	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
	420							700	Concrete Artificial	approximately 6 in this	ck		-			
_	<u>4</u> 30								Clayey S	AND 7.5YR 3/2 Dark I D, some medium SANI	Brown, moist, r D, trace fine G	mostly RAVEL.				
_								/	Sand (Qs	-						
_		1	1	26/24				/ /E.	mostly fine SAND.	ilty SAND 7.5YR 4/6 Se SAND, few medium	SAND, trace o	coarse				
<u>_</u> 5	425	2		30/30					mostly find developm	th CLAY 7.5YR 4/4 St e to medium SAND, fe ent.	rong Brown, m w coarse SAN	ioist, ID, soil				
-									to fine SA	ID 7.5YR 4/4 Brown, r ND, some coarse SAN finnning down section	∖D and GRÁVI	nedium EL.				
-	_	3	•	30/30												
-																
_10		4	2	30/30												
_	<u>4</u> 20						į									
_		5		30/30					fine SAND	ID 7.5YR 4/6 Strong B D, few medium SAND,	trace coarse S	SANĎ.				
-								0 0	loose, mos	th SILT 5YR 4/4 Redd stly fine to medium SA grains, minor bedding s	ND, sub round	ded to				
-15	<u>4</u> 15	6	3	30/30	_				mostly fine	ith SILT 7.5YR 4/6 Str	ong Brown, mo SAND, trace fi	pist ne				
_	_							4 A	Silty SAN SAND, fev	5, massive, micacous. ID 7.5YR Reddish Brown fine GRAVELS and usedded, micas.	wn, mostly fine nedium SAND					
-		7		30/30				1		5YR 4/5 Strong Brown AND, some coarse to						
GRO			32		chl	y, S	uite B	ΓΑΝ	,	THIS SUMMARY APPL OF THIS BORING AND SUBSURFACE CONDIT LOCATIONS AND MAY WITH THE PASSAGE (PRESENTED IS A SIMI CONDITIONS ENCOUN	AT THE TIME (FIONS MAY DIF CHANGE AT T OF TIME. THE I PLIFICATION O	OF DRILLING. FER AT OTHE HIS LOCATION DATA	R 1	FIG	GURE	a

) بی	ノト	Ü	UK		RO	RIN	G	PROJECT NAME Champion Supplemental Faul	t Trench1B8#B	T NUMBER gs		¯	ORING B-7	
SITE	LOC	ATIC	N						DATE(S) DRILLED	LOGGE	BY			HEET N	О.
DRII	LING	ME	THO	 .					10/2/2014 DRILL BIT SIZE/TYPE	K.Neill	CHECKED			of 2	PTH DRILLE
HSA	LING	IVIL	ınoı	,					8"		CHECKED	6 1		et)	25
	L RIC	TY	PE						DRILLED BY		INCLINATIO	ON FI	ROM	VERTICA	AL/BEARING
CME									ABC Drilling	, · <u> </u>		0			
	AREN e enco			NDWA	TER	DEP	ТН				APPROXIM (feet)			TOP ELE	VATION
СОМ	MEN.	TS									BOREHOLE		31 CKFIL	.L	
			-	RO	CK (CORE									
£)NC				1			ξ				EST	ORY S	ATE,	FIEL D
DEPTH (ft)	ELEVATION (#)	RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DE	SCRIPTION	;	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
		8	4	30/30				2	─ GRAVELS Coarse to fine GR	AVEL, sub ang	ılar to				
-	<u>4</u> 10								\angular. OLDER ALLUVIUM (Qoal(u)		/				
-	<u> </u>								Clayey SAND, 7.5YR 5/6 Str	ong Brown, mois	st,				
		9		30/30					mostly fine SAND, some med fine GRAVEL, grussification,	ium to coarse S. micas, interbedo	AND, few ded black				
									clay laminations.						
-															
25	-	10		30/30											
	405								Total Depth: 25 Ft Groundwater: No encountered	I					
	_								Boring backfilled with tamped patch.	cuttings and cor	ncrete				
													ı		
•	-														
30	- 1														
	<u>4</u> 00														
	-														
35	-														
	<u>3</u> 95														
	_														
	-														
	-												ļ		
										<u> </u>					
ROL	JP (RC)UP	DEI	_TA	CO	NSUL	TAN	ITS, INC. THIS SUMMARY APP	ID AT THE TIME	OF DRILLING.				
J							uite B		LOCATIONS AND MA	DITIONS MAY DII AY CHANGE AT	FER AT OTHE			CHEC	- h
					J. 11	,, U	J D		WITH THE PASSAGE PRESENTED IS A SI	OF TIME, THE	DATA		[GURE	נו

	E LOC						RIN	+	DATE(S) DR	Supplemental Fa		GGED	·			B-8 HEET N	O .
DRII	LLING	ME	THOE)					10/2/2014 DRILL BIT S	SIZE/TYPE	K.N	leill	CHECKED	BY	TO		PTH DRILLE
HSA	١								8"		·					eet)	25
DRII CME	LL RIC	G TY	PE						DRILLED B				INCLINATIO		ROM '	VERTICA	L/BEARING
	PAREN	NT G	ROUN	NDWA	TFR	DFP	TH		ABC Drilling				ADDDOVIA	0		TOD 51.5	
	e enco						•••						APPROXIM (feet)		PILE 24	TOP ELE	EVATION
CON	MEN	TS											BOREHOLE			L	****
·	(#)		-	RO	CK C	ORE	.	 						TS.	≿	uiœ	
DEPTH (ft)	ELEVATION (ft)	RUN NO.	BOX NO.	RECOVERY, %	FRAC, FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	ПТНОГОСУ		MATERIAL D	ESCRIPT	TION	i	PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
								4		approximatly 6 in	thick						
_									Clayey S	AND 7.5YR 4/6 S to fine SAND, few	trong Brown fine GRAVE	, moist L.	, mostly				
-									Sand (Q	<u>s</u>)							
- -5	<u>4</u> 20	4		04/00			;		Clayey S fine to me roots.	AND7.5YR 5/6 Steedium SAND, few	rong Brown, coarse SAN	moist. D, mica	mostly acous,				
_		1	1	24/30													
-	_									h CLAY7.5YR 4/4 ace medium SAND		st, mos	stly fine				
_	415	2		24/30													
-									GRAVEL Grussifica	mostly coarse GF	RAVEL, few	fine GF	RAVEL,				
-10	\vdash	3	2	30/30		\dashv			(=:5556								
-																	
		4		30/30						ID 7.5YR 4/4 Brow			edium				
_	<u>4</u> 10								SAND, fe interbedd	w coarse SAND, to ed CLAY lenses.	ace fine GR	AVEL,					
-15	-	5		28/30													
-			•	15,00				·	094 045	ID 40VD 5/0 V "	uiah Da						
-	_								fine SAN	ID 10YR 5/6 Yellov D and trace mediu	visn Brown, m SAND.	inoist i	nostiy				
_		6		26/30	•				Clayey, S mostly fin	Sility, SAND 7.5YR e to medium SANI	4/6 Strong I O, trace coal	Brown, rse SA	moist, ND.				
									Large qua	artzite clasts, gleyi	ng in soild m	axtrix.					
SRO	UP (32		chl	y, S	uite B		ITS, INC.	THIS SUMMARY A OF THIS BORING SUBSURFACE CO LOCATIONS AND WITH THE PASSA PRESENTED IS A CONDITIONS ENC	PPLIES ONL AND AT THE INDITIONS M MAY CHANG GE OF TIME SIMPLIFICA	Y AT T TIME (IAY DIF GE AT T THE I	OF DRILLING. FER AT OTHE HIS LOCATION DATA	R N	FI	GURE	a

LO	G ()F	C	OR	E	BC	RIN	G	PROJECT NAME Champion Supplemental Fault 1	PROJEC	T NUMBER			ORING B-8	
SITE	LOC	ATIC	N						DATE(S) DRILLED	LOGGED			S	HEET N	0.
DRIL	LING	ME	THOD)				-+	10/2/2014 DRILL BIT SIZE/TYPE	K.Neill	CHECKED	BY	TC	TAL DE	PTH DRILLED
HSA DRIL	I DIC	TVI							8"		INCLINATION	N F	١.	et) /ERTIC	25 AL/BEARING
CME			FE						DRILLED BY ABC Drilling		INOLINATIO	0	(OIII)	LICITO	ADDLANING
APPA None				IDWA	TER	DEP'	TH				APPROXIM (feet)			TOP EL	EVATION
СОМІ	MEN	TS									BOREHOLE		24 CKFIL	L	
		1						1				1			
£	€				CK	ORE	<u> </u>	<u>}</u>				STS	RY	'n,Ē	
DЕРТН (ft)	ELEVATION (ft)	Š.	ġ.	RY, %	REQ.	% "	URE NG/ ER	LITHOLOGY	MATERIAL DES	CRIPTION		PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
	ELEV	RUN NO.	BOX NO.	RECOVERY,	FRAC. FREQ	R.Q.D.,	FRACTURE DRAWING/ NUMBER	Ē				PACK	LABO	DRIL	110120
		7	4	₩ 24/30					Silty SAND 5YR 4/4 Reddish B	rown, moist, n	nedium				
_	_								dense, mostly medium to fine S. SAND, few large GRAVELS, in	AND, some co	arse				
									black clay lenses. Clayed SAND 7.5YR 4/6 Strong	Brown, mois	t, mostly				
		8		27/30					fine SAND, interbedded black of Silty SAND 7.5YR 4/6 Strong B medium to fine SAND, some control of the same strong	rown, moist, n	nostly				
	<u>4</u> 00								GRAVELS.	aise onivo, le	w large				
25	_			_											
	_								Total Depth: 25 Ft						
									Groundwater: No encountered Boring backfilled with tamped cu patch.	ttings and cor	ncrete				
	_								,						
	395														
_30															ļ
_50	_														
	390			:											
	<u>5</u> 50														
_35	-										į.				
_	-														
-	_														
-	-														
_ <u> </u>	<u>3</u> 85														
								<u></u>	THIS SUMMARY APPL			l			
GROL	JP (iRC	JUP	DE	_TA	CO	NSUL		ITS, INC. OF THIS BORING AND SUBSURFACE CONDITIONS			R			
			39 I	Mari	chl	v C	uite B		LOCATIONS AND MAY	CHANGE AT T	HIS LOCATION	N		GURE	_ ,

GDC_ROCK_CORE_ENG_LA1183C CHAMPION SUPPLEMENTAL BORINGS B-6_B-8.GPJ_ROCK2.GDT_2//3/15

	G (OR	E	BC	RIN	G	PROJECT NAME Champion Site DATE(S) DRILLED	LA1183D			SI	DRING BA-1 HEET NO of 2	0.
	L LING ket Au		THOD)			-		11/19/2014 DRILL BIT SIZE/TYPE 8"	KN	CHECKED I		TO (fe	TAL DE et)	PTH DRILLE
Calv	LL RIC weld 4	2 LS							DRILLED BY Tri-Valley		INCLINATIO	0 O	ROM V	ERTICA	L/BEARING
Non	PAREN e enco	unte		(DWA	ATER	DEP'	TH 				APPROXIMA (feet) BOREHOLE	4:	28		VATION
æ	£		-		CK C	CORE		<u>}</u>				STS	RY	mj ex	
DЕРТН (ft)	ELEVATION (ft)	RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DES	SCRIPTION		PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
	ļ							/;	Concrete, 3" ARTIFICIAL FILL (Qaf)	·					
-									\ Silty Clayey SAND 7.5YR 4/4 \ mostly fine to medium sand; fe _\ subrounded to subangular clas	w fine to coars	e gravel. /				
-	<u>4</u> 25								\langle white evaporate layer. \langle ORGANIC HORIZON (Qor) \langle OLDER ALLUVIUM (Qoal (u			į			
-5									Poorly Graded Sand with Cla Brown); moist, mostly fine to m coarse sand; some fines; mica Clayey Sand 7.5YR 5/6 (Stron mostly fine to medium sand; fer fine gravels; roots.	edium sand; s ceous. g Brown): moi:	ome / 				
-	<u>4</u> 20								-2" gravel layer - perched groundwaterConglomerate lens above 8 ft Silty Sand 7.5YR 5/6 (Brown) to fine sand; few fine to coarse micaceous,	: moist: mostly	medium			į	
-10	_								 \ \ N55E, vertical erosion by sand \rounded to rounded clasts 1/8 i	o 1/4 in.	i				
-	<u>4</u> 15								Silty Sand 7.5YR 5/8 (strong bifine to medium sand; few coars fine and coarse gravel. - Interbeds of clayey sand and	e sand; few fir	es; trace				
.15		W-0.							sand 9" thick horizontal sand bed Gravel 4" thick lens. Some fine and coarse gravel.						
									Clay layers in bucket auger cut North side 1/4" root; offset bed; carbonate nodules, well develo	gray clayey be	nick. ed; 6"				
-	<u>4</u> 10								- Fracture. OLDER ALLUVIUM (Qoal (1)) Silty Clayey SAND 7.5YR 5/4		mosth				
-	-								fine to medium sand, few coars gravel; clay lenses in cuttings.						
SRO	UP (32 I	Mau	chl		uite B	ΓΑΝ	THIS SUMMARY APPLOF THIS BORING AND SUBSURFACE CONDITIONS AND MAWITH THE PASSAGE PRESENTED IS A SIM CONDITIONS ENCOU	O AT THE TIME ITIONS MAY DI Y CHANGE AT OF TIME. THE IPLIFICATION (OF DRILLING. FFER AT OTHEI THIS LOCATION DATA	R I	FIG	GURE	a

_O	G (DF	C	OR	E	BC	RIN	G	PROJECT NA Champion Si		LA1183D	TNUMBER			ORING BA-1	
SITE	LOC	ATIC	N						DATE(S) DRIL	LED	LOGGED	ВҮ			HEET N	О.
DRII	LING	MET	THOD)					11/19/2014 DRILL BIT SI	ZE/TVDE	KN	CHECKED E	2∨			PTH DRILLE
	et Au		11100	•					8"	26/1176		SK) I		et)	30
DRIL	L RIG	TYI	PE						DRILLED BY			INCLINATIO	N FF	ROM	/ERTIC	
	/eld 42								Tri-Valley				0			
	AREN e enco			IDWA	TER	DEP	ТН					APPROXIMA (feet)			TOP ELI	EVATION
COM	IMEN	ΓS										BOREHOLE	BAC		L	
									<u> </u>							
	(£)			RO	СКС	ORE	•						2	>-	***	
DEPTH (ft)	NOI (%	g	٠	ш,,,,,	LITHOLOGY			ODIDTION		PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD
DEPT	ELEVATION	RUN NO.	BOX NO.	RECOVERY,	FREQ	R.Q.D., %	FRACTURE DRAWING/ NUMBER	욷		MATERIAL DES	CRIPTION		XER	BOR/ TES	RILL F	NOTES
		RU	80	ECO	FRAC.	a.	FRAC DRA NUI	-					PAC	₹	97	
				<u>«</u>				/:	- 2 feet of o	clay fractures, massiv	re.					
-	_							<i>'</i> ;								
_								1								
	405							·/·								
-	403							<i>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</i>								
_	-							<i>[:]</i>	- Increase	in medium sand.						
25	_							1.	- Soil deve	lopment.						
								1.								
-	_							1	Clayey Sa	nd 7.5YR 5/6 (strong some medium sand;	brown); moist	; mostly				
-	400							<i>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</i>		some medium sand; o ; clay films on grains;						
_	_							<i>'';</i>						ĺ		
-30																
-									Total Depti No ground	n: 30 Feet bgs						
-									140 ground	water						
-	395															
25																
35																
	-															
_	<u>3</u> 90															
•																
SROI	up G							TAN	NTS, INC.	THIS SUMMARY APPL OF THIS BORING AND SUBSURFACE CONDI LOCATIONS AND MAY	AT THE TIME TIONS MAY DI	OF DRILLING. FFER AT OTHEI			01:5:	<u> </u>
			JZ	viat ne,	ICI II	y, S	uite B			MITH THE PASSAGE (PRESENTED IS A SIMI	OF TIME. THE	DATA		-	GURE	= b

	G (OR	RE_	ВС	RIN	G	PROJECT NAME Champion Site DATE(S) DRILLED 11/19/2014	PROJEC LA1183D LOGGED KN			s	ORING BA-2 HEET N	O.
Buck DRIL	LING ket Aug L RIC veld 42	ger S TYI		•					DRILL BIT SIZE/TYPE 8" DRILLED BY Tri-Valley		SK INCLINATION		(fe	eet)	36.5 AL/BEARING
None	AREN e enco	unte		IDWA	TER	DEP	тн		•		APPROXIM (feet)	4.	28		EVATION
COM	IMEN	ıs									BOREHOLE	E BA	CKFIL	. L	
(£)	(£)			RO		ORE	E					ESTS	ORY	H,R,E	
DEPTH (ft)	ELEVATION (ft)	RUN NO.	BOX NO.	RECOVERY, 9	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DES	CRIPTION		PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
- - - - - - - - - -	425 								Concrete, 4". ARTIFICIAL FILL (Qaf) Lean Clay with Sand 7.5YR 5/4 moist; some fine to medium sand responsible to medium sand sand responsible to coarse sand; some fine sand; - Gravel lense; large cobble; hor channel fill, interbedded with red Clayey Sand 7.5YR 4/6 (strong medium to coarse sand; some fill responsible to medium sand; some coarse sand; some fill responsible to medium sand; some coarse sand; some sand;	own); mostly micaceous; r izontal beddir sand lenses. brown); most ne sand; roots	medium nassive. ig				
-15 - -	 		ı						Poorly Graded Sand 7.5 YR 6/8 moist; mostly medium sand; few - Few gravels, subrounded to sul horizontal sandy clay with krotov to 20.5 feet. Increase in clayey s - Increase in gravels and cobbles boring.	coarse sand. bangular. An inas. Massiv sand lenses.	gular e bedding				
SRO	UP G		32 I	Mau	ıchl	y, S	NSUL [*] uite B 618	TAN	THIS SUMMARY APPLI OF THIS BORING AND SUBSURFACE CONDIT LOCATIONS AND MAY WITH THE PASSAGE C PRESENTED IS A SIMP CONDITIONS ENCOUN	AT THE TIME TIONS MAY DI CHANGE AT OF TIME. THE PLIFICATION O	OF DRILLING. FFER AT OTHE THIS LOCATIOI DATA	ER N	FI	GURE	Ē a

	G (OR	RE	BC	RIN	G	PROJECT N Champion S DATE(S) DR	Site	PROJEC LA1183D LOGGEI				ORING BA-2 HEET N	O.
	_LING		THOD)					11/19/2014 DRILL BIT \$	·	KN	CHECKED	вү	тс	of 2 OTAL DE	PTH DRILLE
DRIL	cet Au LL RIC veld 42	TY	PE						DRILLED B	Y		SK	ON F	١.	,	36.5 AL/BEARING
None	AREN e enco	unte		IDW/	ATER	DEP	ТН					APPROXIM (feet)		PILE 1	TOP ELI	EVATION
CON	IMEN	TS —										BOREHOLE	BA	CKFIL	L	
Œ	(#) Z	ı			Γ	CORE	1						STS)RY	Щ. Ж.	
DEPTH (ft)	ELEVATION (ft)	RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY		MATERIAL D	ESCRIPTION		PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES
								<i>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</i>	\ Contac	t N56°E, 18°S. ALLUVIUM (Qoal (u))					
-									Silty Cla	yey Sand 7.5YR 4/ edium sand; few co	4 (brown); moist; arse sand; gleyin	mostly / -				
_	<u>4</u> 05								Clayey S	sand 7.5YR 4/3 (brown medium to coarse	own); moist; most sand.	ly fine				
_ _25	_															
_25																
_									-Gleying	interbed in section.						
-	<u>4</u> 00															
- -30					i											
-									- Gley ler	ns interbedded on m	nassive unit.					
-	_															
-	395							<i>::::</i>								
- -35																
-	<u> </u>															
-										groundwater.						
_	390								Fotal Dep Groundwa	oth: 36.5 Feet bgs ater at 36.5 feet bgs	8					
										Г						
SROI DELT	UP C		32 I	Маι	ıchl	y, S	NSUL uite B 618	TAN	NTS, INC.	THIS SUMMARY AF OF THIS BORING A SUBSURFACE COI LOCATIONS AND M WITH THE PASSAG PRESENTED IS A CONDITIONS ENC	AND AT THE TIME NDITIONS MAY DI MAY CHANGE AT SE OF TIME. THE SIMPLIFICATION (OF DRILLING. FFER AT OTHE THIS LOCATION DATA	R N	FIG	GURE	E b

LO	G C	F	C	2R	E	ВС	RIN	G	PROJECT N Champion Site		PROJEC LA1183D	TNUMBER		E	BORING BA-3	
	LOCA		١						DATE(S) DR	RILLED	LOGGED	BY		- 1	HEET N	0.
<u></u>	wood,							_	1/19/2015 to		KN				1 of 5	
	LING i et Auge		HOD					-	DRILL BIT S	SIZE/TYPE		CHECKED SK	BY		TOTAL [feet)	EPTH DRILLE 44
DRIL	L RIG	TYP	E						DRILLED B	Y			ON F	ROM	VERTICA	L/BEARING
Calw	eld 42	LS							Tri-Valley				0			
	ARENT deasur		OUN	DWA	TER	DEP	ТН					APPROXIM	ATE	SURI	ACE EL	EVATION
	MENT											(feet) BOREHOLI		30		
00		•										Soil Cutting		CKFIL	-L	
												1	Ī —			
Ð	£		,	RO	CK C	ORE	.	<u>}</u>					STS	≿	ய்ல	
DEPTH (ft)	ELEVATION (#)			۲, %	Ö.	%	# 6 K	LITHOLOGY		MATERIAL DE	SCRIPTION		PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD
DEP	EVA	RUN NO.	BOX NO.	ECOVERY, %	F.	R.Q.D., %	MBE	Ĭ		MATERIAL DE			S.	BOR	RILL EET/	NOTES
	ᆸ	P.	BO	ECO	FRAC. FREQ	R.S.	FRACTURE DRAWING/ NUMBER	-					Ā	5	Or	
				Ж	_				Concrete	e, 3"		· "		-		-
								/4	_	r Casing - Not logged	d in field to 30 in	ches /				
								1	\below gro	ound surface.						
-								,	1 \		1/4-4/5-					
										yey SAND 7.5YR 4/4 ne to medium sand; fo						
									ORGAN	IC HORIZON (Qor)						
										_UVIUM (Qoal (u))				i		
									sand; few	lay 7.5YR 5/6 (Stron medium sand; trace	coarse sand: tr	ace fine				
								<i>``.</i>	to coarse	gravels; moist; dens	e; roots; glaying	,7.5YR				
	_							1.	clasts.	ior, vortical, macono,	miodocodo, odi	rounded				
								[·/	- soil dev	elopment.						
5	425							<i>(</i> ;								
٠	- 4 25							·/·								
								(;								
								7;	–, - Interbed	led sand lense, 10YF	R 5/6 (Yellowish	Brown).				
								<i>[:]</i>	sub-round	ded clasts, krotovina.	Soil developme	nt at 6 ft /				
								1;	-Clayey S	Sitly Sand 7.5YR 6/6	(Reddish Yellov	v);				
-								<i>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</i>		ostly fine sand; few n el; magnesium oxide		ots; trace				
								7.	 ====							
				İ					'	UVIUM (Qoal (I))						
.	-							17.		leosol, minor clay film lay 7.5YR 4/4 (Brown						
								\ <u>'</u> ,'		•						
								[;;	-roots alo	uncated by the over ling fault surface						
	_								Silty San	d 10YR 5/6 (Yellowis ; few medium sand; t	sh Brown); mois	t; mostly				
								7	Sand wit	h Gravel 10YR 5/4 (Yellowish Brown					
	notes and									e sand; few fine to co						
ROU	IP ■ GR	OU	IP [ŒL	TA	CON	NSULT	ΆN	TS, INC.	THIS SUMMARY APP OF THIS BORING AN			1			
7							uite B	.	, - .	SUBSURFACE CONI LOCATIONS AND MA	DITIONS MAY DIF	FER AT OTHE		 	O. 15.	- _
4										WITH THE PASSAGE PRESENTED IS A SI	OF TIME. THE	DATA		[GURE	: a
ELT	'A .		Irvi	ne,	CA	92	618			CONDITIONS ENCO				1		

GDC_ROCK_CORE_ENG_REV LA-1183D BUCKET AUGER BORINGS.GPJ ROCK2.GDT 2/13/15

LO	G C	F	C	OR	RE_	BC	RIN	G	PROJECT NA Champion Site	ME	PROJEC LA1183D	T NUMBER			ORING BA-3	
	LOCA ywood,		N						DATE(S) DRIL		LOGGE	BY			HEET N	0.
	LING I		HOD						1/19/2015 to 1		KN	CHECKED	BY			EPTH DRILL
Buck	ket Aug	er							8"	_		SK	- •		eet)	44
	L RIG		E						DRILLED BY			INCLINATIO		ROM V	ERTICA	L/BEARING
	veld 42 ARENT		UIIN	DWA	TER	DED.	TH		Tri-Valley				0			
	Measur		0011		\	DLI	•••					APPROXIM/ (feet)		SURF 30	ACE EL	EVATION
COM	MENT	S										BOREHOLE			L	
	1	1						1	<u> </u>			Soil Cuttings	3	I I		
_	£			RO	CK C	ORE							TS.	>		
DEРТН (ft)	ELEVATION (ft)			% .	g	l 😺	#) % ~	LITHOLOGY		MATERIAL DEC	CDIDTION		ACKER TEST	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD
DEPT	EVA	RUN NO.	BOX NO.	ECOVERY,	. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	H		MATERIAL DES	CRIPTION		CKER	BOR/	RILL I EET/	NOTES
	🗇	ŖŪ	BO	ECO	FRAC.	8.	PRA	-					PA(
				ш.					subrounde	d clats; gravel lens a	t base.					
									fine sand; r	7.5YR 5/6 (Strong I	Brown); moist; agnesium oxid	mostly e		ļ		
_									staining.			, _				
									\ fault.	nd lens off-set appro	·	-				
									\ - 6" of Basa \ to subangu	al gravels and cobble lar, grussification.	es 1/8" - 6", su	brounded /				
-	_								\ \Fault = N76	•		<i>i</i>				
									Silty Sand fine to med	10YR 5/6 (Yellowishium sand; few coars	n Brown); mois	st; mostly				
_	L								gravel, root	s along fracture. bedding ~1/8" - 1/4"						
									rounded cla	asts.	unok, Subioui	ded to				
										13 feet laminated S ely 1.8 feet along the						
-	_							*	staining wit	hin the sand beds. Fit given the difference	ault appears t	obea ¦				
									:: at 11 feet.	n coarse sand and g		leet and II				
-15	<u>415</u>								∷ 10YR 5/6	(Yellow Brown); moi	st; mostly fine					
							i		_ mostly fine	unconformity; 7.5YF to medium sand; tra	ce sand lense	s with fine				
									staining.	s in sand lenses; ma	·	- II I				
-	_								_ ¦ moist; mos	with Gravel 10YR 6 tly medium sand; fe	w fine to coars	e sand;				
									\\subrounded	coarse gravel; root to rounded clasts; l	norizontal bed					
_									Silty Sand	7.5 YR 5/5 (strong to 7.5 YR 4/6 (Strong E	Brown); moist;	mostly				
									\fine sand; to \gleying.	race course sand, fir	ne gravel; fract	ure				
									Clayey Silt	y Sand 7.5YR 4/6 (Sand; some medium	Strong Brown)	moist;				
-	_			İ					sand; trace	gravel; massive; grung, 7.5YR 2.5/1 (blace	ssification cla	sts; roots				
									staining, 7.5	5YR 6/2 (pinkish gra ng zones; basalt and	y); increased s	and				
_									16.8 ft- fine	to coarse gravel alo	ng the base of	the fault.				
									From 17 to along fractu	19 feet: Fractures of	oserved with g	leying				
									- approxima	ite attitude of fractur						
ROU	ID .							17.	1	silty sand lens. App THIS SUMMARY APPI				i l		
NOC	GR	ROU	IP [EL	TA	CON	NSULT	AN'	TS, INC. 🏻 🤇	OF THIS BORING AND SUBSURFACE CONDI	AT THE TIME	OF DRILLING.				
		3	32 N	Иau	ichl	y, S	uite B		L	OCATIONS AND MAY	CHANGE AT TO THE	THIS LOCATION DATA	i	FIG	SURE	b
ELT	12		Irvii	ne	CA	92	618		F	PRESENTED IS A SIM CONDITIONS ENCOU	PLIFICATION (F THE ACTUAL	-			

LO	G C	F	C)R	RE	BC	RIN	3	PROJECT NAME Champion Site	PROJEC LA1183D	T NUMBER		E	BA-3	·
	LOCA		1						DATE(S) DRILLED	LOGGE	BY			HEET N	0.
	wood,						· · · · · · · · · · · · · · · · · · ·	_	1/19/2015 to 1/20/2015	KN	-			3 of 5	
	LING I		HOD						DRILL BIT SIZE/TYPE 8"		CHECKED	BY		FOTAL D feet)	EPTH DRILLE
	et Auge L RIG							+	-		SK	ON F			44 AL/BEARING
	eld 42		_						DRILLED BY Tri-Valley		III O E II O E II O	0	. Civi	VER 110	EBLANING
	ARENT leasure		OUN	DWA	ATER	DEP	TH				APPROXIM			ACE EL	EVATION
COM	MENT	S								<u></u>	BOREHOLI		30 CKFIL	 .L	
								ı	I .		Soil Cutting	ıs		1	
	£			RO	СКС	CORE	Ē					ည	>		
£	NO			8	ď		ш~	-0G				TEST	TOR.	ATE, OUR	FIELD
DEPTH (ft)	ELEVATION (#)	RUN NO.	BOX NO.	RECOVERY,	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL D	ESCRIPTION		PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	NOTES
				2	II.				fractures below the base of	silty sand lens wit	h				
									manganese oxide staining			1			
								<i>[:]:</i>							
	_							<u> ;;</u>							
	_							//							
								<u> ;;</u>	Increase in clay contact						
ŀ	_								- Increase in clay content. Silty Sand 7.5YR 5/6 (Stro	ng Brown); moist;	mostly	1			
								<i>%</i>	fine to medium sand; few co subrounded to rounded class	sts; grussification;	roots;				
									Gleying 7.5YR 2.5/1 (black) increase fine sand along gle	, 7.5YR 6/2 (pinkis eying zones.	sh gray);				
								رُبُن ا	Silty Sand Lens - undulator	contact along the	upper				
									and lower surface. Coarse s gravel along the base fining	sand and fine to co	parse				
; }	4 05							K .;	fracture surfaces which extends \ lens.						
								<i>``\;</i>	Clayey Silty Sand 7.5YR 4 mostly fine sand; few mediu	/6 (Strong Brown)	; moist;				
								<i>`;</i> ;	fine gravel; gleying root zon	es; massive	nse sand;				
İ	_							.;;	 Increase in gravel, subrou grussification; trace sand le 	nses.					
								(;;	 Minor soil development; m gravel; massive unit 	agnesium oxide z	one; no				
-	_							<u>;;</u>	- Increase in gleying zone.						
								<i>[:</i> ;							
								<i> `;</i>							
-								<i>[.].</i>							
								<i>\\\</i> :\							
								\.\.\ \.\.\							
Ī	_							//							
								7.7					<u> </u>		
0U	P ■ GR	ROU	PE	DEL	.TA	COI	NSULT.	ΑN	TS. INC. OF THIS BORING	APPLIES ONLY AT AND AT THE TIME	OF DRILLING.				
3							uite B		LOCATIONS AND	NDITIONS MAY DI MAY CHANGE AT	FFER AT OTHE THIS LOCATIO	ΞR	_,	CLIDI	
(PRESENTED IS A	GE OF TIME. THE SIMPLIFICATION (۱L	[GUR	C C
LT	\mathbf{A}		ΙΓVΙ	ne,	CA	92	618		CONDITIONS ENG	COUNTERED.					

GDC_ROCK_CORE_ENG_REV_LA-1183D BUCKET AUGER BORINGS.GPJ_ROCK2.GDT_2/13/15

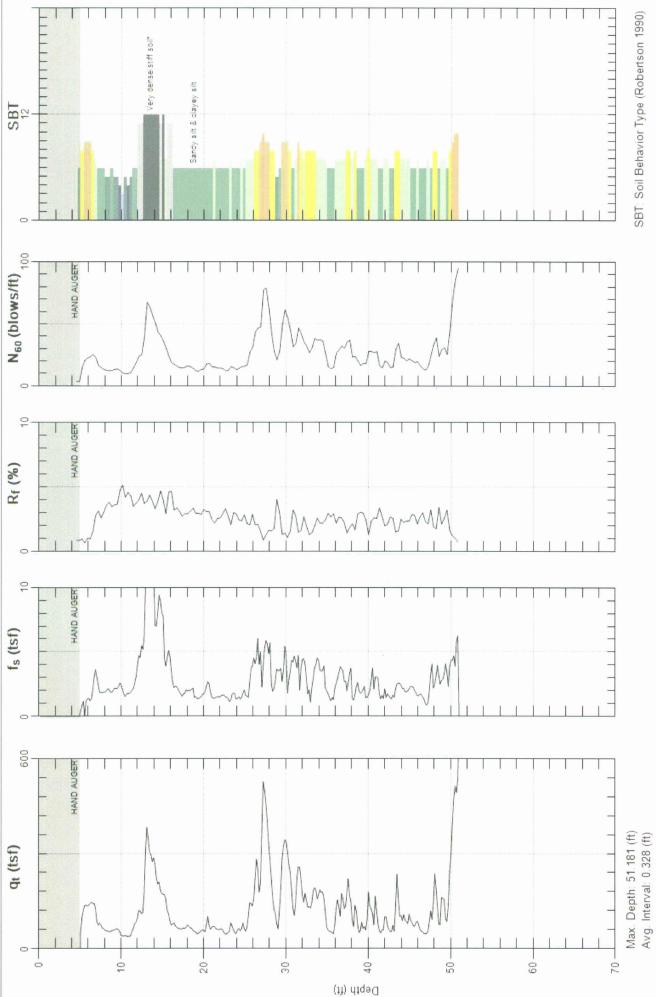
LO	G C	F	C	DR	RE	BC	RIN	G	PROJECT NAME Champion Site	LA1183D	TNUMBER			ORING BA-3	
	LOCA		١						DATE(S) DRILLED	LOGGE	BY			HEET N	0.
	ywood,								1/19/2015 to 1/20/2015	KN	T			of 5	
	L ING I cet Aug		HOD						DRILL BIT SIZE/TYPE 8"		CHECKED	BY		OTAL D feet)	EPTH DRILL
	L RIG		 E						DRILLED BY		SK	ON F	ROM \	/ERTIC	44 AL/BEARING
	/eld 42							i	Tri-Valley			0			
	ARENT		OUN	DWA	ATER	DEP	TH				APPROXIM	ATE	SURF	ACE EL	EVATION
	Measur								A Section of Congression		(feet)		30	,	
COM	IMENT	5									Soil Cutting		CKFIL	L	
											3011 Cutting	· -			
	£			RO	CK C	ORE		>_				STS	۲۲	uin	
DEPTH (ft)	EVATION	<u>.</u>		%,	g	%	# /S ~	LITHOLOGY	MATERIAL DESC	PDIDTION		PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD
DEP	EVA.	RUN NO.	BOX NO.	ECOVERY,	FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	ΙĘ	WATERIAL DESC	SKIF HON		CKEF	BOR	RILL EET/	NOTES
		S	ВО	ECO	FRAC.	я. О	PRA	-				PA	Z	으ㅛ	
				uz.	-			1/2		<u> </u>					
								[:]							
								1.							
-								<i>'</i> .'.							
								(;							
-	_							7.	Clayey Sand with Gravel 7.5YR	5/6 (Strong	Brown):				
								7.	moist; mostly fine to medium sar few fine to coarse gravel; gleying	d; some coa	rse sand;				
								(;)							
-	_							1.	\No observed gleying to the botto Clayey Silty Sand 7.5YR 4/6 (Si	rong Brown)	; moist;				
								<i>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</i>	mostly fine sand; few medium sa and fine gravel; gleying root zone	nd; trace coa es; massive	rse sand;				
_	L							1.							
								1.							
							ļ	1.							
-35	395														
								1.							
_	L							<i>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</i>							
								<i>'</i> .'.	Groundwater, no down-hole logg depth.	ing occured l	elow this				
								1.	•						
-	<u> </u>							<i>'.'.</i>							
								(;							
								1.							
-	_		ĺ												
								[:/							
_	L							()							
								[:/							
ROU	ID							1.7	THIS SUMMARY APPLI	ES ONLY AT	THE LOCATION				
INUL	GF	ROU	IP [EL	AT.	COI	NSULT	AN	TS, INC. OF THIS BORING AND SUBSURFACE CONDIT	AT THE TIME	OF DRILLING.				
		3	32 N	Иaι	uchl	y, S	uite B		LOCATIONS AND MAY WITH THE PASSAGE O	CHANGE AT	THIS LOCATION		FI	GURE	∃ d
	1/4					-	618		PRESENTED IS A SIMP			L	Ι΄.		-

	G C			OR	RΕ	ВС	RIN	G	PROJECT NAME Champion Site DATE(S) DRILLED 1/19/2015 to 1/20/2015 DRILL BIT SIZE/TYPE 8" PROJECT LA1183D LOGGED KN		NUMBER BY	BORING BA-3 SHEET NO. 5 of 5 TOTAL DEPTH DRILLE (feet)					
DRIL	ywood, _LING	METI	HOD								CHECKED BY						
Bucket Auger DRILL RIG TYPE Calweld 42 LS									DRILLED BY Tri-Valley			SK (1984) 44 INCLINATION FROM VERTICAL/BEARING					
	ARENT Measur		OUN	DW.	TER	DEP	TH			(foot)				SURFACE ELEVATION 430			
COM	MENT	S				-				BOREHOLE BACKFILL Soil Cuttings							
DЕРТН (ft)	ELEVATION (ft)	ROCK CORE											≿ uiα	uir			
		RUN NO.	BOX NO.	RECOVERY, %	FRAC. FREQ.	R.Q.D., %	FRACTURE DRAWING/ NUMBER	LITHOLOGY	MATERIAL DESCRIPTION			PACKER TESTS	LABORATORY TESTS	DRILL RATE, FEET/HOUR	FIELD NOTES		
·								11:1:									
-	_																
-									,			7					
-																	
-								\(\frac{1}{2}\)			120,00						
45	_385								Total Der	oth 44 Feet bgs							
				:					Groudwa								
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GROU	UP GF								TS, INC.	THIS SUMMARY APPLI OF THIS BORING AND SUBSURFACE CONDIT LOCATIONS AND MAY	AT THE TIME IONS MAY DIF	OF DRILLING. FFER AT OTHE	R				
DELI							uite B 618			WITH THE PASSAGE O PRESENTED IS A SIMP CONDITIONS ENCOUN	F TIME. THE LIFICATION O	DATA		FI	GURE	E e	

Site: YUCCA CHAMPION Sounding: CPT-1

Engineer: S.KOLTHOFF

Date: 1/21/2014 07:17



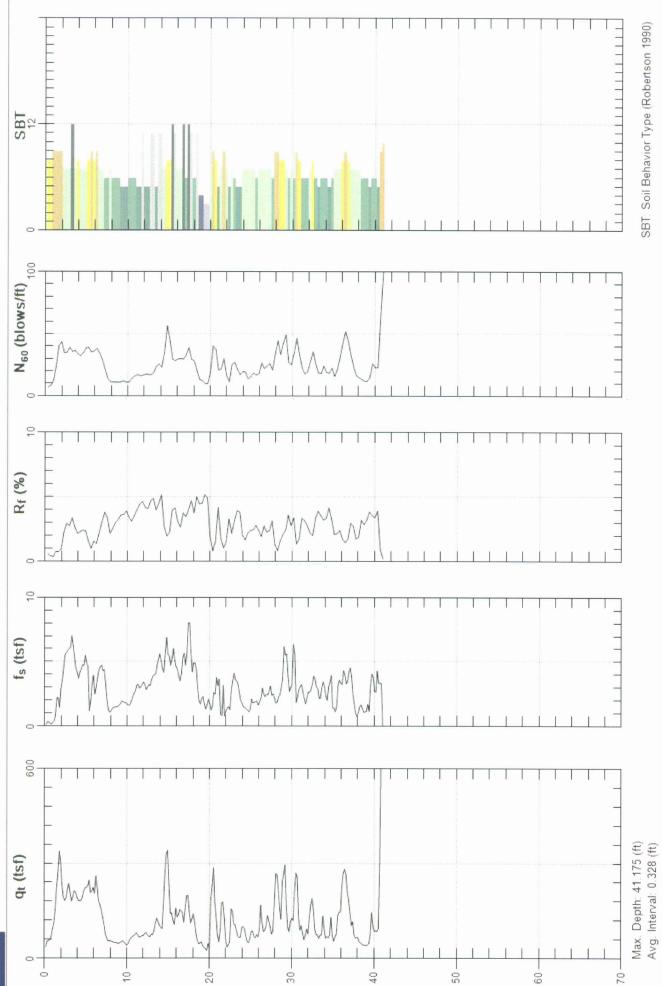
SBT 12

ery dense/stiff soil

Site: YUCCA CHAMPION Sounding: CPT-2

Engineer: S.KOLTHOFF

Date: 1/21/2014 08:52



Depth (ft)

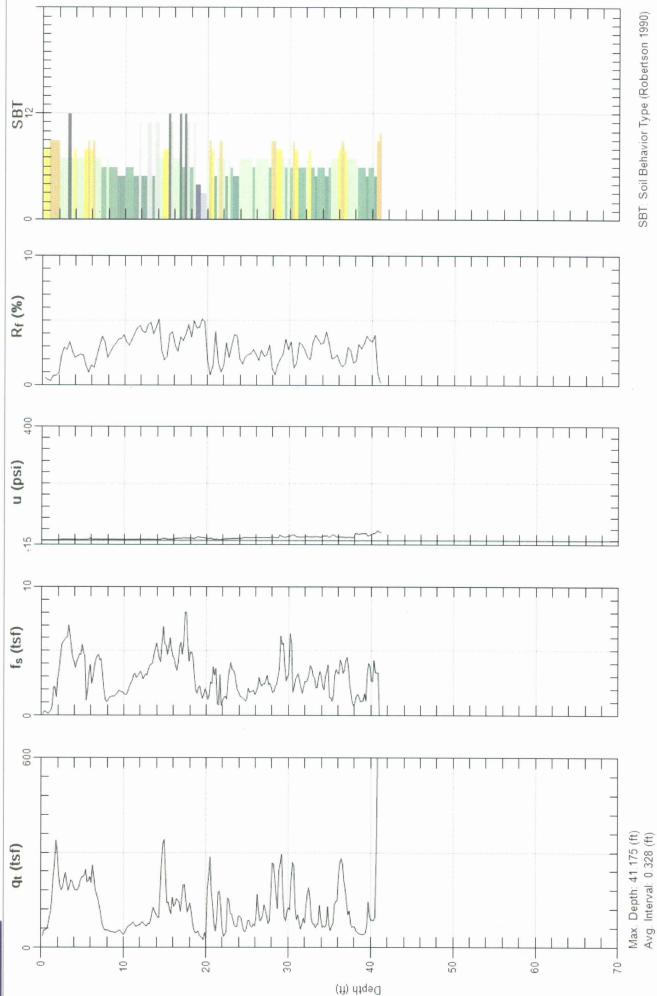


Site: YUCCA CHAMPION Sounding: CPT-2

Engineer: S.KOLTHOFF

Date: 1/21/2014 08:52





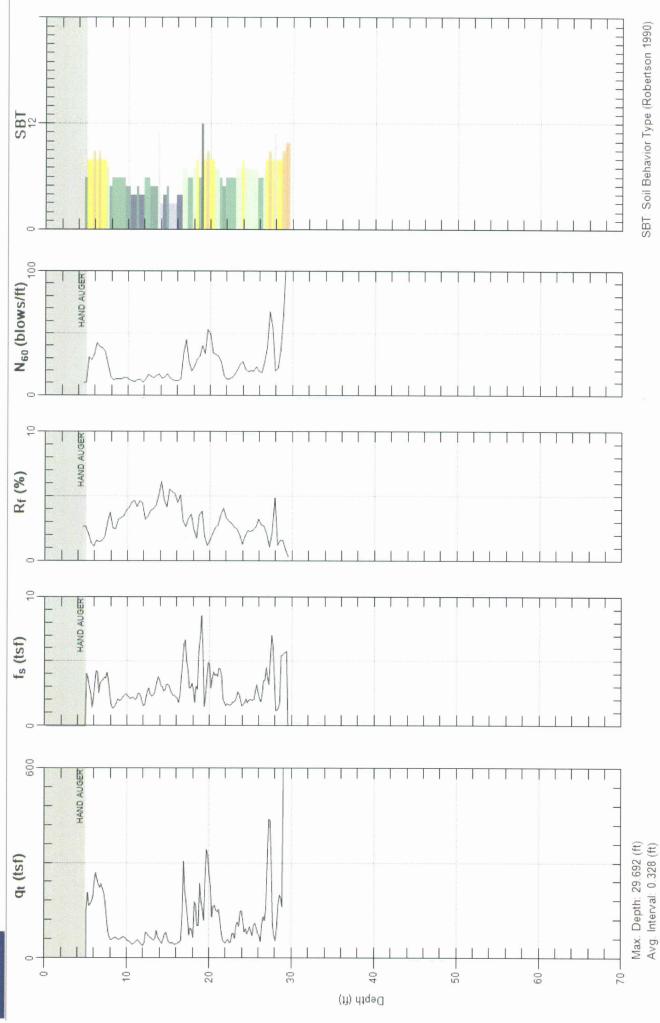


Site: YUCCA CHAMPION Sounding: CPT-3

Engineer: S.KOLTHOFF

Date: 1/21/2014 09:18



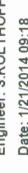


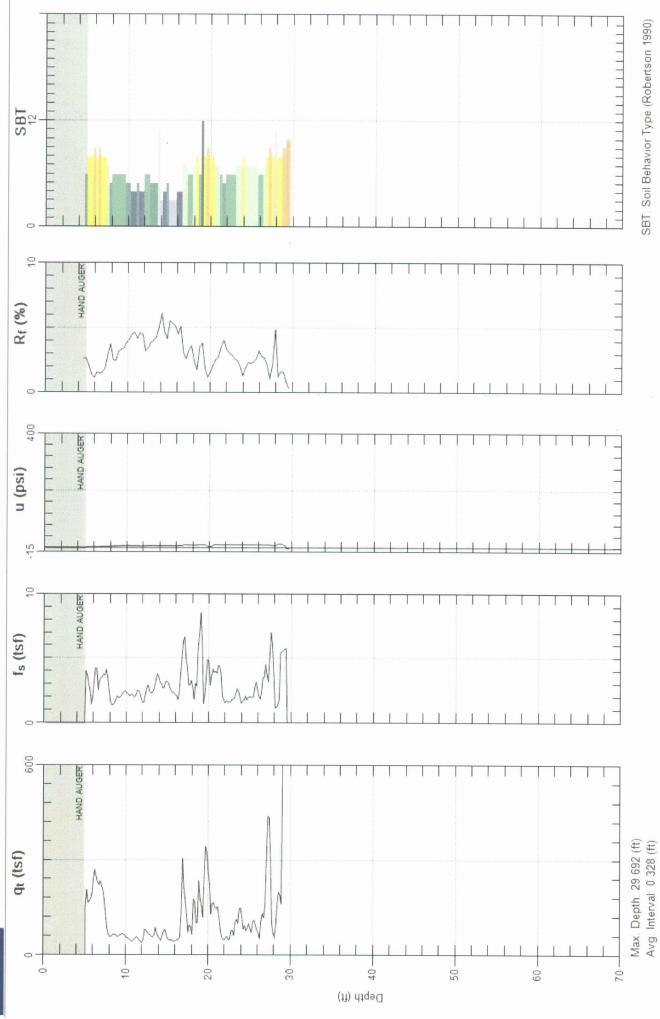


Site: YUCCA CHAMPION Sounding: CPT-3

Engineer: S.KOLTHOFF

Date: 1/21/2014 09:18





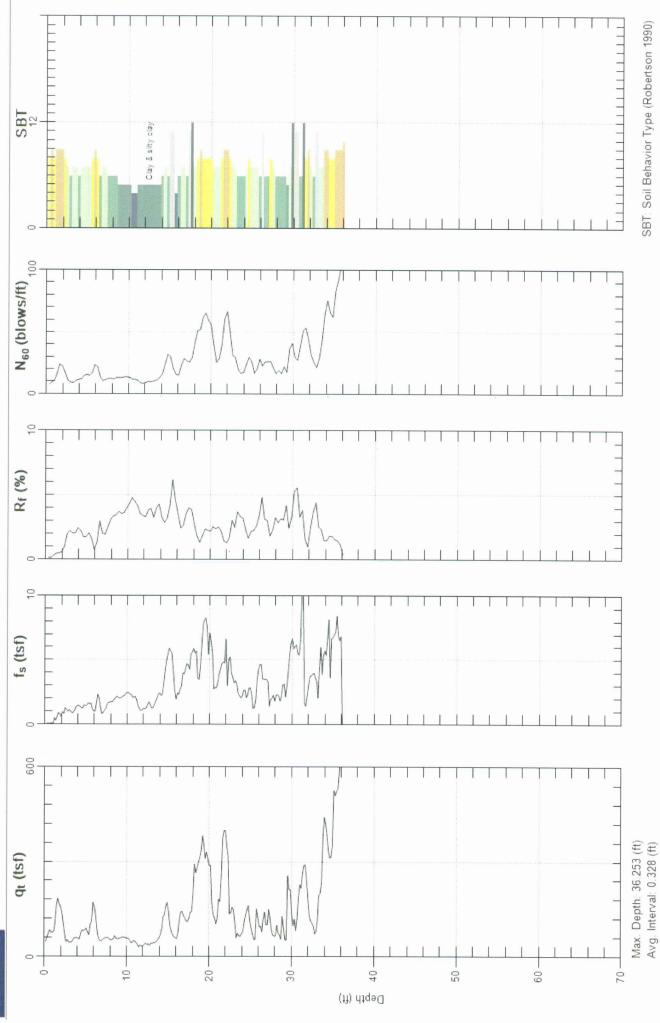


Site: YUCCA CHAMPION Sounding: CPT-4

Engineer: S.KOLTHOFF

Date: 1/21/2014 10:02









600

qt (tsf)

20-

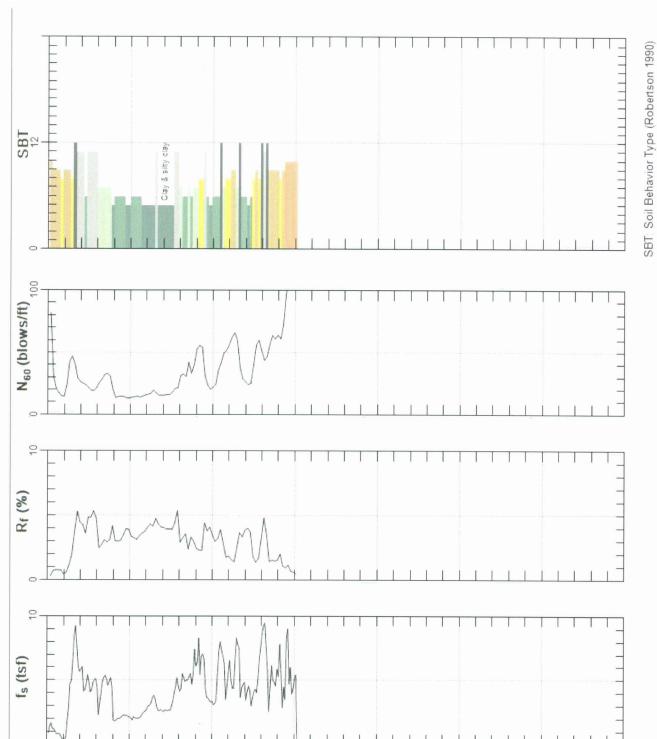
30

10 -

Site: YUCCA CHAMPION Sounding: CPT-6A

Engineer: S.KOLTHOFF

Date: 1/21/2014 12:05



Max. Depth: 30.512 (ft) Avg. Interval: 0.328 (ft)

70 -

- 09

50 -

40-

Depth (ft)

Site: YUCCA CHAMPION

Engineer: S.KOLTHOFF

SBT 12

100

N₆₀ (blows/ft)

Date: 1/21/2014 11:32



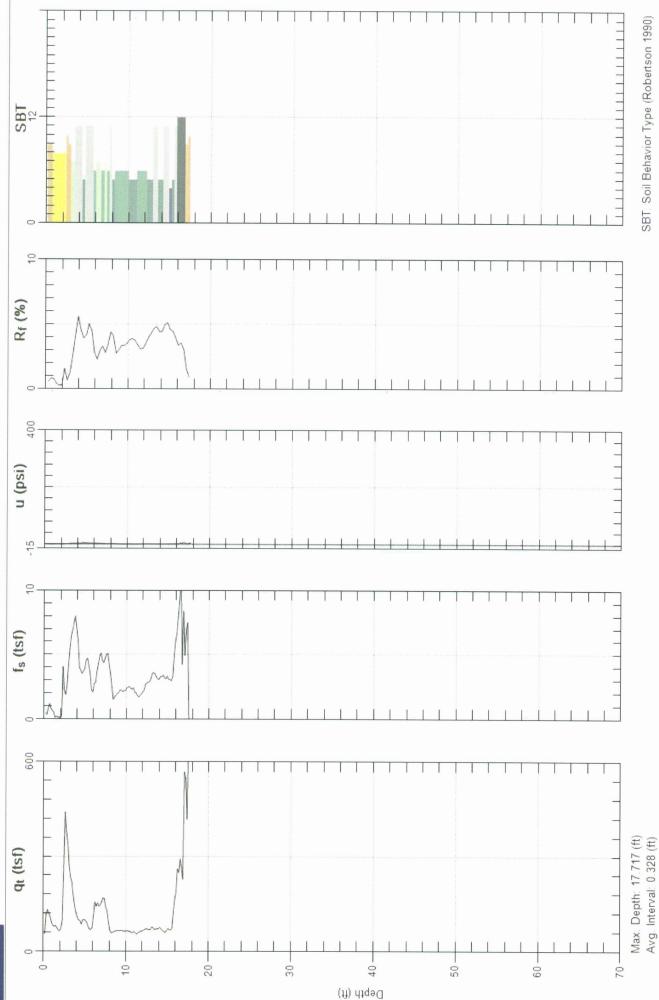
GROUP DELTA

Site: YUCCA CHAMPION Sounding: CPT-6

Engineer: S.KOLTHOFF

Date: 1/21/2014 11:32



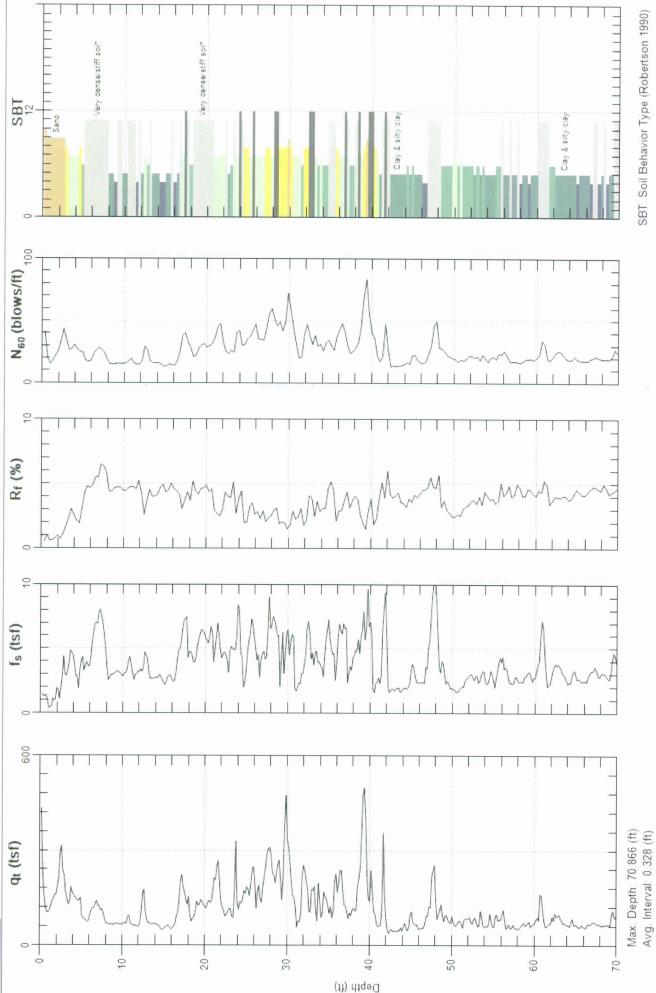


GROUP DELTA

Site: YUCCA CHAMPION Sounding: CPT-8

Engineer: S.KOLTHOFF

Date: 1/21/2014 01:10



SBT: Soil Behavior Type (Robertson 1990)

Figure A - 19

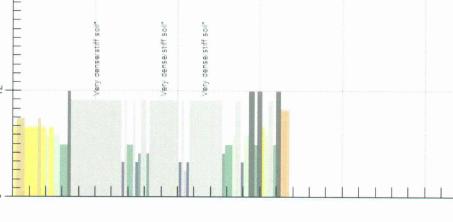


GROUP DELTA

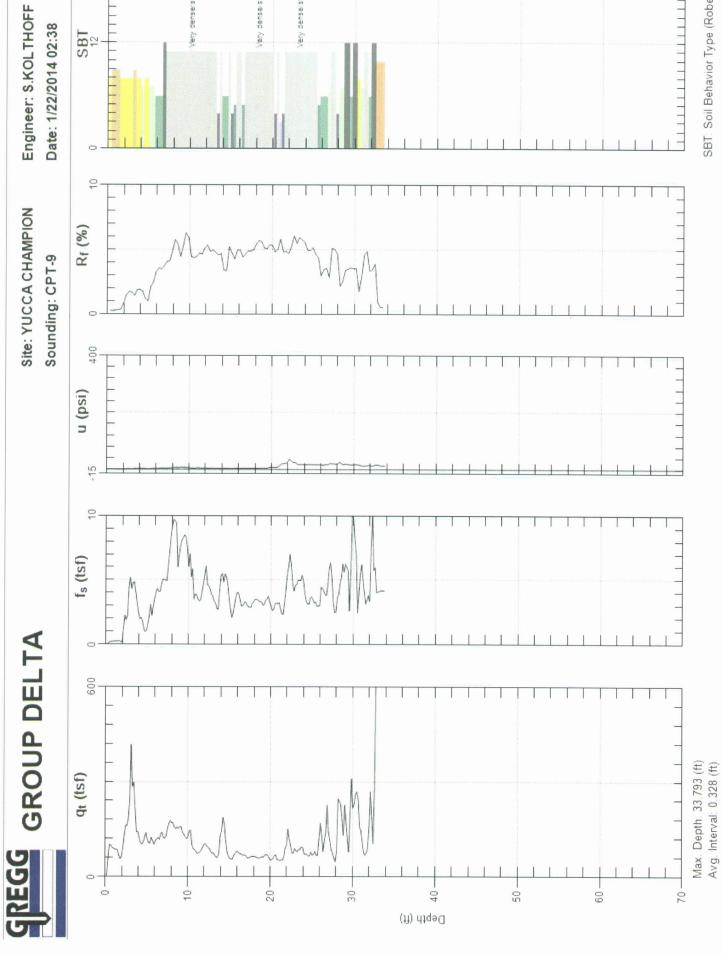
Site: YUCCA CHAMPION Sounding: CPT-9

Engineer: S.KOLTHOFF

Date: 1/22/2014 02:38



SBT 12



Pry dense stiff soil

Very dense stiff soil*

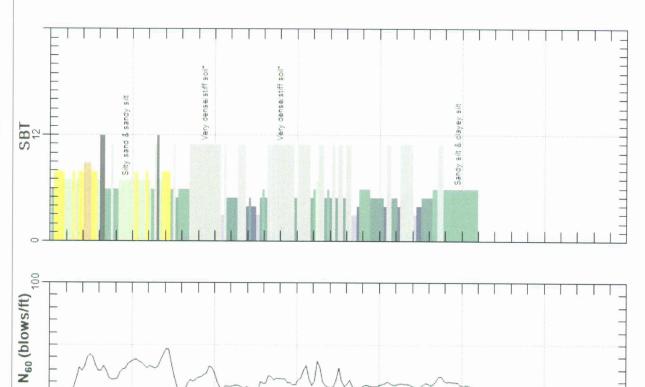
SBT: Soil Behavior Type (Robertson 1990)

Site: YUCCA CHAMPION Sounding: CPT-11

Rf (%)

Engineer: S.KOLTHOFF

Date: 1/22/2014 04:12



SBT: Soil Behavior Type (Robertson 1990)

Max. Depth: 52.165 (ft) Avg. Interval: 0.328 (ft)

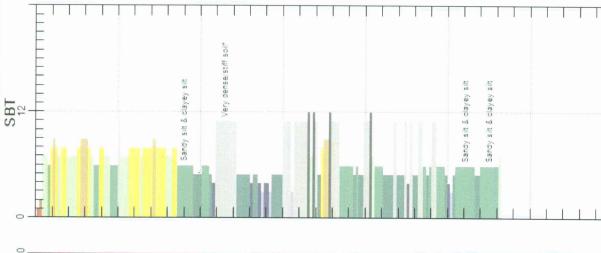
70-

09

SBT: Soil Behavior Type (Robertson 1990)

Engineer: S.KOLTHOFF

Date: 1/22/2014 04:52



SBT: Soil Behavior Type (Robertson 1990)

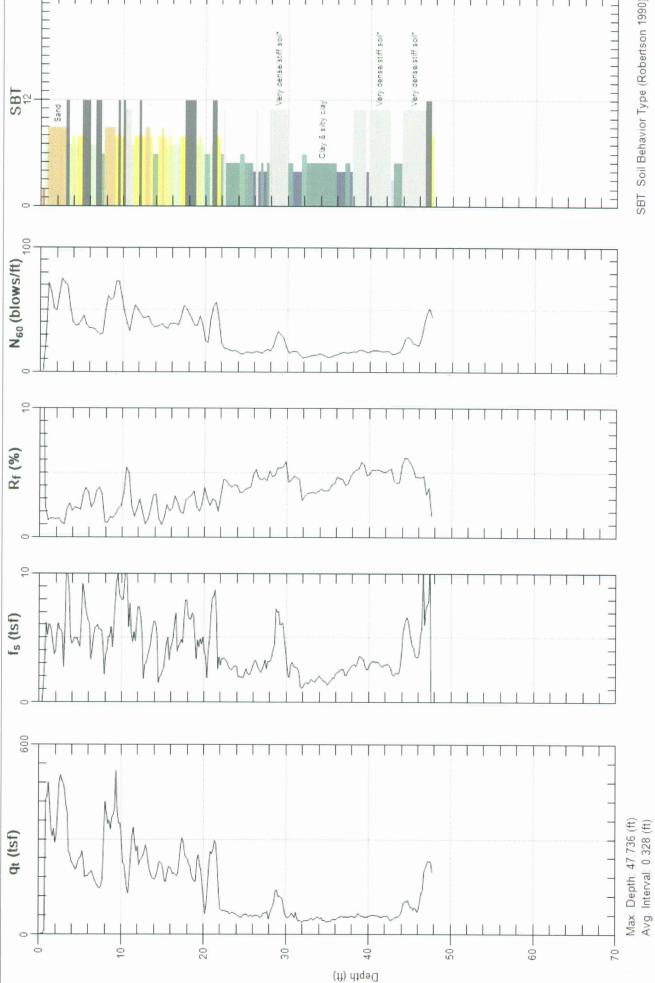
GROUP DELTA

Site: YUCCA CHAMPION

Sounding: CPT-13

Engineer: S.KOLTHOFF

Date: 1/22/2014 12:18



SBT: Soil Behavior Type (Robertson 1990)

APPENDIX C LABORATORY TESTING

APPENDIX C LIMITED LABORATORY TESTING

C.1 General

The laboratory testing was performed using appropriate American Society for Testing and Materials (ASTM) and Caltrans Test Methods (CTM).

The samples of earth materials were obtained from the prior fault investigation. Laboratory testing for this investigation included:

- Expansion Index
- Soil Corrosivity:
 - o pH (CTM 643);
 - Water-Soluble Sulfate (ASTM D 516, CTM 417);
 - Water-Soluble Chloride(Ion-Specific Probe, CTM 422);
 - o Minimum Electrical Resistivity (CTM 643).

Brief descriptions of the laboratory testing program and test results are presented below.

C.2 Expansion Index

The Expansion Index of the soils was determined by testing a sample in accordance with the California Building Code Standard No. 29-2 method. The results of the tests is presented in the table below. The details of the tests results are included in this appendix.

Sample No.	Expansion Index		
B-3@16'	106 (High)		

C.3 Soil Corrosivity

Tests were performed in order to determine corrosion potential of site soils on concrete and ferrous metals. Corrosivity testing included minimum electrical resistivity and soil pH, water-soluble chlorides (Orion 170A+ Ion Probe), and water-soluble sulfates (ASTM D 516). The test results are presented in the table below. The details of the tests results are included in this appendix.

Boring No.	Depth (ft)	USCS Soil Type	Minimum Resistivity CTM 643 (ohm-cm)	рН СТМ 643	Soluble Sulfate Content CTM 417 (%)	Soluble Chloride Content CTM 422 (%)
B-3	16	CL	495	7.22	0.02	0.01