Stantec Consulting Services Inc.
735 East Carnegie Drive, Suite 280
San Bernardino, California 92408

May 20, 2019

Benjamin Orcutt
Ormat Nevada Inc.
6140 Plumas Street
Reno, Nevada 89519

Reference: CEQA LEVEL GEOTECHNICAL STUDY
Wister Solar Project
East of Wilkins Road and Weist Road
Niland, Imperial County, California
Stantec Project No. 185804156

Dear Mr. Orcutt:

Stantec Consulting Services Inc. (Stantec) has prepared this California Environmental Quality Act (CEQA) Level Geotechnical Study to provide support documentation for the "Environmental Checklist Form" in accordance with the CEQA Guidelines for the proposed Wister Solar Project, located northeast of Wilkins Road and Weist Road, near the City of Niland, California.

PURPOSE AND SCOPE OF WORK

- Review available subsurface information for the Site,
- Excavate and sample a total of 13 test pits to a maximum depth of 10 feet at the Site,
- Perform soil mechanics laboratory testing on select soil samples,
- Evaluate geotechnical properties of soils pertinent to the CEQA Guidelines, and
- Summarize findings, conclusions, and recommendations in this letter.

SITE DESCRIPTION

The proposed Wister Solar project comprises approximately 640 gross acres. The permanent disturbance acreage associated with development of the solar facility and associated infrastructure (Project Site) within the Project Area would be less than the gross acreage of the Project Area. The topography of the Project Area is relatively flat and slopes from the northeast to the southwest at approximately 1.3 percent. The site is located approximately 2 to 3 miles north-northeast of Niland, California in the area shown on Figure 1.

PRE FIELD ACTIVITIES

Test pit exploration locations were selected based on review of aerial photography and confirmed in the field at the time of field sampling. In addition, a site-specific Health and Safety Plan (HASP) was developed in accordance with California Occupational Safety and Health Administration (Cal OSHA) requirements to guide field activities.

FIELD EXPLORATION ACTIVITIES

Thirteen shallow test pits (TP1 through TP13) were advanced at selected locations throughout the site to a maximum depth of ten feet below the existing ground surface (bgs) (Figure 2). Relatively undisturbed samples were obtained using a modified California (CAL) sampler, which is a ring-lined split tube sampler with a 3-inch outer diameter and 2½-inch inner diameter. CAL sampling followed ASTM D3550 (Standard Practice for Ring-Lined Barrel Sampling of Soils) procedures. Disturbed bulk samples were also obtained from the excavation at locations where CAL sampling could not be completed. The CAL sampler was advanced with a backhoe bucket.

Samples were classified in the field using the Unified Soil Classification System (USCS), in accordance with ASTM D2488 (Standard Practice for Description and Identification of Soils [Visual-Manual Method]) procedures. The laboratory testing confirmed or modified field classifications as necessary for presentation on the boring logs. Soil samples were removed from the samplers, placed in appropriate containers, and transported in accordance with ASTM D4220 (Standard Practice for Preserving and Transporting Soil Samples).

The test pit logs are located in Attachment A. Soils are classified in accordance with the USCS, which is explained in "Symbols and Terms Used on Borehole and Test Pit Records" in Attachment A. the approximate test pit locations are shown on Figure 2.

LABORATORY SOIL TESTING

The following laboratory tests were performed on samples collected at the Site either in general accordance with the American Society for Testing and Materials (ASTM) or contemporary practices of the soil engineering profession:

Table 1 – Summary of Laboratory Tests

Type of Test	ASTM Designation	Number Performed
Materials Finer Than 75mm	ASTM D-1140	8
Sieve Analysis	ASTM D422 and ASTM C136	5

The results of the laboratory tests are presented in Attachment B.

REGIONAL GEOLOGY

The Site is located in the eastern portion of the Colorado Desert Geomorphic Province in the southern part of California. According to the California Geological Survey (CGS) website, the Colorado Desert Geomorphic Province consists of a low-lying barren desert basin separated by northwest trending valleys of the Peninsular Ranges to the west. The province is a depressed block between active branches of alluvium covered by the San Andreas Fault. It is characterized by the ancient beach lines and silt deposits of extinct Lake Cahuilla. The province extends to the southern border of California and Mexico and Mojave Desert to the east.

Based on information depicted on available geologic maps (CDMG, 1967) and shown on Figure 3 (Geologic Map), the site is located within an area underlain by Quaternary Lake Deposits (Ql).

A description of the mapped soil units is provided below.

Quaternary Lake (Ql) Deposits – Pleistocene lake deposits consisting of claystone, sand, and beach gravel deposited in former extensive lake and Salton trough (CDMG, 1967).

SUBSURFACE CONDITIONS IN TEST PIT EXPLORATIONS

The near surface (approximately 10 feet deep) soils encountered in the test pits we performed are sand with variable amount of silt and clay (SP, SP-SM, SP-SC, SC and SM USCS soil type) followed by clay with variable amounts of sand (CL USCS soil type). Near surface sandy soil with variable amounts of silt and clay were dry to the maximum depth of exploration. Clay with variable amounts of sand below the near surface sand was low in plasticity, dry to moist, and very stiff to hard in consistency.

The subsurface soils were not difficult to penetrate, and the test pit excavations did not cave to the maximum depth of exploration. Groundwater was not encountered during this investigation.

REGIONAL GROUNDWATER

East Salton Sea Groundwater Basin underlies the western portion of the Mohave Desert and is part of the Colorado River Hydrologic Region. The basin is bounded on the north and east by non-water bearing rocks of the Chocolate Mountains, on the west by the San Andreas and Banning Mission Creek Faults, and on the south by the Imperial Valley Groundwater Basin (DWR, 2004).

Static groundwater was not encountered in the test pits performed for this investigation. Groundwater data from an offsite location approximately 8 miles southwest of the site indicates the depth to groundwater is approximately 49 feet below the ground surface (DWR, 2010). The offsite location is at an elevation of approximately 120 feet above mean sea level. Groundwater levels may fluctuate in the future due to rainfall, irrigation, broken pipes, or changes in site drainage.

REGIONAL SEISMICITY

The project site is located within a highly active seismic zone. A Regional Faulting and Seismicity Map is presented in Figure 4 and a local Earthquake Fault Map is presented in Figure 5. The regional fault map also provides information regarding recent earthquakes in the project area. Several of the more recent earthquakes in the project area include the 1975 Brawley (Map No. 43) earthquake, the 1979 Imperial, Brawley, and Rico (Map No. 48) earthquake, and the 1987 Superstition Hills (Map No. 59) earthquake (CGS, 2016).

The estimated distance of the Site to the nearest expected surface expression of major active faults is presented in the table below. The purple colored faults noted in Figure 4 are either inactive or have a very low slip rate. The distance measurement was taken from a location at the southwest corner of the site which is closest to the Elmore Ranch fault (the closest active fault relative to the

site). The location from which measurements were obtained has a latitude of 33.263984°, and a longitude of -115.510046°.

Fault	Distance (miles) [2]	Maximum Moment Magnitude [1]
Elmore Ranch	8.8	6.7
South San Andreas	13.1	8.2
Imperial	23.5	7.0
Superstition Hills	24.5	6.8
San Jacinto	28.1	7.9

1. 2008 National Seismic Hazard Maps – USGS.
2. Measured from approximate center of site.

REGIONAL SEISMIC HAZARDS

Fault Rupture Hazard

The Site is not located within a currently mapped Alquist-Priolo Special Studies Fault Zone (CDMG, 2002b). As noted above, the nearest active major fault is the Elmore Ranch fault, located approximately 8.8 miles northwest of the Site. Based on the fault's distance from the project site, and since the fault does not project towards the project site, it is our opinion that the potential for surface fault rupture to occur on the project site is low.

Strong Ground Shaking

Strong ground shaking can be expected at the Site during moderate to severe earthquakes in the general region. This is common to most areas in Southern California.

Information published by the Unites States Geologic Survey (USGS) indicates the Peak Ground Acceleration (PGA) with a 2 percent probability of being exceeded at the Site in 50 years is 0.5g (USGS, 2008); where g is the acceleration due to gravity; determined in accordance with the US Seismic Design Maps web site. Mitigation of strong ground shaking is typically provided by designing structures in accordance with the latest addition of the California Building Code.

Liquefaction

Liquefaction of saturated sandy soils is generally caused by the sudden decrease in soil shear strength due to vibration. During cyclic shaking, typically caused by an earthquake, the soil mass is distorted, and inter-particle stresses are transferred from the soil particles to the pore water. As pore pressure increases the bearing capacity decreases and the soil may behave temporarily as a viscous fluid (liquefaction) and, consequently, loses its capacity to support the structures founded thereon.

Engineering research of soil liquefaction potential (Seed, et. al., 1982 and 1985) indicates that generally three basic factors must exist concurrently in order for liquefaction to occur, namely:

- A source of ground shaking, such as an earthquake, capable of generating soil mass distortions.
- A relatively loose sandy soil fabric exhibiting a potential for volume reduction.
- A relative shallow groundwater table (within approximately 50 feet below ground surface) or completely saturated soil conditions that will allow positive pore pressure generation.

The Site is not located within a current, mapped California Liquefaction Hazard Zone. In addition, groundwater in the site vicinity is expected to be approximately greater than 49 feet below the ground surface (DWR, 2010). Based on the near surface soil conditions and depth to groundwater, it is our opinion that the potential for liquefaction related ground failure, including liquefaction, is low.

Lateral Spreading

Lateral spreading typically occurs as a form of horizontal displacement of relatively flat-lying alluvial material toward an open or "free" face such as an open body of water, channel, or excavation. This movement is generally due to failure along a weak plane, and may often be associated with liquefaction. As cracks develop within the weakened material, blocks of soil displace laterally toward the open face. Cracking and lateral movement may gradually propagate away from the face as blocks continue to break free.

Due to the low potential for liquefaction, the depth of groundwater, and the fact that the Site is not located near free faces or bodies of water, the potential for lateral spreading is considered low.

SUBSIDENCE

The site is not located within a mapped area of known land subsidence (USGS, 2019). Due to the depth of groundwater and the fact that the Site is not located in a mapped subsidence area, the potential for subsidence is considered low. However, strong shaking in the region could cause subsidence in the loose to medium dense sand below the site.

EXPANSIVE SOIL POTENTIAL

Expansion and contraction of volume can occur when expansive soils undergo alternating cycles of wetting (swelling) and drying (shrinking). Since near-surface soils encountered during the recent geotechnical investigation are mostly sandy soils whose expansion potential is considered low. As such, special design for expansive soils will likely not be necessary for the proposed development.

SLOPES

The Site is relatively flat, with a topographic gradient less than 2%. Permanent slopes steeper that 5:1 (horizontal to vertical) or higher than 5 feet are not anticipated for the project. Due to the existing topography and the proposed grading, landslides are not considered a potential hazard for the project. The stability of slopes, if any, should be verified when design-grading information becomes available.

EROSION

The predominately coarse-grained soils underlying the site are potentially susceptible to erosion or the loss of topsoil due to surface water flows.

Mitigation of soil erosion may include selective grading, establishment of anchoring vegetation, design of runoff control features such as drainage ditches, and construction of erosion control features such as pavements and surface mats. These mitigation options should be addressed in the design level evaluations for the project.

CONCLUSIONS

Based on the currently planned development, it is our opinion that the soils will require additional assessments to determine mitigation measures for strong ground shaking and erosion as discussed above.

Mitigation options for these hazards are provided in the preceding sections. Impacts should be mitigated through the application of standard conditions of development, which require preparation of a design-level geotechnical study as a condition of grading permit issuance.

Based on the findings of this CEQA Level Geotechnical Study, a completed CEQA questionnaire for the Geology and Soils Section has been included in Attachment C. As recommended above, items checked as "Less than Significant with Mitigation" should be addressed in the scope of a future design-level geotechnical investigation.

We trust that the information provided herein meets the project requirements. If there are any questions regarding this project, please contact the undersigned at your convenience.

Respectfully submitted,
Stantec Consulting Services Inc.

LICENSED PROFESSIONAL ENGINEER
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FIGURES

Figure 1 - Site Location Map
Figure 2 – Subsurface Exploration Map
Figure 3 – Geologic Map
Figure 4 – Regional Faulting Map
Figure 5 – Earthquake Fault Map

ATTACHMENTS
Attachment A – Test Pit Logs
Attachment B – Laboratory Test Results
Attachment C – CEQA Guidelines Form – Geology and Soils

REFERENCES

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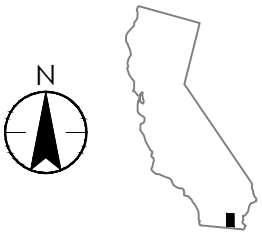
FIGURES



2 1 0 2

SCALE IN MILE

2000 0 2000 4000 6000 8000 10000 12000 14000

SCALE IN FEET

REFERENCE: USGS 7.5 X 15 MINUTE QUADRANGLE; IRIS WASH; 1992

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FOR:

ORMAT WISTER SOLAR PROJECT
NEC WILKINS ROAD AND WEIST ROAD
IMPERIAL COUNTY, CALIFORNIA

SITE LOCATION MAP

FIGURE: 1

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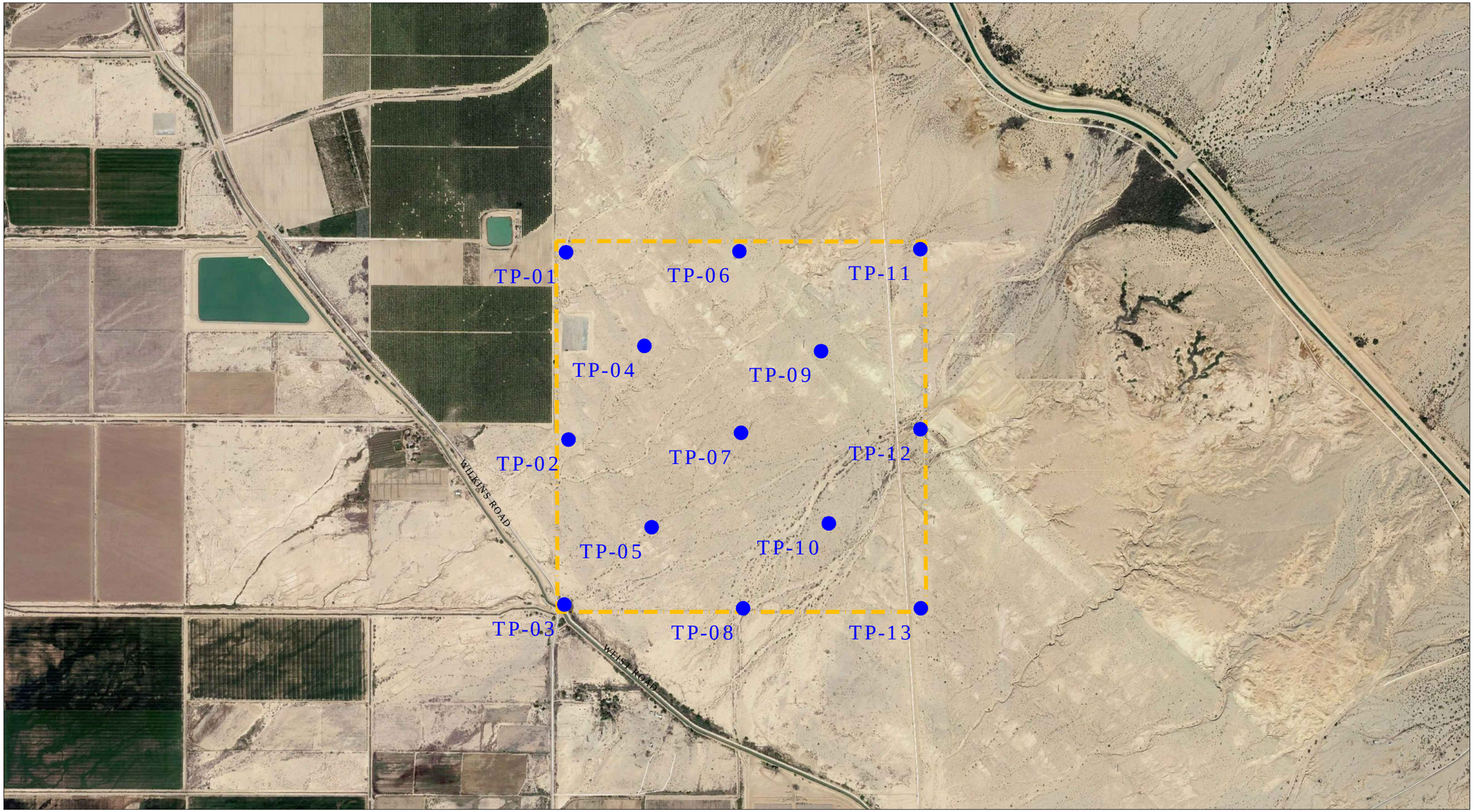

LEGEND

APPROXIMATE LIMITS OF PROPERTY

N

0 1,500 3,000

SCALE (FEET)

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SUBSURFACE EXPLORATION MAP

FIGURE: 2

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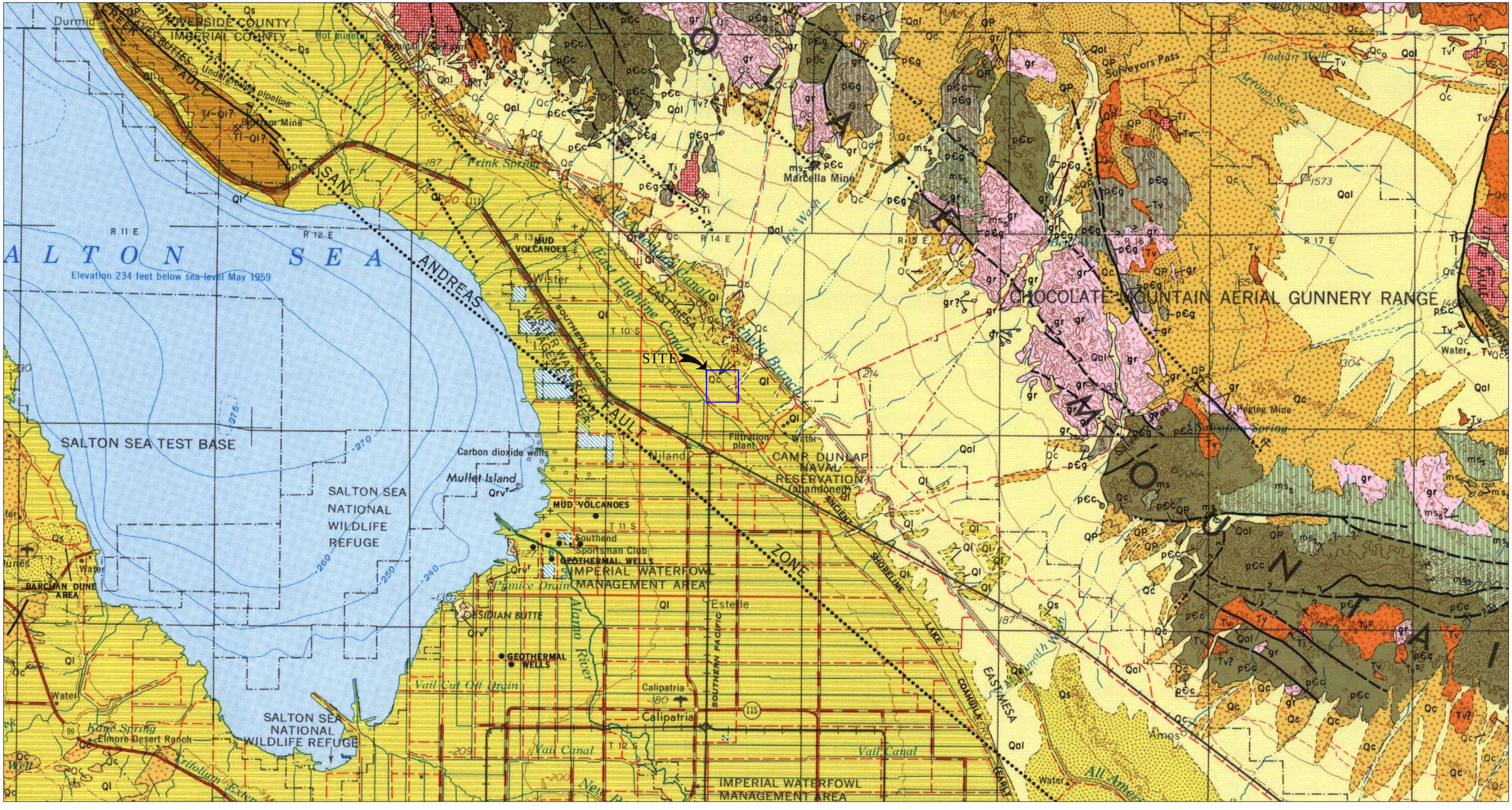

LEGEND

▬ ▬ ▬	APPROXIMATE LIMITS OF PROPERTY
Ql	LAKE DEPOSITS CONSISITNG OF CLAYSTONE, SAND, AND BEACH GRAVEL
Qal	ALLUVIAL SAND, SILT, CLAY, AND GRAVEL

N

0 3 6

SCALE (MILES)

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IMPERIAL COUNTY, CALIFORNIA

GEOLOGIC MAP

FIGURE: 3

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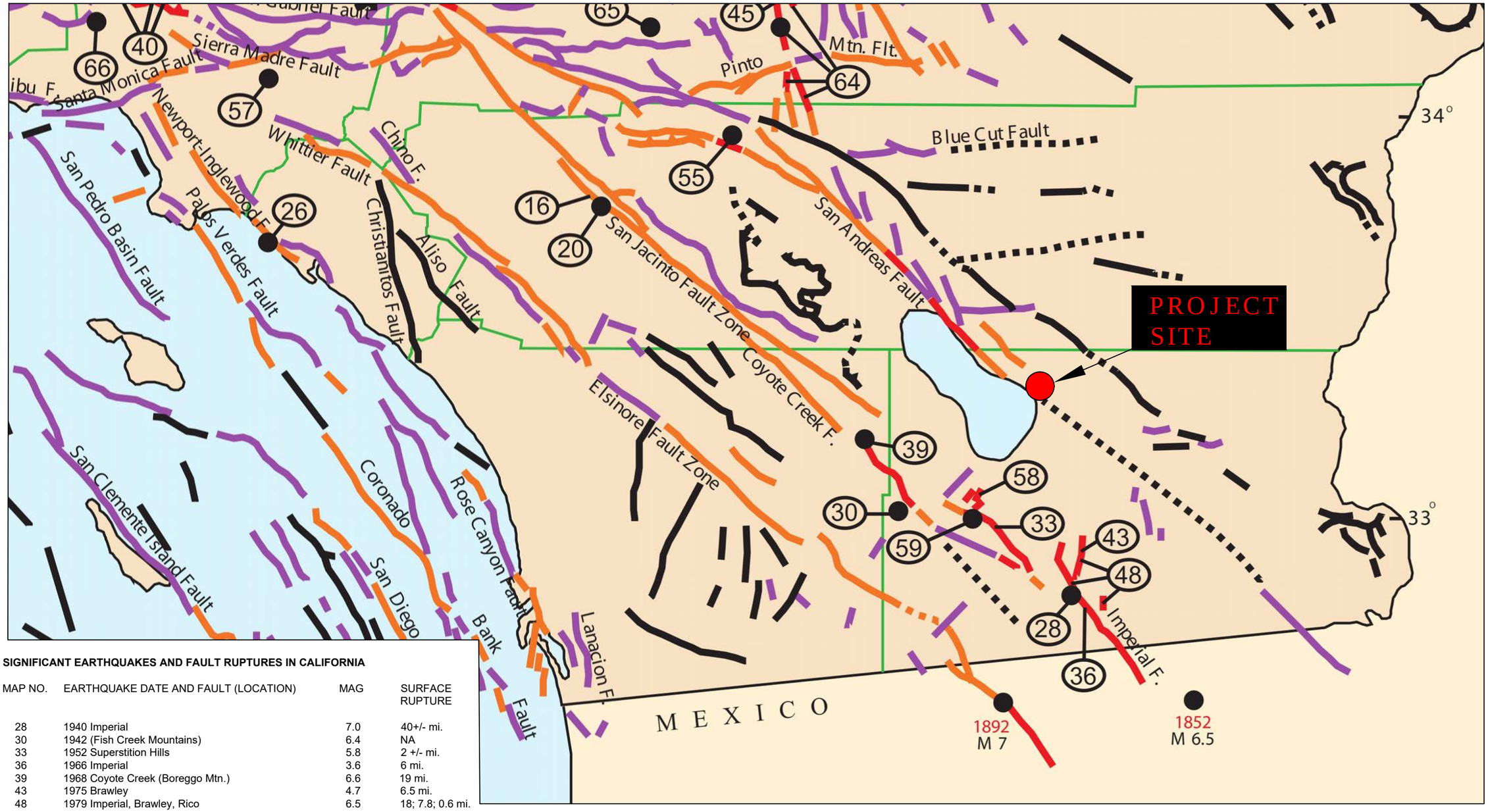

SIGNIFICANT EARTHQUAKES AND FAULT RUPTURES IN CALIFORNIA

MAP NO.	EARTHQUAKE DATE AND FAULT (LOCATION)	MAG	SURFACE RUPTURE
28	1940 Imperial	7.0	40+/- mi.
30	1942 (Fish Creek Mountains)	6.4	NA
33	1952 Superstition Hills	5.8	2 +/- mi.
36	1966 Imperial	3.6	6 mi.
39	1968 Coyote Creek (Boreggo Mtn.)	6.6	19 mi.
43	1975 Brawley	4.7	6.5 mi.
48	1979 Imperial, Brawley, Rico	6.5	18; 7.8; 0.6 mi.
59	1987 Superstition Hills	6.6	16.8 mi.

FAULT WITH KNOWN ACTIVITY IN LAST 200 YEARS

FAULT WITH KNOWN ACTIVITY IN LAST 10,000 YEARS

FAULT WITH KNOWN ACTIVITY IN LAST 1,600,000 YEARS

N

0 15 30

SCALE (MILES)

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REGIONAL FAULT MAP

FIGURE: 4

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LEGEND

APPROXIMATE LIMITS OF PROPERTY

N

0 8,000 16,000

SCALE (FEET)

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EARTHQUAKE FAULT MAP

FIGURE: 5

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
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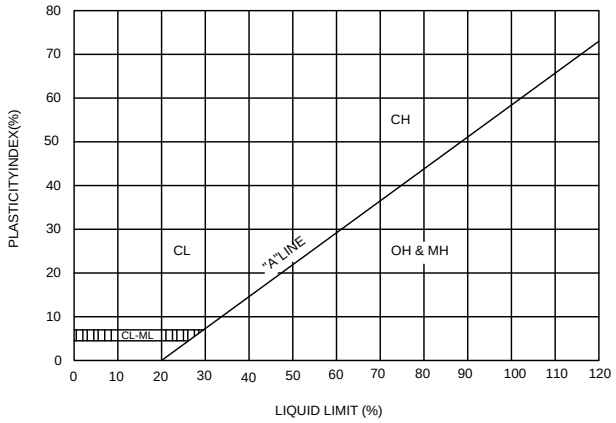
ATTACHMENT A
TEST PIT LOGS

UNIFIED SOIL CLASSIFICATION (ASTM D-2487)

MATERIAL TYPES	CRITERIA FOR ASSIGNING SOIL GROUP NAMES			GROUP SYMBOL	SOIL GROUP NAMES & LEGEND
COARSE-GRAINED SOILS >50% RETAINED ON NO. 200 SIEVE	GRAVELS >50% OF COARSE FRACTION RETAINED ON NO 4. SIEVE	*CLEAN GRAVELS <5% FINES	Cu>4 AND 1<Cc<3	GW	WELL-GRADED GRAVEL
			Cu>4 AND 1>Cc>3	GP	POORLY-GRADED GRAVEL
		*GRAVELS WITH FINES >12% FINES	FINES CLASSIFY AS ML OR CL	GM	SILTY GRAVEL
			FINES CLASSIFY AS CL OR CH	GC	CLAYEY GRAVEL
	SANDS >50% OF COARSE FRACTION PASSES ON NO 4. SIEVE	*CLEAN SANDS <5% FINES	Cu>6 AND 1<Cc<3	SW	WELL-GRADED SAND
			Cu>6 AND 1>Cc>3	SP	POORLY-GRADED SAND
		*SANDS AND FINES >12% FINES	FINES CLASSIFY AS ML OR CL	SM	SILTY SAND
			FINES CLASSIFY AS CL OR CH	SC	CLAYEY SAND
FINE-GRAINED SOILS >50% PASSES NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT<50	INORGANIC	PI>7 AND PLOTS>"A" LINE	CL	LEAN CLAY
			PI>4 AND PLOTS<"A" LINE	ML	SILT
		ORGANIC	LL (oven dried)/LL (not dried)<0.75	OL	ORGANIC CLAY OR SILT
	SILTS AND CLAYS LIQUID LIMIT>50	INORGANIC	PI PLOTS >"A" LINE	CH	FAT CLAY
			PI PLOTS <"A" LINE	MH	ELASTIC SILT
		ORGANIC	LL (oven dried)/LL (not dried)<0.75	OH	ORGANIC CLAY OR SILT
HIGHLY ORGANIC SOILS		PRIMARILY ORGANIC MATTER, DARK IN COLOR, AND ORGANIC ODOR		PT	PEAT

* Dual symbols required for fines content between 5% and 12%

PLASTICITY CHART



SAMPLER TYPES

- SPT
- Modified California (2.5" I.D.)
- Rock Core
- Shelby Tube
- No Recovery
- Grab Sample

ADDITIONAL TESTS

COR	-	CHEMICAL ANALYSIS (CORROSIVITY)	PI	-	PLASTICITY INDEX
CD	-	CONSOLIDATED DRAINED TRIAXIAL	EI	-	EXPANSION INDEX
CN	-	CONSOLIDATION	TC	-	CYCLIC TRIAXIAL
CU	-	CONSOLIDATED UNDRAINED TRIAXIAL	TV	-	TORVANE SHEAR
DS	-	DIRECT SHEAR	UC	-	UNCONFINED COMPRESSION
PP	-	POCKET PENETROMETER (TSF)	(1.5)	-	(WITH SHEAR STRENGTH IN KSF)
#200	-	Percent Passing #200 SIEVE			
RV	-	R-VALUE	UU	-	UNCONSOLIDATED UNDRAINED TRIAXIAL
SA	-	SIEVE ANALYSIS: % PASSING			
▼	-	WATER LEVEL			

PENETRATION RESISTANCE (RECORDED AS BLOWS / FOOT)				
SAND & GRAVEL		SILT & CLAY		
RELATIVE DENSITY	BLOWS/FOOT*	CONSISTENCY	BLOWS/FOOT*	STRENGTH** (KSF)
VERY LOOSE	0 - 4	VERY SOFT	0 - 2	0 - 0.25
LOOSE	4 - 10	SOFT	2 - 4	0.25 - 0.5
MEDIUM DENSE	10 - 30	MEDIUM STIFF	4 - 8	0.5-1.0
DENSE	30 - 50	STIFF	8 - 15	1.0 - 2.0
VERY DENSE	OVER 50	VERY STIFF	15 - 30	2.0 - 4.0
		HARD	OVER 30	OVER 4.0

* NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 INCHES TO DRIVE A 2 INCH O.D. (1-3/8 INCH I.D.) SPLIT-BARREL SAMPLER THE LAST 12 INCHES OF AN 18-INCH DRIVE (ASTM-1586 STANDARD PENETRATION TEST).

* * UNDRAINED SHEAR STRENGTH IN KIPS/SQ. FT. AS DETERMINED BY LABORATORY TESTING OR APPROXIMATED BY THE STANDARD PENETRATION TEST, POCKET PENETROMETER, TORVANE, OR VISUAL OBSERVATION.

LEGEND TO BORING LOGS AND SOIL DESCRIPTIONS

Stantec

PROJECT: **Ormat Wister Solar Project**
LOCATION: **Niland, CA**
PROJECT NUMBER: **185804156**
DRILLING: STARTED **4/25/19** COMPLETED: **4/25/19**
INSTALLATION: STARTED **4/25/19** COMPLETED: **4/25/19**
DRILLING COMPANY: **Strong Arm**
DRILLING EQUIPMENT: **Backhoe**
DRILLING METHOD: **Bucket**
SAMPLING EQUIPMENT: **Bucket**

WELL / TEST PIT / BOREHOLE NO: **TP-01** PAGE 1 OF 1

NORTHING (ft): EASTING (ft):
LATITUDE: **33° 16' 39.93"** LONGITUDE: **115° 30' 35.94"**
GROUND ELEV (ft): **-7** TOC ELEV (ft):
INITIAL DTW (ft): **NE** BOREHOLE DEPTH (ft): **10.5**
STATIC DTW (ft): **NE** WELL DEPTH (ft): **---**
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **ND** CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
			QUATERNARY LAKE DEPOSITS (QI)						
		SP	**SAND** ; SP; (10YR 4/3) brown; 90% fine to coarse-grained sand; 10% fines; loose; dry; no odor; no staining						
		SC	**CLAYEY SAND** ; SC; (10YR 4/3) brown; 10% fine to coarse-grained gravel; 60% fine to coarse grained sand; 30% low plasticticty fines; dense; dry; no odor; no staining						
5		CL	**CLAY** ; CL; (10YR 4/3) brown; 3% fine grained sand; 97% fines; hard; dry; no odor; no staining (pocket penetrometer (PP) = 4.0 tons per square foot (tsf))		0910 TPI-5	#200			5
10					0900 TP1-10				10
			Hole terminated at 10.5 feet.						

GEO FORM 304 NILAND.GPJ SECOR INTL.GDT 5/17/19

PROJECT: **Ormat Wister Solar Project**
LOCATION: **Niland, CA**
PROJECT NUMBER: **185804156**
DRILLING: STARTED **4/25/19** COMPLETED: **4/25/19**
INSTALLATION: STARTED **4/25/19** COMPLETED: **4/25/19**
DRILLING COMPANY: **Strong Arm**
DRILLING EQUIPMENT: **Backhoe**
DRILLING METHOD: **Bucket**
SAMPLING EQUIPMENT: **Bucket**

WELL / TEST PIT / BOREHOLE NO:

TP-02

NORTHING (ft):
EASTING (ft):
LATITUDE: **33° 16' 13.55"**
LONGITUDE: **115° 30' 35.68"**
GROUND ELEV (ft): **-30**
TOC ELEV (ft):
INITIAL DTW (ft): **NE**
BOREHOLE DEPTH (ft): **10.5**
STATIC DTW (ft): **NE**
WELL DEPTH (ft): **---**
WELL CASING DIAMETER (in): **---**
BOREHOLE DIAMETER (in):
LOGGED BY: **ND**
CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
		SM	**QUATERNARY LAKE DEPOSITS (QI)** **SILTY SAND** ; SM; (10YR 4/3) brown; 75% very fine to medium sand; 25% fines; coarse; dry; no odor; no staining						
5		CL	**CLAY** ; CL; (10YR 4/5) brown; 12% fine to coarse gravel; 27% fine to coarse grained sand; 61% low plasticity fines; very stiff; dry; no odor; no staining (PP = 4.0 TSF)		0825 TP2-5	SA			5
10					0835 TP2-10				10
			Hole terminated at 10.5 feet.						

PROJECT: **Ormat Wister Solar Project**
LOCATION: **Niland, CA**
PROJECT NUMBER: **185804156**
DRILLING: STARTED **4/25/19** COMPLETED: **4/25/19**
INSTALLATION: STARTED **4/25/19** COMPLETED: **4/25/19**
DRILLING COMPANY: **Strong Arm**
DRILLING EQUIPMENT: **Backhoe**
DRILLING METHOD: **Bucket**
SAMPLING EQUIPMENT: **Bucket**

WELL / TEST PIT / BOREHOLE NO: **TP-03** PAGE 1 OF 1

Stantec

NORTHING (ft): EASTING (ft):
LATITUDE: **33° 15' 50.34"** LONGITUDE: **115° 30' 36.17"**
GROUND ELEV (ft): **-47** TOC ELEV (ft):
INITIAL DTW (ft): **NE** BOREHOLE DEPTH (ft): **10.5**
STATIC DTW (ft): **NE** WELL DEPTH (ft): **---**
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **ND** CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
		SM	**QUATERNARY LAKE DEPOSITS (QI)** **SILTY SAND** ; SM; (10YR 4/5) brown; 80% very fine - coarse-grained sand; 20% fines; lose; dry; no odor; no staining						
5					TP3-5	SA			5
10		CL	**CLAY** ; CL; (10YR 4/3) brown; trace gravel; very stiff (4.0); dry; no odor; no staining		TP3-10				10
			Hole terminated at 10.5 feet.						

GEO FORM 304 NILAND.GPJ SECOR INTL.GDT 5/17/19

PROJECT: **Ormat Wister Solar Project**
LOCATION: **Niland, CA**
PROJECT NUMBER: **185804156**
DRILLING: STARTED **4/25/19** COMPLETED: **4/25/19**
INSTALLATION: STARTED **4/25/19** COMPLETED: **4/25/19**
DRILLING COMPANY: **Strong Arm**
DRILLING EQUIPMENT: **Backhoe**
DRILLING METHOD: **Bucket**
SAMPLING EQUIPMENT: **Bucket**

WELL / TEST PIT / BOREHOLE NO: **TP-04** PAGE 1 OF 1

Stantec

NORTHING (ft): EASTING (ft):
LATITUDE: **33° 16' 26.35"** LONGITUDE: **115° 30' 22.55"**
GROUND ELEV (ft): **-9** TOC ELEV (ft):
INITIAL DTW (ft): **NE** BOREHOLE DEPTH (ft): **10.5**
STATIC DTW (ft): **NE** WELL DEPTH (ft): **---**
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **ND** CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
			QUATERNARY LAKE DEPOSITS (QI)						
		SP-SM	**POORLY GRADED SAND WITH SILT** ; SP-SM; (10YR 4/3) brown; 90% fine to coarse-grained sand; 10% fines; loose; dry; no odor; no staining						
5		CL	**CLAY** ; CL; (10YR 4/3) brown; 10% fine to coarse gravel; 18% fine to coarse grained sand; 72% low plasticity fines; hard; dry; no odor; no staining (PP = 4.0 TSF)		1220 TP4-5	#200			5
10					1225 TP4-10				10
			Hole terminated at 10.5 feet.						

GEO FORM 304 NILAND.GPJ SECOR INTL.GDT 5/17/19

PROJECT: **Ormat Wister Solar Project**
LOCATION: **Niland, CA**
PROJECT NUMBER: **185804156**
DRILLING: STARTED **4/25/19** COMPLETED: **4/25/19**
INSTALLATION: STARTED **4/25/19** COMPLETED: **4/25/19**
DRILLING COMPANY: **Strong Arm**
DRILLING EQUIPMENT: **Backhoe**
DRILLING METHOD: **Bucket**
SAMPLING EQUIPMENT: **Bucket**

WELL / TEST PIT / BOREHOLE NO: **TP-05** PAGE 1 OF 1

Stantec

NORTHING (ft): EASTING (ft):
LATITUDE: **33° 16' 1.05"** LONGITUDE: **115° 30' 21.17"**
GROUND ELEV (ft): **-31** TOC ELEV (ft):
INITIAL DTW (ft): **NE** BOREHOLE DEPTH (ft): **10.5**
STATIC DTW (ft): **NE** WELL DEPTH (ft): **---**
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **ND** CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
			QUATERNARY LAKE DEPOSITS (QI)						
		SC	**CLAYEY SAND** ; SC; (10YR 4/5) brown; 80% very fine to coarse grained sand; 20% fines; loose; dry; no odor; no staining						
5		CL	**CLAY** ; CL; (10YR 4/3) brown; 2% fine grained sand; 98% low plasticity fines; very stiff ; dry; no odor; no staining (PP = 4.0 TSF)		1150 TP5-5	#200			5
10					1155 TP5-10				10
			Hole terminated at 10.5 feet.						

GEO FORM 304 NILAND.GPJ SECOR INTL.GDT 5/17/19

PROJECT: **Ormat Wister Solar Project**
LOCATION: **Niland, CA**
PROJECT NUMBER: **185804156**
DRILLING: STARTED **4/25/19** COMPLETED: **4/25/19**
INSTALLATION: STARTED **4/25/19** COMPLETED: **4/25/19**
DRILLING COMPANY: **Strong Arm**
DRILLING EQUIPMENT: **Backhoe**
DRILLING METHOD: **Bucket**
SAMPLING EQUIPMENT: **Bucket**

WELL / TEST PIT / BOREHOLE NO: **TP-06** PAGE 1 OF 1

NORTHING (ft): EASTING (ft):
LATITUDE: **33° 16' 40.24"** LONGITUDE: **115° 30' 6.28"**
GROUND ELEV (ft): **28** TOC ELEV (ft):
INITIAL DTW (ft): **NE** BOREHOLE DEPTH (ft): **10.5**
STATIC DTW (ft): **NE** WELL DEPTH (ft): **---**
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **ND** CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
			QUATERNARY LAKE DEPOSITS (QI)						
		SP	**SAND** ; SP; (10YR 4/3) brown; 90% fine to coarse-grained sand; 10% fines; loose; dry; no odor; no staining						
		SC	**CLAYEY SAND** ; SC; (10YR 4/3) brown; 5% fine gravel; 60% fine to coarse grained sand; 35% low plasticity fines; dry; no odor; no staining						
5		CL	**CLAY** ; CL; (10YR 4/3) brown; 27% fine to coarse grained sand; 73% low plasticity fines; very stiff; moist; no odor; no staining (PP = 4.0 TSF)		1010 TP6-5	#200			5
10					1015 TP6-10				10
			Hole terminated at 10.5 feet.						

GEO FORM 304 NILAND.GPJ SECOR INTL.GDT 5/17/19

PROJECT: **Ormat Wister Solar Project**
LOCATION: **Niland, CA**
PROJECT NUMBER: **185804156**
DRILLING: STARTED **4/25/19** COMPLETED: **4/25/19**
INSTALLATION: STARTED **4/25/19** COMPLETED: **4/25/19**
DRILLING COMPANY: **Strong Arm**
DRILLING EQUIPMENT: **Backhoe**
DRILLING METHOD: **Bucket**
SAMPLING EQUIPMENT: **Bucket**

WELL / TEST PIT / BOREHOLE NO: **TP-07** PAGE 1 OF 1

Stantec

NORTHING (ft): EASTING (ft):
LATITUDE: **33° 16' 14.14"** LONGITUDE: **115° 30' 5.88"**
GROUND ELEV (ft): **-3** TOC ELEV (ft):
INITIAL DTW (ft): **NE** BOREHOLE DEPTH (ft): **10.5**
STATIC DTW (ft): **NE** WELL DEPTH (ft): **---**
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **ND** CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
			QUATERNARY LAKE DEPOSITS (QI)						
		SP-SC	**POORLY GRADED SAND WITH CLAY** ; SP-SC; (10YR 4/3) brown; 90% fine to coarse-grained sand; 10% fines; loose; dry; no odor; no staining						
		SC	**CLAYEY SAND** ; SC; (10YR 4/3) brown; 5% fine gravel; 70% fine to coarse grained sand, 25% fines, dry; no odor; no staining						
5		CL	**CLAY** ; CL; (10YR 4/3) brown; 32% fine to coarse grained sand, 68% low plasticity fines, very stiff; dry; no odor; no staining (PP = 4.0 TSF)		1040 TP7-5	#200			5
10					1045 TP7-10				10
			Hole terminated at 10.5 feet.						

GEO FORM 304 NILAND.GPJ SECOR INTL.GDT 5/17/19

PROJECT: **Ormat Wister Solar Project**
LOCATION: **Niland, CA**
PROJECT NUMBER: **185804156**
DRILLING: STARTED **4/25/19** COMPLETED: **4/25/19**
INSTALLATION: STARTED **4/25/19** COMPLETED: **4/25/19**
DRILLING COMPANY: **Strong Arm**
DRILLING EQUIPMENT: **Backhoe**
DRILLING METHOD: **Bucket**
SAMPLING EQUIPMENT: **Bucket**

WELL / TEST PIT / BOREHOLE NO: **TP-08** PAGE 1 OF 1

Stantec

NORTHING (ft): EASTING (ft):
LATITUDE: **33° 15' 49.26"** LONGITUDE: **115° 30' 5.77"**
GROUND ELEV (ft): **-28** TOC ELEV (ft):
INITIAL DTW (ft): **NE** BOREHOLE DEPTH (ft): **10.5**
STATIC DTW (ft): **NE** WELL DEPTH (ft): **---**
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **ND** CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
			QUATERNARY LAKE DEPOSITS (QI)						
		SC	**CLAYEY SAND** ; SC; (10YR 4/3) brown; 75% very fine to medium grained sand; 25% fines; dry; no odor; no staining						
5		CL	**CLAY** ; CL; (10YR 4/5) brown; 5% fine to coarse gravel; 22% fine to coarse graiend sand; 73% high plasticity fines; very stiff ; moist; no odor; no staining (PP = 4.0 TSF)		0945 TP8-5	#200			5
10					0950 TP8-10				10
			Hole terminated at 10.5 feet.						

GEO FORM 304 NILAND.GPJ SECOR INTL.GDT 5/17/19

PROJECT: **Ormat Wister Solar Project**
LOCATION: **Niland, CA**
PROJECT NUMBER: **185804156**
DRILLING: STARTED **4/25/19** COMPLETED: **4/25/19**
INSTALLATION: STARTED **4/25/19** COMPLETED: **4/25/19**
DRILLING COMPANY: **Strong Arm**
DRILLING EQUIPMENT: **Backhoe**
DRILLING METHOD: **Bucket**
SAMPLING EQUIPMENT: **Bucket**

WELL / TEST PIT / BOREHOLE NO: **TP-09** PAGE 1 OF 1

Stantec

NORTHING (ft): EASTING (ft):
LATITUDE: **33° 16' 25.98"** LONGITUDE: **115° 29' 52.31"**
GROUND ELEV (ft): **21** TOC ELEV (ft):
INITIAL DTW (ft): **NE** BOREHOLE DEPTH (ft): **10.5**
STATIC DTW (ft): **NE** WELL DEPTH (ft): **---**
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **ND** CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
			QUATERNARY LAKE DEPOSITS (QI)						
		SP	**SAND** ; SP; (10YR 4/3) brown; 90% fine to coarse-grained sand; 10% fines; loose; dry; no odor; no staining						
		SC	**CLAYEY SAND** ; SC; (10YR 4/3) brown; 5% fine gravel; 80% very fine to coarse grained sand; 15% fines; dry; no odor; no staining						
5		CL	**SANDY CLAY** ; CL; (10YR 4/3) brown; 1% fine gravel, 16% fine to coarse grained sand; 83% low plasticity fines; very stiff; dry; no odor; no staining (PP = 4.0 TSF)		1255 TP9-5	SA			5
10					1300 TP9-10				10
			Hole terminated at 11 feet.						

GEO FORM 304 NILAND.GPJ SECOR INTL.GDT 5/17/19

PROJECT: **Ormat Wister Solar Project**
LOCATION: **Niland, CA**
PROJECT NUMBER: **185804156**
DRILLING: STARTED **4/25/19** COMPLETED: **4/25/19**
INSTALLATION: STARTED **4/25/19** COMPLETED: **4/25/19**
DRILLING COMPANY: **Strong Arm**
DRILLING EQUIPMENT: **Backhoe**
DRILLING METHOD: **Bucket**
SAMPLING EQUIPMENT: **Bucket**

WELL / TEST PIT / BOREHOLE NO: **TP-10** PAGE 1 OF 1

Stantec

NORTHING (ft): EASTING (ft):
LATITUDE: **33° 16' 0.99"** LONGITUDE: **115° 29' 51.78"**
GROUND ELEV (ft): **-3** TOC ELEV (ft):
INITIAL DTW (ft): **NE** BOREHOLE DEPTH (ft): **10.5**
STATIC DTW (ft): **NE** WELL DEPTH (ft): **---**
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **ND** CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
			QUATERNARY LAKE DEPOSITS (QI)						
5		SC	**CLAYEY SAND** ; SC; (10YR 4/3) brown; 23% fine to coarse gravel; 64% fine to coarse grained sand; 13% fines; coarse; dry; no odor; no staining		1445 TP10-5	SA			5
		CL	**CLAY** ; CL; (10YR 4/5) brown; 5% fine gravel; 10% fine to coarse grained sand; 85% low plasticity fines; very stiff; dry; no odor; no staining (PP = 4.0 TSF)						
10					1450 TP10-10				10
			Hole terminated at 10.5 feet.						

GEO FORM 304 NILAND.GPJ SECOR INTL.GDT 5/17/19

PROJECT: **Ormat Wister Solar Project**
LOCATION: **Niland, CA**
PROJECT NUMBER: **185804156**
DRILLING: STARTED **4/25/19** COMPLETED: **4/25/19**
INSTALLATION: STARTED **4/25/19** COMPLETED: **4/25/19**
DRILLING COMPANY: **Strong Arm**
DRILLING EQUIPMENT: **Backhoe**
DRILLING METHOD: **Bucket**
SAMPLING EQUIPMENT: **Bucket**

WELL / TEST PIT / BOREHOLE NO: **TP-11** PAGE 1 OF 1

NORTHING (ft): EASTING (ft):
LATITUDE: **33° 16' 40.56"** LONGITUDE: **115° 29' 35.57"**
GROUND ELEV (ft): **48** TOC ELEV (ft):
INITIAL DTW (ft): **NE** BOREHOLE DEPTH (ft): **10.5**
STATIC DTW (ft): **NE** WELL DEPTH (ft): **---**
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **ND** CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
			QUATERNARY LAKE DEPOSITS (QI)						
5		SC	**CLAYEY SAND** ; SC; (10YR 4/3) brown; 3% fine to coarse gravel; 63% fine to coarse grained sand; 34% fines; coarse; dry; no odor; no staining		1350 TP11-05	SA			5
		CL	**CLAY** ; CL; (10YR 4/3) brown; 10% fine grained sand; 90% low plasticity fines; very stiff; dry; no odor; no staining (PP = 4.0 TSF)						
10					1355 TP11-10				10
			Hole terminated at 10.5 feet.						

GEO FORM 304 NILAND.GPJ SECOR INTL.GDT 5/17/19

PROJECT: **Ormat Wister Solar Project**
LOCATION: **Niland, CA**
PROJECT NUMBER: **185804156**
DRILLING: STARTED **4/25/19** COMPLETED: **4/25/19**
INSTALLATION: STARTED **4/25/19** COMPLETED: **4/25/19**
DRILLING COMPANY: **Strong Arm**
DRILLING EQUIPMENT: **Backhoe**
DRILLING METHOD: **Bucket**
SAMPLING EQUIPMENT: **Bucket**

WELL / TEST PIT / BOREHOLE NO: **TP-12** PAGE 1 OF 1

NORTHING (ft): EASTING (ft):
LATITUDE: **33° 16' 14.64"** LONGITUDE: **115° 29' 35.57"**
GROUND ELEV (ft): **25** TOC ELEV (ft):
INITIAL DTW (ft): **NE** BOREHOLE DEPTH (ft): **10.5**
STATIC DTW (ft): **NE** WELL DEPTH (ft): **---**
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **ND** CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
			QUATERNARY LAKE DEPOSITS (QI)						
		SC	**CLAYEY SAND** ; SC; (10YR 4/3) brown; 75% very fine to coarse grained sand; 25% fines; dry; no odor; no staining						
5		CL	**CLAY** ; CL; (10YR 4/5) brown; 5% fine grained sand; 95% low plasticity fines; very stiff; dry; no odor; no staining (PP = 4.0 TSF)		1325 TP12-5	#200			5
10					1330 TP12-10				10
			Hole terminated at 10.5 feet.						

GEO FORM 304 NILAND.GPJ SECOR INTL.GDT 5/17/19

PROJECT: **Ormat Wister Solar Project**
LOCATION: **Niland, CA**
PROJECT NUMBER: **185804156**
DRILLING: STARTED **4/25/19** COMPLETED: **4/25/19**
INSTALLATION: STARTED **4/25/19** COMPLETED: **4/25/19**
DRILLING COMPANY: **Strong Arm**
DRILLING EQUIPMENT: **Backhoe**
DRILLING METHOD: **Bucket**
SAMPLING EQUIPMENT: **Bucket**

WELL / TEST PIT / BOREHOLE NO: **TP-13** PAGE 1 OF 1

Stantec

NORTHING (ft): EASTING (ft):
LATITUDE: **33° 15' 49.1"** LONGITUDE: **115° 29' 35.42"**
GROUND ELEV (ft): **-5** TOC ELEV (ft):
INITIAL DTW (ft): **NE** BOREHOLE DEPTH (ft): **10.5**
STATIC DTW (ft): **NE** WELL DEPTH (ft): **---**
WELL CASING DIAMETER (in): **---** BOREHOLE DIAMETER (in):
LOGGED BY: **ND** CHECKED BY: **JF**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
			QUATERNARY LAKE DEPOSITS (QI)						
		SM	**SILTY SAND** ; SM; (10YR 4/5) brown; 80% very fine - coarse-grained sand; 20% fines; lose; dry; no odor; no staining						
5		CL	**CLAY** ; CL; (10YR 4/3) brown; trace gravel; very stiff (4.0); dry; no odor; no staining		1420 TP13-5	#200			5
10					1425 TP13-10				10
			Hole terminated at 10.5 feet.						

GEO FORM 304 NILAND.GPJ SECOR INTL.GDT 5/17/19

ATTACHMENT B
LABORATORY TEST RESULTS

Stantec

Materials Finer Than 75µm (No. 200) Sieve

ASTM D 1140

Project Name	Ormat Wister Solar Project	Project Number	185804156
Source	Grab	Lab ID	TP1-5'
		Date Received	05-02-2019
Preparation Method	ASTM D 1140 Method A	Test Date	05-03-2019

Initial Sample Wet Mass (g)	404.00	Moisture Content (%)	12.5
Initial Oven Dry Sample Mass (g)	359.20		
Final Oven Dry Sample Mass (g)	10.80		
Materials Finer Than 75µm (No. 200) Sieve (g)	348.40		
Percent Finer Than 75µm (No. 200) Sieve (%)	97.0		

Comments

Reviewed By JF

Stantec

Gradation Analysis

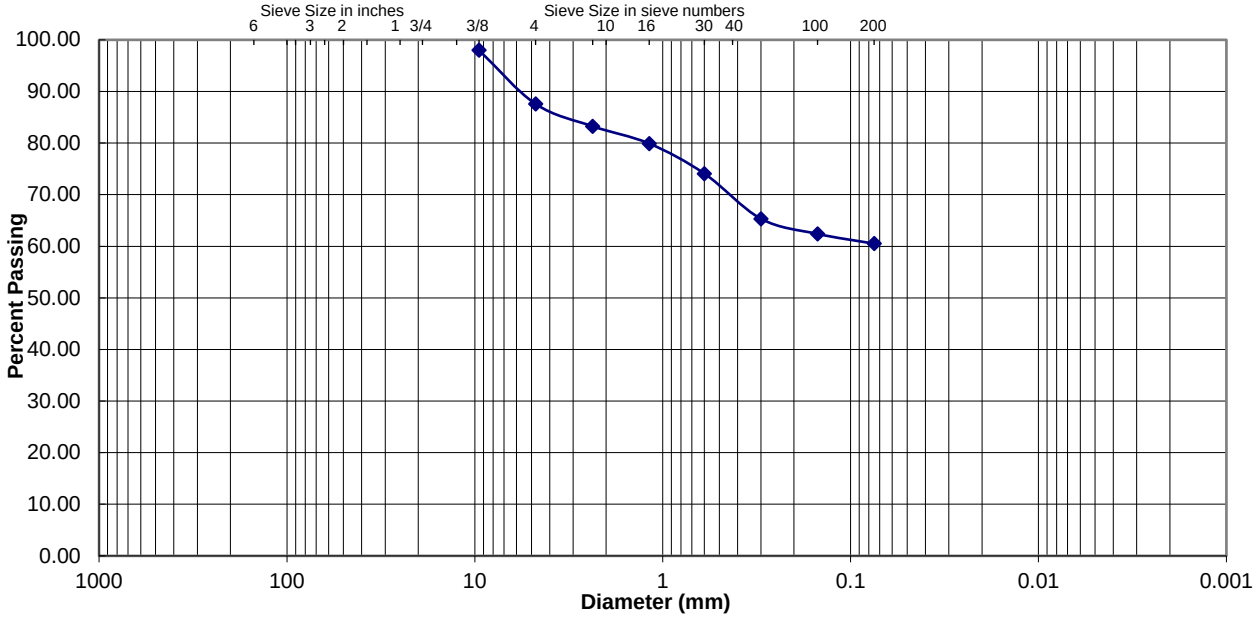
ASTM D 422

Project Name	Ormat Wister Solar Project	Project Number	185804156
Source	Grab	Lab ID	TP2-5'
		Date Received	05-02-2019
Preparation Method	ASTM D 1140 Method A	Preparation Date	05-03-2019
Particle Shape		Test Date	05-04-2019
Particle Hardness			
Sample Dry Mass (g)	406.60	Analysis based on total sample.	
Moisture Content (%)	7.6		

Sieve Size	Grams Retained	% Retained	% Passing
3/8"	8.20	2.0	98.0
No. 4	42.30	10.4	87.6
No. 8	17.60	4.3	83.3
No. 16	13.60	3.3	79.9
No. 30	23.70	5.8	74.1
No. 50	35.60	8.8	65.3
No. 100	11.90	2.9	62.4
No. 200	7.70	1.9	60.5
Pan	246.00	60.5	---

% Gravel	12.4
% Sand	27.1
% Fines	60.5
Fines Classification	CL
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Particle Size Distribution



Comments

Reviewed By JF

Stantec

Gradation Analysis

ASTM D 422

Project Name: Ormat Wister Solar Project
Source: Grab

Preparation Method: ASTM D 1140 Method A
Particle Shape:
Particle Hardness:
Sample Dry Mass (g): 461.10
Moisture Content (%): 1.4

Project Number: 185804156
Lab ID: TP3-5'
Date Received: 05-02-2019
Preparation Date: 05-03-2019
Test Date: 05-04-2019

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
3/8"	24.00	5.2	94.8
No. 4	44.70	9.7	85.1
No. 8	21.10	4.6	80.5
No. 16	18.80	4.1	76.4
No. 30	26.70	5.8	70.7
No. 50	112.50	24.4	46.3
No. 100	107.20	23.2	23.0
No. 200	31.30	6.8	16.2
Pan	74.80	16.2	---

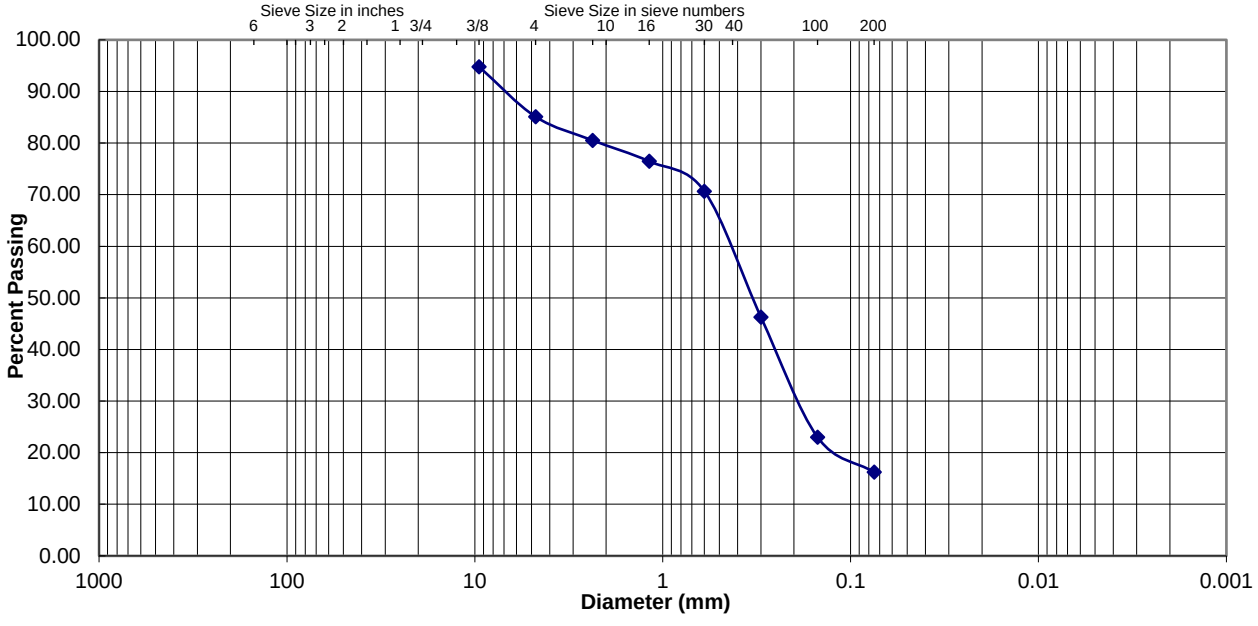
% Gravel	14.9
% Sand	68.9
% Fines	16.2
Fines Classification	CL
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Classification

Clayey Sand (SC)

Classification determined by ASTM D 2487. -200 material classification determined by visual assessment, ASTM D 2488.

Particle Size Distribution



Comments

Reviewed By: JF

Stantec

Materials Finer Than 75µm (No. 200) Sieve

ASTM D 1140

Project Name	Ormat Wister Solar Project	Project Number	185804156
Source	Grab	Lab ID	TP4-5'
		Date Received	05-02-2019
Preparation Method	ASTM D 1140 Method A	Test Date	05-03-2019

Initial Sample Wet Mass (g)	463.70	Moisture Content (%)	12.8
Initial Oven Dry Sample Mass (g)	411.10		
Final Oven Dry Sample Mass (g)	114.70		
Materials Finer Than 75µm (No. 200) Sieve (g)	296.40		
Percent Finer Than 75µm (No. 200) Sieve (%)	72.1		

Comments

Reviewed By JF

Materials Finer Than 75µm (No. 200) Sieve

ASTM D 1140

Project Name	Ormat Wister Solar Project	Project Number	185804156
Source	Grab	Lab ID	TP5-5'
		Date Received	05-02-2019
Preparation Method	ASTM D 1140 Method A	Test Date	05-03-2019

Initial Sample Wet Mass (g)	351.60	Moisture Content (%)	9.1
Initial Oven Dry Sample Mass (g)	322.20		
Final Oven Dry Sample Mass (g)	4.90		
Materials Finer Than 75µm (No. 200) Sieve (g)	317.30		
Percent Finer Than 75µm (No. 200) Sieve (%)	98.5		

Comments

Reviewed By JF

Stantec

Materials Finer Than 75µm (No. 200) Sieve

ASTM D 1140

Project Name	Ormat Wister Solar Project	Project Number	185804156
Source	Grab	Lab ID	TP6-5'
		Date Received	05-02-2019
Preparation Method	ASTM D 1140 Method A	Test Date	05-03-2019

Initial Sample Wet Mass (g)	366.00	Moisture Content (%)	15.8
Initial Oven Dry Sample Mass (g)	316.00		
Final Oven Dry Sample Mass (g)	86.80		
Materials Finer Than 75µm (No. 200) Sieve (g)	229.20		
Percent Finer Than 75µm (No. 200) Sieve (%)	72.5		

Comments

Reviewed By JF

Materials Finer Than 75µm (No. 200) Sieve

ASTM D 1140

Project Name	Ormat Wister Solar Project	Project Number	185804156
Source	Grab	Lab ID	TP7-5'
		Date Received	05-02-2019
Preparation Method	ASTM D 1140 Method A	Test Date	05-03-2019

Initial Sample Wet Mass (g)	435.30	Moisture Content (%)	5.5
Initial Oven Dry Sample Mass (g)	412.50		
Final Oven Dry Sample Mass (g)	130.80		
Materials Finer Than 75µm (No. 200) Sieve (g)	281.70		
Percent Finer Than 75µm (No. 200) Sieve (%)	68.3		

Comments

Reviewed By JF

Stantec

Materials Finer Than 75µm (No. 200) Sieve

ASTM D 1140

Project Name	Ormat Wister Solar Project	Project Number	185804156
Source	Grab	Lab ID	TP8-5'
		Date Received	05-02-2019
Preparation Method	ASTM D 1140 Method A	Test Date	05-03-2019

Initial Sample Wet Mass (g)	516.70	Moisture Content (%)	17.2
Initial Oven Dry Sample Mass (g)	440.80		
Final Oven Dry Sample Mass (g)	117.60		
Materials Finer Than 75µm (No. 200) Sieve (g)	323.20		
Percent Finer Than 75µm (No. 200) Sieve (%)	73.3		

Comments

Reviewed By JF

Stantec

Gradation Analysis

ASTM D 422

Project Name: Ormat Wister Solar Project
Source: Grab

Preparation Method: ASTM D 1140 Method A
Particle Shape:
Particle Hardness:
Sample Dry Mass (g): 377.40
Moisture Content (%): 14.5

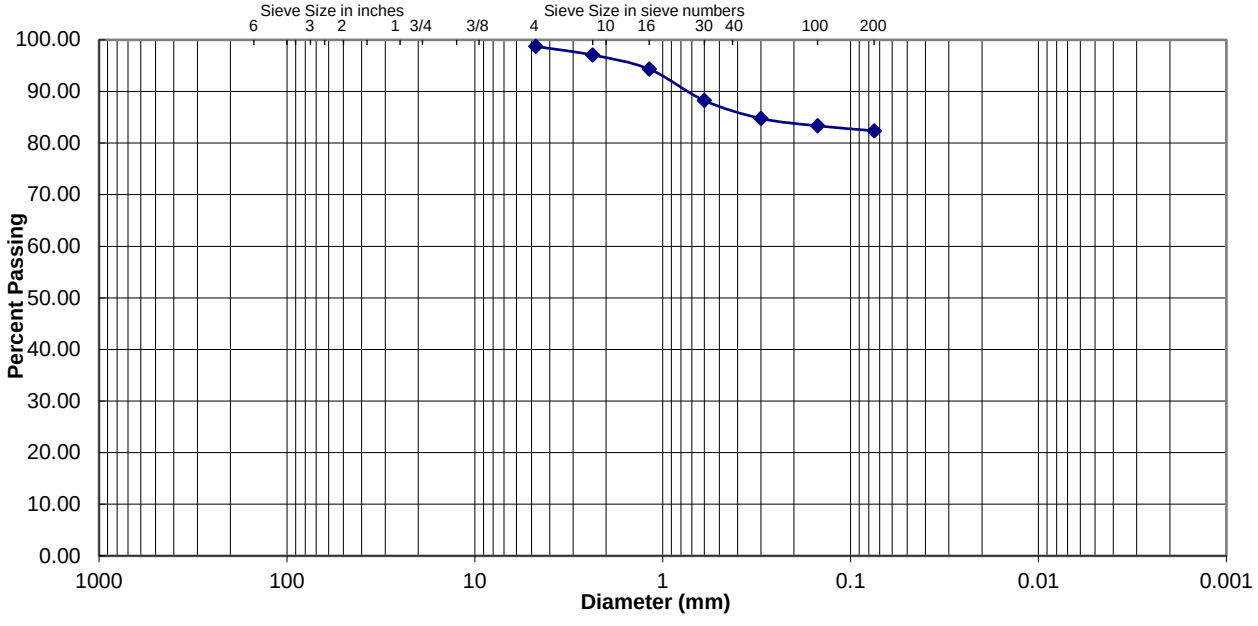
Project Number: 185804156
Lab ID: TP9-5'
Date Received: 05-02-2019
Preparation Date: 05-03-2019
Test Date: 05-04-2019

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 4	4.80	1.3	98.7
No. 8	6.30	1.7	97.1
No. 16	10.30	2.7	94.3
No. 30	23.00	6.1	88.2
No. 50	13.10	3.5	84.8
No. 100	5.40	1.4	83.3
No. 200	3.60	1.0	82.4
Pan	310.90	82.4	---

% Gravel	1.3
% Sand	16.3
% Fines	82.4
Fines Classification	CL
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Particle Size Distribution



Comments

Reviewed By

Stantec

Gradation Analysis

ASTM D 422

Project Name: Ormat Wister Solar Project
Source: Grab

Preparation Method: ASTM D 1140 Method A
Particle Shape:
Particle Hardness:
Sample Dry Mass (g): 462.00
Moisture Content (%): 1.7

Project Number: 185804156
Lab ID: TP10-5'
Date Received: 05-02-2019
Preparation Date: 05-03-2019
Test Date: 05-04-2019

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
3/4"	17.00	3.7	96.3
1/2"	11.90	2.6	93.7
3/8"	38.30	8.3	85.5
No. 4	40.40	8.7	76.7
No. 8	48.90	10.6	66.1
No. 16	44.50	9.6	56.5
No. 30	132.40	28.7	27.8
No. 50	57.70	12.5	15.3
No. 100	11.20	2.4	12.9
No. 200	0.20	0.0	12.9
Pan	59.50	12.9	---

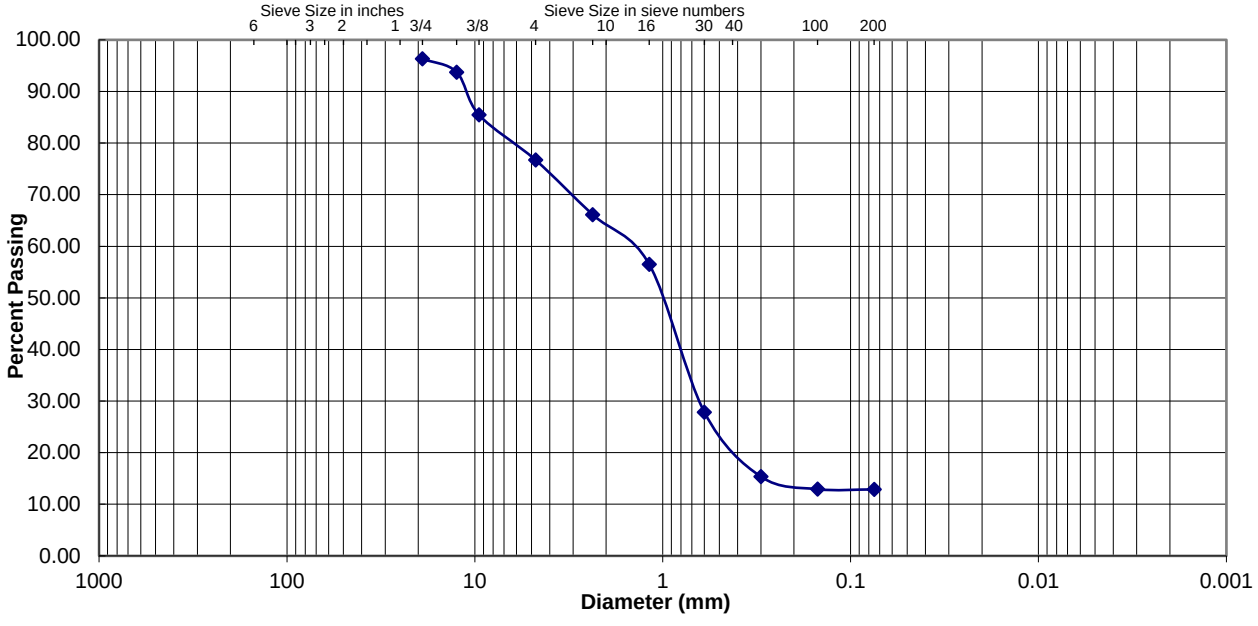
% Gravel	23.3
% Sand	63.8
% Fines	12.9
Fines Classification	CL
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Classification

Clayey Sand (SC) with Gravel

Classification determined by ASTM D 2487. -200 material classification determined by visual assessment, ASTM D 2488.

Particle Size Distribution



Comments

Reviewed By: JF

Stantec

Gradation Analysis

ASTM D 422

Project Name	Ormat Wister Solar Project	Project Number	185804156
Source	Grab	Lab ID	TP11-5'
		Date Received	05-02-2019
Preparation Method	ASTM D 1140 Method A	Preparation Date	05-03-2019
Particle Shape		Test Date	05-04-2019
Particle Hardness			
Sample Dry Mass (g)	369.00	Analysis based on total sample.	
Moisture Content (%)	4.6		

Sieve Size	Grams Retained	% Retained	% Passing
No. 4	9.70	2.6	97.4
No. 8	0.00	0.0	97.4
No. 16	0.00	0.0	97.4
No. 30	0.00	0.0	97.4
No. 50	0.40	0.1	97.3
No. 100	29.90	8.1	89.2
No. 200	201.90	54.7	34.4
Pan	127.10	34.4	---

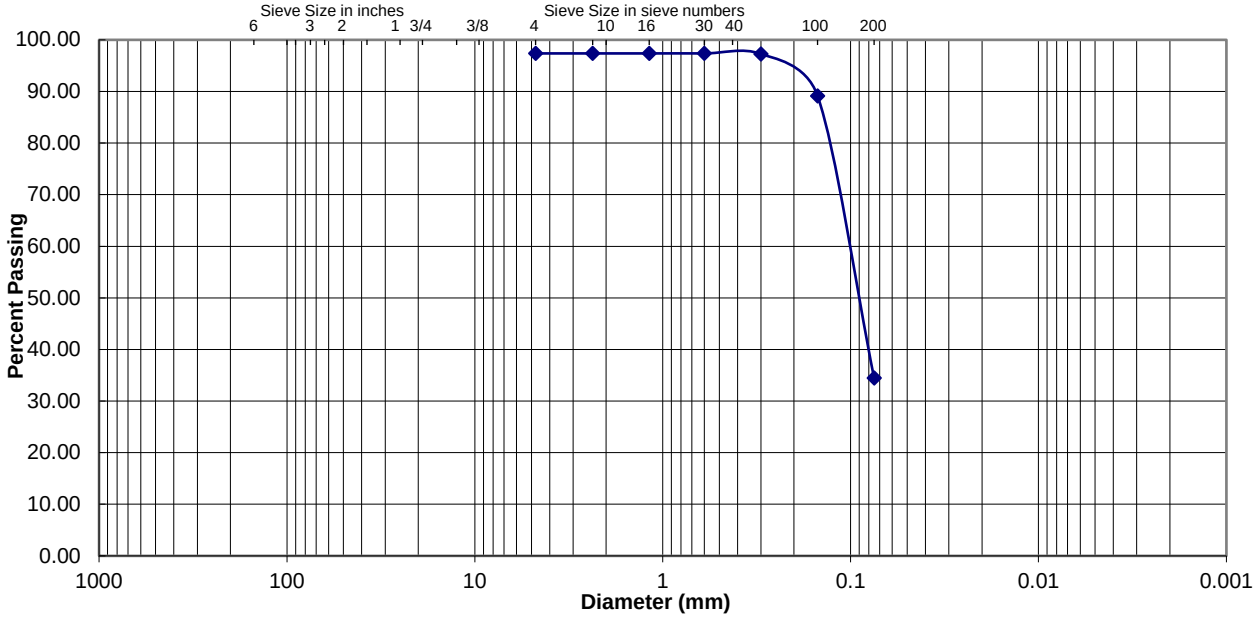
% Gravel	2.6
% Sand	62.9
% Fines	34.4
Fines Classification	CL
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Classification

Clayey Sand (SC)

Classification determined by ASTM D 2487. -200 material classification determined by visual assessment, ASTM D 2488.

Particle Size Distribution



Comments

Reviewed By JF

Stantec

Materials Finer Than 75µm (No. 200) Sieve

ASTM D 1140

Project Name	Ormat Wister Solar Project	Project Number	185804156
Source	Grab	Lab ID	TP12-5'
		Date Received	05-02-2019
Preparation Method	ASTM D 1140 Method A	Test Date	05-03-2019

Initial Sample Wet Mass (g)	355.80	Moisture Content (%)	26.8
Initial Oven Dry Sample Mass (g)	280.60		
Final Oven Dry Sample Mass (g)	53.90		
Materials Finer Than 75µm (No. 200) Sieve (g)	226.70		
Percent Finer Than 75µm (No. 200) Sieve (%)	80.8		

Comments

Reviewed By JF

Stantec

Materials Finer Than 75µm (No. 200) Sieve

ASTM D 1140

Project Name	Ormat Wister Solar Project	Project Number	185804156
Source	Grab	Lab ID	TP13-5'
		Date Received	05-02-2019
Preparation Method	ASTM D 1140 Method A	Test Date	05-03-2019

Initial Sample Wet Mass (g)	421.50	Moisture Content (%)	15.8
Initial Oven Dry Sample Mass (g)	364.00		
Final Oven Dry Sample Mass (g)	20.00		
Materials Finer Than 75µm (No. 200) Sieve (g)	344.00		
Percent Finer Than 75µm (No. 200) Sieve (%)	94.5		

Comments

Reviewed By JF

ATTACHMENT C
CEQA GUIDELINES FORM – GEOLOGY AND SOILS

GEOLOGY AND SOILS	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
Would the project:					
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:					
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault (refer to CDMG Special Publication 42)?			X		
ii) Strong Seismic ground shaking?		X			
iii) Seismic-related ground failure, including liquefaction?			X		
iv) Landslides?			X		
b) Result in substantial soil erosion or the loss of topsoil?		X			
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?			X		
d) Be located on expansive soil, as identified in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?			X		
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for disposal of waste water?			X		