Appendix D.
Core Boring Logs and Core Photographs

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Core Boring Logs and Core Photographs

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Key to Log of Core Boring

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1	2	3	4	5	6	7	8	9	10	11	12	13	14

COLUMN DESCRIPTIONS

1 **Elevation:** Elevation (in feet) referenced to mean sea level (MSL).

2 **Depth:** Distance (in feet) below the ground surface of the borehole.

3 **Run No.:** Number of the individual coring interval.

4 **Box No.:** Number of the core box which contains core from the corresponding run.

5 **Recovery:** Amount (in percent) of core recovered from the coring interval; calculated as length of core recovered divided by run length.

6 **Fractures per Foot:** (Fracture Frequency) The number of naturally occurring fractures in each foot of core; does not include mechanical breaks (induced by drilling) or healed fractures. "NA" indicates not applicable due to lack of core recovery.

7 **RQD:** (Rock Quality Designation) Amount (in percent) of intact core (pieces of sound core greater than 4 inches in length) in the coring interval; calculated as the sum of lengths of intact core divided by the run length. RQD value with "*" indicates moderately weathered / altered rock that does not meet soundness requirements, but provides an indication of rock quality with respect to degree of fracturing.

8 **Fracture Drawing:** Sketch of the naturally occurring fractures and mechanical breaks, showing the angle of the fractures relative to the cross sectional axis of the core. "NR" indicates no recovery.

9 **Fracture Number:** Location of each naturally occurring fracture (numbered) and mechanical break (labeled "M"). Naturally occurring fractures are described in Column 11 (keyed by number) using descriptive terms defined on Sheet 2 (Items a through g).

10 **Lithology:** A graphic log of material encountered using symbols to represent different soil and rock types; symbols are explained below.

11 **Description:** Lithologic description in this order: rock type, color, texture, grain size, weathering, strength, and other features; descriptive terms are defined on Sheet 2. A detailed description of overburden material is not necessary unless provided. Also, abbreviated descriptions of fractures numbered in Column 9 using terms defined on Sheet 2.

12 **Packer Test Intervals:** A vertical bar depicts the interval over which a packer test is performed. The test identification number and depth range is printed above the bar symbol.

13 **Drill Time [Rate]:** Time (in 24 hour clock) marking start and finish of each run; drilling rate (in feet per hour) is reported in brackets.

14 **Field Notes and Other Tests:** Comments regarding drilling and sampling made by driller or field personnel. Tested rock specimen intervals and a record of tests performed using the abbreviations listed below.

TYPICAL MATERIAL GRAPHIC SYMBOLS

- ARTIFICIAL FILL
- CLAYEY GRAVEL with SAND (GC)
- SILTY GRAVEL with SAND (GM)
- CLAYEY SAND with GRAVEL (SC)
- SANDY LEAN CLAY with GRAVEL (CL)
- SANDY SILT (ML)
- BASALT
- BASALT BRECCIA

OTHER GRAPHIC SYMBOLS

- First water encountered at time of drilling
- Static water as measured
- Change in material properties within a stratum
- Inferred or transitional contact

LABORATORY TEST ABBREVIATIONS

PL: Point load index strength [psi]
UC: Unconfined Compressive Strength test [psi]

Material descriptions and stratum lines are interpretive field descriptions may have been modified to reflect lab test results Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced and are not warranted to be representative of subsurface conditions at other locations or times

AECOM

Report GEO CORE OAK CKEY File N D AECOM ROCK CORE GPJ 12/2/2015 KEY

Project: Proposed Water Storage Project
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Key to Log of Core Boring

KEY TO DESCRIPTIVE TERMS USED ON CORE LOGS

DISCONTINUITY DESCRIPTORS

a D p of d scont nu ty, measured re at ve to a p ane norma to the core ax s.

b **Discontinuity Type:**

F	Fau t
J	Jo nt
Sh	Shear
Fo	Fo at on
V	Ve n
B	Bedd ng

c **Aperture (inches):**

W	W de (0.5 2.0)
MW	Moderate y W de (0.1 0.5)
N	Narrow (0.05 0.1)
VN	Very Narrow (<0.05)
T	T ght (0)

d **Type of Infilling:**

B	B ot te	Mn	Manganese
C	C ay	My	My on te
Ca	Ca c te	No	None
Ch	Ch or te	Py	Pyr te
Ep	Ep dote	Qz	Quartz
Fe	Iron Ox de	Sd	Sand
H	Hea ed	S	S ty
K^+	Potass um	Uk	Unknown
CR	Crushed Rock		

e **Amount of Infilling:**

Su	Surface Sta n
Sp	Spotty
Pa	Part a y F ed
F	F ed
No	None

f **Surface Shape of Joint:**

P	P anar
Wa	Wavy
St	Stepped
Ir	Irregu ar

g **Roughness of Surface:**

S k	S ckens ded [surface has smooth, g assy f n sh w th v sua ev dence of str at ons]
S	Smooth [surface appears smooth and fee s so to the touch]
SR	S ght y Rough [asper t es on d scont nu ty surfaces are d st ngu shab e and can be fe t]
R	Rough [r dges and s de ang e steps are ev dent; asper t es are c ear y v s b e; surface fee s very abras ve]
VR	Very Rough [near vert ca steps and r dges occur on d scont nu ty surface]

ROCK FRACTURING

Description	Recognition
Intense y Fractured	Fractures spaced ess than 2 nches apart
H gh y Fractured	Fractures spaced 2 nches to 1 foot apart
Moderate y Fractured	Fractures spaced 1 foot to 3 feet apart
S ght y Fractured	Fractures spaced 3 feet to 10 feet apart
Mass ve	Fracture spac ng greater than 10 feet

ROCK WEATHERING / ALTERATION

Description	Recognition
Res dua So	Or g na m nera s of rock have been ent re y decomposed to secondary m nera s, and or g na rock fabr c s not apparent; mater a can be eas y broken by hand
Comp ete y Weathered/A tered	Or g na m nera s of rock have been a most ent re y decomposed to secondary m nera s, a though or g na fabr c may be ntact; mater a can be granu ated by hand
H gh y Weathered/A tered	More than ha f of the rock s decomposed; rock s weakened so that a m n mum 2 nch d ameter samp e can be broken read y by hand across rock fabr c
Moderate y Weathered/A tered	Rock s d sco ored and not ceab y weakened, but ess than ha f s decomposed; a m n mum 2 nch d ameter samp e cannot be broken read y by hand across rock fabr c
S ght y Weathered/A tered	Rock s s ght y d sco ored, but not not ceab y ower n strength than fresh rock
Fresh/Unweathered	Rock shows no d sco orat on, oss of strength, or other effect of weather ng/a terat on

ROCK STRENGTH

Description	Recognition	Approximate Uniaxial Compressive Strength (psi)
Extreme y Weak Rock	Can be ndented by thumbna	35 150
Very Weak Rock	Can be pee ed by pocket kn fe	150 700
Weak Rock	Can be pee ed w th d ff cu ty by pocket kn fe	700 3,600
Moderate y Strong Rock	Can be ndented 5 mm w th sharp end of p ck	3,600 7,200
Strong Rock	Requ res one hammer b ow to fracture	7,200 14,500
Very Strong Rock	Requ res many hammer b ows to fracture	14,500 36,000
Extreme y Strong Rock	Can on y be ch pped w th hammer b ows	>36,000

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Log of Rock Core Boring CB-1

Sheet 1 of 13

Date(s) Dr ed	**10/27/2015-10/30/2015**	Logged By	**S. Janowski / B. Kozlowicz**	Checked By	**D. Simpson**
Dr ng Method	**HQ-3 Wireline Core**	Dr B t S ze/Type	**3 7/8" HQ Diamond LF Series 8/ AO Series 6**	Tota Depth of Boreho e	**199.7 feet**
Dr R g Type	**LF-70 Track-Mounted Rig**	Dr ng Contractor	**Ruen Drilling**	NAVD 88 Ground Surface E evat on	**1788-ft**
Groundwater Leve	**127.7-ft 10/30/2015**	Samp ng Methods	**HQ-3 Wireline**	Inc nat on from Hor zonta /Bear ng	**60° / 0°**
Boreho e Comp et on	**Neat cement grout to surface**	Locat on	**Axis 2 South, Geophysics line 2-1 and 2-4**	Coord nate Locat on	**N 2141006.0 E 6838731.0**

E evat on, feet	Depth, feet	ROCK CORE Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %	Fracture Draw ng Number	L tho ogy	MATERIAL DESCRIPTION	Packer Test Interva s	Dr T me, 24 hr [Dr Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	0		1		NA				CLAYEY GRAVEL w th SAND (GC); dry; brown; 40% angu ar basa t GRAVEL and COBBLES to 5"; 30% f ne to coarse gra ned SAND; 20% med um p ast c ty f nes		1449	S Janowski logging 100% water circulation return (WCR)
1788									COLLUVIUM			
	1	1		0		0	NR				[32]	Only angular basalt gravel and cobbles recovered to 11'
					NA							
	2										1453	
					NA						1459	
1786	3	2		13		0	NR				[144]	
					NA							
	4										1500	
					NA						1512	
1784	5											
					NA							
	6											
		3		14	NA	0	NR				[88]	
	7											
1782					NA							
	8											
					NA						1515	
	9										1524	
					NA							
1780	10						NR					
		4		39	NA	0					[72]	
	11											
					NA				CLAYEY SAND w th GRAVEL (SC); wet; red; 30% angu ar basa t grave to 2"; 50% f ne to coarse gra ned SAND; 20% med um p ast c ty FINES			
1778	12								RESIDUAL SOIL, BASALT		1527	
					NA						1604	4" HWT casing advanced to 5'
		5		26		0	NR					
	13											

Report GEO CORE OAK C B MAP File N D AECOM ROCK CORE GPJ 12/10/2015 CB-1

AECOM

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Log of Rock Core Boring CB-1

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
				ROCK CORE								
	13		1		NA				CLAYEY SAND with GRAVEL (SC); wet; red; 30% angular basalt gravel to 2"; 50% fine to coarse grained SAND; 20% medium plasticity FINES			
									RESIDUAL SOIL, BASALT *(continued)*			
1776	14	5		26	NA	0	NR				[70]	
	15				NA							Lost all WCR
	16				NA						1607	
1774											1615	
	17	6		64	NA	0	NR				[56]	
	18				NA						1618	
1772	19						NR				1626	
					NA							
	20	7		68	NA	0					[56]	
1770	21				NA							
	22								Becomes light brown		1630	
					NA		NR				1639	
	23								BASALT; moderately yellowish brown; highly weathered; weak to very weak; intensely fractured; aphanitic			
1768					>10		1		mv			
	24	8		86	8	0	2 2		1: 45°, Sh, VN, Fe, Su, P , S? 2: 20° 30°, J, T VN, Mn+Fe, Su, P , S 3: 50°, J, VN, Mn+Fe, Su, P , S SR		[53]	
	25						2 2					
					6		2					
1766							3 2					
	26						3				1643	End of day 10/27/2015
					NA				Becomes completely weathered; extremely weak; friable		0838	Begin day 10/28/2015
	27	9		13	NA	0	NR				[46]	AM water level=dry Advance 4" HWT casing to 20' 0% WCR Casing fell advance to 25'
	28										0841	
1764		10		67	NA	67	NR				0905	
	29						1 2					

AECOM

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	29		1		NA		NR 1 2		BASALT; light brown; completely weathered; extremely weak; friable and soft			50% WCR
									mv *(continued)*			
	30						1 1					
1762		10		67	NA	67	1 1		1: 40° 50°, J, VN, Fe+Mn, Su, P , ?		[84]	
	31				NA		1 1					
	32		2								0908	
					NA						0913	
1760	33				NA							
	34	11		0		0	NR				[50]	
					NA							
1758	35										0917	
					NA						0924	
	36											
					NA							
	37	12		0		0	NR				[52]	
1756					NA							
	38										0927	
					NA		NR		1: 65°, J, VN, Fe+Mn, Su, P , S 2: 30°, J, VN, Fe+Mn, Su, P , S		0934	
	39						1					
		13		76	>6	0	2 2		Becomes highly weathered; very weak; intensely fractured: surfaces are Fe+Mn, Su, P , S		[42]	
1754	40											
					NA				Becomes completely to highly weathered; very to extremely weak; intensely fractured to crushed		0937	
											0942	
	41											
		14		30	NA	0	NR				[40]	
1752	42								Only highly weathered; gravel size cast recovered			
					NA						0945	
											0951	
	43						NR					
		15		60	NA	0					[38]	
	44											
1750					>10							
	45										0955	

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Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	45		2		NA		NR		BASALT; light brown; highly to completely weathered; very to extremely weak; intensely fractured to crushed; Fe+Mn, Su on fracture surfaces mv *(continued)*		1003	Continued 50% WCR
	46	16		50	NA	0					[36]	Shorter runs to increase recovery %
1748	47				NA						1007 1017	
	48	17		12	NA	0	NR				[31]	
1746	49				NA						1022	
	50	18		44	NA	0	NR				1048 [36]	
1744	51				NA						1051	
	52				NA						1121	Trip out rods change bit to AO Series 6
	53	19		50		0	NR		Becomes highly weathered; weak to very weak		[36]	
1742	54				NA							
	55				>10				Becomes moderately weathered; weak to very weak		1126 1146	
	56	20		92	>10	0			1: 70°, J, VN, Mn, Su, P , SR 2: 30°, J, VN, Mn, Su, P , SR 3: 80°, J, VN, Mn, Su, P , SR		[38]	
1740	57				>10		NR		Becomes completely weathered; very to extreme y weak; crushed; with some highly weathered casts		1150	
	58				NA						1157	
1738	59	21		22	NA	0	NR				[81]	0% WCR
	60				NA						1159 1204	
1736	61	22		28	NA	0	NR					

AECOM

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Log of Rock Core Boring CB-1

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	61											
		22	2	28	NA	0	NR		BASALT; light brown; completely weathered; very to extremely weak; crushed mv *(continued)*		[38]	Continued 0% WCR
	62											
					>10						1208	
1734	63		3				1				1215	
							2		Highly weathered; very weak. Becomes highly fractured at 63.0';			
		23		96	>6	0	3		occasionally crushed at 63.8'		[72]	
	64						3		Intact and fr able			
							3 3		1: 60°, J, VN, Mn, Su, P , S			
					NA		3		2: 85°, J, N, Fe+Mn, Su, Wa, R 3: 30° 40°, J, T N, Mn, Su, P , ?+SR			
											1217	
1732	65										1224	Pump paper in hole to increase WCR unsuccessful
					NA							
	66	24		31		0	NR				[52]	
					NA				Core recovered as only gravel sized fragments			
	67											
1730					NA						1227	
											1234	
	68				NA							
		25		21		0	NR				[72]	
	69											
					NA							
1728											1236	
	70						NR				1243	
					NA							
	71	26		77		0					[39]	
					NA		1		1: 60°, J, ?, Mn, Su, P , S			
1726	72										1247	
					NA						1301	
	73						NR					
					NA							
		27		50		0					[48]	
	74											
1724					>10		1				1304	
	75								1: 60°, J, VN, Mn, Su, P , S		1328	
					NA							
	76						NR					
		28		36		0					[30]	
					NA							
1722	77											

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Project Number: 60393322

Log of Rock Core Boring CB-1

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	77	28	3	36		0			BASALT; light brown; completely weathered with some high y weathered casts; very to extremely weak; intensely fractured with Fe+Mn, Su. Core recovered as only gravel size casts mv *(continued)*		1333	Continued 0% WCR
	78				NA		NR				1356	
		29		68	NA	0			Becomes high y weathered; weak		[38]	
1720	79				NA		1 2		1: 40°, J, VN, Fe+Mn, Su, P , S 2: 80°, J, VN, Fe+Mn, Su, P , SR		1400	
	80				NA				Becomes completely weathered with some high y weathered casts; very to extremely weak; intensely fractured with Fe+Mn, Su. Core recovered as only gravel size casts		1410	
1718	81	30		27		0	NR				[52]	
	82				NA						1413	
					NA						1426	
1716	83	31		40	NA	0	NR				[75]	
	84				>10				Recovered some clayey matrix with more competent casts			
	85										1428	
					NA						1448	
1714	86	32		48		0	NR				[38]	
	87				NA						1452	
	88		4				1 1		Becomes moderately weathered; weak; intensely fractured and occasionally crushed; aphanitic		1502	0 5' slough/cave recovered at top of run
1712		33		100	>6	0			1: 60° 70°, J, VN ?, Fe+Mn, Su, Wa, VR		[29]	
	89						2		Crushed			
					NA		1		2: 10°, J, T VN, Fe+Mn, Su, P , SR Crushed		1507	
	90						M		Crushed		1518	
1710					NA		NR 1 2		Becomes gray sh brown			
	91	34		88	>10	0	3 3 2 2 3		Phaneritic 1: 30°, J, VN, Mn, Su, P , S 2: 75°, J, VN, Mn, Su, P , S	PT #1	[31]	
	92						4 2		3: 40° 50°, J, VN, Mn, Su, P , S 4: 15°, J, VN, Mn, Su, P , S		1523	
1708		35		67	>10	0	1				1532	
	93								1: 40°, J, ?, Mn, Su, Wa, R			

AECOM

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Log of Rock Core Boring CB-1

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	93		4		10		2 2 2 2 2 2 2 2		BASALT; gray sh brown; moderate y weathered; weak; ntense y fractured and oca y crushed mv *(continued)*			Continued 0% WCR
	94	35		67	0		2 3 3		← Crushed 2: 25°, J, VN, Mn, Su, P , S 3: 60° 70°, J, VN, Mn, Su, P , SR		[45]	
1706	95				NA		NR				1536	
	96				NA		1 1 1 1 2		1: 20°, J, N, Mn, Su, P , R 2: 50°, J, VN, Mn, Su, P , SR		1545	
	97	36		59	>10	0			} Crushed		[41]	
1704	98				NA		NR				1550	
	99				NA		NR				1600	
1702	100	37		74	>10	15*	1 2 2		1: 40°, J, VN, Mn, Su, P , S 2: 60°, J, VN, Mn, Su, P , S 3: 2" ves c e w th Qz nf ng 4: 30°, J, VN, Fe+Mn, Su, P , SR		[41]	*Rock does not meet soundness criteria for RQD calculation
	101				>10				} Very weak			
1700	102						3 4		▼ Becomes o ve gray; s ght y weathered; moderate y strong; h gh y fractured; ves cu ar w th stretched ves c es to 2"; oca y nf ed w th quartz		1605	
	103	38		83	4 >6	20	1 2 3 2 2 2 2 2 2		▼ Ves c es become ess stretched; 0.2" 0.7" n d ameter; w th ess quartz nf ng 1: 75° 85°, J, VN, Fe+Mn, Su, Wa, VR 2: 30°, J, VN, Fe+Mn, Su, P , SR 3: 85°, J, T, H+No, No, Wa (nc p ent)		1615 [36]	
1698	104				NA		2 1 2 2 M					
	105						NR				1620	
	106		5		NA 5		1 1 2 2 3		} Ca c te nf ed ves c es to 0.5"		1628	
1696	107	39		100	3	51	1 2 1 2		1: 50°, J, VN, Mn, Su, Wa P , SR 2: 40°, J, VN, Mn, Su, P , S 3: 20°, J, VN, Mn, Su, P , S		[37]	
	108				5		2 1					
	109						2				1634	

AECOM

Project: Proposed Water Storage Project
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Project Number: 60393322

Log of Rock Core Boring CB-1

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1694	109		5		4		1 1 1 2		BASALT; gray sh brown to o ve; s ght y to oca y moderate y weathered; strong; h gh y to ntense y fractured; porphyr t c w th 0.1" sub vert ca or ented p ag oc ase phenocrysts; ves cu ar w th equant ves c es to 0.3" w th trace quartz nf mv *(continued)*		1641	B Kozlowicz logging Continued 0% WCR PL 4856 psi
	110				5							
		40		100		14	2 3 3		1: 40°, J, N, Mn, Su, P , R 2: 25°, J, VN, Mn+Fe, Su, P , S SR 3: 10° 15°, J, VN, Mn, Su, P , SR 4: 50°, J, VN, Mn, Su, P , SR 5: 60° 70°, J, N, Mn+Fe, Su, P , SR R	PT #2	[35]	
1692	111				5		4 5					
	112						5 3					End of day 10/28/2015
					4		1		Becomes oca y ess ves cu ar and porphyr t c		1647	
	113						2 2				1004	Begin day 10/29/2015 AM water level=85 0' Pump paper in hole to increase WCR unsuccessful Continued 0% WCR
1690					4		1		1: 25° 30°, J, N, Mn+Fe, Su, P , SR 2: 10° 35°, J, N, Mn+Fe, Su, P Ir, SR R 3: 50°, J, N, Mn+Fe, Su, P , SR 4: 60°, J, N, Mn+Fe, Su, P , SR			
	114											
					5		1 1 3					
	115	41		100		36	2				[43]	
					2							
1688	116						3					
					2		4 3					
	117						3					
					5						1011	
	118						1 2 1 2		1: 10° 20°, J, N, Mn+Fe, Su, P Ir, SR R 2: 75°, J, N, Mn+Fe, Su, P , SR 3: 60°, J, N, Mn+Fe, Su, P , SR 4: 40° 50°, J, N, Mn+Fe, Su, P Ir, SR R		1018	
1686					4		3 3 4					
	119	42		100		17	1				[36]	
					3							
	120		6				3 4 3				1023	
1684					5		1				1031	Bit blocked off
	121						2 3					
					3				Becomes more ves cu ar to 0.2"			
	122						3 4		1: 90°, J, N, Mn+Fe, Su, P , SR 2: 30°, J, N, Mn+Fe, Su, P , SR 3: 20°, J, N, Mn+Fe, Su, P , SR 4: 60°, J, N, Mn+Fe, Su, P , SR 5: 50°, J, N, Mn+Fe, Su, P , SR			
					4		4					
1682	123	43		100		42					[33]	
					3		4					
	124						2 5					
					3		4 4					PL 2142 psi
	125											

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-1

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1680	125	43	6	100	3	42	1		BASALT; gray sh brown; s ght y to oca y moderate y weathered; strong; h gh y to oca y ntense y fractured; porphyr t c w th 0.1" rregu ar p ag oc ase phenocrysts; ves cu ar w th sma ves c es to 0.2"		1040	
	126				4		2 2 2		mv *(continued)* 1: 70°, J, VN, Fe+Mn, Su, P , SR 2: 45°, J, N, Mn+Fe, Su, P , SR 3: 25°, J, N, Mn+Fe, Su, P , SR 4: 85°, J, VN, Mn+Fe, Su, P Wa, SR 5: 5° 10°, J, N, Mn+Fe, Su, P , SR		1047	
	127	44		100		24	1					UC 2667 psi
1678					4		3				[37]	
	128						4					
					5		5 5 5					
	129						3 5		Becomes ntense y fractured; not ves cu ar		1053	
					>6		1				1101	Bit blocked off
1676	130	45		100		0	2 3		1: 50°, J, N, Mn, Su, P , SR 2: 40°, J, N MW, Mn+Fe+CR, Su+F , P , SR 3: 30°, J, VN, Mn+Fe, Su, P , SR		[24]	
					6		2 3 2				1105	
	131										1114	
					>6		1 2		1: 15°, J, N, Mn, Su, P , SR 2: 55°, J, N, Mn, Su, P , SR 3: 85°, J, N, Mn, Su, P , SR			
1674	132	46		70		0	1 3				[23]	
					NA		2					
	133								Recovered as d st nct rock fragments n top of Run 47	PT #3	1120	
					>6		1 2 2 2		Becomes dark gray; s ght y weathered; very strong; ntense y fractured; w th ca c te phenocrysts/ves c e nf ; no p ag oc ase		1307	
	134						2					
		47	7	100		0	3 3		1: 80° 90°, J, N, Mn+Fe, Su, P , SR 2: 20° 30°, J, N, Mn+Fe, Su, P , SR 3: 35° 45°, J, N, Mn+Fe, Su, P , SR		[19]	
1672					>6		3 2					
	135						2 1				1314	
					NA		NR				1323	Run 48 core fell out of inner barrel Trip rods to recover PL 19485 psi
							1		1: 15° 30°, J, N?, Mn+Fe, Sp, P , SR 2: 50° 60°, J, N?, Mn+Fe+Ca, Sp, P , SR			
	136						1 1					
		48		86	5	0	1				[17]	
1670							2 M					
	137						2					
					2		M				1331	
							1		1: 30°/70°, J, VN, Mn+Fe, Sp, P St, SR 2: 45°, J, N, Mn+Fe, Sp, P , SR		1423	
	138	49		100		70					[20]	
					>6		2				1426	
		50		100		0			Intense y fractured to crushed w th Mn+Fe, Su		1436 [18]	
1668	139										1438	
							1		1: 60°, J, N, Mn, Su, P , SR 2: 30°, J, N, Mn, Su, P , SR		1447	
					>6		2					
	140						3		3: 40° 45°, J, N, Mn+Fe, Su, P , SR 4: 20°, J, N, Mn, Su, P , SR			
							2					
					3		4		Becomes fresh; very strong; h gh y to moderate y fractured; w th abundant ca c te c asts and occas ona ve ns			
		51		100		62					[26]	UC 12543 psi
	141											

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-1

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	141		7				5		BASALT; gray sh b ue; fresh; very strong; h gh y to moderate y fractured; w th abundant ca c te c asts and occas ona ve ns mv *(continued)*			
1666		51	9	100	2	62	6					
	142								5: 20°, J, VN, No, No, P , SR 6: 40°, J, VN, No, No, P , SR		1455	
					0		M				1505	
	143											
					1		1					
1664									1: 30°, J, VN, Ca, Sp, P , SR 2: 70°, J, VN, Ca, Sp, P , SR			
	144						1					
					1				W thout ca c te phenocrysts			
	145	52		100		88					[33]	
					2		2					
1662							2					
	146								W thout ca c te phenocrysts			
					0							
	147											
							M				1514	
					0		M				1522	
			8									
	148						M					
1660					1							
	149						1					
									1: 15°, J, VN, No, No, P , SR 2: 40°, J, VN, No, No, P , SR			
					0							
	150	53		100		100					[38]	
							2 2					
1658					2							
	151											
					0							
	152											
											1530	
					0						1538	
1656												
	153											
		54		100	1	100					[30]	
							1		1: 45°, J, VN, No, No, P , SR			
	154									PT #4		
					0						1542	End of day 10/29/2015
											0756	Begin day 10/30/2015 AM water level=127 7'
	155											
1654					1							
		55		100		100	1				[25]	
	156											
					0							
	157										0802	

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-1

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	157		8		1		1		BASALT; gray sh b ue to dusky b ue; fresh; very strong; h gh y fractured; porphyr t c w th wh te, p nk, and b ack phenocrysts up to 0.3"		0802	
1652									mv *(continued)*			
	158	55		100	2	100	1		1: 40° 45°, J, VN, No, No, P , SR		[25]	
	159						1					
					0						0808	
1650											0818	
	160				1		1		1: 45°, J, VN, No, No, P , SR			PL 24509 psi
					1		M		2: 30°, J, VN, No, No, P , SR 3: 20°, J, VN, No, No, P , SR			
	161	56		100		84	1				[30]	
					2		2					
	162						3					
1648							2 2					
					4						0824	
							M				0835	
	163						1		1: 30°, J, VN, No, No, P , SR 2: 45°, J, VN, No, No, P , SR 3: 35°, J, N, Ca, Pa, P , SR			
					2		2					
	164						2					
1646					1							
	165	57		100		92	3				[33]	
					1		1					
	166											
					1							
1644							1		Decreas ng s ze of phenocrysts			
	167											
					1		3				0844	
											0850	
	168				1				1: 0° 5°, J, VN, Ca, Pa, P , SR 2: 55°, J, N, Ca+Ch, Pa, P , SR 3: 10°, J, N, Ca, Pa, P , R 4: 60°, J, VN, Ca, Sp, P , SR 5: 60°, J/V, N, Ca+Ch, F +Sp, P , SR			
1642	169						1					
					2		2 3					
	170	58		100		92	4				[30]	
					1							
	171											
1640					1		5					
	172						3					
							M				0900	
		59		100	2	82	1		0.2" 0.5" hea ed ca c te ve n		0909	
	173						2					

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-1

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	173		9						1: 20°, J, N, Ca+Ch, Pa+Su, P , SR 2: 40°, J, VN, Ca, Pa, P St, SR R 3: 80°, J, T, H+Ca+Ch, Pa+Sp, P 4: 50°, J, VN, No, No, P , SR 5: 30°, J, VN, No, No, P , SR			
1638		59		100	1	82	3 4 5		BASALT; dark gray; fresh; very strong; h gh y to moderate y fractured; porphyr t c w th wh te, p nk, and b ack phenocrysts and hea ed ca c te ve ns	PT #5	[30]	
	174				1		M				0913 1110	
	175				1				mv *(continued)*			
1636	176		10				1		0.5" 30° ght o ve ve ns/a terat on			
					0				1: 10°, J, VN, No, No, P , SR 2: 35°, J, VN, No, No, P St, SR R 3: 20° 30°, J/V, N, Ca, Pa, P Ir, SR R			
	177	60		100		100	2				[27]	
					1				0.5" 30° ght o ve ve ns/a terat on w th feathered marg ns			
	178											
1634					0				Abundant narrow ca c te ve ns			
	179						3				1121	
					1						1130	
	180											
					1				Narrow ca c te ve ns 1: 60°, J, VN, Ca, Pa, P , SR 2: 20° 25°, J, VN, No, No, P , SR			
1632	181						1					
					0				Narrow ca c te ve ns			
	182	61		100		94					[25]	
					1							
1630	183						2 2		30° rregu ar, w de ca c te ve n			
					1							
	184										1142	
					0		M				1152	
	185								Becomes dark gray w th moderate ye ow sh brown d ffuse bands			
1628							V 1					
					1				1: 50°, J, VN, No, No, P , SR 2: 30°, J, VN, No, No, P , SR 3: 60°, J, N, Ca, Sp, P , SR 4: 70° 80°, J, N, Ca, Sp, P , SR 5: 10°, J/V, N, Ca, F , P , SR			
	186						1					
					1							
	187	62		100		63	2 3				[28]	
							V		0.25" ca c te ve n 30°			
1626					4		2 3 1					
	188						4					
					4		1 4					
	189						1					

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-1

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	189	62	10	100	1	63	5 M M		BASALT; light gray; fresh to locally slightly weathered; very strong; moderately to highly fractured; porphyritic with calcite phenocrysts up to 0.2"		1203 1212	
1624	190		11		0				mv *(continued)*			
	191				0				1: 30°, J, VN, Ca, Pa, P , SR 2: 45°, J, N, Mn+Fe, Su, P , R 3: 40°/80°, Sh, N MW?, Fe+Mn+Sd+C , Su+Pa, P /Ir, R			
1622	192	63		100	1	92	1				[24]	
	193				1							
	194				1		2					
1620					3		3				1225	
	195						1				1232	
	196				0							
					1				1: 50°, J, N, Mn+Fe, Su, P , SR 2: 10° 20°, J, N, No, No, P Wa, SR (poss by mechan ca) 3: 30°, J, N, Mn+Fe, Sp, P , SR			
1618	197	64		100		86	2				[27]	
	198				0							
					1		3					
1616	199				2		3 3				1243	
	200								**TOTAL DEPTH = 199.7 FEET** **Caliper & Televiewer performed 10/30/2015 - Neat cement grout to surface on 10/31/2015**			
	201											
1614												
	202											
	203											
1612												
	204											
	205											

AECOM

Depth 0.0’ to 31.9'

Depth 31.9' to 62.5'

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-1 Boxes 1 and 2	Figure CB-1-1

Depth 62.5’ to 87.5'

Depth 87.5' to 105.3'

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-1 Boxes 3 and 4	Figure CB-1-2

Depth 105.3’ to 120.0'

Depth 120.0' to 133.9'

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-1 Boxes 5 and 6	Figure CB-1-3

Depth 133.9’ to 147.5'

Depth 147.5' to 161.4'

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-1 Boxes 7 and 8	Figure CB-1-4

Depth 161.4’ to 175.9'

Depth 175.9' to 189.8'

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-1 Boxes 9 and 10	Figure CB-1-5

Depth 189.8’ to 199.7'

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-1 Box 11	Figure CB-1-6

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-2

Sheet 1 of 12

Date(s) Dr ed	**10/27/2015-10/29/2015**	Logged By	**J. Tabor**	Checked By	**D. Simpson**
Dr ng Method	**HQ-3 Wireline Core**	Dr B t S ze/Type	**3 7/8" HQ Diamond AO Series 6**	Tota Depth of Boreho e	**178.0 feet**
Dr R g Type	**LF-70 Track-Mounted Rig**	Dr ng Contractor	**Ruen Drilling**	NAVD 88 Ground Surface E evat on	**1723-ft**
Groundwater Leve	**27-ft 10/29/2015**	Samp ng Methods	**HQ-3 Wireline**	Inc nat on from Hor zonta /Bear ng	**75° / 0°**
Boreho e Comp et on	**Neat cement grout to surface**	Locat on	**Axis 2 South, Geophysics line 2-2 and 2-4**	Coord nate Locat on	**N 2141236.7 E 6838747.3**

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Seismic Velocity, ft/sec [P wave S wave]	Packer Test Interva s	Drilling Time, 24 hr [Drilling Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	0		1		NA				SANDY SILT (ML); red; w th grave fragments RESIDUAL SOIL			0912	
1722	1				NA								
	2						NR						
		1		20	NA	NA						[21]	
1720	3				NA								Lost all water circulation return (WCR)
	4				3				BASALT; gray; s ght y weathered; strong to very strong; moderate y fractured mv				
1718	5				0							0926	
												0932	
	6				0				Becomes redd sh gray				
1716	7						1		Becomes h gh y fractured 1: 45°, J, T, Ca, Pa, P , S				
		2		100	3	88	1					[21]	
	8				5		1						
1714	9						1 1						
					6								
	10											0946	
					0							1002	
1712	11												
					3								
	12												
		3		100	4	100						[29]	
	13												

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-2

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Seismic Velocity, ft/sec [P wave S wave]	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1710	13		1		1				BASALT; redd sh gray; s ght y weathered; strong to very strong; moderate y fractured		PT #1A		1 blow to break core
	14	3		100	0	100	M		mv *(continued)*			1012	
1708	15				0							1014	
	16	4		100	1	100						[14]	
1706	17				1		1		1: 65°, V/J, N, Ca, F , Wa, ?				PL 21019 psi
	18	5	2	67	0	67						1026 1215 [14]	Advance 4" HWT casing to 5'
1704	19				0				Becomes dark gray; s ght y weathered to fresh; phaner t c; w th hornb ende fe dspar and quartz			1220 1231	
	20				2								
1702	21	6		100	0	100						[42]	
	22				0								
1700	23				0				Becomes aphan t c; strong			1237 1256	
	24				4						PT #1B		
1698	25	7		98	4	98			H gh y fractured			[20]	0% WCR
	26				4								
1696	27				1							1308 1320	
	28	8		100	0	80				11217 *4770*			
	29												

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-2

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Seismic Velocity, ft/sec [P wave S wave]	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	29		2						BASALT; dark gray; slightly weathered to fresh; strong; moderately to highly fractured; with calcite phenocrysts and veins				
1694		8		100	0	80						[19]	
	30								mv *(continued)*	18227 *10253*			
					1								UC 24095 psi
	31												
					3								
1692											PT #2		End of day
	32								← Becomes black; fresh; very strong; moderately fractured	18227 *11151*		1336	10/27/2015
			3									0815	Begin day 10/28/2015
		9		100	1	100						[12]	PL 32173 psi
							1		1: 45°, J, ?, ?, ?, P , ?			0820	
	33											0826	
					1								
1690	34									19299 *10628*			
					0				1: 60°, J/V, ?, Ca+Ch?, F , Wa, Sk 2: 70°, J, N, No, No, P , SR				
	35												
		10		100	1	60							
1688							M						
	36						2			20506 *11717*			Very difficult to break core with hammer
					1								
	37						M						
					0		M						
1686	38									20506 *10476*			
					0								
	39								← 3/4" dissolution void				
					0								
1684	40									21167 *11125*			
		11		100	0	84							
	41												
					1								
1682	42						1		1: 50°, J/V, ?, Ca, F , Wa, ?	21167 *9072*			
					3				} Iron oxide stained fractures				
	43								← Becomes massive			0910	
					0							0950	0% WCR Pump paper to attempt to regain WCR
		12		100		100				18748 *8874*			
1680	44				0								
	45												

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-2

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Seismic Velocity, ft/sec [P wave S wave]	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	45	12	3	100	0	100	M		BASALT; black; fresh; very strong; massive *(continued)*			[32]	
	46									20506 *8446*			
1678			4		0		M						PL 24724 psi
	47						M					0958	
					0							1002	
	48						M			20506 *11134*			
1676					0				Becomes strong				1 blow to break core
	49												
					0								
	50	13		100		100				21167 *11379*			
1674					0								
	51												
					0								
	52						M			20506 *9774*			
1672					0								
	53									19804 *11035*			
					0								
	54	14		100		100				18677 *12041*			
1670					0						PT #3		
	55								Becomes phaneritic			1304	
					0								
	56									19299 *10253*			
1668					0				Becomes slightly reddish black				
	57	15		100	0	100						[27]	
	58									19299 *10339*			
1666					0								
	59												
					0								
	60									19804 *10095*		1315	
		16	5	100	0	100							
1664	61												

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-2

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Seismic Velocity, ft/sec [P wave S wave]	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	61		5						BASALT; dark grey; slightly weathered to fresh; strong to very strong; massive; phaneritic				
		16		100	0	100			mv *(continued)*				
	62				0					18484 *9944*			
1662	63												
					0								
	64									20108 *9796*			
					0								
1660	65												
		17		100	0	100							
	66						M			18677 *9735*			
					0								
1658	67												
					0								
	68									19884 *9794*			
					0								
1656	69												
					1								
	70						1		1: 70°, J, N, Ca, F , P , SR	19884 *9868*			
		18		100	0	100							
1654	71												
					0								
	72									19224 *11122*			
					0								
	73												
1652			6										
					0								
	74									20421 *11224*			
					0								
	75						M						
1650		19		100	0	100							
	76						M			19224 *10653*			
					0								
	77												

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-2

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Seismic Velocity, ft/sec [P wave S wave]	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	77		6						1: 70°, J, N, Ca, Pa, P , SR BASALT; dark grey; s ght y weathered to fresh; strong to very strong; moderate y fractured; phaner t c				
1648		19		100	2	100	1		mv *(continued)*				
	78									19884 *10023*			
					1		1						
	79								1: 70°, J, N, Ca, F , P , SR				
1646					0								
	80									18484 *8658*			
		20		100	0	100							
	81												
1644					0								
	82									20421 *8989*			
					0		M M						
	83											1410	
												1552	
1642					0								
	84								Becomes h gh y fractured	19884 *9735*			
					1		M				PT #4		
	85						1						
							2		1: 70°, V/J, MW, Ca, F , Wa, ?				
1640		21		100	1	100	2		2: 70°, V, ?, H+Ca, F , P				
	86						3		3: 70°, J, VN, Ca, F , P , SR 4: 30°, J, N, Fe, Su, P , SR	17103 *8751*			
					4								
	87								Intense y fractured to crushed				
					1								
1638							4						
	88						M			16612 *8808*			
			7						1: 60°, J, N, Ca, Pa, P , SR				
					1		1		Becomes s ght y fractured				
	89												
					0								
1636													
	90						M			19587 *9189*			
		22		100	0	100							
	91												
					0								
1634													
	92						M			20506 *10670*			
					1								
							2		2: 60°, J, ?, Ca, F , P , ?				End of day 10/28/2015
	93											1640	

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-2

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Seismic Velocity, ft/sec [P wave S wave]	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	93		7		0		M		BASALT; dark grey; fresh; strong to very strong; slightly fractured; phaneritic mv *(continued)*			0745	Begin day 10/29/2015
1632	94				0					19965 *10586*			
	95				0								
		23		100	0	60							
1630	96				1		M 1		Becomes highly fractured 1: 70° 90°, V/J, MW, Ca, F , Wa+St, ?	19224 *11526*			
	97				1		M M						
1628	98				1		1		1: 70° 90°, V/J, MW, Ca, F , Wa+St, ?	20273 *12385*			
	99				2								
1626	100				1				Calcite filled vod/cavity	21776 *11262*			
		24		100		20							
	101				1								
1624	102				1				Calcite filled vod/cavity	19299 *11490*			
	103		8		1				Calcite filled vod/cavity			0845	
1622	104				1		1		1: 70° 90°, V/J, MW W, Ca, F , Wa+St, ?	20506 *10532*			
	105												
		25		100	0	64							
	106						M			20108 *11824*			
1620					1		2		2: 60°, J, N, Ca, F , P , S				
	107						M						
					0								
	108						M			19224 *10023*		0857	
1618		26		100	0	56							
	109												

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-2

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Seismic Velocity, ft/sec [P wave S wave]	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	109		8		1				BASALT; dark grey; slightly weathered to fresh; strong to very strong; highly fractured; phaneritic mv *(continued)*				
	110									19587 *10906*			
1616		26		100	1	56	M						
	111				1		1		1: 90°, J/V, ?, Ca+Fe, F +Su, Wa+St, ?				
					1		M						
	112									20108 *12911*			
1614					1								
	113								Becomes moderately fractured		PT #5	1157	
					0								
	114									19884 *12311*			
1612					1								
	115						1		1: 40°, J, VN, Ca, F , P , SR				
		27		100	0	100						[25]	
	116		9							19884 *11724*			
1610					0		M						
	117						M						
					0								
	118								Becomes highly fractured: 45° and 90° fractures with ron oxide staining	19884 *12785*		1209 1210	
1608					5								
	119												
					3								
	120						M						
										19299 *10644*			
1606		28		100	1	0							
	121												
					1								
	122						M			19685 *9564*			
							M						
1604					1				Becomes slightly fractured				
	123						M					1225	
					0								
	124	29		100		100	M			20506 *10828*			UC 18997 psi
					0		M						
1602	125												

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-2

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Seismic Velocity, ft/sec [P wave S wave]	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	125		9						BASALT; dark grey; slightly weathered to fresh; strong to very strong; slightly fractured; phaneritic				
		29		100	0	100	M						
	126						M		mv *(continued)*	20635 *11134*			
					0								
1600	127						M						2 blows to break core
					1		1		1: 75°, J, VN, Ca, F, P, R				
	128						M M			19884 *10179*		1242	
			10										
					0								
1598	129												
					0								
	130									20506 *9868*			
		30		100	0	100							
	131												
1596					0								
	132						M			20190 *9669*			
					1				Becomes highly fractured				
	133						1		1: 60°, J, VN, Ca, F, P, R				
1594									With larger phenocrysts and some partially calcite filled vesicles				
					2		M						
	134									20506 *8990*			
					3								
	135												
1592		31		100	0	100							
	136									19884 *8989*			
					2								
	137												
1590					2								
	138								With larger calcite filled vesicles	20190 *9181*		1259	
					3								
	139												
1588					3								
	140									18748 *9121*			
		32		100	1	64						[13]	
	141												

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-2

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Seismic Velocity, ft/sec [P wave S wave]	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1586	141		10		0		M		BASALT; dark grey; slight y weathered to fresh; strong to very strong; moderately fractured; phaneritic with larger phenocrysts; some partially calcite filled vesicles mv *(continued)*				
	142	32		100		64				19020 *9115*			
					0						PT #6		
	143											1323	
1584			11		1							1523	
	144						1		Becomes highly to occasionally moderately fractured 1: 85°, V/J, N, Ca, F, Wa St, R	20190 *9051*			
					1								
	145												
1582		33		100	2	36							
	146						1			18748 *9376*			
					2								
	147												
					1								
1580	148								Becomes banded aphanitic to phaneritic; flow bedding 30° 40°; no calcite filled vesicles	19884 *9382*			
					0								
	149												
					0								
1578	150						M			18484 *9374*			
		34		100	1	44							
	151												
					2		1 1		1: 30°, J, VN, Ca, F, P, S				
1576	152									17268 *9178*			
					3								
	153											1552	
					0								
1574	154						M			17735 *8931*			
			12		0								
	155												
		35		100	0	70							
1572	156									17896 *9429*			
					1		1		1: 50° 70°, J, N, Ca, F, Wa, SR				
	157												

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-2

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Seismic Velocity, ft/sec [P wave S wave]	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	157		12						BASALT; dark grey; slightly weathered to fresh; strong to very strong; highly fractured with calcite infilling, rough surfaces				
		35		100	1	70	1		mv *(continued)*	17896 *8413*			
1570	158				2								
	159				3								
1568	160									17896 *8692*			
		36		100	5	44							
	161				5								
1566	162									17896 *8485*			
					0								
	163											1626	
					0				Slightly fractured	15875 *8575*			
1564	164				0								
	165												
		37		100	1	96	1		1: ?, V/J, W, Ca, F , Wa, ?				
1562	166				1								
	167						2		2: ?, V, N MW, H+Ca, F , Wa				
					2		2						
	168		13										
1560					1		1 2		1: 45°, V, MW, H+Ca, F , P 2: 70°, J, VN, Ca, F , P , S				
	169								Becomes reddish gray; aphanitic				
					1		1						
	170						M						
1558		38		100	0	100	1						
	171								Partially calcite filled 2" fracture; some crystals are euhedra				
					2								
	172								Becomes slightly fractured				
1556					0								
	173											1653	

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-2

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Seismic Velocity, ft/sec [P wave S wave]	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	173		13		0				BASALT; redd sh grey; s ght y weathered to fresh; strong to very strong; s ght y fractured			1705	
	174								mv *(continued)*				
1554					0								
	175						M						
		39		100	0	100						[30]	
	176												
1552					0								
	177												
					0								
	178											1715	
									TOTAL DEPTH = 178.0 FEET **Caliper, Televiewer & OYO performed 10/30/2015 - Neat cement grout to surface on 10/31/2015**				
1550	179												
	180												
1548	181												
	182												
1546	183												
	184												
1544	185												
	186												
1542	187												
	188												
	189												

AECOM

Depth 0.0’ to 17.6'

Depth 17.6’ to 32.0’

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-2 Boxes 1 and 2	Figure CB-2-1

Depth 32.0’ to 46.0'

Depth 46.0’ to 60.0'

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-2 Boxes 3 and 4	Figure CB-2-2

Depth 60.0’ to 73.0'

Depth 73.0’ to 88.0'

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-2 Boxes 5 and 6	Figure CB-2-3

Depth 88.0’ to 101.8'

Depth 101.8’ to 115.6'

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-2 Boxes 7 and 8	Figure CB-2-4

Depth 115.6’ to 128.0'

Depth 128.0’ to 141.5'

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-2 Boxes 9 and 10	Figure CB-2-5

Depth 141.5’ to 154.3'

Depth 154.3’ to 168.0'

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-2 Boxes 11 and 12	Figure CB-2-6

Depth 168.0’ to 178.0'

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-2 Box 13	Figure CB-2-7

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-3

Sheet 1 of 17

Date(s) Dr ed	**11/3/2015-11/8/2015**	Logged By	**S. Janowski**	Checked By	**D. Simpson**
Dr ng Method	**HQ-3 Wireline Core**	Dr B t S ze/Type	**3 7/8" HQ Diamond AO Series 6 & ADT 8**	Tota Depth of Boreho e	**254.2 feet**
Dr R g Type	**LF-70 Track-Mounted Rig**	Dr ng Contractor	**Ruen Drilling**	NAVD 88 Ground Surface E evat on	**1883-ft**
Groundwater Leve	**228.3-ft 11/8/2015**	Samp ng Methods	**HQ-3 Wireline**	Inc nat on from Hor zonta /Bear ng	**60° / 180°**
Boreho e Comp et on	**Neat cement grout to surface**	Locat on	**Axis 2 North, Geophysics line 2-3**	Coord nate Locat on	**N 2142212.2 E 6838690.5**

E evat on, feet	Depth, feet	ROCK CORE Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %	Fracture Draw ng Number	L tho ogy	MATERIAL DESCRIPTION	Packer Test Interva s	Dr T me, 24 hr [Dr Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	0		1		NA		NR		CLAYEY SAND w th GRAVEL (SC); mo st; brown; w th cobb es up to 4"		1235	
	1								COLLUVIUM			
1882		1		48	NA	NA					[40]	
	2				NA							
	3								BASALT; ght brown; res dua so to comp ete y weathered; extreme y weak; soft to fr ab e; w th some rock fabr c; few h gh y weathered fragments up to 2"		1240	
									mv		1258	
1880	4				NA							
	5				NA							
		2		100	NA	NA					[55]	
1878	6				NA							
	7				NA							
											1303	
	8										1314	
1876					NA		NR					
	9				NA							
	10	3		73	NA	NA					[62]	
					NA							
1874	11				NA							
											1318	
	12										1326	
		4		100	NA	0						
	13											

Report GEO CORE OAK C B MAP File N D AECOM ROCK CORE GPJ 12/10/2015 CB-3

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-3

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	13											100% Water circulation return (WCR)
1872		4	1	100	NA	0			BASALT; light brown; residual soil to completely weathered; extremely weak; soft to friable; with some rock fabric; few highly weathered fragments up to 2"		[62]	
	14				NA				mv *(continued)* Becomes highly to completely weathered; very weak; soft and friable; mostly aphanitic and local porphyritic; manganese staining on fracture surfaces			
	15										1329	
											1336	
1870					NA							
	16				NA							
	17	5		100		0					[68]	
			2		NA							
1868	18										1339	
					NA						1411	Advance 4" HWT casing to 5'
	19				NA							
	20	6		100		0					[70]	
1866					NA							
	21				NA							
	22										1414	
											1423	
1864					NA							
	23						NR					
					NA							
	24											
		7		49	NA	0			Becomes yellowish brown; highly weathered; very weak; highly to intensely fractured: J, T, Mn, Su, P, S		[49]	
1862	25											
					>6							
	26											
					>10							
									Green shale		1429	
1860	27										1438	
					NA				Becomes completely weathered; very weak; friable			
	28	8		81		0					[39]	
					NA							
	29											

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-3

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	29	8	2	81	NA	0	NR		BASALT; light brown; completely weathered; very weak; friable; porphyritic. Becomes highly weathered; weak to moderately strong; intensely fractured; manganese staining on fracture surfaces at 29.5' mv *(continued)*		1442	
1858											1448	
	30	9		56	NA	0					[36]	
	31						NR				1451	
					NA		1		Becomes over black; slightly weathered; very strong; intensely fractured 1: 80°, J, VN, Fe+Mn, Su, P Wa, SR		1541	Driller indicates very hard drilling
1856	32	10		100		0	1				[14]	Casing fell 1' 60%-70% WCR Short runs due to bit blocking off
					>10				1: 85°, J, N?, Mn, Su, Wa, R		1546	
	33	11		100	>6	0	1		Highly weathered; very weak on half of core; slightly weathered; strong on other half at 1	PT#1A	1556 [24]	
1854	34		3		NA						1600	
		12		88		0	1 1		Becomes dusky blue; slightly weathered; strong		1608 [20]	50% WCR Cave-in after each run
	35				>10		1 1		1: 50° 60°, J, VN, Fe+Mn, Su, P Wa, S R		1613	
	36	13		100		0	1				[6]	
		14		100		0	M				[6]	
1852					>6		1				1645	
	37	15		100		0	1 1 1		1: 40° 60°, J, VN, Fe, Su, Wa, SR		[34]	
					8		1 1					
	38						M				1648	End of day 11/3/2015
		16		100	5	67	1		1: 10°, J, N, Fe, Su, P , R		0755 [9]	PL 36472 psi Begin day
1850											0759	11/4/2015
	39	17		100	6	0	1 1 1		1: 25°, J, N, Fe, Su, P , SR 2: 60°,J, T VN, Fe, Su, Wa, R		0853 [22]	AM water level=dry Advance 4" HWT casing to 15'
							2 2 M				0856	
	40						1 2				0902	
		18		100	7	0	2 2 2 3		1: 90°, J, VN, Fe+Mn, Su, Wa, R 2: 60° 70°, J, T VN, Mn+Fe, Su, Wa, R 3: 40°, J, VN, Fe, Su, P Wa, SR VR		[26]	
1848	41						3					
					>6		3		Becomes over gray and moderately over brown; moderately weathered; moderately strong			
	42										0907	
							1				0913	
					>10		2		1: 45°, J, VN, Fe+Mn, Su, P , SR 2: 80°, J, ?, Fe+Mn, Su, P , SR 3: 90°, J, VN, Fe+Mn, Su, Wa+St, R VR 4: 30°, J, VN, Fe+Mn, Su, P , SR			
	43	19		100		0	3 3 4				[27]	
1846					>10		2 4			PT #1B		
											0917	
	44	20		100		0					[30]	
		21		100	>10	0	1		1: 40°, J, VN, Mn, Su, P , S SR		0930	
	45											

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-3

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	45								2: 85°, J, VN, Mn, Su, Wa, SR			50% WCR
1844		21	3	100	>10	0	2 1 1 1		BASALT; olive gray and moderate olive brown; moderately weathered; moderately strong; intensely fractured. Becomes yellowish gray brown; high weathered; weak; occasionally crushed at 45.3'		[29]	
	46								mv *(continued)*		0934	
			4		>10						1020	Advance 4" HWT casing to 25'
	47	22		67		0					[30]	
					NA						1023	
1842	48						1 1 1		Becomes moderately weathered; moderately strong to strong		1029	Hole continues to cave-in after each run
		23		100	>10	0	1 1		1: 45° 80°, J, T VN, Mn+Fe, Su+Sp, Wa, SR S		[25]	
	49						1 1					
					>10		1 1 M				1034	
	50								Becomes moderately yellowish brown; high to moderately weathered; weak; vesicular with mineral infilled cavities		1042	
1840					>10		1 2		1: 75° 80°, J, VN, Fe+Mn, Su, Wa, R VR 2: 20°, J, N, Fe+Mn, Su, Wa, R			
	51	24		100		14			Crushed		[44]	
					6		2 2 1 2 2		Olive gray; slightly weathered; strong; high fractured; mineral infilled vesicles to 0.5"			
	52						1 1				1045	
					>10		1 1		1: 20° 50°, J, VN N, Fe+Mn, Su, Wa, R		1053	
1838	53	25		100		0	1		Crushed		[40]	
					6		1 1 1			PT#2		
	54						1				1056	
					>6		1		Becomes brownish gray; slightly weathered; moderately strong; high fractured; phaneritic with mineral infilled vesicles throughout			
1836	55						2					UC 6461 psi
					1				1: 40°, J, VN, Fe, Su, Wa, VR 2: 30°, J, N, Fe+Mn, Su, P , VR R 3: 50°, J, VN, Fe+Mn, Su, Wa St, VR 4: 40°, J, VN, Fe+Mn, Su, Wa P , R			
	56											
		26		100	1	70	2					
	57						3					
1834					2		3		Highly weathered; very weak			
	58											
					2		4		Many vesicles			
	59						4				1335	
							1		Becomes moderately brown; moderately weathered; weak to strong; intensely fractured		1340	
1832					9		1 1 1 1					
	60											
					>6				Locally crushed			Many blows to break core
			5				2		1: 15° 25°, J, N, Fe, Su, Wa P , SR R			
	61											

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-3

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	61	27	5	92	3	15	3		2: 50°, J, N, Fe+Sd, Su+Sp, Wa, R 3: 60°, J, N, Fe+Sd, Su+Sp, Wa, R BASALT; moderate brown; moderately weathered; weak to strong; highly fractured; phaneritic; calcite and minera nfilled vesicles. Slightly weathered; strong 61' 61.6'		[39]	50% WCR
1830	62	27		92	NA	15	NR		mv *(continued)* Crushed		1346	
	63				3		1 1		Becomes moderate brown and dark gray; slightly weathered; strong		1354	UC 10020 psi
1828	64				2		2		1: 50° 60°, J, N, Fe+Mn, Su, Wa, R 2: 10°, J, N, Fe+Mn+Sd, Su+Sp, Wa, R 3: 50° 60°, J, N, Fe+Mn+C , Su+Sp F , P , S SR			
	65	28		100	2	73	3 3				[41]	
	66				2		3 2 1					
1826	67				3		2 3				1400	
	68				3		1 1 2		Becomes slightly to moderately weathered; moderately strong; with occasional vesicles to 1". Highly weathered; very weak 67.8' 68.0'		1407	
1824	69	29		100	2 1	49*	3		1: 30°, J, N, Fe, Su, Wa, R 2: 50°, J, VN, Fe+C , Su+F Sp, P , S 3: 70°, J, VN, Mn+Fe, Su, P , SR 4: 60°, J, VN, Mn, Su, P , SR		[31]	PL 15603 psi *Rock does not meet soundness criteria for RQD calculation
	70						2 3					
	71				5		2 4 4		Becomes dusky blue; slightly weathered; strong		1415	
1822	72				5		M 1 2 1				1424	
	73	30		100	2	48	3 3 4		1: 60°, J, N, Fe+Mn+C +Sd, Su+Pa, P , SR 2: 25°, J, VN, Fe+Mn, Su, P , SR 3: 80°, J, T VN, Fe+Mn+C , Su+Sp, Wa P , SR R Becomes slightly weathered to fresh; strong to very strong		[29]	
1820	74				2		5 5 2 1		4: 20°, J, N, Mn, Su, Wa, VR 5: 60° 80°, J, VN, H+Mn, Su, P	PT #3	1430	
	75		6		4		M 1 1 1		1: 60°, J, N, Fe+Mn, Su, Wa P , SR R 2: 80°, J, T N, Fe+Mn, Su, Wa, ? 3: 40°, J, VN, Fe+Mn, Su, P , SR		1603	
1818	76				3		2 3 2					
	77	31		100	3	36	3 1				[28]	

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-3

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	77		6				1		BASALT; dusky blue; slightly weathered to fresh; strong to very strong; high y fractured; phaneritic; occas ona arge m nera nf ed ves c es			80%-90% WCR
		31		100	3	36	M					
1816	78						1 1 3		mv *(continued)*		1612	
									←Becomes fresh; moderately fractured		1618	
	79				3							
					0							
	80	32		100		100	M				[33]	
1814					0							
	81											
					0							
	82						M				1625	End of day 11/4/2015
											0838	Begin day 11/5/2015 AM water level=62 0' Change bit to ADT 8
1812					6							
	83						1 2 1		←Becomes slightly weathered; high y fractured			
					4							
							1		←Becomes moderately fractured			
	84											
		33		96	0	81			1: 60°, J, VN, Fe+Mn, Su, Wa, SR R 2: 35°, J, VN, Fe+Mn, Su, Wa, SR R		[29]	
1810	85											
					2		2 2		←Large calc te nf ed ves c e			
	86											
					0							
	87						M				0848	
1808			7									
					0							
	88											
					0							
	89						1		←Becomes high y fractured 1: 30° 60°, J, VN, Fe+Mn, Su, P Wa, SR 2: 85°, J, T VN, Fe+Mn, Su, Wa, R 3: 40°, J/V, MW, Qz+Fe+Mn, F +Su, Wa, SR			
1806		34		100	2	73						
	90						1 1 2 1					
					6							
	91						3					
					2		1 2					
1804	92						M				0907	
							1		1: 30°, J, VN, Fe+Mn, Su, Wa, R 2: 60° 70°, J, VN, Fe+Mn, Su, Wa, R		0918	
		35		100	2	59						
	93						2					

AECOM

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Log of Rock Core Boring CB-3

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	93		7						BASALT; dusky blue; slightly weathered to fresh; strong to very strong; moderately to highly fractured; phaneritic			85% WCR
		35		100	1	59	2 M		mv *(continued)*		[32]	
1802	94				2		2					
	95						2				0924	
					3		2				0932	
	96						1 1		1: 20°, J, VN, Fe+Mn, Su, Wa, SR R 2: 70°, J, VN, Fe+Mn, Su, Wa, R 3: 40°, J, T VN, Fe+Mn, Su, Wa St, SR R 4: 50°, J, VN, Fe+Mn, Su, P , S			
1800					0							
	97						2					
		36		100	2	80	2				[33]	
	98						3 3					
					4		3					
1798	99						1					
					0							
	100						4				0941	
					1		M				0948	PL 31803 psi
			8				1		1: 10°, J, VN, Ch, Su, St, SR 2: 40°, J, VN, Fe+Ch, Su, P , SR			
1796	101								← N MW F ow bedd ng am nat ons B=40°			
					0							
	102								← N MW F ow bedd ng am nat ons B=40°			
		37		100		93					[29]	
					0							
	103											
1794					1							
	104						2			PT #4	0956	
							1 2				1151	
					3		1					
	105						3		1: 65°, J, VN, Fe+Mn, Su, P , SR 2: 20°, J, ?, Fe+Mn, Wa, SR 3: 40°, J, VN, Fe+Mn, Su, Wa, R VR 4: 60°, J, T, Fe+Mn, Su, Wa P , SR R 5: 75°, J, T, H+?, Su, P (nc p ent) 6: 50°, B, MW, H+No, No, P			
					1							
1792	106						4					
		38		100	2	86	5					
	107						4		← Ca c te nf ed ves c e			
					1		3					
1790	108											
					2		3					
	109						3 6					

AECOM

Project: Proposed Water Storage Project
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Project Number: 60393322

Log of Rock Core Boring CB-3

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	109		8		0		M		BASALT; dusky blue; slightly weathered to fresh; strong to very strong; moderately to highly fractured; phaneritic		1214	85% WCR
							M		mv *(continued)*			
1788	110				1		1 2		1: 30°, J, VN, Fe+Mn, Su, Wa, SR 2: 60°, J, T, H+No, No, Wa (nc pent) 3: 40° 60°, J, N, Fe+Mn, Su, Wa, R 4: 90°, J, T, H+No, No, Wa+St, SR (nc pent, where open)			
	111	39		100	1	78					[20]	
	112						3		Becomes highly fractured			
1786					3		4 3					
	113						3 3					
					3		4 4					
							M					
	114						1				1229	
					4		2				1237	
1784							M		1: 30° 70°, J, ?, Fe+Mn, Su, Wa, R 2: 50°, J, T, Fe+Mn, Su, St, VR 3: 60°, J, VN, Fe+Mn, Su, Wa, R 4: 60°, V, W, H+Unk, F, P 5: 70°, J, VN, Fe+Mn, Su, Wa, R VR			
	115		9				3 2					
		40		100	3	21	3 4				[26]	
	116						2 3					
					5		2		Becomes green shale and brown shale; increased staining; healed/ incipient fractures common			
							2 5					
	117										1244	
1782					4						1249	
							M		1: 60°, J, T, H+Fe, Su, Wa 2: 70°, J, T, Fe+Mn, Su, Wa, R 3: 60°, J, VN, Fe+Mn, Su, Wa, R			
	118						1 1					
		41		100		0	2 1				[21]	
					8		3					
	119						3 3		Intense y fractured			
											1255	
1780					5		1		Aphantic		1308	
							2					
	120								Becomes gray shale brown; moderately weathered; moderately strong; some calcite infilled vesicles			
					4		2					
							3					
	121						1					
							4		1: 20°, J, VN, Mn, Su, Wa, R VR 2: 40°, J, VN N, Fe+Mn, Su, Wa+St, R VR 3: 30°, J, VN, Mn, Su, St, VR 4: 70°, J, T, H+Fe+Mn, Su, Wa, R (sometimes nc pent)			UC 1902 psi
		42		100	3	47*	4				[33]	*Rock does not meet soundness criteria for RQD calculation
1778	122						1					PL 16938 psi
							1					
					2		4					
	123											
					4				Highly weathered; very weak			PL 8163 psi
									Becomes gray shale black; fresh; very strong			
	124										1317	
1776							M				1330	
		43		100	5	92	1		1: 20° 40°, J, VN N, Fe+Mn, Su, Wa, R VR			
	125						1 1					

AECOM

Project: Proposed Water Storage Project
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Project Number: 60393322

Log of Rock Core Boring CB-3

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	125		9		1		1		BASALT; gray sh b ack; fresh; very strong; h gh y fractured; phaner t c; ca c te nf ed ves c es and m nera cav t es mv *(continued)*			
	126											
1774		43		100	1	92					[23]	
	127						1		Becomes moderate y fractured			
					1		1					
	128											
					0							
1772	129										1343	
			10				M				1351	
					0							
	130						1		1: 30°, J, N, Fe+Mn, Su, Wa lr, R VR 2: 60°, J, N, Fe+Mn, Su, Ir, R VR			
					2							
1770	131						2		H gh y fractured			
		44		100	2	96	1		Becomes s ght y fractured		[17]	
	132											
					0				Becomes ess to no ca c te nf ed ves c es and m nera cav t es; occas ona hea ed ca c te ve ns			
	133						M					
1768					0		3		3: 60°, V, T, H+Ca, Pa, Ir			Down for rig repairs End of day 11/5/2015
	134						M			PT #5	1408	
							M				0957	Begin day 11/6/2015
					0		1					
	135						1					
							1 1		1: 60° 80°, V, T MW, H+Ca, F , Wa+St			
1766					0		1 1					
	136						1					
		45		100	0	100					[20]	
	137											
					0							
1764	138						M					
					0							
	139						M				1012	
											1022	
					0							
	140	46		100		23	1		Becomes s ght y weathered; h gh y fractured 1: 60°, J, N, C +Fe, Sp+Su, P , SR R			0% WCR
1762					4		2		2: 60°, J, N, Fe+Mn, Su, P , R VR			
							2					
	141						3		3: 80°, J, ?, Fe+Mn, Su, Wa, R			

AECOM

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Log of Rock Core Boring CB-3

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	141	46	10	100	7	23	2 3 2		BASALT; gray sh b ack; s ght y weathered; strong; h gh y fractured; phaner t c. Becomes ntense y fractured at 141.7' mv *(continued)*		[12]	Difficult drilling Fluctuating 30%-50% WCR
	142				7		3 3 4 2					
1760							2 2 2 3 2					
	143				>6		1				1046	
	144	47	11	100	2	46	1 2 3 3		Becomes o ve gray; h gh y fractured 1: 60°, J, ?, Fe+Mn, Su, P , SR 2: 40°, J, VN, Fe+Mn, Su, P , SR 3: 80°, J, T, H+Fe+Mn, Su, Wa (nc p ent) 4: 60°, V, W, Qz+Unk, F , P , S w th 2" a terat on at top contact		1111 [24]	20% WCR
1758	145				0?		4					
	146						M				1117	
	147	48		100	1 4	0	1 2 1 1 1 2		1: 90°, J, N, Fe+Mn, Su, P Wa, SR 2: 25°, J, VN, Fe+Mn, Su, P Wa, SR R		1128 [33]	
1756	148						2 2				1132	
	149	49		100	4 6 7	11	1 1 1 2 2 1 1		1: 60°, J, VN, Fe+Mn, Su, Wa St, R VR 2: 20°, J, N, Fe+Mn, Su, Wa St, R VR Becomes ntense y fractured		1144 [37]	0% WCR 20% WCR
1754	150											
	151				7		2 3 3		3: 15°, J, VN, Mn, Su, P , S			
1752	152						3 1 M				1150	
	153	50		100	4 2	71	2 2 3 3 1		Becomes h gh y fractured 1: 70°, J, VN, Fe+Mn, Su, P , SR R 2: 20°, V, W, H+Qz+Unk, F , Wa w th contact a terat on 3: 30°, J, VN, Fe+Mn, Su, Wa, R	PT #6	1159 [24]	0% WCR 20% WCR
	154						1				1204	
1750							M				1336	Pump paper into hole to increase WCR
	155	51		100	3 9	0	1 1 2 3 4 4		1: 65°, J, VN, Fe+Mn, Su, Wa, SR 2: 20°, J, VN, Fe, Su, P , S 3: 60°, V, W, H+Qz+Unk, Fe+Mn, F +Su, P , R Becomes dark gray w th weathered se vages; ntense y fractured 4: 60°, J, T, Fe+Mn, Su, P , SR 5: 70° 85°, J, T, Fe+Mn, Su, Wa+St+Ir, R		[14]	
	156						2 1 5					40%-50% WCR
1748					>10		5 5					
	157										1349	

AECOM

Project: Proposed Water Storage Project
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Project Number: 60393322

Log of Rock Core Boring CB-3

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	157		12		1		1		BASALT; dark gray with brown weathered sleeves; slightly weathered to fresh; strong; highly fractured; phaneritic; with occasional vesicles, weathered mineral cavities and incipient fractures		1401	40%-50% WCR
	158						2					
					4		1/H		mv *(continued)*			
1746							3					
	159						1		1: 80° 90°, J, VN, Fe+Mn, Su, Wa, SR 2: 35° 45°, J, VN, Fe+Mn, Su, Wa, SR R 3: 15°, J, VN, Fe+Mn, Su, Wa, R 4: 70°, J, VN, Fe+Mn, Su, Wa, R			
		52		100	3	34	3				[38]	
	160						1/H					
					2		3					PL 20027 psi
							2					
1744	161						3					
					2		1/H					
							4					
	162						M				1409	
					2						1415	90%-100% WCR
							1		1: 45°, J, VN, Fe, Su, Ir, VR 2: 10°, J, N, Fe+Mn, Su, Wa, VR 3: 40° 50°, J, VN, Qz+Fe+Mn, Sp+Su, P Wa, SR R 4: 70°, J, T VN, Fe+Mn, Su, Wa, R (occasionally incipient)			
	163						2					
1742					4							
							3					
	164						4		Dark yellowish brown			
		53		100	4	58	4				[43]	
							3		Becomes porphyritic with aphanitic groundmass; with calcite infilled vesicles to 1" and minerale cavities			
	165						3					
					1				Becomes fresh			
1740							M					
	166											
					0		M					
							M					
	167						M				1422	
							1 1				1428	
					3		2		1: 60°, J, VN, Fe+Mn, Su, Wa, R 2: 20°, J, N, Fe+Mn, Su, P , SR			
1738	168											
					0							
	169											
		54		100	1	92	2		Becomes slightly fractured		[38]	
	170											
1736					0							
	171						M					
					0		M					
	172						M M				1436	
			13								1445	
1734		55		100	0	100						
	173											

AECOM

Project: Proposed Water Storage Project
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Log of Rock Core Boring CB-3

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	173	55	13	100	0	100			BASALT; dark gray; fresh; very strong; slightly fractured; porphyritic; with occasional calcite infilled vesicles	PT #7A	[40]	
	174						M		mv *(continued)*		1448	
					0						1629	
1732	175				0							
	176				0				Becomes highly fractured			
		56		100	1	100	1				[41]	
							M					
	177						M		1: 40°, J, VN, Mn, Su, P, S			
1730					1				2: 60°, J, VN, Fe+Mn, Su, P Wa, SR R			2-5 blows to break core
	178						2					
					1							
							2				1636	End of day 11/6/2015
	179										0805	Begin day 11/7/2015 AM water level=138 5'
1728					0							
	180											
					1		1					
							2		1: 50°, V, W, H+Qz+Unk, F, P Ir			
	181						3		2: 60°, J, T, Ca+Fe+Mn, Sp+Su, P, SR R			
		57		100	2	100			3: 25°, J, Fe+Mn, Su, Wa, SR R		[49]	
1726	182						3					
					0							
	183											
					1		2				0811	
	184										0823	
1724					1							
	185						1		1: 40°, J, T VN, Ch+Fe+Mn, Su, P, SR R			
					1		M		2: 90°, J, T, Fe+Mn, Su, Wa, SR (nc p ent at top)			
			14				1					2 blows to break core
	186	58		100	2	67	1				[44]	
1722	187						2					
					2		1					
	188											
					1							
1720	189						1				0830	
											0838	

AECOM

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Log of Rock Core Boring CB-3

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	189		14		4		1 1 1		BASALT; dark gray; fresh; very strong; high y fractured; porphyr t c mv *(continued)*			50%-60% WCR
	190				2		2		1: 25° 40°, J, VN, Fe+Mn, Su, P Wa, SR R 2: 85°, J, T VN, Fe+Mn, Su, Wa, R VR 3: 60°, J/Sh, VN MW, CR+Fe+Mn, F +Su, P , SR			
1718	191	59		100	2	56	1				[38]	
	192				2		3 3 1 2/M		Becomes moderately fractured; mostly aphan t c			
1716	193				0		M M				0846	
	194	60		100	1	100					0900 [33]	
	195				1		1 M		1: 60°, J, ?, Fe+Mn, Su, Wa, SR		0902 0914	
1714	196				2		1		Becomes slightly weathered; high y fractured 1: 50° 70°, J, VN, Fe+Mn, Su, Wa, R			4 blows to break core
	197	61		100	3	67	1 1				[47]	
1712	198				5		1 1 1 1		With occasional calcite infilled vesicles			
	199				4		1 2 M		Becomes slightly to moderately weathered; slightly vesicular 2: 80°, J, ?, Fe+Mn, Su, Wa, R		0920 0931	
1710	200		15		2?		1 M		Becomes dusky red; fresh; strong to very strong; high y fractured; aphan t c and phaner t c am nat ons throughout B=40°			15%-20% WCR
	201				1		2 M		1: 40°, J, VN, Fe, Su Sp, P , SR 2: 40°, B/J, VN, Fe, Sp, P , SR (poss b y mechan ca) 3: 65°, J, VN, Fe, Sp, P , SR (poss b y mechan ca)			
1708	202	62		100	2	71	1 1				[38]	
	203				1?		M 3					
	204				1		3/H					
1706	205						M				0939 0953	

AECOM

Project: Proposed Water Storage Project
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Project Number: 60393322

Log of Rock Core Boring CB-3

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	205		15		2		1 2		BASALT; dusky red; fresh; strong to very strong; highly fractured; amygdaloidal aphanitic and phaneritic B=40° mv *(continued)*			Continued 15%-20% WCR
	206				1		3 M		1: 80°, J, VN, Fe, Sp, P Wa, SR 2: 60°, J, VN, Fe+Ch, Sp, P , SR 3: 40°, J, VN, Fe+C , Sp, Wa, SR			
1704	207	63		100	3?	45	2 4		Phaneritic bed 4: 70°, J, VN, No, No, P , S (possibly mechanical) 5: 60° 90°, J, VN Fe, Su, Ir+St, VR		[37]	
	208				3?		5 2		Phaneritic bed			
	209						2 M				1000 1012	
1702	210				1		M 1		1: 40° 60°, J, VN, Fe+Mn, Su, P , SR 2: 80° 90°, J, T, H+Unk, ?, Wa (nc p ent)			
	211				1		2					
	212	64		100	2	96	1 1				[33]	
1700	213				0		M 1					
	214				2		1		Becomes olive gray; slightly to moderately weathered; moderately strong; highly fractured; phaneritic; vesicular		1021 1244	Pump paper into hole to increase WCR 50% WCR
1698	215		16		3		1 2 3		Dusky red; amygdaloidal			
	216	65		100	3	19	3 1		1: 90°, J, VN, Fe+Mn, Su, Wa, R 2: 50°, J, N, Qz+Fe+Mn, F +Su, P , R 3: 70°, J, T, Fe+Mn, Su, P , SR		[30]	
1696	217				3		M		Becomes olive gray and dusky red; slightly weathered; very strong; amygdaloidal B=40°; vesicular and phaneritic		1250 1303	
	218				2		1 1 M		1: 30° 40°, J, N, No, No, P , R 2: 35°, V, N, Qz, Pa, P , R			9 blows to break core
1694	219				0		M					
	220	66		100	1	88	2 1				[43]	0% WCR
	221				1							

PT #8A

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-3

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
												Continued 0% WCR
1692	221	66	16	100	1	88	M 3		3: 75°, J, VN, Fe+Mn, Su, Wa, R BASALT; olive gray and dusky red; slightly weathered; very strong; highly fractured; amnated aphanitic and phaneritic B=40°; vesicular mv *(continued)*		1310	
	222				1		M				1321	
	223						1 2		1: 60°, J, VN, Mn, Su, Wa, R 2: 30° 40°, J, T VN, Fe+Mn, Su, P Wa, R SR			
1690					3		2 2					
	224	67		100	2	80	2 2				[43]	
	225				1		2					
1688	226				0		M					
	227		17				M 1				1328 1336	
					2				Becomes dusky red throughout			
1686	228				2		2		1: 50°, J, T, Fe+Mn, Sp, P , SR 2: 70°, J, T, Fe+Mn, Sp, P , SR 3: 40°, J, VN			
					2		M					
	229						2					
		68		90	>6	48	3				[50]	
	230						3		Intense y fractured			
1684					>6		1 3					
	231						3					
					NA		2		Sma amount of sandy cay recovered			Last 6" of Run 68 very soft
	232								On y grave s zed c asts recovered		1342 1353	
1682		69		100	>6	0					[54]	
	233						1		Becomes fresh; s ght y fractured 1: 30°, J, ?, Mn, Su, P , R		1354 1412	
		70		100	0	100				PT #9		End of day 11/7/2015
	234						M				0845	Begin day 11/8/2015 AM water level=228 3'
					0							
1680	235						M 1 M		1: 40°, V, W, Ca, F , P , S			3 blows to break core 25% WCR
					0				Banded/ amnated B=40°			
	236											
		71		100	0	100					[27]	
	237											

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-3

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	237						M		2: 40°, V, T, H+Ca+Ch, Pa, P , S SR (mechan ca y broken)			25% WCR
1678			17		0		M/2		3: 40°, V, VN, H+Ca, F , P BASALT; dusky red; fresh; strong to very strong; s ght y fractured;			
	238	71		100		100	M/2		am nated aphan t c and phaner t c; occas ona hea ed ca c te ve ns mv *(continued)*			
					0		2					
							M					
	239						M				0856	
											0906	
1676					0							
	240											
					0							
							1 1		1: 30°, V, T VN, H+Ca, F , Wa+Ir			
	241						2		2: 40°, J/B, VN, Mn, Sp, P , R			
		72	18	100	1	100					[48]	
1674	242											
					0							
	243											
					0							
							M				0912	
	244										0925	
1672					0							
	245											
					0							
							M					1 blow to break core
	246	73		100	0	94					[39]	
1670	247											
					0				← Irregu ar hea ed ca c te ve ns			
	248											
					1		1		1: 80°, J, VN, Fe+Mn, Su, Wa, R			
1668	249						M				0933	
					1		1		1: 80°, J, VN, Fe+Mn, Su, Wa, R		0943	0% WCR
	250											
		74		100	0	84					[45]	
1666	251											
					0							
	252						M				0947	
											0957	
		75		100	0	100						
	253											

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-3

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1664	253	75	18	100	0	100	M		BASALT; dusky red; fresh; strong to very strong; slightly fractured; aphanitic and phaneritic mv *(continued)*		[44]	Continued 0% WCR
	254										1000	End of day 11/8/2015
1662	255								**TOTAL DEPTH = 254.2 FEET** **Caliper & Televiewer performed 11/9/2015 - Neat cement grout to surface on 11/9/2015**			Begin day 11/9/2015 AM water level=226.0'
	256											
	257											
1660	258											
	259											
	260											
1658	261											
	262											
1656	263											
	264											
1654	265											
	266											
1652	267											
	268											
	269											

AECOM

Depth 0.0’ to 17.3'

Depth 17.3’ to 34.1'

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-3 Boxes 1 and 2	Figure CB-3-1

Depth 34.1’ to 46.2'

Depth 46.2’ to 60.6'

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-3 Boxes 3 and 4	Figure CB-3-2

Depth 60.6’ to 74.0'

Depth 74.0’ to 86.9'

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-3 Boxes 5 and 6	Figure CB-3-3

Depth 86.9’ to 100.6'

Depth 100.6’ to 115.0'

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-3 Boxes 7 and 8	Figure CB-3-4

Depth 115.0’ to 129.1'

Depth 129.1’ to 143.7'

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-3 Boxes 9 and 10	Figure CB-3-5

Depth 143.7’ to 157.0'

Depth 157.0’ to 172.0'

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-3 Boxes 11 and 12	Figure CB-3-6

Depth 172.0’ to 185.5'

Depth 185.5’ to 199.7'

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-3 Boxes 13 and 14	Figure CB-3-7

Depth 199.7’ to 214.0'

Depth 214.0’ to 227.0'

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-3 Boxes 15 and 16	Figure CB-3-8

Depth 227.0’ to 241.2'

Depth 241.2’ to 254.0'

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-3 Boxes 17 and 18	Figure CB-3-9

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-4

Sheet 1 of 10

Date(s) Dr ed	**11/10/2015-11/12/2015**	Logged By	**S. Janowski / B. Kozlowicz**	Checked By	**D. Simpson**
Dr ng Method	**HQ-3 Wireline Core**	Dr B t S ze/Type	**3 7/8" HQ Diamond ADT 2**	Tota Depth of Boreho e	**154.5 feet**
Dr R g Type	**LF-70 Track-Mounted Rig**	Dr ng Contractor	**Ruen Drilling**	NAVD 88 Ground Surface E evat on	**1883-ft**
Groundwater Leve	**Not encountered before rotary wash**	Samp ng Methods	**HQ-3 Wireline**	Inc nat on from Hor zonta /Bear ng	**60° / 0°**
Boreho e Comp et on	**Neat cement grout to surface**	Locat on	**Axis 2 North, Geophysics line 2-4**	Coord nate Locat on	**N 2142219.5 E 6838690.4**

E evat on, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %	Fracture Draw ng Number	L tho ogy	MATERIAL DESCRIPTION	Packer Test Interva s	Dr T me, 24 hr [Dr Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	0		1		NA				SANDY CLAY w th GRAVEL (CL); ye ow sh red; 30% subrounded basa t GRAVEL to 2"; 20% f ne to coarse gra ned SAND; 50% med um p ast c ty FINES RESIDUAL SOIL		1108	S Janowski logging
	1	1		14	NA	NA	NR					
1882	2				NA							
	3										1118	
					>6				BASALT; ght brown; comp ete y weathered; extreme y weak; soft mv			
1880	4	2		100	>6	0	1 1 1 1 2 2 1 2 1		H gh y weathered; weak to very weak; ntense y fractured 1: 40°, J, T, Fe, Su, P , ? 2: 70°, J, T VN, Fe+Mn, P , S SR		[53]	
	5				NA		1					
	6										1122	
1878					NA		NR				1127	
	7						1 2		Becomes moderate y weathered; weak to moderate y strong; h gh y fractured; phaner t c w th p ag oc ase phenocrysts 1: 80°, J, VN N, Mn, Su, Wa, R 2: 40°, J, N MW, Mn+C +Fe, Su+Pa, Wa, R 3: 60°, J, VN, Mn, Su, Wa, R 4: 30°, J, VN, Fe+C , Su+F , P , ?			
					5		2 2					
	8	3		88		0	3 2		Comp ete y weathered; washed out		[48]	Advance 4" HWT casing to 5'
1876					6		1 1					
	9						4 4 1		Comp ete y weathered; very to extreme y weak; soft Becomes gray sh o ve; ntense y fractured			
					>6		2 1 1					
	10						2					
											1132	
					>6		1 3 3 1		Becomes moderate o ve brown 1: 40°, J, N, Mn, Su, Wa St, R 2: 60°, J, N, Mn, Su, Wa, R 3: 80° 90°, J, VN, Mn, Su, Wa, R		1205	
1874	11	4		100		100	1 2 2 2				[40]	
					>6		3		Becomes h gh y weathered; very weak; fr ab e			
	12						1				1208	
		5		100	>6	14*	2 2		Becomes o ve gray; moderate y weathered; strong; h gh y fractured 1: 60°, J, ?, Mn+Fe, Su, P , S (nc p ent)		1213	PL 4813 psi
	13						2					

Report GEO CORE OAK C B MAP File N D AECOM ROCK CORE GPJ 12/10/2015 CB-4

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-4

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	13						3		2: 50°, J, T, Mn+Fe+C , Su+Sp, P , S (nc p ent)			100% Water circulation return (WCR)
1872		5	1	100	7	14*	4		3: 80°, J, VN, Mn+Fe+C , Su+F , Wa, R		[26]	*Rock does not meet soundness criteria for RQD calculation
	14						4		4: 10° 20°, J, N MW, C +Fe+Mn, Su+F , Wa, R			
							5		5: 50°, J, MW W, C +Fe+Mn, F +Su, P , SR R			
							5		6: 40°, J, VN, Fe+Mn, Su, P , R			
							1		BASALT; o ve gray; moderate y weathered; strong; h gh y to	PT #1		
					4		6		ntense y fractured; phaner t c w th p ag oc ase phenocrysts.		1218	
							1 2		Becomes dusky b ue; s ght y weathered; strong to very strong; h gh y		1223	
	15						2		fractured at 14.5'			
							M		mv *(continued)*			
1870					1		M		1: 70°, J, VN, Fe+Mn, Su, Wa, R			
									2: 70° 90°, J, VN, Fe+Mn, Su, St, VR			
									3: 20°, J, W, C +Fe+CR, F +Su, Wa, R			
	16						3		Becomes moderate y fractured			PL 38940 psi
		6		100	3	81	M				[42]	
			2				M					
	17											UC 26636 psi
					0							
1868	18											
					4							
							4		Becomes ntense y fractured, am nated		1229	
							1		1: 20°, J/B, VN, Fe+Sd+S , Su+Pa, P , S		1236	
	19						2		2: 70°, J, VN, Fe+Mn, Su, Wa, R			
							1		3: 20°, J/V, W, Qz+Fe+S +Sd+CR, F +Su, P , S			
					8		3		Gray sh ye ow			
		7		100		13	1 1		4: 20°, J, ?, Fe, Su, P , S		[69]	
	20						4 1		O ve gray			
1866							1					
					5		5		5: 90°, J, N, C +Sd+Fe, F +Su, Wa, R			
							6		6: 40°, J, MW, C +Fe, F +Su, P , SR			
	21						M				1238	
							1				1245	Short runs due to bit blocking off
					>6		2					
		8		100		0	1		1: 20° 30°, J, Qz+Ch+Fe+Mn, Pa No+Su, P Wa, SR R			
	22						2 2		2: 80°, J, VN N, C +Fe+Mn, F No+Su, Wa, R		[20]	
1864							1					
					>6		1				1250	
	23										1255	
		9		13	NA	0			Becomes comp ete y weathered; extreme y weak; soft; w th competent c asts		[48]	
	24										1257	
					NA						1303	Washed clasts at top of Run 10
1862									C ay w th sand and grave s ze fragments			
	25	10		100		0			Becomes moderate y weathered; moderate y strong to strong;		[36]	
					>6				ntense y fractured			
	26								1: 70°, J, N, C +Sd+Fe, F +Su, P , R		1306	
									Becomes s ght y weathered; strong; h gh y fractured		1311	
					4		1		1: 90°, J, N, Fe+Mn, Su, Wa+St, R			
							2		2: 50°, J, VN, Fe+Mn, Su, P , R			
	27								3: 20° 30°, J, MW, Fe+Mn+C , Su+Sp No, P Wa, SR R			
1860									4: 70°, J, N, C +Fe+Mn, F +Su, Wa, R			
					3		3		5: 60°, J, N, Fe+Mn, Su, P , SR			
	28	11		100		14	3				[56]	PL 14372 psi
							4					
							3					
					5		3		O ve gray; moderate y weathered; moderate y strong; w th red			
							5		c ay on fractures			
	29											

Report GEO CORE OAK C B MAP File N D AECOM ROCK CORE GPJ 12/10/2015 CB-4

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-4

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	29								BASALT; olive gray; slightly to moderately weathered; strong; intensely fractured; phaneritic with plagioclase phenocrysts mv *(continued)*			100% WCR
1858		11	2	100	>6	14					1315	
	30	12		100		0					1322 [14] 1325	Bit binding
					>6				Becomes banded medium olive brown and gray sheared; moderately strong to strong; aphanitic		1334	
	31	13	3	100	>10	0			1: 20°, J/B, T, Mn, Su, P, S SR 2: 60° 90°, J, VN, Fe+Mn, Su, Wa, S SR 3: 40°, J, ?, Fe+Mn, Su, P, S SR		[30]	
1856												
	32				>6						1338	
											1346	
	33	14		100	9	0			1: 15°, J, VN, Fe+Mn, Su, St, VR 2: 50°, J, VN, Fe+Mn, Su, Wa, R 3: 85°, J, N MW, Fe+Mn, Su, Wa, R		[60]	
1854	34									PT #2	1348	
					>6				Becomes moderate yellow brown; moderately weathered; weak; high to intensely fractured		1527	75% WCR
	35								1: 80° 90°, J, VN, Mn, Su, Wa+St, R VR 2: 10° 30°, J, VN, Mn+Fe, Su, P, S SR 3: 60°, J, VN, Mn+Fe, Su, P, R			
					5							
	36											
1852		15		100	3	7					[42]	
	37								Becomes dark gray; slightly weathered; strong; with calcite infilled veins and plagioclase phenocrysts			
					8							PL 31339 psi
	38											
					4						1533	
1850	39										1539	
					6				1: 10° 30°, J, VN, Mn, Su, Wa P, SR R 2: 30°, V/J, N, Qz+Ch+C, F, P, SR			
	40								Becomes dusky yellow green; slightly to moderately weathered; intensely fractured			
		16		100	10	16			Moderate yellow sh brown, and gray sh yellow green 40.6' 40.8'		[57]	
1848	41											
					6				Becomes dark gray; with red clay on fractures 3: 80°, J, N, C+Mn+Fe, F+Su, Wa, S			
	42											
					4						1543	
									1: 80°, J, N, C+Mn+Fe, F+Su, Wa, S 2: 15° 30°, J, VN, Mn+Fe, Su, P, SR		1548	
1846	43								Moderate yellow sh brown			
					10							
	44		4						Gray sh yellow green			
					1							
	45	17		90		33			Highly fractured			

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-4

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	45		4		4				H gh y fractured		[58]	
1844							3 4		BASALT; dark gray; s ght y to moderate y weathered; strong; ntense y fractured w th red c ay on fractures; phaner t c w th p ag oc ase phenocrysts			
	46	17		90		33	5 5		mv *(continued)*			
					NA				3: 60°, J, MW, C , F , P , S SR 4: 50°, J, T VN, Mn, Su, Wa, R 5: 50° 75°, J, VN N, C +Fe+Mn, Pa No+Su, Wa, R			
	47						NR				1553	
					NA						1559	Driller indicates soft drilling in 3 spots during Run 18 No recovery is likely from 3 undetermined locations within core *Rock does not meet soundness criteria for RQD calculation
1842	48						1		Becomes moderate brown; moderate y to h gh y weathered; weak to moderate y strong; h gh y to ntense y fractured 1: 50°, J, VN, Mn, Su, P , S SR 2: 15°, J, VN, Mn, Su, P , S SR			
					5		2 2					
	49								H gh y weathered; very weak; crushed; 1/4" quartz ve n			
					>6		1					
		18		75		25*					[51]	
1840	50						1					
					3							
	51						1					
					NA							
	52						NR					
											1605	
1838					NA				Becomes o ve gray; moderate y weathered; moderate y strong 1: 20°, J, N, Fe+Mn, Su, Wa, R 2: 40° 50°, J, N, Fe+Mn, Su, Wa, R 3: 70°, J, N, Fe+Mn, Su, Wa, R		1613	Bottom of Run 18 and top of Run 19 match
	53						1 1					
		19		100	6	0	2 1				[40]	
	54						2		Becomes moderate brown; h gh y weathered; weak			
							3			PT #3	1616	End of day 11/10/2015
					8						0918	Begin day 11/11/2015 AM water level=40 5'
1836							1					
	55						1		Poss b e vo d zone			
					NA		NR					
	56						2		Becomes gray sh b ue green; s ght y weathered; strong; h gh y fractured; ca c te nf ed ves c es and m nera cav t es			
					2		1					
									Becomes moderate y fractured 1: 10° 25°, J, VN N, Fe+Mn, Su, Wa, R 2: 60°, J, T, Fe+Mn, Sp, Wa, VR			
	57	20		92		56					[38]	
1834					0							0% WCR
	58						M					
					0							
	59											
							M		Becomes dark gray 1: 40°, J, ?, Fe, Su, Wa, R 2: 80°, J, N, Fe+Mn, Su, Wa, R		0926	
1832		21	5	94	3	52					0936	50% WCR
	60						1		Intense y fractured			
					NA							
							2		Becomes h gh y fractured			
	61											

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-4

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	61	21	5	94	3	52	2 3		3: 20°, J, VN, Mn, Su, St, VR BASALT; dark gray; slightly weathered; strong; highly fractured mv *(continued)*		[47]	Continued 50% WCR
1830	62				1		M				0940	UC 17808 psi
	63	22		91	2	38	1 2 3 4		1: 80°, J, N, C +Fe, Sp+Su, Wa, R 2: 70°, J, TN, H+Fe, Su, Wa, R (nonplanent) 3: 70°, J, T, Fe, Su, Wa, R 4: 30°, J, VN, Fe+Mn, Su, P, R		0947 [51]	
1828	64				4		2		Infilled vesicle to 1"			
	65				NA		3 5		Becomes olive gray 5: 50°, J, VN, C +Fe+Mn, Sp+Su, Wa, VR		0951	
	66	23		100	>10	0	NR		Becomes moderate brown; moderately weathered; moderately strong; intensely to highly fractured		1022	Rod chatter 0% WCR Difficult drilling
1826	67				6		1 1		1: 85°, J/V, N, Unk+Fe+Mn, F +Su, Wa, SR R		[45]	
	68				>6				Highly weathered; weak			
1824	69				4		1 2				1026	
	70	24		100	5	14*	2 2 2 2 2		1: 40° 90°, J, N, Unk+Fe+Mn, F +Su, P, S 2: 40° 60°, J, TN, Fe+Mn, Su, P Wa+St, SR R		1056 [54]	Rod chatter PL 2440 psi
1822	71				3		2					
	72				>6		2 M M				1100	
	73	25	6	100	5	20	1		1: 55°, J, N, C +Mn, Pa+Su, Wa, R 2: 80°, J, ?, Fe+Mn, Su, Wa, R Dark gray; slightly weathered; strong		1111 [60]	
1820	74				6		2		Becomes highly weathered along fracture zones 1: 80° 90°, J, N, Mn+Fe, Su, P, SR 2: 50 60°, J, N, Mn+Fe Su, Ir, R 3: 50°, J, N, Mn+Fe+C, Su+Pa, P, SR 4: 10° 30°, J, VN, Mn+Fe, Su, Ir, R 5: 50°, J, N, Mn+Fe, Su, P, SR R	PT #4	1113 1242	B Kozlowicz logging Pump paper into hole to increase WCR
	75	26		100		45*	1					
1818	76				3		2 3					
	77				4		4 5		Gray; slightly weathered			

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-4

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	77	26	6	100		45*	6		BASALT; dark yellowish brown to olive gray; moderately weathered; moderately strong to locally weak; highly to locally intensely fractured; plagioclase and mafic phenocrysts to 0.2"; vesicles partially infilled with calcite		[49]	*Rock does not meet soundness criteria for RQD calculation
					6		6 6					
1816	78						7 8		mv *(continued)*			
					3		8		6: 20° 30°, J, N, Mn+Fe+Ca, Su+Sp, P , SR 7: 70° 80°, J, N, Mn+Fe, Su, P Ir, R 8: 60°, J/V, N MW, Mn+Fe+Ca, Su+Pa Sp, P , SR			
	79										1248	
					1		1		With fewer vesicles		1255	
	80											
1814					3		1 2		1: 70°, J, N, Mn+Fe, Su, P , SR 2: 30°, J, N, Mn+Fe, Su, P , SR 3: 30° 60°, J, N, Mn, Su, P St, SR			25% WCR PL 2112 psi
	81	27		100		61*	3				[37]	PL 3797 psi *Rock does not meet soundness criteria for RQD calculation
					2		2					
	82											
					2						1300	
1812							1				1308	0% WCR
	83						1 1					
					3		1		1: 60°, J, N, Mn+Fe, Su, P , SR 2: 40°, J, N, Mn+Fe, Su, P , SR R 3: 75°, J, N, Mn+Fe, Su, P , SR 4: 35° 50°, J, N, Mn+Fe, Su, P Wa, SR 5: 80° 85°, J, N, Mn+Fe, Su, P St, SR			PL 1994 psi
	84						2					
					3		2					
1810	85	28		100		16*					[50]	*Rock does not meet soundness criteria for RQD calculation 25% WCR
					2		3					
							1					
	86						4					
					3		1					
							1					
	87											
1808							5					
					NA		1		Becomes moderately to highly weathered; weak to moderately strong		1314	
			7			NR					1325	100% WCR
	88								Gray shallow purple; highly weathered; very weak			
					1		1					
	89								1: 70°, J, VN T, Mn+Fe, Su, P , ? (nc p ent) 2: 40°, J, N, Mn+Fe, Su, P , SR R 3: 30°, J, N, Mn+Fe, Su, P , R 4: 50°, Sh, MW, Mn+Fe+C , Su+Sp, P , SR 5: 70°, J, N, Mn+Fe, Su, P , SR			
1806		29		89		36*	2				[54]	*Rock does not meet soundness criteria for RQD calculation 75%-100% WCR
					2							
	90						3 4					
					2		5					
	91								Completely weathered; extreme weak		1329	
							1				1336	
					4		1 1		Becomes moderately to locally slightly weathered 1: 60° 70°, J, N, Mn+Fe, Su, P , SR R 2: 55° 60°, J, N, Mn+Fe, Su, P , SR 3: 60°, J, VN, H+Mn+Fe, Su, P Ir			
1804	92											
					3		2					
							2					
	93	30		100		56*	3				[29]	

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-4

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	93		7				4 4		4: 10° 15°, J, N, Mn+Fe, Su, P , SR 5: 75°, J, N, Mn+Fe+C , Su+Pa, P , SR			*Rock does not meet soundness criteria for RQD calculation
		30		100	2	56*			BASALT; dark ye ow sh brown to o ve gray and med um gray; moderate y to oca y s ght y weathered; moderate y strong to strong; h gh y fractured; p ag oc ase and maf c phenocrysts; ca c te nf ed ves c es			
1802	94						5 5		mv *(continued)*	PT #5	1343	
					2				1: 30°, J, N, Mn+Fe, Su, Ir, R 2: 40°, J, N, Mn+Fe, Su, P , R 3: 60°, Sh/F, MW, Mn+C +CR, Su+F , P , SR		1510	Continued 75%-100% WCR
	95						1					PL 2112 psi
					3		2 3		H gh y weathered a ong fractures			
	96						4					
1800					4		4		4: 20°, J, N, Mn+Fe, Su, P , SR			
	97	31		100		40*			5: 30° 70°, J, N, Mn+Fe, Su, P Wa, SR 6: 70°, J, VN, Mn, Su, P , SR		[50]	*Rock does not meet soundness criteria for RQD calculation
					3		4 6		7: 10° 40°, J, VN, Mn, Su, Wa, SR 8: 10° 20°, J, VN, Mn+Fe, Su, Wa, SR			
	98						7 7		9: 60°, J, N, Mn, Su, P , SR 10: 40°, J, N, Mn+Sd, Su+F , P , SR			
					3		8					
1798	99						10 9				1516	
					3						1522	
	100						1		1: 30°, J, N, Mn, Su, P , SR			
					2		2 1		2: 20° 60°, J, N, Mn, Su, Ir, R 3: 65°, J, VN, Mn+Fe, Su, P , SR			
1796	101						3		4: 40°, J, N, Mn+Fe+Sd, Su+Pa, P , SR 5: 60°, J, N, Mn+Fe+Sd, Su+Pa, P , SR			
					3		2		6: 50°, J, N, Mn+Fe, Su, P , R 7: 75°, J, VN, Mn, Su, P , SR			
	102	32	8	100		33*	4 5		8: 60°, J, N, Mn+Fe, Su, P , R 9: 40°, J, VN, Mn+Fe, Su+Sp, P , SR		[49]	*Rock does not meet soundness criteria for RQD calculation
					4		6 2		10: 60°, J, VN, Mn, Su, P , SR 11: 10°, J, N, Mn+Fe, Su+Sp, P , SR			
	103						7 6					
1794					3		8					
	104						9 10					
					3		11 1				1528	
											1538	
	105								1: 40°, J, N, Mn+Fe, Su, P , SR			
					4		3 2		2: 70°, J, N MW, Mn+Fe+C , Su+Pa, P , SR 3: 60°, J, N, Mn+Fe, Su, P , SR			
1792									4: 85° 90°, J, N, Mn+Fe, Su, P , SR			
	106	33		100		14*	3 3 4		5: 15°, J, N, Mn+Fe, Su, Ir, R 6: 65°, J, N, Mn+Fe+Sd, Su+F , P , SR		[42]	*Rock does not meet soundness criteria for RQD calculation
					5		3 5					
	107						6					
							3 3		Intense y fractured			
					>6		4 4					
1790							5 1				1543	
	108						1		Becomes med um gray; s ght y to moderate y weathered; strong; w thout phenocrysts		1551	
		34		100	4	17						
	109						2 2					

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-4

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	109						2		BASALT; medium gray; slightly weathered; strong; highly fractured mv *(continued)*			Continued 75%-100% WCR
		34	8	100	4	17			1: 85° 90°, J, N, Mn+Fe, Su, P , SR		[36]	
	110						2 3		2: 65° 70°, J, N, Mn+Fe, Su, P , SR 3: 50°, J, N, Mn+Fe, Su, P , SR			
1788					3				4: 40°, J, N, Mn, Su, P , SR			
							2					
							2 4				1556	
	111						1				1605	
					>6		1		Broken; disturbed			
							2		1: 30°, J, N, Mn+Fe, Su, P , SR			
	112								2: 60°, J, N, Mn+Fe, Su, P , SR 3: 85° 90°, J, N, Mn, Su, P , SR			
		35		100	0	47			4: 20°, J, N, Mn+Fe+Sd, Su+F , P , SR 5: 50°, J, N, Mn+Fe, Su, P , SR		[37]	
1786									6: 20°, J, N, Mn+Fe, Su, P , SR			
	113						3					
					6		4					
							1 5					
							2 6				1610	
	114						1		1: 80°, J/V, N MW, Mn+Fe+Sd+Ca, Su+F , P , SR		1625	
					4		2		2: 45°, J/Sh, N, Mn+Fe+Ca, Su+Pa, P , Sk (rake at 90°) 3: 70°, J, N, Mn+Fe, Su, P , SR			
1784	115						2		Becomes porphyritic 4: 10°, J, N, Mn+Fe, Su, P , R			
					4		3		5: 35°, Sh, MW, Mn+Fe+CR, Su+F , P , SR			
							3		6: 85°, J, N, Mn+Fe, Su, P , SR			
	116		9									
		36		100	0	45					[40]	
	117											
1782					2		4					
							5					
	118						3		Becomes aphanitic			
					5		6					
							1				1632	
	119						1		1: 30°, J, N, Mn+Fe, Su, P , SR		1639	
							1		2: 85°, J, N, Mn+Fe+Ca, Su+Sp, P , SR			
1780					6		2		3: 30°, Sh, MW, Mn+Fe+CR, Su+F , P , SR			
							1 3		Highly weathered and sandy			
	120						4 5					
		37		100		0	4		Becomes porphyritic 4: 60° 70°, J, N, Mn+Fe, Su, P , SR		[54]	
					4		4		5: 15° 30°, J, N, Mn+Fe, Su, P Ir, R			
	121						5					
							4					
							4		Highly weathered; disturbed; with weathered calcite 0.2" wide		1642	
							4		Becomes slightly weathered to fresh; strong to very strong		1651	
1778					3							
	122						1		1: 80° 90°, J, N, Mn+Fe, Su, P Wa, SR			
					3		2		2: 35° 40°, J, N, Mn+Fe, Su, P , SR			
	123											
		38		100		45	2				[47]	
					2							
	124											
1776							2			PT #6		PL 39779 psi End of day 11/11/2015
					1						1655	
		39		100		52	M				0932	Begin day 11/12/2015
	125											

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-4

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	125		9		0				BASALT; medium gray; slightly weathered to fresh; strong to very strong; highly fractured; porphyritic with plagioclase and mafic phenocrysts to 0.1"			AM water level=65.4' Continued 75%-100% WCR
	126								mv *(continued)*			
1774					4		1 2					
	127	39		100		52	3		1: 25°, J, N, Mn+Fe, Su, P , SR 2: 80°, J, VN, H+Mn+Fe, Sp, P , SR (where open) 3: 60° 70°, J, N, Mn+Fe, Su, P , SR		[43]	
					4		4 3 3		4: 50°, J, N, Mn+Fe, Su, P , SR 5: 20° 40°, J, N, Mn+Fe, Su, Wa, SR			
	128						5 5					
					5		1 1 3					
1772	129						3				0939	
					1		M 1				0948	
	130		10				1 1		0.75" highly weathered between 2 fractures (#1)			
					3				1: 70°, J, N MW, Mn+Fe+Ca, Su+Pa+Sp, P , SR 2: 60°, J, N, Mn+Fe, Su, P , SR			
1770	131						2		3: 90°, J, N, Mn+Fe, Su, P , SR 4: 30°, J, N, Mn+Fe, Su, P , SR			
					2		3		5: 40° 60°, J, N, Mn+Fe, Su, P St, SR 6: 10° 20°, J, N, Mn+Fe+Sd, Su+Pa, P St, SR			
	132	40		96		38	4		7: 20°, J, N, Mn+Fe, Su, P , SR		[43]	
					4		5 6					
	133											
1768					2		1					
							7					
	134						7 7				0955	
					4		7				1008	
	135						1		1: 70°, J, N, Mn+Fe, Su, P , SR 2: 50°, J, N, Mn+Fe, Su, P , SR			
					1		2		3: 10°, J, N, Mn+Fe, Su, P , SR 4: 30°, J, N, Mn+Fe, Su, P , SR			
1766									5: 80°, J, N, Mn+Fe+Ca, Su+Pa, P , SR 6: 20°, J, N, Mn+Fe+Sd, Su+Pa, P , SR			
	136						3 4		7: 90°, J, N, Mn+Fe, Sp, P , SR			
					6		3 3					
	137	41		100		22	4 4		←0.1" weathered rock fragment		[59]	
					>6		5					
1764							4					
	138						4 3					
					5		4					
	139						3 6					
							6					
					5		6 7				1013	
	140						3		1: 10° 20°, J, N, Mn+Fe, Su, P , SR		1022	
							1 1		2: 70°, J, N, Mn+Fe, Sp, P , SR			
1762		42		100		55	1 2		3: 40°, J, N, No, No, P , R			
					5		1					
							1 1 1 3		Dark yellowish brown; moderately weathered; moderately strong			
	141											

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Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322

Log of Rock Core Boring CB-4

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	141		10						BASALT; brown sh gray to pa e brown; s ght y weathered; strong; h gh y fractured; ves cu ar somet mes nf ed w th ca c te; porphyr t c w th p ag oc ase and maf c phenocrysts to 0.1" mv *(continued)*			
	142	42		100	2 / 4	55	4 / 4				[46]	
1760							4 5		Becomes gray sh red purp e; w th 20° f ow bands w thout phenocrysts. H gh y weathered; weak; c ayey 142.7' 143.0'			
	143				4 / 3		5 5		4: 60° 70°, J, N, Mn, Sp, P , SR 5: 20° 25°, J, N, Mn, Sp, P , SR			
	144						6				1028	
			11				1 2				1041	
1758	145				4 / 5		3 / 2		1: 55° 60°, J, N, No, No, P , SR 2: 15°, J, VN, No, No, P , S SR 3: 40°, J, N, No, No, P , SR 4: 10°, J, N, No, No, P , R			
							1 2					
	146	43		100	5 / 5	33	4 1 / 4 1				[49]	
							1 2					
	147				4		2 / 2					
1756							2 / 1					
	148						M				1046	
							1				1054	
	149				1 / 2				Becomes green sh gray to gray sh b ue w th gray sh red purp e bands; coarse gra ned (vo can c brecc a); very strong			
1754							2					
	150	44		100	2	81	1 / 1		1: 60°, J, N, Fe, Sp, P , SR 2: 30°, J, N, No, No, Ir, R 3: 40°, J, N, Fe, Sp, P , SR		[53]	
	151						3					
1752					0							
	152						2				1059	
					3		1				1110	
	153						2 / 1		1: 10°, J, N, Mn+Fe, Su, P , SR 2: 65°, J, N, Fe, Sp, P , SR			
		45		100	1	63					[60]	
1750	154				NA						1112	End of day 11/12/2015
									TOTAL DEPTH = 154.5 FEET **Caliper & Televiewer performed 11/12/2015 - Neat cement grout to surface on 11/13/2015**			
	155											
	156											
1748												
	157											

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Depth 0.0’ to 16.8'

Depth 16.8’ to 30.5'

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-4 Boxes 1 and 2	Figure CB-4-1

Depth 30.5’ to 43.5'

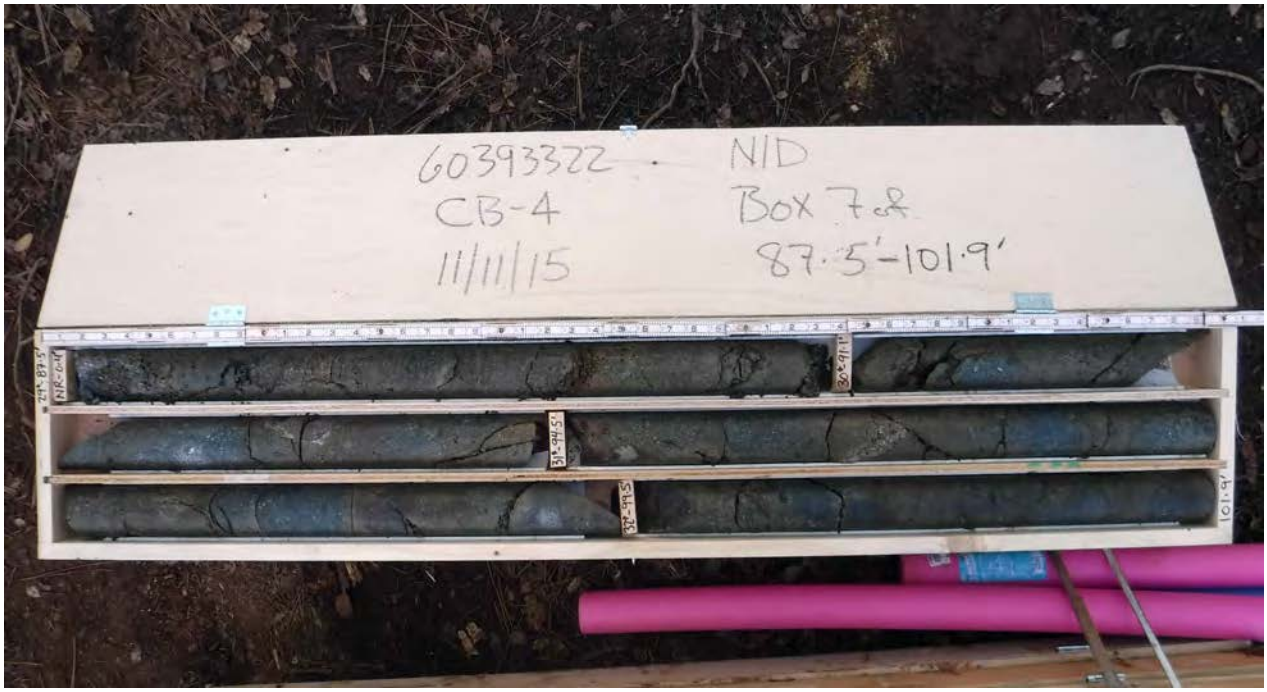
Depth 43.5’ to 59.4'

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-4 Boxes 3 and 4	Figure CB-4-2

Depth 59.4’ to 73.1'

Depth 73.1’ to 87.5'

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-4 Boxes 5 and 6	Figure CB-4-3



Depth 87.5’ to 101.9'

Depth 101.9’ to 115.7'

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-4 Boxes 7 and 8	Figure CB-4-4

Depth 115.7’ to 129.7'

Depth 129.7’ to 144.0'

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-4 Boxes 9 and 10	Figure CB-4-5

Depth 144.0’ to 154.5'

AECOM	Nevada Irrigation District Proposed Water Storage Project Project Number 60393322	Rock Core Photos Boring CB-4 Box 11	Figure CB-4-6

Project: Proposed Water Storage Project **Project Location: Nevada and Placer Counties, CA** **Project Number: 60393322/60503855**	**Log of Rock Core Boring CB-10** Sheet 1 of 13

Date(s) Dr ed	**6/14/2016-6/17/2016**	Logged By	**B. Kozlowicz**	Checked By	**S. Janowski**
Dr ng Method	**HQ-3 Wireline Core**	Dr B t S ze/Type	**3 7/8" HQ Diamond**	Tota Depth of Boreho e	**202.8 feet**
Dr R g Type	**LF-70 Track-Mounted Rig**	Dr ng Contractor	**Ruen Drilling**	NAVD 88 Ground Surface E evat on	**1759-ft**
Groundwater Leve	**40.9-ft 6/28/2016**	Samp ng Methods	**HQ-3 Wireline**	Inc nat on from Hor zonta /Bear ng	**60° / 0°**
Boreho e Comp et on	**1.0-in Sch 40 PVC Piezometer**	Locat on	**Axis 2 South - CFRD Plinth**	Coord nate Locat on	**N 2141070.3 E 6839017.2**

E evat on, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %	Fracture Draw ng Number	L tho ogy	MATERIAL DESCRIPTION	We D agram	Packer Test Interva s	Dr T me, 24 hr [Dr Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	0								CLAYEY SAND w th GRAVEL (SC); oose; dark brown ALLUVIUM				**Well: 4-in Steel Stovepipe Box at surface**
1758	1												Advance 5" HWT casing to 2 5'
	2												
	3	1	1		NA							1133	
1756		1		68	NA	NA			LEAN CLAY w th GRAVEL (CL); st ff; strong brown; angu ar var ab y weathered Basa t GRAVEL; sma roots COLLUVIUM			[44]	
	4				NA		NR					1136	
	5											1150	**Well: 1-in PVC solid well casing -3.5'-42' in neat cement grout**
1754					NA								
	6	2		100		0			BASALT; gray sh to ye ow sh brown; comp ete y weathered; extreme y weak; w th weak rock fabr c RESIDUAL SOIL/SAPROLITE			[52]	
					NA								
	7								BASALT; b u sh to med um gray and ye ow sh brown; s ght y weathered and oca y comp ete y weathered up to 4"; very weak to strong; h gh y to ntense y fractured; porphoryt c w th Ca c te nodu es and J, W, Fe+Mn+C , Su+F up to 2" mv			1153	
					>6							1219	Advance 5" HWT casing to 3 5' 90%-100% Water Circulation Return (WCR)
1752	8	3		100		0						[40]	
					>6								
	9											1222	
					NA				Becomes h gh y to comp ete y weathered; very to extreme y weak			1231	
	10	4		100		0						[26]	
1750					NA								
	11											1235	
					NA							1242	
	12	5		40		0						[30]	
					NA		NR						
1748	13											1246	

Report GEO CORE OAK C BMP WELL File N D AECOM ROCK CORE GPJ 1/16/2017 CB-10

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-10

Elevation, feet	Depth, feet	Run No.	Box No.	ROCK CORE Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Weldiagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	13		1						BASALT; yellowish brown; high to completely weathered; very to extremely weak; high to intensely fractured mv *(continued)*			1257	90%-100% WCR
		6		77	NA	0						[26]	
	14						NR					1300	
					NA		1		Bush to medium gray; slightly weathered; strong			1305	
1746	15						1		1: 60°, J, N, Mn+Fe+C, Su+F, P, SR				
		7		91	NA	0						[44]	
	16												
					NA		NR					1308	
	17								Grey, slight weathered; strong			1314	
1744									Becomes dark yellowish brown; high to occasionally completely weathered; very to occasionally extremely weak; high fractured				
		8		67	NA	17						[48]	
	18												
					NA		NR					1317	
	19		2									1314	
					NA		1						
1742	20								1: 70°, J, N, Mn+Fe+C, Su+F, P, SR				
					NA								
	21	9		100		0						[16]	
					NA		2		2: 30°, J, MW, Mn+Fe+C, Su+F, P, SR				
							3		3: 60°, J, N, Mn+Fe, Su, P, SR				
1740	22						1 4		4: 40° 50°, J, N, Mn+Fe, Su, P, SR				
					NA		3						
							4						
	23						2					1329	
					NA				40° 50° clayey shear zone			1336	
	24								Completely weathered; extreme weak; clayey				
1738					NA								
	25												
		10		98	5	0						[50]	
	26						1		1: 25°, J, MW, Mn+Fe+C, Su+F, P, SR				PL 681 psi
1736					2								
	27												
					>6								
	28											1342	
		11		89	5	0	1		1: 30°, J, MW, Mn+Fe+C, Su+F, P, SR (disturbed)			1348	
1734	29												

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-10

Elevation, feet	Depth, feet	Run No.	Box No.	ROCK CORE Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Well Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	29								BASALT; dark yellowish to reddish brown; high to occasionally moderately and completely weathered; very weak; high fractured; Fe&Mn staining on fractures and occasionally coated; with Calcite nodules				90% WCR
	30	11	2	89	NA	0	2 2		mv *(continued)*			[41]	
					NA		NR		2: 10° 20°, J, N, Mn+Fe, Su, P , SR			1352	
1732	31						1					1358	
					5		2 1		Moderately weathered; weak 1: 40° 50°, J, N, Mn+Fe, Su, P , SR 2: 20° 30°, J, N, Mn+Fe+C , Su+Pa, P , SR				
	32	12		87		0	1					[46]	
					NA		1 2 2						
	33						NR 2		Becomes highly to moderately weathered; very weak 1: 20°, J, N, Mn+Fe, Su, P , SR 2: 50°, J, N, Mn+Fe+C , Su+Pa, P , SR 3: 30°, J, N, Mn+Fe, Su, P , SR 4: 5°, J, N, Mn+Fe, Su, P , SR 5: 60° 65°, J, N, Mn+Fe, Su, P , SR			1401 1411	
1730			3		2		1 2						
	34						3						
					2								
	35						1						
		13		100	3	0	4 5					[50]	
1728	36						1						PL 963 psi
					4		3						
	37						5						
					5		5 1		Becomes highly weathered				**Well: Bentonite pellets seal 36'-39'**
1726	38											1417 1425	
					NA								
	39								W de, vuggy Calcite veins				
					NA								
	40	14		98		0						[53]	**Well: #2/12 Sand filter pack 39'-52'**
1724					NA								
	41												
					NA								
	42												
					NA		1					1430 1436	
1722	43						1		Becomes highly to moderately weathered; weak 1: 0° 10°, J, N, Mn+Fe, Su, P /Ir, SR R (washed out)				
					NA		1						
		15		88		0							
	44						1 1						**Well: 1-in PVC 0.020 slotted well casing 42'-52'**
					NA								
	45												

AECOM

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Log of Rock Core Boring CB-10

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Well Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
									ROCK CORE				
1720	45		3	88	2	0	1 2		BASALT; redd sh to dark ye ow sh brown; h gh y to moderate y weathered; weak; h gh y fractured; aphan t c to phaner t c w th Ca c te nodu es mv *(continued)*			[44]	90% WCR UC 705 psi
	46	15		88	NA	0	1 1		1: 20° 30°, J, N, Mn+Fe, Su, P , SR 2: 5°, J, N, Mn+Fe, Su, P , SR				
	47						3		3: 70° 90°, J, N, Mn+Fe, Su, P , SR				
1718					NA		NR					1443	
			4				NR					1518	Advance 5" HWT casing to 7 5'
	48				NA								
	49						1 2		Becomes b u sh gray; s ght y weathered; very strong; h gh y to moderate y fractured; aphan t c; w th rregu ar Ca c te nodu es up to 0.75"(nf ed ves c es) oca y d sso ved a ong fractures; w th Ca c te ve ns 1: 10°, J, N, Mn+Fe, Su, P , SR 2: 30° 45°, J, N, Mn+Fe, Su, P Wa, SR 3: 0° 5°, J, N, Mn+Fe, Sp, P , SR 4: 35°, J, N, Fe, Su, P , SR (at bottom of 0.5" Ca c te ve n)				
1716					2		3						
	50	16		91	0	68						[45]	
	51				0						PT #1		
1714	52				1		4		← 35° 0.5" Ca c te ve n				
							1					1525	
	53											1535	
					1		2		1: 40°, J/V?, Ca+Ch, F +Su, P , SR (run break) 2: 20°, J, N, Mn+Fe, Su, P , SR (at top of 0.3" Ca c te ve n) 3: 70°, J, VN, Fe, Sp, P , SR 4: 10°, J, VN, No, No, P , SR 5: 60°, J, N, Fe+Ca, Su+F , P , S				
1712	54				0								
	55	17		100	1	100	3					[42]	
	56						V		← 0.5" Ca c te ve n				
1710					1		4						
	57						5						
					1							1542	PL 14838 psi
	58											1550	
					0								
1708	59												
					0								
	60												
		18		100	2	78	1 2		1: 15°, J, VN, Fe, Su, P , R 2: 80°, J, N, Fe+Ca, Su+Pa, P , SR			[43]	**Well: Neat cement grout 55'-202.8'**
	61						2						

AECOM

Project: Proposed Water Storage Project
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Project Number: 60393322/60503855

Log of Rock Core Boring CB-10

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Weld Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1706	61		4				2 1		BASALT; bluish to greenish gray with dusky red/purple; slightly weathered; very strong; highly to moderately fractured; with Calcite nodules and veins				
	62	18		100	4	78	1						
							3		mv *(continued)*				
					0				3: 0° 10°, J, VN, No, No, P , SR 4: 30°, J, N, Fe, Su, P , SR (run break)				
							4					1557	
	63		5				M					1619	
1704					1		1		1: 35°, J, VN, No, No, P , SR 2: 15°, J, N, Fe, Su, P , SR 3: 60°, J, N, Mn+Fe+Ca, Su+F , P , SR 4: 10°, J, VN, No, No, P , SR				
	64				0								
	65	19		100		90	2				PT #2	[44]	
					2		3 V						
1702	66				1		2						
	67						4						
					2		2						
												1626	End of day 6/14/2016
	68											1047	Begin day 6/15/2016
1700					2		1 2		1: 40° 80°, J, N, Fe, Su, Wa, SR 2: 30°, J, N, Fe, Su, P , SR 3: 40°, J, N, Fe, Su, P , SR 4: 30°, J, VN, No, No, P , SR 5: 60°, J, VN, Fe, Sp, P , SR 6: 50°, J, VN, Fe, Sp, P , SR				
	69						2						
					3		3						
	70						4						
1698		20		100	3	69	4					[44]	
	71						5 2						
					2		2						
							3						
	72												
					2		4 5		Becomes moderately fractured				
1696												1054	
	73											1102	
					0								
	74						1		1: 45°, J, T, No, No, P , SR 2: 30°, J/V, N MW, Fe+Ca, Sp+F , P , SR (1" J, W along Calcite vein)				
					1								
1694	75	21		100		98						[43]	
					0								
	76		6				2 2						
					2								
	77												

AECOM

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Log of Rock Core Boring CB-10

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Weld Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	77						M		3: 70°, J/V, N, Ca, F , P St, SR				
1692		21	6	100	1	98	3		BASALT; b u sh gray; s ght y weathered to fresh; very strong; h gh y to moderate y fractured; aphan t c and porphoryt c w th maf c phenocrysts to 0.15"; w th Ca c te nodu es and ve ns mv *(continued)*			1109	
	78				1							1117	
	79						1		1: 45°, J, VN, No, No, P , SR (top of 0.25" Ca c te ve n) 2: 70°, J/V, N, Ca, F , P , R 3: 55°, J, VN, No, No, P , SR				
1690					0								
	80						2						
		22		100	1	100						[44]	
	81												
					0								
1688	82												
					1		3		Becomes s ght y fractured				
	83						M					1124	
												1136	
	84				0								
1686													
	85				0								
		23		100		100						[44]	
	86						1		Becomes h gh y to moderate y fractured 1: 65°, J, VN, Ca, Pa, P , SR 2: 50° 70°, J, N, Mn+Fe, Su, P /Ir, SR 3: 25°, J/V, N, Ca, F , P , SR (J n 0.25" Ca c te ve n)				
1684					1								
	87						2 3						
					2								
	88											1143	
					1				Become b u sh to green sh gray; w thout maf c phenocrysts 1: 10°, J, VN, Fe, Sp, P , SR (top of 0.15" Ca c te ve n) 2: 75°, J, N, Fe, Su, P , SR (run break)			1158	
1682	89						1/V						
			7		0								
	90												
		24		100	1	100	1					[43]	
1680	91												
					1		1						
	92												
					2		1				PT #3	1205	
	93						2						

AECOM

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Log of Rock Core Boring CB-10

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Weld Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1678	93		7		4		1		BASALT; blue gray to green gray; slightly weathered to fresh; very strong; highly to occasionally moderately fractured; aphanitic and porphyritic with green gray phenocrysts to 0.2"; with Calcite nodules			1354	
	94				1		2 3 4		mv *(continued)*				
	95	25		100	2	60	4 4		1: 30°, J, T, No, No, P, SR 2: 0° 5°, J, N, Fe, Su, P, SR 3: 60°/10°, J, VN, Fe, Sp, P/St, SR 4: 15° 20°, J, N, Fe, Su, P, SR 5: 85°, J, N, Fe, Su, P, SR 6: 70°, J, N, Fe, Su, P, SR			[48]	
1676	96				3		4 5						
	97				5		4 6 4 2						
1674	98				3		1 2 3		1: 10°, J, ?, Fe, Su, P, SR (run break) 2: 60°, J, N, Fe, Su, P, SR 3: 50°, J, VN, Ca, Pa, P, SR			1400 1407	
	99				2		4		Open vesicles with dissolved Calcite nodules				
	100						3 4		Open vesicles with dissolved Calcite nodules				
1672		26		100	2	75	5		4: 15°, J, MW, Ca, Pa, P, R (vuggy with 1" Calcite nodule/vein)			[45]	
	101				2		6 7		5: 30°, J, N, No, No, Wa, R 6: 20°/60°, J, VN, No, No, P/St, SR				
	102				0		7 M M M M		7: 0° 10°, J, VN, No, No, P, SR				
1670	103		8		0							1414 1425	
	104				1		1		1: 60°, J, VN, Ca, Pa, P, SR 2: 10° 15°, J, VN, Ca+Uk (Ch?), Pa, P, SR				
1668	105	27		100	1	94						[38]	
	106				1		2 2						
	107				0								
1666	108											1433 1448	
	109	28		100	0	96							

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Log of Rock Core Boring CB-10

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Well Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	109		8		1		1		BASALT; blush gray; slightly weathered to fresh; very strong; highly to occasionally moderately fractured; aphanitic and porphyritic with Calcite phenocrysts to 0.2" and Calcite veins mv *(continued)*				
1664	110	28		100	1	96			1: 30°, J, T, No, No, P, SR 2: 60°, J, VN, Fe+Ch?, Su, P, SR 3: 55°, J, N, Mn+Fe, Sp, P, SR 4: 60°, J, T, No, No, P, SR			[42]	
	111				0		2						
1662	112				2		3 4						
	113						M M M					1455 1502	Damage to core at shoe during removal
	114				0								
1660					1		V						
	115	29		100	1	84	1 1		Less Calcite nodules/phenocrysts			[42]	
	116				1								
1658													
	117				2		2 3		1: 60°, J, VN, No, No, P, SR 2: 50°, J, VN, Ca, Pa, P, SR 3: 70°, J, N, Mn+Fe, Su, P Wa, SR				
					2		M M						
	118		9				M M					1509 1530	Damage to core at shoe during removal
1656					0								
	119												
					0								
	120	30		100	1	100	1		1: 60°, J, N, Ca, F, P, SR 2: 50°, J, VN, No, No, P, SR			[42]	
1654	121						2				PT #4		
					1								
	122				0				With abundant rounded Calcite nodules up to 1"			1537	End of day 6/15/2016
	123											0821	Begin day 6/16/2016 AM water level=47 7'
1652					0								
	124	31		100		94							
					0								
	125												

AECOM

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Log of Rock Core Boring CB-10

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Well Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	125		9						BASALT; bluish gray; slightly weathered to fresh; very strong; highly to moderately fractured; aphanitic and porphyritic with angular Calcite phenocrysts to 0.1", rounded Calcite phenocrysts to 1" and Calcite veins				
1650	126	31		100	1	94	1		mv *(continued)*			[35]	
					0				1: 60°, J, N, Ca, Pa, P Wa, SR 2: 45°, J, VN, No, No, P , SR 3: 60°, J, VN, No, No, P , SR				
	127						2						
					2		3						
	128						M						Damage to core at shoe during removal
1648												0830	
					0							0839	
	129												
					0								
	130						1						
1646		32		100	3	92	1 2		1: 40°, J, VN, Ca, F , P , SR 2: 60°, J, VN, Ca, Pa, P , SR			[33]	
	131				1								
							1						
	132						2						
			10		1								
1644	133											0848	
					0							0858	
	134												
					1								
	135						1		1: 30°, J, N, Ca, F , P , SR				
1642					0								
	136	33		100		100						[34]	
					0								
	137						2		2: 45°, J, N, Ca+Uk, Pa+Su, P , SR				
1640					1								
	138											0907	
					0							0917	
	139												
					0								
1638	140												
		34		100	0	100						[26]	
	141												

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-10

Sheet 10 of 13

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Weld Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	141		10		0				BASALT; blue gish gray; slightly weathered to fresh; very strong; highly to moderately fractured; aphanitic and porphyritic with green shale gray phenocrysts; Calcite nodules and occasional veins				
1636	142	34		100	1	100	1		mv *(continued)*				
	143								1: 60°, J, VN, Ca, Pa, P, SR			0928	
					1		1					0939	
	144						2		1: 65°, J, N, Ca, F, P, SR 2: 40° 60°, J, VN, No, No, P Wa, SR 3: 75°, J, VN, No, No, P, SR (mechanical)				
1634					1								
	145	35		100	0	92						[32]	
	146				1								
1632							1						
	147		11		2				BASALT BRECCIA; blue gish gray; slightly weathered to fresh; very strong; highly fractured; aphanitic and porphyritic with green shale gray phenocrysts; Calcite nodules and occasional veins			0948	
	148						3/M					0959	
					5		1		Partially dissolved wide Calcite veins				
1630	149						2 2						
					1		2		1: 45°, J, N, Ca, Pa, P, SR 2: 60° 70°, J/V, MW W, Ca, Pa, P, R 3: 40° 50°, J/V, N MW, Ca, Pa, P, SR R				
	150						1						
		36		100		52	3		Partially dissolved wide Calcite veins			[32]	
					4								
							3		Partially dissolved wide Calcite veins				
1628	151						3						
							4						
					2				4: 60°, J, N, Ca, Pa, P, SR 5: 60°, J/V, MW, Ca, Pa, P, R (partially open, vuggy Calcite crystals)		PT #5		
	152						1						
									6: 70°, J, N, Ca, PA, P Wa, SR				
					4		5 6						
	153						1					1008	
									1: 20°, J/V, MW, Ca, Pa, P Ir, R (open, vuggy Calcite crystals)			1235	
									2: 60°, J, N, No, No, P, R				
1626					2				70° large Calcite Vug/vein, up to 1" void with Calcite crystals				
	154												
									70° large Calcite Vug/vein, up to 1" void with Calcite crystals				
					3								
	155						2						
		37		100		65	3 3		BASALT; blue gish gray; slightly weathered to fresh; very strong; highly fractured; aphanitic			[39]	
					2				3: 60° 70°, J, N, No, No, P Wa, SR 4: 50°, J, VN, Ca, Pa, P, SR				
1624	156						4						
					1								
	157												

Report GEO CORE OAK C BMP WELL File N D AECOM ROCK CORE GPJ 1/16/2017 CB-10

AECOM

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Log of Rock Core Boring CB-10

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Weld Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	157								5: 40°, J, VN, Ca, Pa, P , SR BASALT; b u sh gray and dusky red; fresh; very strong; h gh y to moderate y fractured; aphan t c and oca y porphoryt c w th Ca c te nodu es and ve ns and green sh gray phenocrysts mv *(continued)*				
		37	11	100	2	65	5 5					1243	
1622	158						1					1251	
					2								
	159						2		1: 45°, J, N, Ca, F , P , SR 2: 30°, J, T, No, No, P , SR 3: 70°, J, T, No, No, P , SR 4: 40°, J, N, Ca, Pa, P , SR				
					0								
	160						3						
1620		38		100	2	76	4		Sma Ca c te vugs			[38]	
	161		12				1						
							2						
					3		4						
	162												
					1								
1618							1					1259	
	163											1307	
					1								
	164						1		1: 30°, J, VN, Ca, Pa, P , SR 2: 50°, J/V, N, No, No, P , SR (through 0.5" Ca c te ve n)				
					1								
	165						1						
1616		39		100	1	98						[34]	
	166						2 2						
					1								
	167						M						
1614					0								
							M M					1316	Damage to core at shoe during removal
	168											1325	
					0								
	169												
					0								
1612							1						
	170				1				BASALT BRECCIA; green sh gray and dusky red on 60° 80° contact 1: 70°, J, N, Ca, F , P , SR 2: 15°, J, VN, Ca, Pa, Wa, SR				
		40		100		100						[31]	
	171				1		2						
1610	172						3		3: 45°, J, VN, Ca, F , P , SR		PT #6		
					1							1335	
	173												

AECOM

Project: Proposed Water Storage Project
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Log of Rock Core Boring CB-10

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Weld Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	173		12		0				BASALT; basalt to greenish gray; fresh; very strong; moderately fractured; aphanitic to porphyritic with irregular, rounded Calcite nodules and veins mv *(continued)*			1538	
	174		13		1		1						
1608	175	41		100	1	100	1		1: 45°, J, VN, Ca, F , P , SR 2: 0° 15°, J, VN, No, No, P Wa, R 3: 55°, J, ?, Fe, Sp, P , R (run break)			[33]	
	176				1		2		← 50° Calcite vein 0.25"				
1606	177				1								
	178				1		3					1547	
					1		1		BASALT BRECCIA; basalt to greenish gray; fresh; very strong; moderately fractured; aphanitic with abundant Calcite nodules			1600	
1604	179				1		H		1: 60°, J, N, Ca, Pa, P , SR 2: 20°, J, T, No, No, P , SR R 3: 60°, V, MW, H+Ca, Pa, P , SR (vuggy with Calcite crystals open ~0.1")				
	180	42		100	0	100	2 3					[28]	
	181				2								
1602	182				0		1 2					1610	
					0							1620	
	183				0								
1600	184				1		1		1: 60°, J, VN, Ca, Pa, P , SR R				
	185	43		100	0	100			← With increasing rounded Calcite nodules			[35]	
1598	186				1								
	187				0		1						
	188											1629	
1596		44	14	100	2	71	1		1: 0° 10°, J, N, No, No, P St, SR R			1637	
	189												

Project: Proposed Water Storage Project
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Log of Rock Core Boring CB-10

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Weld Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	189		14		2		2		BASALT BRECCIA mv *(continued)*				
	190						3		BASALT; green sh gray and dusky red; fresh; very strong; h gh y fractured; aphan t c to phaner t c on 40° contact w th 30° 40° f ow bands				
1594		44		100	2	71	4		2: 85° 90°, J, N, Ca, F , P , R 3: 30°, J, VN, Ca, Pa, P , SR 4: 40°, J, VN, Ca, Pa, P , SR 5: 65°, J, N, No, No, P , SR			[28]	
	191				1		3						
	192				3		3						
1592	193						5 3					1648	End of day 6/16/2016
					5		1					0801	Begin day 6/17/2016 AM water level=46 7'
	194						2 2 3 4		1: 30° 60°, J, N, Ca, Pa, P St, SR 2: 80° 90°, J, VN, No, No, P , SR 3: 20°, J, VN, Ca, Pa, P , SR 4: 30°, J, VN, Ca, Pa, P , SR				
					5		4 4		5: 30°, J/V, W, Ca, F , P , SR (w th 0.5" fr ab e, a tered Ca c te)				
1590	195						5						
		45		100	3	48	6 7 6		BASALT BRECCIA; green sh to b u sh gray and dusky red; fresh; very strong; h gh y to oca y moderate y fractured; aphan t c to porphoryt c 6: 50°, J, VN, Ca, Pa, P , R 7: 15°, J, VN, Ca, Pa, P , R 8: 30° 35°, J, VN, Ca, Pa, P Wa, R			[26]	
	196						8 8						
					2		4/V						
	197												
1588					1		M						
	198						8					0812	
					1							0820	
	199						1		1: 50°, J/V, N, Ca, F , P , SR (n 0.3" Ca c te ve n) 2: 20° 30°, J/V, N MW, Ca, Pa, P , R (vuggy, open 0.1" w th Ca c te crysta s) 3: 40°, J, VN, Ca, Pa, P , SR 4: 55°, J, VN, Ca, Pa, P , SR (top of d ke) 5: 30° 35°, J, VN, Ca, Pa, P , SR				
					0								
1586	200												
		46		100	1	88	2					[30]	
	201												
					2		3 4		1" w de, 55° dusky purp e aphan t c d ke				
1584	202						5						
					NA		5					0830	End of day 6/17/2016
	203								**TOTAL DEPTH = 202.8 FEET** **Caliper, Televiewer and Piezometer Installation performed 6/18/2016**				Begin day 6/18/2016 AM water level=38 0'
	204												
1582													
	205												

AECOM

Depth 2.5’ to 18.9'

Depth 18.9’ to 33.0’

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-10 Boxes 1 and 2	Figure CB-10-1

Depth 33.0’ to 47.5'

Depth 47.5’ to 62.7’

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-10 Boxes 3 and 4	Figure CB-10-2

Depth 62.7’ to 76.0'

Depth 76.0’ to 89.6’

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-10 Boxes 5 and 6	Figure CB-10-3

Depth 89.6’ to 103.2'

Depth 103.2’ to 118.0’

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-10 Boxes 7 and 8	Figure CB-10-4

Depth 118.0’ to 132.3’

Depth 132.3’ to 146.7’

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-10 Boxes 9 and 10	Figure CB-10-5

Depth 146.7’ to 160.6’

Depth 160.6’ to 174.1’

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-10 Boxes 11 and 12	Figure CB-10-6

Depth 174.1’ to 188.2’

Depth 188.2’ to 202.8’

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-10 Boxes 13 and 14	Figure CB-10-7

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-11

Sheet 1 of 10

Date(s) Dr ed	**6/20/2016-6/22/2016**	Logged By	**S. Janowski**	Checked By	**D. Simpson**
Dr ng Method	**HQ-3 Wireline Core**	Dr B t S ze/Type	**3 7/8" HQ Diamond ADT 8**	Tota Depth of Boreho e	**150.4 feet**
Dr R g Type	**LF-70 Track-Mounted Rig**	Dr ng Contractor	**Ruen Drilling**	NAVD 88 Ground Surface E evat on	**1773-ft**
Groundwater Leve	**65.05-ft 7/16/2016**	Samp ng Methods	**HQ-3 Wireline**	Inc nat on from Hor zonta /Bear ng	**90°**
Boreho e Comp et on	**1.0-in Sch 40 PVC Piezometer**	Locat on	**Axis 2 South - CFRD Plinth**	Coord nate Locat on	**N 2141285.1 E 6839014.9**

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Well Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	0		1						CLAYEY SAND (SC); dry; light red RESIDUAL SOIL			1500	**Well: 1-in PVC solid well casing 0'-95' in neat cement grout with 6" Christy box installed at surface**
1772	1	1		33	NA	0	NR					[60]	
	2				2				BASALT; gray sh red; h gh y to comp ete y weathered; very weak; h gh y fractured mv			1503	
1770	3				NA		NR					1509	
	4				0								
1768	5	2		94	1	0						[74]	
	6				0								
1766	7				8		1 1 1 1 1		Comp ete y weathered; extreme y weak Becomes ye ow sh brown; moderate y weathered; weak; ntense y fractured w th dark brown sta n ng on fracture surfaces; aphan t c 1: 10° 30°, J, T, Fe+Mn, Su+Sp, P , S (po shed)			1513	
	8				>6		M 1					1554	Advance 5" HWT casing to 5'
1764	9	3		100		0	1 1 2		1: 10° 15°, J, T VN, Fe+Mn, Su, P , S 2: 80°, J, VN, S +Fe+Mn, Pa+Su, Wa, S SR			[44]	
	10				>6		1 1					1557	
							1 2		1: 80°, J, VN, Fe+Mn, Su, St, VR 2: 10° 15°, J, T, Fe+Mn+C , Su+Pa, P , S 3: 10° 60°, J, T, Fe+Mn, Su, P , SR			1605	
1762	11	4		100		0	2 2 2		Soft c ay nf ng			[42]	
					5		2 3 2		H gh y fractured; extreme y weak and soft 11.6' 11.8'				
	12						2 2					1608	
		5		100	>6	0						1613	
1760	13						1 1		1: 70°, J, VN, Mn, Su, Wa, SR				

Report: GEO CORE OAK C BMP WELL; File: NID AECOM ROCK CORE.GPJ; 1/16/2017 CB-11

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-11

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Well Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
									2: 10°, J, T, Mn, Su, P , S SR			[36]	
1760	13	5	1	100	>6	0			BASALT: ye ow sh brown; moderate y weathered; moderate y strong; ntense y fractured; aphan t c				
									mv *(continued)*			1616	
	14								W th soft, red CLAY nf ng throughout run			1620	Evidence of clay infilling and washout at top of Run 6
					NA				1: 10°, J, T VN, Mn+C , Su+Sp F , P , S SR				
1758	15	6		89		0						[38]	
					8				2: 50° 65°, J, VN, Mn, Su, Wa, R			1623	
	16		2									1628	
					>6				1: 10° 15°, J, T VN, Mn, Su, P , SR 2: 10°, J, MW W, C +Mn, F +Su, P , S SR				
1756	17	7		100		0			Increased CLAY nf ng			[38]	
					6				Becomes green sh gray; s ght y weathered; strong; h gh y to ntense y fractured w th brown se vages 3: 20° 55°, J, VN, Mn+Fe, Su, Wa, SR			1631	
	18								4: 70°, J, ?, Mn+Fe, Su, P , SR			1635	
					6				1: 10° 20°, J, N, C +Fe+Mn, Pa+Su, Wa, SR R 2: 70°, J, VN, Fe+Mn, Su, Wa+St, R				
1754	19	8		100		11			H gh y to comp ete y weathered; very to extreme y weak			[42]	
					6				Moderate y weathered; weak				
	20												
					6							1639	End of day 6/20/2016
		9		100		0						0818	Begin day 6/21/2016
1752	21											[30] 0819	
					>6				1: 10°, J, N, Mn, Su, Wa, SR 2: 10°, J, W, C +Fe, F +Su, P , S			0824	AM water level=18 6'
	22								Brown to red; moderate y to comp ete y weathered; weak to soft				
		10		100	8	0						[44]	
1750	23				7				3: 80°, J, N, Fe+Mn+C , Su+Sp, Wa, SR 4: 60°, J, VN, Mn+Fe, Su, Wa, SR R				
	24											0828	
					8							0834	
1748	25								1: 80° 90°, J, N, Fe+Mn, Su, Wa St, R 2: 10° 30°, J, T VN, Fe+Mn, Su, P , SR		PT #1		
		11		100	6	0						[45]	
	26				6								
												0838	
1746	27	12		100	>6	38						0953 [24]	Unsuccessful packer test attempt 8'-27'
												0955	Advance 5" HWT casing to 10'
	28								Becomes h gh y fractured			1011	
		13		100	4	38			1: 60° 80°, J, VN, Fe+Mn, Su, Wa, SR				
1744	29												PL 17726 psi

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-11

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Well Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1744	29						2		BASALT; blue gray with stained fracture surfaces; slightly weathered; strong; high fractured; aphanitic mv *(continued)*				
		13	3	100	3	38	1					[38]	
	30						2						
					4		2		2: 10°, J, VN, Mn+Fe, Su, P , SR				
							1 1						
1742	31						3		3: 40°, J, ?, Mn+Fe, Su, P , SR			1016	
												1026	
					3								
	32						1						
							2						
		14		100	3	48	1		1: 10°, J, VN, Fe+Mn, Su, Wa, SR R 2: 60°, J, VN, Fe+Mn, Su, P , SR			[47]	
1740	33												
					4		3						
							3 3		3: 30°, J, VN, Fe+Mn, Su, P St, SR R				
	34								Becomes slightly weathered to fresh; strong to very strong; with Ca cite infilled vesicles			1030	
							1		1: 60°, J, VN, Fe+Mn, Su, Wa, SR			1035	
					2				2: 30° 40°, J, VN, Fe+Mn, Su, Wa, SR				
							2						
1738	35						3		3: 80°, J, N, Fe+Mn, Su, Wa, SR 4: 20°, V, N, H+Ca, F , P				
					1								
							4		5: 10°, J, N, Fe+Mn, Su, Wa+St, R				
	36												
							2						
		15		100	1	94						[49]	
1736	37												
					1		5						
	38												
					1								
							5						
1734	39						M					1041	
					1							1052	
							1		1: 30°, J, T, H+Fe, Su, P				
	40						2		Becomes slightly weathered 2: 30°, J, N, Fe+Mn, Su, P , S SR 3: 70° 80°, J, N, Fe+Mn, Su, Wa, SR R				
					4								
		16		100		57	3 2					[44]	
1732	41						3						
					4		3 2						
	42												
							2						
					3		3					1057	
							1					1102	
1730	43								1: 10°, J, N, Mn, Su, Wa, R				
		17		100	1	100	1					[78]	
			4										
	44						M					1103	
							1					1112	
		18		100	1	65			Becomes fresh 1: 10°, J, N, Fe+Mn, Su, P , SR				
1728	45						M						

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-11

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Well Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1728	45		4	100		65			BASALT; blue gray; fresh; strong to very strong; highly fractured; aphanitic			[60]	
		18		100	6	65			mv *(continued)*		PT #2		
	46								Becomes gray shish brown; slightly weathered; strong; intensely fractured			1114	
												1253	
					>6		1		Becomes blue gray to gray shish brown; slightly weathered; moderately strong to strong; intensely fractured				
1726	47						2 2		1: 80°, J, N, Fe+Mn, Su, Wa+St, R VR				
					9		2 2		2: 20° 30°, J, VN N, Fe+Mn, Su, Wa, SR R				
	48						2 2						
		19		100	4	26	1 2		Becomes highly fractured			[46]	
1724	49						1 2						
					3		2 2		Becomes fresh				
	50												
					1		M 1		Irregular vesicles increasing in size to 1"; most completely infilled with Calcite			1259	
1722	51								1: 70°, J, VN, Fe+Mn, Su, Wa, R			1305	Vesicles drawn are not infilled too many infilled vesicles to draw
					0				Moderately fractured				
	52	20		100	2	81						[38]	
1720	53						2 2		2: 30°, J, N, Fe+Mn, Su, Wa, R				
					3		1						
							2 2					1310	
	54						M 1		Becomes slightly fractured			1315	
					1		2 2		1: 30°, V, MW, Ch+Ca+Mn, F +Su, Wa+St, VR				PL 21518 psi
1718	55												
					0				Lower mt of large irregular Calcite infilled vesicles				
	56	21		100	0	96						[45]	
1716	57												
					1		3		Becomes highly to moderately fractured				
			5				2		2: 15°, J, T VN, Mn+Ch, Su, P , SR				
	58						4		3: 70°, J, VN, Mn+Ch, Su, P , SR R				
					1		4						
							4 4						
1714	59								4: 20°, V, VN MW, H+Ca, F , P			1322	
					1							1327	
	60	22		100		75	1		1: 20°, J, VN, Mn+Ch, Su, Wa, R				
					>6		2 2		2: 20° 30°, J, T, H+Uk, Su?, Wa P				
							2		Becomes green shish brown; moderately weathered; moderately strong; intensely fractured; with green mineralized zones (Olivine?)				
1712	61						2						

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
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Log of Rock Core Boring CB-11

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Well Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1712	61		5						BASALT; green sh brown; moderate y weathered; moderate y strong; ntense y fractured; phaner t c w th Ca c te nf ed ves c es and green m nera zed zones (O v ne?). Becomes b u sh gray; s ght y weathered to fresh; strong to very strong; h gh y fractured; porphoryt c w th Ca c te and green m nera zat on nf ed ves c es at 61.5' mv *(continued)*				PL 2178 psi
		22		100	6	75	1					[62]	
	62				1		M M 1						
1710	63						3		3: 70°, J, T, H+Mn+Ch, Su, Wa (nc p ent fracture)				
					1		1						
	64						M					1332	
					1		1					1338	
1708	65	23		100		100			1: 30°, J, VN, Fe+Mn, Su, Wa, VR			[60]	
					1		1						
	66						M		Becomes fresh		PT #3	1340	
					0							1524	
1706	67						1		1: 20° 30°, J, N, Fe+Mn+Ca, Su+Sp, Wa, R				
					1								
	68						1						
		24		100	1	100						[44]	
1704	69												
					0								
	70												
					1		1						
1702	71						M M					1531	
			6				M					1536	
					0		1		1: 60°, J, VN, H+Mn, Su, Wa				
	72												
		25		100	0	100						[39]	
1700	73						2		2: 60°, J, N, Mn+Fe+Ch+Ca+O , Su+Sp, Wa, R				
					1								
	74						M		Part a y nf ed ves c e 1.5" d ameter			1540	
					0							1546	
1698	75						1		1: 30°, V, VN, Ca+Mn, F +Su, Wa, R				
					1								
	76												
		26		100	0	100						[50]	
1696	77												

AECOM

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Log of Rock Core Boring CB-11

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Well Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1696	77		6		1		2		BASALT; blue gray to green gray; fresh; very strong; slightly fractured; porphyritic; light foliated texture; with Calcite and Opaline nodules				
	78	26		100	0	100	M		mv *(continued)* 2: 40°, V/J, N, Ca+Mn, F +Su, Wa St, VR			1552	
1694	79				0		M					1558	
	80				0								
1692	81				2		1 1		Becomes highly fractured 1: 70° 90°, J, VN, Fe+Mn+Ca, Su+Sp, Wa+St, R			[42]	
	82	27		100	2	43							
1690	83				1		1 1						
	84				1		M		Becomes moderately fractured 1: 10°, J, VN, Mn, Su, Wa, R			1605 1612	
		28		100		100	1					[44]	
1688	85		7		0		M				PT #4		
	86						M					1615 0910	End of day 6/21/2016 Begin day 6/22/2016 AM water level=61 1'
					1		1		Becomes slightly fractured 1: 30°, J, VN, Fe, Su, Wa, R				
1686	87				0								
	88	29		100	0	100	M					[39]	
1684	89				0								
	90						M						**Well: Bentonite pellets seal 89'-92'**
					0		M						
1682	91						M M M					0918	
					0							0924	
	92												
		30		100	0	71						[42]	
1680	93												

Report: GEO_CORE_OAK_C_BMP_WELL; File: NID AECOM ROCK CORE.GPJ; 1/16/2017 CB-11

AECOM

Project: Proposed Water Storage Project
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Project Number: 60393322/60503855

Log of Rock Core Boring CB-11

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Well Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1680	93		7						1: 90°, J, VN, Fe+Mn, Su, Wa, VR				Well: #2/12 Sand filter pack 92'-108'
		30		100	1	71	1		BASALT; b u sh gray; fresh; strong to very strong; moderate y fractured; porphoryt c; w th Ca c te and O v ne nf ed ves c es				
	94								mv *(continued)*			0928	
					1		1					0934	
									1: 90°, J, VN, Fe+Mn, Su, Wa, VR				
1678	95												
					0								
	96						M						
		31		100	0	80	2		2: 30°, V, VN, H+Ca, F , P (mechan ca y broken)			[43]	
1676	97												Well: 1-in PVC 0.020 slotted well casing 95'-105'
					1				Becomes s ght y weathered to fresh; h gh y fractured				
	98						1						
					1		M						
1674	99						M					0941	
			8									0947	
	100				1		1		1: 50° 80°, J, N, Fe+Mn, Su, Wa+St, VR				
					1				2: 20° 30°, J, ?, Fe+Mn, Su, St, R				
1672	101								3: 30°, J, T, Fe+Mn, Su, P , S				
		32		100	2	72	2					[50]	
	102						3						
					2								
1670	103						2 2		Becomes ntense y fractured				
							2		4: 70°, J, T, Fe+Mn, Su, Wa, SR				
					7		4 2						
	104						2 2					0953	
							M					1000	
					3		1 1		1: 30° 40°, J, N, Fe+Mn, Su, Wa, R				
1668	105						2		2: 80°, J/V, VN, Ca+Fe+Mn, Pa+Su, Wa+St, R VR				
					1				3: 20°, J/V, T, H+Ca, Pa, Wa				
	106						3				PT #5		
		33		100		49						[41]	
					3		2 2						
1666	107												
					1								
	108						1		1: 30°, J, N, Fe, Su, Wa, SR			1006	Bit blocked off
									2: 60°, J, N MW, Ca+Fe+Mn, Pa+Su, Wa+St, SR VR			1152	
		34		100	2	86	2 3		3: 80°, V, N, H+Ca, F , Wa				
1664	109								So ut on vo d 2" d ameter				

AECOM

Project: Proposed Water Storage Project
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Log of Rock Core Boring CB-11

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Well Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
				ROCK CORE									
1664	109		8		0				BASALT; bluish gray; slightly weathered to fresh; strong to very strong; moderately fractured; porphyritic; with Calcite and Opaline infilled vesicles and some solution voids mv *(continued)*				
	110												**Well: Bentonite pellets 108'-130'**
		34		100	1	86	2					[60]	
1662	111				1				Solution void				
	112								Abundant large Calcite infilled vesicles and voids				
					0								
1660	113						M M		Becomes very strong 1: 30°, J, N, Fe+Mn+Ca, Su+Sp, Wa, R 2: 70°, J/V, N, Fe+Mn+Ca, Su+Pa, Wa, VR			1157 1204	
			9		1		1						
	114				0								
1658	115												
		35		100	0	92						[45]	
	116						1						
					1		2						
1656	117				1								
	118											1211	
					3		M 1					1234	Advance 5" HWT casing to 15'
							2 1		Highly fractured 1: 70°, J, VN, Fe+Mn+Ca, Su, Wa, R 2: 40°, J, N, Fe+Mn+Ca, Su+Sp, Wa, R VR				
1654	119						2						
					2				Becomes slightly fractured				
	120												
					0								
1652	121	36		100		87						[45]	
					0								
	122												
					0								
1650	123						M M						
					0		M		1: 60°, V, T, H+Ca, F , Wa 2: 60°, J, VN, Fe+Mn, Su, Wa, VR			1241 1252	
	124						1						
					1		2						
		37		100		69	1		Becomes highly fractured			[39]	
1648	125												

Report: GEO_CORE_OAK_C_BMP_WELL; File: NID AECOM ROCK CORE.GPJ; 1/16/2017 CB-11

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-11

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Well Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
				ROCK CORE									
1648	125		9				2 2		3: 90°, J, T, Fe+Mn, Su, St, VR BASALT; b u sh gray; s ght y weathered to fresh; very strong; h gh y fractured; porphoryt c; ght fo at on fabr c mv *(continued)*				
		37		100	4	69	2				PT #6		
	126						3 M					1256	
							1 2		Becomes moderate y fractured 1: 80°, J/V, VN N, Ca+Fe+Mn, Pa+Su, Wa St, R VR 2: 20°, J, VN, Fe+Mn, Su, P Wa, R 3: 20°, J, VN, H+Uk, F , St+Wa			1436	
					2		3						
1646	127				0								
	128		10										
		38		100	3	88	3					[37]	
							2 2						
1644	129				1								
	130						1						
					0								
1642	131						M					1444	
					0							1449	
	132												Well: Neat cement grout 130'-150.4'
		39		100	1	100						[36]	
1640	133						1		1: 25°, J/V, N, Ca+Fe, Pa+Su, P , R 2: Crysta ne Ca c te nf ed vo d				
					0								
	134						2 M					1454	
							1					1500	
					0				1: 80°, V, VN N, H+Ca, F , Wa+Ir				
1638	135								Becomes phaner t c; no fo at on fabr c 2: 70°, V/J, MW, Ca+Fe+Mn, F +Su, Wa+St, R VR				
					0		M						
	136												
		40		100	1	92	2					[43]	
1636	137						1						
					1		2						
							M						
	138								Becomes fresh; mass ve 3: 10°, V, T, H+Ca, F , Wa				
					0		3						
1634	139						M					1507	
					0							1515	
		41		100		100	1		1: 50°, V, VN, H+Ca, Pa, P (mechan ca y broken)				
	140				0		M						
1632	141												

Report: GEO CORE OAK C BMP WELL; File: NID AECOM ROCK CORE.GPJ; 1/16/2017 CB-11

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-11

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Well Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1632	141	41	10	100	0	100			BASALT; bluish gray; fresh; very strong; massive; phaneritic; occasional Ca cite infilled vesicles			[43]	
	142		11		0				mv *(continued)*				
1630	143				0		M						
	144						M					1522	
					0							1528	
							1						
1628	145						M		1: 20°, V, VN, H+Ca, F , P				
					0		1						
	146						1/M						
		42		100	0	100						[45]	
1626	147								Becomes slightly fo ated; porphoryt c; with Ca cite infilled vesicles				
					0								
	148						M						
					0								
1624	149												
							M					1535	
					0							1544	
		43		100		100						[36]	
	150				0							1546	End of day 6/22/2016
									TOTAL DEPTH = 150.4 FEET				Begin day 6/23/2016 AM water level=63 7'
									Caliper, Televiewer and Piezometer Installation performed 6/23-24/2016				
1622	151												
	152												
1620	153												
	154												
1618	155												
	156												
1616	157												

Depth 0.0' to 15.9'

Depth 15.9' to 29.0'

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-11 Boxes 1 and 2	Figure CB-11-1

Depth 29.0' to 43.5'

Depth 43.5' to 57.5'

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-11 Boxes 3 and 4	Figure CB-11-2

Depth 57.5’ to 71.1’

Depth 71.1’ to 85.5’

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-11 Boxes 5 and 6	Figure CB-11-3

Depth 85.5' to 99.0'

Depth 99.0' to 113.1'

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-11 Boxes 7 and 8	Figure CB-11-4

Depth 113.1’ to 127.8’

Depth 127.8’ to 142.0’

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-11 Boxes 9 and 10	Figure CB-11-5

Depth 142.0’ to 150.4’

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-11 Box 11	Figure CB-11-6

Project: Proposed Water Storage Project **Project Location: Nevada and Placer Counties, CA** **Project Number: 60393322/60503855**	**Log of Rock Core Boring CB-12** Sheet 1 of 7

Date(s) Dr ed	**6/25/2016-6/27/2016**	Logged By	**S. Janowski**	Checked By	**D. Simpson**
Dr ng Method	**HQ-3 Wireline Core**	Dr B t S ze/Type	**3 7/8" HQ Diamond ADT 8**	Tota Depth of Boreho e	**100.3 feet**
Dr R g Type	**LF-70 Track-Mounted Rig**	Dr ng Contractor	**Ruen Drilling**	NAVD 88 Ground Surface E evat on	**1897-ft**
Groundwater Leve	**51.0-ft 6/27/2016**	Samp ng Methods	**HQ-3 Wireline**	Inc nat on from Hor zonta /Bear ng	**90°**
Boreho e Comp et on	**1.0-in Sch 40 PVC Piezometer**	Locat on	**Axis 2 south - south end of dam axis**	Coord nate Locat on	**N 2140738.2 E 6838715.4**

E evat on, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %	Fracture Draw ng	Number	L tho ogy	MATERIAL DESCRIPTION	We D agram	Packer Test Interva s	Dr T me, 24 hr [Dr Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	0		1		NA					SILTY SAND w th GRAVEL (SM); dry; brown sh red; Basa t grave RESIDUAL SOIL			0948	**Well: 1-in PVC solid well casing 0'-45' in neat cement grout with 6" Christy box installed at surface**
1896	1				NA		N/R							
	2	1		23	NA	NA							[70]	Only Basalt gravel recovered in Run 1
1894	3				NA								0951	
	4				>6		NR						0956	
1892	5	2		83	NA	0		1		BASALT; green sh brown; h gh y to comp ete y weathered; weak to very weak; h gh y fractured mv 1: 45°, J, N, Fe+Mn, Su, Wa, R Becomes redd sh brown; comp ete y weathered; very to extreme y weak			[58]	
	6												0959	
1890	7				NA		NR						1006	
	8	3		70	NA	0		1 1		Becomes h gh y to comp ete y weathered; very weak; ntense y fractured 1: 70° 80°, J, VN, Fe+Mn, Su, Wa, SR			[56]	
1888	9				>6									
	10				>6			1					1010	
					NA		NR						1018	
1886	11	4		77	>6	0		1		1: 80°, J, VN, Mn+Fe, Su, Wa, SR			[39]	
	12				NA								1022	
1884	13						NR						1029	

Report GEO CORE OAK C BMP WELL File N D AECOM ROCK CORE GPJ 1/30/2017 CB-12

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-12

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Weld Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
				ROCK CORE									
1884	13		1		NA		NR		BASALT; orange brown; highly to completely weathered; very weak; intensely fractured				
		5		55		0			mv *(continued)*			[60]	
	14				NA								
												1031	
1882	15											1036	
					NA								
	16	6		58		0						[29]	0% Water Circulation Return (WCR) caving hole
					>6		1		1: 80°, J, VN, Mn+Fe, Su, Wa, R				
1880	17											1041	
					NA		NR					1049	
	18	7		72		0						[36]	
					>6								
												1052	
1878	19	8		100		0						1225 [10] 1228	Advance 5" HWT casing to 17' 100% WCR
					NA							1233	Only Basalt gravel recovered in Run 8
	20						NR						
									Becomes moderately weathered; weak				Only Basalt gravel recovered in Run 9
		9		65	NA	0						[46]	
1876	21												
			2		>6							1236	
	22						1					1242	
					>6								
		10		100		0	1		1: 80°, J, VN, Fe+Mn, Su, Wa, SR			[69]	
1874	23						2		2: 20°, J, VN, Mn+Fe, Su, P , SR				
							3		3: 50°, J, VN, Fe+Mn, Su, Wa, R				
					>6		3						
	24								Becomes highly to completely weathered; very to extremely weak			1244	
					NA		NR					1249	
1872	25	11		76		0						[75]	
					>6		1 1		1: 50°, J, VN, Fe+Mn, Su, P , SR				
	26												
					>6		1		Becomes dusky purple; slightly weathered; strong; intensely fractured; aphanitic			1251	
1870	27						1					1255	
		12		100		0			1: 50° 70°, J, N, Fe+Mn, Su, Wa, SR			[54]	
					>6		1						
	28											1257	
		13		100	NA	39*			BASALT BRECCIA; orange brown; completely weathered; extremely weak and soft			1303	
1868	29												

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-12

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Weld Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1868	29		2		NA				BASALT BRECCIA; orange brown; completely weathered; extreme y weak and soft mv *(continued)*				
	30	13		100	3	39*	1 2		Becomes moderately weathered; weak on 60° contact; highly fractured 1: 60°, weathered contact 2: 20°, J, T, Mn, Su, Wa, R 3: 70°, J, N, C +Sd+Fe+Mn, F +Su, Wa, SR			[65]	
1866	31				3		3 2		Grave s zed BRECCIA 4: 60° 80°, J, T, H+Mn, Su, Wa Becomes BASALT BRECCIA with manor BASALT flow bands; green sh gray to med um gray; s ght y weathered; strong; h gh y fractured		PT #1		*Rock does not meet soundness criteria for RQD calculation
	32				4		4 2					1307	
1864	33	14		100	1	77	1 2 1		1: 30°, J, VN, Mn+Fe, Su, P , S SR 2: 80°, J, T, H+Mn, Su, Wa+St			1313 [78] 1314	
	34				1		1					1318	
1862	35				2		2		1: 70°, J, VN, Fe+Mn, Su, Wa, R 2: 10°, J, N?, Fe+Mn, Su, Wa, R 3: 35°, J, N, H+Mn, Su, P , SR 4: 20°, J, T, H+Mn, Su, Wa				UC 1804 psi
	36	15	3	100	1	92	3 4 5		5: 50°, J, VN, Fe+Mn, Su, Wa, R 6: 70°, J, T, H+Mn+Fe, Su, Wa			[52]	PL 22563 psi
1860	37				3		2 6						
	38				1		2 5						
1858	39				4		M					1324 1328	
	40	16		100		38	1 1		1: 10°, J, N, Fe+Mn, Su, P , SR			[78]	**Well: Bentonite pellets seal 39'-42'**
		17		100	>6	0	M 1 1		BASALT; brush gray; s ght y weathered; strong; h gh y fractured; aphan tic 1: 10°, J, VN, Fe, Su, P , SR			1329 [24]	
1856	41				2							1339	0% WCR
	42	18		100	>6	32	1 2 3 3		Becomes intensely fractured 1: 30°, J, ?, Fe+Mn, Su, P , S 2: 80°, J, N, Fe+Mn, Su, Wa+St, SR 3: 40°, J, VN, Fe+Mn, Su, P , S SR			[47]	
1854	43				>6		3 3 3 3		Becomes gray sh brown; moderately weathered; weak; intensely fractured to crushed Becomes strong; h gh y fractured				
	44	19		100	3	63	1 1 1		BASALT BRECCIA; green sh gray; s ght y weathered; strong; h gh y fractured; vesicular			1343 1351	**Well: #2/12 Sand filter pack 42'-58'**
1852	45												

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-12

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Weld Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1852	45		3		6		1 1 1		BASALT BRECCIA; green sh gray; s ght y weathered; strong; h gh y fractured; ves cu ar. Med um green sh brown 44.9' 46.0'				Continued 0% WCR
	46	19		100	6	63	2 3 1 1 4		mv *(continued)* Becomes fresh; strong to very strong; moderate y fractured; grave s zed brecc a c asts 1: 50°, J, VN, Fe+Mn, Su, Wa, R 2: 20°, J, VN, Mn+Fe, Su, P , SR 3: 80°, J, VN, Mn, Su, Wa, SR 4: 70°, J, N, Fe, Su, Wa, R SR			[49]	
1850	47				0								**Well: 1-in PVC 0.020 slotted well casing 45'-55'**
	48				0		M M						UC 9360 psi
1848	49				1		M 1					1357 1403	
	50	20	4	100	0	100			1: 50°, J, N, Fe+Mn, Su, Wa, R			[54]	PL 16326 psi
1846	51				NA		M					1406	*Driller reamed 0 2' after packer test between run breaks
	52				0		M				PT #2	1004	End of day 6/25/2016
1844	53	21		100	3	95	1 2 3		Becomes h gh y to moderate y fractured (poss b y mechan ca) 1: 50°, J, N, Fe, Su, Wa, R Becomes f ner gra ned brecc a c asts 2: 10°, J, T, No, No, Wa, R (poss b y mechan ca) 3: 50°, J, T, No, No, Wa, R (poss b y mechan ca)			[33]	Begin day 6/26/2016 AM water level=51 0' Pump paper into hole to increase WCR 75% WCR
	54						M					1008 1016	
					0		M		Resumes grave s zed brecc a c asts 1: 35°, J, VN, Fe, Sp, Wa, R				
1842	55				1		1		M?: 10°, J, VN, No, No, Wa, R Becomes mass ve				
	56				1		M?						
		22		100	0	100	M?					[50]	
1840	57				0								
	58				0								
1838	59				0		M M					1022 1027	
					0				Layered BASALT and BASALT BRECCIA; med um gray; fresh; very strong; mass ve 1: 50°, B, T, H+No, No, P (bonded contact)				
	60	23		100		100							
					0		M 1						**Well: Bentonite pellets 58'-64'**
1836	61												

Report GEO CORE OAK C BMP WELL File N D AECOM ROCK CORE GPJ 1/30/2017 CB-12

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-12

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Well Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1836	61		4										Continued 75% WCR
		23		100	0	100	M		Layered BASALT and BASALT BRECCIA; med um gray; fresh; very strong; mass ve; grave s zed brecc a c asts, basa t s aphan t c mv *(continued)*			[50]	
	62				0		1		1: 50° 90°, B, T, H+No, No, P (bonded contact)				
1834	63				0		M						
	64						M					1033	
			5									1039	
					0								
1832	65						1		1: 40° 60°, B, T, H+No, No, P St (bonded contact)				**Well: Neat cement grout 64'-100.3'**
					0								
	66						1						
		24		100	0	100						[50]	
1830	67						M						
					0								
	68						1						
					0								
1828	69											1045	
							1					1053	
					0				BASALT; green sh gray; fresh; very strong; aphan t c; mass ve; w th rregu ar Ca c te ve ns 1: 30° 60°, V, N MW, H+Ca, F , Wa Ir				
	70						1						
		25		100	0	100	M					[60]	
1826	71						1						
					0								
	72											1056	
									Layered BASALT and BASALT BRECCIA; med um gray; fresh; very strong; mass ve 1: 60°, B, T, H+No, No, P (bonded contact)			1227	
					0								
		26		100		100	M					[27]	
1824	73						M						
					0								
	74						M		Red			1231	
							1					1236	
					0				BRECCIA				
1822	75												
					0								
	76												
		27		100	0	100						[45]	
							M		BASALT BRECCIA; green sh gray; fresh; very strong				
1820	77												

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-12

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Well Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1820	77		5		0		M?		BASALT BRECCIA; green sh gray; fresh; very strong; mass ve; grave to cobb e s zed brecc a c asts mv *(continued)*				Continued 75% WCR
	78	27		100	0	100	M						
							M M						
1818	79		6				M					1243	
					0		1					1250	
	80						1		1: 40° 65°, B, T, H+No, No, P (bonded contact)				
					5		2		2: 90°, J, VN, No, No, Wa, R (poss b y mechan ca)				
1816	81						2 2						
		28		100	0	94						[35]	
	82				0								
1814	83				0								
							M						
	84						M					1259	
					0							1305	
1812	85						M						
					0								
	86												
		29		100	0	100						[47]	
1810	87						M						
							M						
	88				0								
							M						
1808	89						M					1311	
					0							1316	
	90						1						
					0				BASALT; aphan t c				
1806	91						1		1: 50° 65°, B, T, H+No, No, P (bonded contact)				
		30		100	0	100						[50]	
	92												
					0								
1804	93												

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-12

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Weld Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1804	93		7						BASALT BRECCIA; green sh gray; fresh; very strong; mass ve; grave to cobb e s zed brecc a c asts mv *(continued)*				Continued 75% WCR
		30		100	0	100						1322	
	94											1328	
					0								
1802	95												
					0								
	96												
		31		100	0	100						[43]	
1800	97												
					0								
	98						1		1: 20°, J, VN, Py, Sp, Wa, R (poss b y mechan ca)				
					1								
1798	99						M					1335	
												1340	
		32		100	0	100						[39]	
	100						M						
					0							1342	End of day 6/27/2016
									TOTAL DEPTH = 100.3 FEET **Caliper and Televiewer performed 6/27/2016; Piezometer Installation performed on 6/29/2016**				Begin day 6/28/2016 AM water level=45 2'
1796	101												
	102												
1794	103												
	104												
1792	105												
	106												
1790	107												
	108												
1788	109												

ROCK CORE

Report GEO CORE OAK C BMP WELL File N D AECOM ROCK CORE GPJ 1/30/2017 CB-12

AECOM

Depth 0.0’ to 21.3’

Depth 21.3’ to 35.9’

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-12 Boxes 1 and 2	Figure CB-12-1

Depth 35.9’ to 49.8’

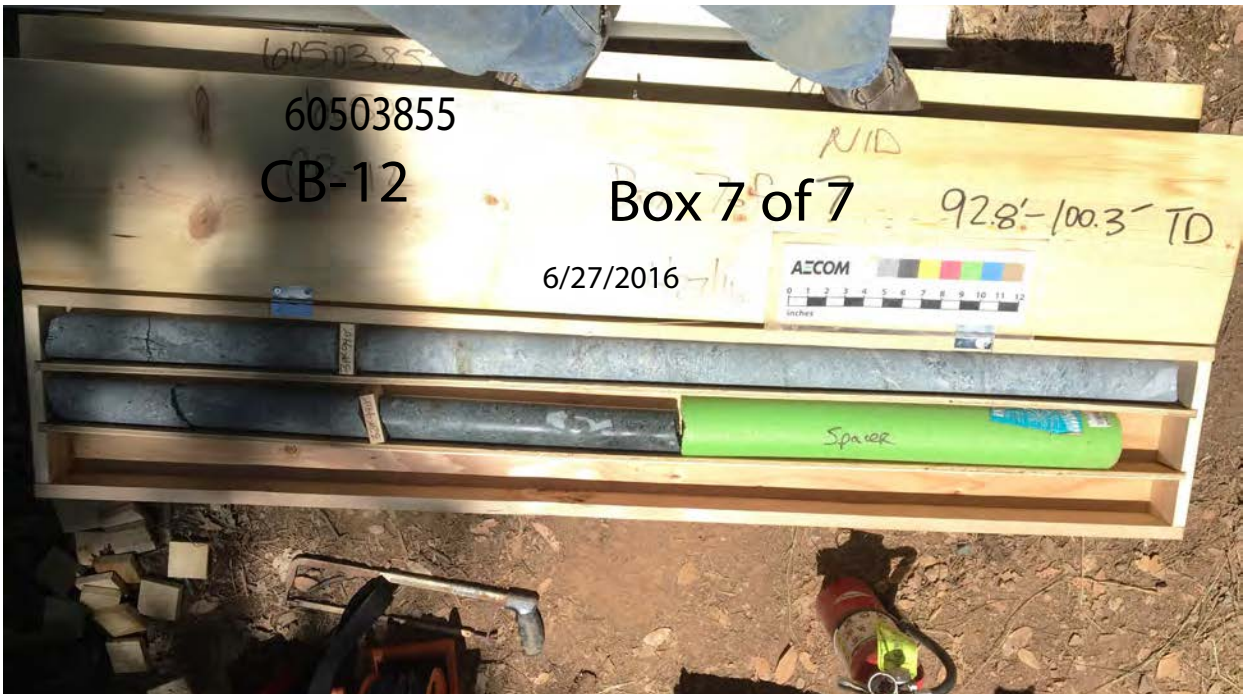
Depth 49.8’ to 64.0’

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-12 Boxes 3 and 4	Figure CB-12-2

Depth 64.0' to 79.0'

Depth 79.0' to 92.8'

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-12 Boxes 5 and 6	Figure CB-12-3



Depth 92.8’ to 100.3’

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-12 Box 7	Figure CB-12-4

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-13

Date(s) Dr ed	**6/6/2016-6/14/2016**	Logged By	**K. Zeiger**	Checked By	**D. Simpson**
Dr ng Method	**HQ-3 Wireline Core**	Dr B t S ze/Type	**3 7/8" HQ Diamond**	Tota Depth of Boreho e	**208.0 feet**
Dr R g Type	**LF-70 Track-Mounted Rig**	Dr ng Contractor	**Ruen Drilling**	NAVD 88 Ground Surface E evat on	**1834-ft**
Groundwater Leve	**178.0-ft 6/14/2016**	Samp ng Methods	**HQ-3 Wireline**	Inc nat on from Hor zonta /Bear ng	**60° / 176°**
Boreho e Comp et on	**Neat cement grout to surface**	Locat on	**Axis 2 North, Dam axis south of CB-3 & CB-4**	Coord nate Locat on	**N 2141956.0 E 6838736.3**

E evat on, feet	Depth, feet	ROCK CORE Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %	Fracture Draw ng Number	L tho ogy	MATERIAL DESCRIPTION	Packer Test Interva s	Dr T me, 24 hr [Dr Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1834	0		1		NA				POORLY GRADED GRAVEL w th CLAY and SAND (GP GC); dry; med um redd sh brown; 70% subangu ar to angu ar, phaner t c BASALT GRAVEL, sem ves cu ar, to 3"; 20% med um gra ned SAND; 10% med um p ast c ty FINES; abundant organ cs		1547	
	1				NA				DRILL PAD/ROAD FILL			
	2				NA							
1832		1		0	NA	0	NR				[38]	
	3				NA							
	4				NA							
1830												
	5										1555	
					NA						1617	
	6											
		2		0	NA	0	NR				[12]	
1828	7											
	8				NA						1635	End of day 6/6/2016
									POORLY GRADED GRAVEL; med um brown; 95% angu ar GRAVEL to 3"; abundant roots		0745	Begin day 6/7/2016 Dry hole Driller indicates change in material at 8 5'
	9				NA		NR		COLLUVIUM			
1826												
	10											
		3		65	>10	0		1	BASALT; dark green sh gray; h gh y weathered; moderate y strong; ntense y fractured; ves cu ar; phaner t c, Fe sta n ng on fractures		[34]	
	11							2 3	mv			
					NA			4	Becomes mott ed w th green sh gray 1: 10°, Contact/J, MW, Sd, Pa, P , S			
1824							NR		Comp ete y weathered 2: 20°, J, N, Fe, Su, Wa, SR 3: 75°, J, N, Fe, Su, Wa, SR 4: 90°, J, N, Fe, Su, Wa, SR			0% Water Circulation Return (WCR)
	12							5	5: 75°, J, N, Fe, Su, Wa, SR		0752	
		4		75	4	35*		1	Becomes moderate y weathered; moderate y strong; w th roots		0810	
	13											

Report GEO CORE OAK C B MAP File N D AECOM ROCK CORE GPJ 1/30/2017 CB-13

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-13

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	13		1		>10		2 3		1: 50°, J, N?, Fe, Su, P , S BASALT; dark green sh gray and green sh gray; moderate y weathered; moderate y strong; ntense y fractured; ves cu ar; phaner t c, Fe sta n ng and roots on fracture surfaces			
1822	14						3 4		mv *(continued)* 2: 40°, J, N, Fe, Su, P , S			
		4		75	4	35*			3: 10° 40°, J, N, Fe, Su, Wa, SR 4: 90°, J, N, Fe, Su, Wa, SR		[48]	*Rock does not meet soundness criteria for RQD calculation
	15						5 6		5: 20°, J/V/So, MW, Ca, Pa, Wa, SR 6: 50°, J, MW, Sd, Pa, Wa, SR			
					NA				Becomes h gh y to oca y comp ete y weathered; very to extreme y weak; h gh y to ntense y fractured and oca y crushed			Pump paper into hole to improve WCR
1820	16						NR					25% WCR after
					NA						0815	
	17						1		1: 25°, J, N, Sd+Fe, Pa+Su, Wa, SR 2: 60°, J, N, Sd+Fe, Pa+Su, Wa, SR 3: 40°, J, N, Fe, Su, P , S SR		0824	
		5		100	>10	20	2 1				[24]	
	18						3		Becomes s ght y weathered; strong; h gh y fractured; phaner t c w th Ca c te nodu es; no ves c es or organ cs			
1818					1						0829	
	19						1 1		1: 40°, J, N, Fe, Su, P , S 2: 30°, J, MW, Sd, Pa, P , SR 3: 20°, J, T, Fe?, Su?, Wa, SR		0840	
		6		100	5	44	1		Becomes med um brown; h gh y weathered; weak; ntense y fractured		[17]	
	20						2 3 4		4: 30°, J, N, Fe, Su, Wa, SR 5: 60°, J, T, Fe, Su, Wa, SR			
					6		5					
1816							4		Becomes green sh gray; s ght y weathered; strong; h gh y fractured w th narrow moderate y weathered r nds			
	21						1 1				0849 0856	
					4				1: 60°, J, N, Fe, Su, Wa, SR 2: 65°, J, MW, Fe, Su, Wa, R (d sso ut on r ng)			
	22	7		85		45	2		3: 40°, J, N, Fe, Su, Wa, SR		[30]	
					NA		3					
							2					
							NR				0900	
1814	23		2				1 2		Becomes moderate y weathered; moderate y strong; ntense y fractured		0908	Advance 5" HWT casing to 15'
					>10		3		1: 60°, J, N, Fe, Su, Wa, SR 2: 85°, J, N, Fe, Su, Wa P , SR			
	24						3		3: 35°, J, N, Fe, Su, Wa P , SR 4: 10°, J, N, No, No, Wa, SR			
					4							
	25	8		75		28			S ght y weathered; strong; moderate y fractured		[17]	0% WCR
1812					3		4		Becomes comp ete y weathered; extreme y weak; w th roots			
	26											
					NA							
							NR					
	27										0922	
					NA		NR				1002	Driller indicates soft drilling
1810												
	28	9		50		15			Becomes moderate y weathered; weak; ntense y fractured		[20]	0% WCR
					>10		1		1: 40° 60°, J, N, Fe, Su, Wa, SR 2: 40°, J, N, Fe, Su, Wa, SR			
	29						2				1008	

Project: Proposed Water Storage Project
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Log of Rock Core Boring CB-13

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	29		2		NA		NR		BASALT; green shale gray and pale brown; slightly weathered; moderately strong; intensely fractured; phaneritic with Calcite nodules, moderately weathered fracture rinds		1015	0% WCR continued
							1 2		mv *(continued)*			
1808	30						3		1: 80°, J, MW, Fe, Su, Wa, SR			
					6		3		2: 40°, J, N, Fe, Su, Wa, R			
							4		3: 20°, J, N, Fe, Su, P, SR			
	31	10		95		13	5		4: 65°, J, N, Fe, Su, Wa, R Sand filled fracture		[20]	
					>10		6		With dissolution cavities			
							6		5: 25°, J, W, Clay +Sand, Fe, Wall Paper, SR?			
	32						7		6: 20°, J, T, Ho+Uk, Pa, Pl, SR			
1806					3		7		7: 50°, J, T, Fe, Su, Pl, S			
	33										1027	
							1				1035	Pump paper into hole to improve WCR
					>10		2 2		Becomes moderate brown; completely weathered; extremely weak; clayey? with roots to 0.5"			25% WCR after
	34								1: 20°, J, N, No, No, Pl, SR			
									2: 55°, J, T, Fe+Mn, Su, Wa, ?			Driller indicates soft drilling
1804					NA							
	35						NR					
		11		52	NA	0			Soft; weathered		[50]	
	36											
					NA							
									Becomes highly weathered; weak; intensely fractured to locally crushed; with dissolution cavities and Fe staining on fracture surfaces			
1802	37						3		3: 20°, J, N, Fe, Su, Pl, SR			
					>10		3		4: 85°, J, N, Fe, Su, Pl, SR			
							4 5		Becomes green shale gray; moderately weathered			
	38						1		5: 40°, J, MW, Cl, Sp Su, Pl, SR		1041	
											1047	0% WCR
					>10				Highly weathered			
							2		1: 85°, J, MW, Fe, Su, Wa, SR			
	39	12		100		0	2 3		2: 50°, J, N, Fe, Su, Pl, S		[12]	
1800					>10				3: 75°, J, N, Fe, Su, Wall St, R			
	40										1057	
			3								1100	
					>10							
							1 2		1: 85°, J, N, Fe, Su, Wa, SR R			
	41								2: 45°, J, N, Fe, Su, Pl +St, SR?			
							3		3: 30°, J, N, Fe, Su, Wa, SR			
1798		13		67	>10	0					[20]	
	42								Becomes slightly weathered with moderately weathered rinds around fractures; strong			
					NA		NR					
											1109	
	43						1		1: 65°, J, N, Fe, Su, Wa, SR		1222	0% WCR
					5		2		2: 30°, J, N, Fe, Su, Pl, S SR			
							2		3: 55°, J, T, Fe, Su, Pl, S			
1796	44	14		100		65	3 4		4: 5°, J, T, Fe, Su, Pl, S		[17]	
					1							
									Becomes highly fractured; no additional weathering rinds around fractures			
	45										1229	

AECOM

Project: Proposed Water Storage Project
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Log of Rock Core Boring CB-13

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	45		3		3		1 2		BASALT; green sh gray; s ght y weathered; strong; h gh y fractured; phaner t c, Fe sta n ng on fracture surfaces mv *(continued)*		1238	0% WCR continued
1794	46	15		100	1	70	3		1: 70°, J, T, H+Uk, F , P 2: 10°, J, N, No, No, Wa, SR (poss b y mechan ca) 3: 70°, J, N, Fe, Su, P , SR		[15]	
	47				3		1 2		1246 1: 20°, J, N, Fe ,Sp+Su, P , S 2: 70°, J, N, Fe, Su, Wa St, SR 3: 60°, J, N, Fe, Su, P , S 4: 20°, J, N, No, No, Wa, SR		1301	
1792	48	16		100	4	64	3				[19]	
	49				>10		3 4 3		Root ets n fracture Becomes moderate y weathered; weak; w th C ay f ed fractures		1309 1505	Hole caved at 38' during packer test setup test aborted
1790	50	17		100	5	0	1 2 3 3		1: 65°, J, N, Fe, Su, P , SR 2: 40°, J, MW, Fe+C , Su+Pa, Wa, SR (w th roots) 3: 70°, J, N, Fe+C , Su+Pa, P , SR 4: 60°, J, N, Fe+C , Su+Pa, P , S 5: 10° 30°, J, N T, H+Fe+C , F , Wa		[15]	
	51				6		4 5					
	52				7?		5 1 2 3		Becomes h gh y weathered; weak; w th oca zed comp ete y weathered; extreme y weak zones 1: 25°, J, MW, Fe+Mn, Su, Wa, SR 2: 50° 60°, Sh, W, H+C , F , Wa 3: 30°, J, N, Fe+C , Su+Pa, P , SR	PT #1	1515 1526	
1788	53	18	4	100	5	40	3 3		Becomes moderate y weathered; weak Becomes s ght y weathered; strong; w th moderate y weathered r nds a ong fractures		[26]	
	54				3		4 4		4: 35°, J, N, Fe, Su, P , S SR 5: 70°, J, N, Fe, Su, Wa, SR			PL 32574 psi
1786	55				3		5 1				1534 1542	8' of water in hole
	56				7		3 2 2		1: 60°, J, N, Fe, Su, P , S 2: 50° 60°, J, T, Fe, Su, P , S 3: 85°, J, N, Fe, Su, Wa, SR 4: 85°, J/Sh, W, C , F , Wa, SR			
1784	57	19		63	>10	8	3 4 2		C ay f ed fracture w th roots		[20]	
	58				NA		NR					
	59				NA						1554	
1782	60	20		100	3	30	1 2		1: 85°, J, N, Fe, Su, Wa, SR 2: 75°, J, W, C , Pa, Wa, SR Becomes med um brown; moderate y weathered; moderate y		1600 [30]	
	61											

Report GEO CORE OAK C B MAP File N D AECOM ROCK CORE GPJ 1/30/2017 CB-13

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
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Log of Rock Core Boring CB-13

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	61								strong; with Clay filled fractures and Calcite deposition features; aphanitic			0% WCR continued
		20	4	100	3?	30	2 1		BASALT; green shale gray and medium brown; moderately weathered; moderately strong; highly to intensely fractured; aphanitic, with wide Clay filled fractures and Calcite deposition features		1604 1620	
	62						1 2		mv *(continued)*			
1780		21		100	4	0	3 2		1: 40°, J, MW, C, Pa, Wa, SR 2: 30°, J, MW, C, Pa, P, SR 3: 80°, J, MW?, C +Fe, Pa+Su, Wa P, SR		[30]	
	63						1		With root ets in Clay	PT #2	1623	End of day 6/7/2016
					5?		2				0846	Begin day 6/8/2016 AM water level=58 3'
	64	22		100		0	2 3		0.5" thick root 1: 85°, J, W, C, F, Wa, SR 2: 30°, J, N, Fe, Su, Wa, SR		[24]	Add polymer and paper to increase WCR
1778					7?		2 2		3: 40°?, J, W, C, F, Wa?, SR?			0% WCR after
	65						2				0851	
					3		1 2		Becomes slightly weathered; strong; with high gh y weathered fracture rinds; no roots seen 1: 85°, J, N, C +Sd, Pa, Wa, ?		0907	
	66	23		100		12	2 3		2: 40°, J, N, C, Pa, Wa, P, SR 3: 65° 70°, J, N, Fe+C, Su+Pa, Wa, SR		[19]	
					>10		4 3 5		4: 10° 30°, J, N, Fe, Su, Wa St, R 5: 60°, J, N, Fe, Su, P, S 6: 60°, J, N, Fe, Su, Wa, SR			
1776	67						5		7: 50°, J, N, Fe, Su, Wa, SR			
					7		6 7				0915	
	68						1		Becomes pale green; highly weathered; very weak; occasionally crushed		0923	
		24		65	NA	0	2 2		1: 30°, J, N, Fe, Su, Wa P, SR 2: 40°, J, W, Sd+C +CR, Pa, Ir, R		[9]	
	69						NR					
1774					NA				Becomes green shale gray and medium brown; weak to moderately strong		0936	
			5				1 2		1: 80°, J, N, Fe, Su+Sp, Wa St, R		0944	
	70						3		2: 5°, J, N, No, No, P, SR			
					NA		4		3: 40°, J, N, Fe, Su, Wa, SR 4: 15°, J, W?, C, F, Wa Ir, R? Possible Clay zone			Driller indicates 1' of soft drilling
	71	25		77		0	NR				[36]	
					NA		3 3		5: 30° 40°, J, N, Fe, Su, Wa, SR			
1772							5					
	72								Crushed		0949	
					>10		1			PT #3	0959	
	73						2		Slightly weathered; strong			
					6		3 2		Becomes pale green to med um brown; moderately weathered			
1770	74	26		90		0	2 4 4		1: 20° 30°, J, N, Fe, Su, Wa St, R 2: 30°, J, N, Fe+Mn, Su, P, SR 3: 75°, J, N, Fe+Mn, Su, P, SR 4: 70°, J, N T, C ?+Fe, Su, Wa, SR		[14]	
					3		5		5: 60°, J, N, Fe+C +Sd, Su+Pa, P, SR			
	75											
					NA						1012	
	76								Possible Clay zone		1019	Driller indicates 1' of soft drilling
1768		27		84		8*	NP					
					NA							
	77						1					

AECOM

Project: Proposed Water Storage Project
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Log of Rock Core Boring CB-13

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	77		5		>10		2		BASALT; pale green and medium brown; highly weathered; weak; highly to intensely fractured; occasionally crushed. 77.4' 78.3' Moderately weathered; moderately strong; highly fractured			0% WCR continued
	78	27		84		8*	3		mv *(continued)*		[18]	*Rock does not meet soundness criteria for RQD calculation
1766					3		4 2 5		Becomes medium brown 1: 60°, J, N, Fe, Su, Wa St, SR 2: 30°, J, N, Fe, Su, P , SR 3: 60°, J, T, H+Fe?, Pa, Wa (partially dissolved) 4: 70°, J, N, Fe, Su, Wa, SR 5: 65°, J, N, Fe, Su, P , SR			
	79				5		6 6		6: 30°, J, N T, C +Sd, Pa, Wa Ir, SR R			
	80						1		Becomes very weak			
					7		2				1036	
1764	81								1: 75°, J, W C , F , Wa P , SR 2: 35°, J, N, Fe, Su, Wa St, R		1044	
							2		Clay filled fracture			
		28		100	3	50	3				[15]	PL 26545 psi
	82						3		Becomes green shale gray; slightly weathered; strong 3: 30°, J, N, Fe, Su, P , S			
					2		4		4: NA, V?, W, H+Ca, F , Ir			
											1054	
1762	83										1456	
					1							
	84						1		1: 10°, J, N, Mn+Fe, Su, P , R 2: 35°, J, N, Mn+Fe, Su, P , SR			
					2		2 3		3: 70° 90°, J, N, Mn+Fe, Su, P , R 4: 20°, J, N, Mn+Fe, Su, P , SR 5: 40°, J, MW, Mn+Fe+Clay, Su+Fill, P , SR 6: 60°, J, N, Mn+Fe, Su, P , SR			
	85	29		93		50	2				[17]	
1760					3		4		Becomes pale green and medium brown; moderately weathered; strong; with highly weathered rinds around fractures			
			6				1					
	86						5					
					6		1 6 6					
	87						1				1510	
											1518	
					4		2					PL 8751 psi
1758							1 3					
	88						1 3					
							3		Dissolution cavities			
					8		3					
							1					
	89						1		1: 35°, J, N, Fe, Su, P , SR			
		30		100		29	4		2: 45°, J, N, Fe, Su, Wa, SR R 3: 50° 60°, J, N T, Fe+Ca, Su+Sp, Wa Ir, R		[21]	
					7		5		4: 75°, J, N, Fe, Su, P Wa, SR			
1756	90						5		5: 30°, J, N, Fe, Su, Wa, SR 6: 80°, J, N, Fe, Su, P , S SR			
												PL 23609 psi
					4		5					
	91											
							5 6					
					9		5				1531	
	92						1		1: 30°, J, N, Fe, Su, P , SR 2: 20°, J, N, Fe+Clay, Su+Sp, Pa, SR		1542	
							2		3: 60°, J, N, Fe+Clay, Su+Sp, Pa, SR			
1754		31		95		0	2 1					
					>10		1		Crushed	PT #4		
	93											

AECOM

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Log of Rock Core Boring CB-13

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	93		6				4		BASALT; pale green and medium brown; moderately weathered with high weathered fracture rinds; moderately strong; high to intensely fractured; occasionally crushed; phaneritic; occasional Ca cite nodules mv *(continued)*			
		31		95	6	0	5 5		4: 85°, J, MW, Fe+Sd, Su+Sp, Wa, SR		[27]	
	94						6 5 5		5: 15° 25°, J, N, Fe, Su, Wa P , SR S			
1752					9		5 7 4		6: 30°, J, N, Fe, Su, P , S			
	95						7 8		7: 50°, J, N, Fe, Su, P , S			
					NA		NR		8: 60°, J, N, Fe, Su, Wa, SR		1551	
											1559	
	96	32		100		0	1		← Without high weathered fracture rinds		[10]	
					4		2		1: 30° 90°, J, MW, C , Pa, Wa P , SR		1605	
							1 2		2: 25°, J, N, Fe, Su, P , S		1611	
1750	97								← Becomes slightly weathered; strong; high fractured			
					5		1 2		1: 20°, J, N, Fe, Su, St, R			
		33		100		40	3 1		2: 30°, J?, T, H+Uk, Uk, P (dissolved vein?)			
							4		3: 80°, J, T, Fe, Su, P , S			
	98						2		4: 70°, J, N, No, No, P , S		[17]	
					4		5		5: 20°, J, N, No, No, P , S			
							2				1620	UC 18909 psi End of day 6/8/2016
	99		7								0749	Begin day 6/9/2016 AM water level=97 5'
1748					4		1		← Becomes green shale gray			
									1: 20°, J, T, H+Clay ?, F , Wa			
	100						1 2		2: 20° 25°, J, N, ,No, No, P , S			
					1		2		3: 70°, J, N, Fe, Su, P Wa, SR			
		34		100		29	1		4: 15°, J, N, Fe, Su, St, R		[13]	
	101						1					
					2		2					
1746												
	102						3		← Becomes intensely fractured			
							4					
					6						0805	
							1			PT #5	0957	Packer test 83'-102 5' aborted because rods would not fill with water
	103						2		1: 70°, J, N, Fe, Su, Wa, SR			
					7		2 3		2: 20°, J, T, Fe, Su, P , S			
		35		100		0	2 2		3: 30°, J, T, Fe, Su, P , S			
1744	104						4 5		4: 60°, V/J, MW, H+Ca, Pa, Wa P (partially dissolved)		[21]	
									5: 35°, J, N, Fe, Su, P , S			
					5		6		6: 75°, J, MW, Fe, Su, Wa St, SR R			
							5					
	105						1 2		← Becomes moderately weathered; strong; intensely fractured to		1004	
							3		crushed; Fe staining on fracture surfaces		1038	Run 36 taking more water than previous runs
					8		3		1: 85°, J, MW, Fe+Sd, Su+Pa, Wa, SR			
	106								2: 15° 25°, J, N, Fe, Su, Wa, SR			
							4		3: 30°, J, N, Fe, Su, P , SR			
1742		36		100		0	4		4: 10°, J, N T, Fe, Su, P , S		[19]	
					>10		4 4		5: 60°, J, MW, Fe, Su, Wa, SR			
	107						5 6		6: 50°, J, N, Fe, Su Wa, P , SR			
							6 7		7: 10°, J, MW, Fe, Su, P , S			
					7						1046	
							1		← Becomes slightly weathered		1102	
	108						1		1: 50°, J, N, Fe, Sp+Su, P , S			
									2: 20°, J, N, Fe, Su, Wa St, SR			
		37		83		0	2		3: 30°, J, N, Fe, Sp, Wa, SR			
1740					2							
							3		← Becomes phaneritic			
	109											

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-13

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	109		7	83		0			BASALT; green sh gray; s ght y weathered; strong; ntense y fractured; phaner t c		[23]	0% WCR continued
		37		83	>10	0			mv *(continued)*			
	110				NA		NR				1110	
1738											1611	Foam added to improve WCR
	111	38		35	NA	0	1		1: 90°, J, MW?, Fe, Su, P , S		[24]	
	112						NR					
					NA				Becomes very strong; aphan t c; h gh y fractured		1616	
									1: 90°, J, N, Fe, Su, P , S	PT #6	1621	
1736	113	39		87	NA	87	1				[9]	
	114						NR		W th abundant f ne (<1mm) Ca c te nodu es		1631	
			8						1: 50°, J, N, Fe, Su, P , S		1648	
					NA				2: 60°, V, T, H+Ca, F , P +St			PL 25583 psi
							1		3: 50°, V/J?, T, H+Uk, Uk, P (d sso ved ve n?)			UC 35673 psi
	115						2		4: NA, V, T, H+Ca, F , Ir			
1734		40		83	1	83	3		5: 20°, J, N, Fe, Su, P , S		[15]	
							4					
	116						5					
					2							
							5					End of day 6/9/2016
	117						1				1700	
							1				0834	Begin day 6/10/2016
					2		2					Dry hole
1732							3		1: 30°, J, N, No, No, Wa, SR			
	118								2: 10°, J, N, Fe, Sp+Su, P , S			
							3		3: 20°, J/V?, T, Ca, Sp, P , ? (d sso ved ve n?)			
									4: 80°, J/V?, T, Ca, Sp, P , ? (d sso ved ve n?)			
					5		2		5: 20°, J, N, Fe, Su+Sp, P , S			Stop to refill water tank
							3		6: NA, V, T, H+Ca, F , Ir			
	119	41		100		95	3		7: 40°, J, N, Fe, Su+Sp, P , S		[14]	
							4					
					2		5					
							5					
1730	120						6					
					2		7					
							7					
	121						1				0851	
							1				1011	Stop to refill water tank
					2		2					
							3		1: 50°, J, N, Fe, Su, P , S			
	122	42		100		70	3		2: NA, V, T, H+Ca, F , Ir		[15]	
1728									3: 20°, J, N, Fe, Su, P , S			
					4		3		4: 80°, J, T, Fe, Su, P , S			
							4		5: 40°, J, N, Fe, Su, P +St, SR R			
	123						5				1019	
							1				1320	Hole caved after Packer Test #6
					4		1					Pump paper into hole to improve WCR
							1 2					0% WCR after
							2		Decreas ng Ca c te nodu es			
	124	43		100		80	3					
							4					
					5							
1726							3		Becomes ntense y fractured			
	125						5					

AECOM

Project: Proposed Water Storage Project
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Project Number: 60393322/60503855

Log of Rock Core Boring CB-13

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	125	43	8	100	5	80	3 6		BASALT; green sh gray; s ght y weathered; very strong; ntense y fractured; aphan t c; w th f ne Ca c te nodu es. Becomes fresh; s ght y fractured at 125.5'	PT #7	[17]	0% WCR continued
	126				0				mv *(continued)* 1: 5° 10°, J/V, T, H+Ca, F , P 2: 20°, J, N, Fe, Sp, P , SR 3: 30°, J, N, No, No, Wa, SR 4: NA, V, T N, Fe, Su, P , S 5: 80°, J, N, Fe, Su, P , S 6: 70°, J, N, No, No P , SR			
1724	127				0		M		W th 0.25" Ca c te nodu es 1: NA, V, MW, H+Ca, F , Ir 2: 30°, V, T, H+Ca, F , Wa 3: 30°, J, N, No, No, P , S 4: 60°, J, N, Fe+Mn, Su, P , SR		1336 1425	Stop to refill water tank
	128		9		0		2					
	129	44		100	0	86					[14]	
1722	130				5		3		Becomes moderate y weathered; ntense y fractured; no Ca c te nodu es			
	131						4 1				1440 1611	Stop to refill water tank
1720	132				4		1		1: 40°, J/V, MW, H+Ca+Fe, Su+Pa, P 2: 80°, J, N, Ca+Fe, Pa+Su, Wa P , SR 3: 50°, J, N, Ca+Fe, Su+Sp, P , SR 4: 30°, J, N, Fe, Su, P , SR 5: 60°, J, N, Fe, Su, Wa, SR 6: 70°, J, N, Fe, Su, Wa, SR 7: 55°, J, N, Fe, Su, P , S			
	133	45		100	7	0	1 1 1 2 3 3				[18]	
	134				5		4 5 4 4					
1718	135				7		5 6 7 7 1		Becomes s ght y weathered; very strong; h gh y to ntense y fractured; w th t ght Ca c te ve ns 1: 30°, J, N, Fe+Mn, Su, P , S 2: 45°, V, T, H+Ca, F , P 3: 45°, J, N, Fe+Mn, Su, P , SR 4: 60°, J, N, Fe+Mn, Su, Wa, SR 5: 20° 30°, J, N, Fe+Mn, Su, Wa, SR 6: 60°, J, N, Fe+Mn, Su, P , SR 7: 90°, J, N, Fe+Mn, Su, Wa, SR		1624 1633	
	136				3		2 2 2					
1716	137	46		100	9	54	2 3 4 6 7 6			PT #8	[15]	
	138				0		2					UC 18386 psi
1714	139				2		2 1 2 3		1: 20°, J, N, Mn+Fe, Su, P , SR 2: 20°, J, N, Mn+Fe+Ca, Su+F , P , SR 3: 30°, J, VN, No, No, P , SR 4: 60° 75°, J, VN, Mn+Fe+Ca, Su+F , P Wa, SR		1647 1655	
	140				3		4					
1712	141	47		98	0	87					[12]	

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-13

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	141		10		0				BASALT; green sh gray; s ght y weathered; very strong; h gh y to oca y moderate y fractured; aphan t c; w th t ght Ca c te ve ns mv *(continued)*			
	142	47		98	0	87						
1710	143				1		1 2 3 3		1: 40°, J, MW, Fe, Sp+Su, Wa, SR 2: 55°, J, MW, Ca, Pa, P , R (d sso ved ve n?) 3: 20° 50°, V, T, H+Ca, F , P 4: NA, V, MW, H+Ca, F , Ir 5: 60°, J, N, Fe+Mn, Su, Wa, SR 6: 15°, J, MW, Fe, Su, Wa St, SR R	PT #9	1718	End of day 6/10/2016 Begin day 6/11/2016 Dry hole
	144				2							
	145						3					
1708		48		100	1	88					[14]	
	146				1		3 6 3					
	147				2		4 3 5 3 3					
1706	148						3 5					
					4		1 2		Becomes fresh; phaner t c 1: 30°, J, MW, Fe+Mn, Su+Sp, P , SR 2: 50° 60°, J/V, N MW, H+Ca, Pa, P , SR 3: 20°, J, MW, Fe+Mn, Su, Wa, SR 4: 50°, J, N, Fe+Mn, Su, P , SR 5: 40°, J, N, Fe, Su, Wa St, SR R 6: 50°, V, T, H+Ca, F ,P 7: NA, V, N, H+Ca, F , Ir			
	149						3 2 4					
					5		2 5 5					
1704	150						2					
		49		100	1	64	6				[14]	
	151				2		4 2 6					
	152						6		Becomes moderate y fractured			
1702					0		7					
	153						M			PT #10		
					0		1					
	154						2 2					
					2		2 3					
1700	155						4		1: 45°, V, N, H+Ca, F , P 2: 40°, V, T, H+Ca, F , P 3: 10°, J, N, Fe+Mn, Su, P , S 4: 60°, V, N, Ca, F , P , SR 5: 10°, J, N, No, No, P , SR 6: 60°, J, N, No, No, P , SR	PT #11		
			11				2					
		50		100	0	96					[14]	
	156						2 5 6					
					2							
	157						2					

Report GEO CORE OAK C B MAP File N D AECOM ROCK CORE GPJ 1/30/2017 CB-13

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-13

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1698	157		11						BASALT; dark brown gray; fresh; very strong; moderately fractured; phaneritic; with tight Ca calcite veins			
		50		100	0	96			mv *(continued)*		[14]	
	158				1		1		Becomes aphanitic 1: 65°, J, MW, Ca, Sp, P , SR 2: 20°, V, T, H+Ca, F , P 3: 5°, J, N, Ca, Sp, P Wa, SR 4: 60°, J, T, H+Uk, F , St 5: 30°, J, N, Ca, Sp, P , SR			
	159											
1696					0		2					
	160											
		51		100	0	100					[14]	
	161						3					
1694					1		4					
	162											
					1		5		Becomes highly fractured; with Olive/Chlorite filled slickensided fracture surfaces			
	163						1					End of day 6/11/2016
											0950	Begin day 6/13/2016
					2		2					Dry hole to 153'
1692	164								1: 10°, J, N, Uk, Sp, P St, S+Sk 2: 50°, J, N, No, No, P , S 3: 15°, J, N, Ch, Su, P , S+Sk 4: 20°, J, N, Ch, Su, Wa, S+Sk 5: 60°, J, N, No, No, P , SR 6: 10° 30°, V, T, H+Ca, F , Wa P 7: 30°, J, MW, Ch, Su, P , S+Sk			
					2		3					
	165						3					
		52		100	1	88	4				[15]	
	166						3 5					
1690					3		5					
	167						3					
			12		2		6					
							7				1010	
	168										1020	
1688					0							
	169						1					
					0							
	170						2		1: 30°, V, T, H+Ca, F , P 2: 25°, J, MW, Fe+Mn, Su, P , SR 3: 90°, J, N, No, No, P , SR 4: 20° 35°, J, N, Ca+Ch, Sp, St, SR			
		53		100	1	100					[13]	
1686	171											
					2		3 2					
	172						4					
					2					PT #12		
	173						4				1043	

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-13

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1684	173		12		2		1		BASALT; dark blue gish gray; slightly weathered; very strong; highly fractured; aphanitic; with Olivine and Chlorite filled, slickensided fracture surfaces mv *(continued)*		1315	
1683	174				5		2 2 2 3 4		Green gish gray; moderately weathered; intensely fractured			0% WCR 174 2'-147 7' Driller indicates hard drilling
1682	175	54		100	3	74	5 6 6		1: 50°, J, N, Fe+Mn, Su, P , SR 2: 45°, J/Sh?, N, Uk, Uk, P , SR 3: 45°, J/Sh, N, H+Uk, Uk, P 4: 20°, J, MW, Fe, Sp, P , SR 5: 85°, V, N T, H+Ca, Pa, Wa 6: 40°, J, MW, Fe+Mn, Su, P , SR 7: 30° 40°, J, N, No, No, St, SR R 8: 0°, J/V, N, Ca, Pa+Su, Wa, S SR 9: 50°, V, T, H+Ca, F , P 10: 70°,J, MW, Fe+Mn, Su, P , SR		[13]	
1681	176				2		7					
1680	177				1		8 9 9					
1679	178						10 10				1339 1349	
1678	179	55		100	1 1 3	40	1 2 3		1: 50°, J, N, Ca, Su, P , S+Sk 2: 35°, J, N, No, No, P , SR 3: 80° 90°, J, N, Fe, Su, Wa, SR 4: 60°, J, N, No, No, St, R 5: 30°, J, N, Ca, Sp, P , S+Sk		[12]	0% WCR
1677	180		13		3		3 4					
1676	181						5					
1675	182				4		3 3					
1674	183				2		M 1 2		1: 70°, J, N, Ch, Su, P , S+Sk 2: 30°, J, N, No, No, P , SR Becomes slightly fractured	PT #13	1414 1541	
1673	184				0							
1672	185	56		100	0	98					[13]	
1671	186				0							
1670	187				1		3 4		3: 40°, J, N, Ca, Pa, P , S+Sk 4: 80°, V, N, H+Ca, F , Wa St			
1669	188						M M				1605 1618	
1668	189	57		100	1	96	M 1					

Report GEO CORE OAK C B MAP File N D AECOM ROCK CORE GPJ 1/30/2017 CB-13

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-13

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1670	189		13		0				BASALT; dark brown to dark gray; fresh; very strong; slightly fractured; aphanitic; with Olivine and Chlorite filled, slickensided fracture surfaces			
									mv *(continued)*			
	190						2		Becomes highly fractured 1: 30°, J, N, Ch+Ca, F, P, S+Sk 2: 60° 30°, J, N, No, No, P+St, S+Sk			
		57		100	2	96					[13]	
1668	191				1		1					
	192				2		2					
							2			PT #14		
	193										1642	End of day 6/13/2016
							M				1011	Begin day 6/14/2016 AM water level=178.0'
					1		1					
1666	194								1: 60°, J, N, Ch, Su, P, S+Sk 2: 50°, J/V, T, H+Ca, F, Wa			
							2		Fractured and rehealed 3: 35°, J/V, N, Ca, F, P, S+Sk			
					1?		3		4: 80°, J/V, N, H+Ca, Pa, Wa, SR			
	195		14				4		5: 30°, J, N, No, No, P, S+Sk 6: 85°, J, MW, Ca, Sp, Wa, SR 7: 45°, V, N, H+Ca+C, F, P St			
		58		100	3	18	5 6		8: 30°, J, MW, Ca, Sp, St, R		[14]	
	196						5					
1664					2							
	197						7 7					
							7					
							3					
					3		8 8					
	198						M				1032	
							1				1044	
1662					1		2		1: 90°, J/V, T, H+Ca, F, Wa			
							2 2		2: 40° 60°, V, MW, H+C, F, P, S			
	199						3		3: 40°, J/V, N, Ca+C, Su, P, S+Sk 4: 15°, J, N, Ca+C, Sp, St, R			Driller indicates hard drilling
					1		2		5: 60°, J, N, Ca+C, Sp, P, S 6: 30°, J, N, No, No, P, SR			
	200						2 4		7: 50°, J, N, Ch, Su, P+St, S+Sk			
		59		100	1	98	2				[10]	
1660	201						5		Green sh gray			
					2							
	202						3					
					2		6					
							2					
	203						7 1				1114	
1658					1		2				1148	Stop to refill water tank
		60		100		86						
	204						2					
					4		1					
							2					
							2					
	205											

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-13

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1656	205	60	14	100	3	86	3 3 4		BASALT; dark brown gray; fresh; very strong; highly fractured; aphanitic; with Olivine and Chlorite filled fracture surfaces mv *(continued)*		[16]	
	206				1				1: 30°, V, N, C, F, Wa 2: 40°, J, N, C+Ca, Su, P, S+Sk 3: 30°, J/V, MW, C+Ca, Su, Wa, SR+Sk 4: 15°, J, N, No, No, P, S 5: 15°, J, N, No, No, Wa, SR 6: 85°, J/V, T, H+Ca, Sp, Wa			
	207				1		4 5 11					
1654	208										1207	
									TOTAL DEPTH = 208.0 FEET **Caliper, Televiewer and Neat cement grout to surface performed 6/14/2016**			
1652	209											
	210											
	211											
	212											
1650	213											
	214											
1648	215											
	216											
1646	217											
	218											
	219											
1644	220											
	221											

Report GEO CORE OAK C B MAP File N D AECOM ROCK CORE GPJ 1/30/2017 CB-13

AECOM

Depth 8.5’ to 23.0’

Depth 23.0’ to 40.0’

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-13 Boxes 1 and 2	Figure CB-13-1

Depth 40.0’ to 54.0’

Depth 54.0’ to 69.5’

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-13 Boxes 3 and 4	Figure CB-13-2

Depth 69.5’ to 85.4’

Depth 85.4’ to 99.0’

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-13 Boxes 5 and 6	Figure CB-13-3

Depth 99.0’ to 114.0’

Depth 114.0’ to 127.5’

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-13 Boxes 7 and 8	Figure CB-13-4

Depth 127.5’ to 140.7’

Depth 140.7’ to 155.0’

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-13 Boxes 9 and 10	Figure CB-13-5

Depth 155.0’ to 167.5’

Depth 167.5’ to 181.3’

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-13 Boxes 11 and 12	Figure CB-13-6

Depth 181.3’ to 194.6’

Depth 194.6’ to 208.0’

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-13 Boxes 13 and 14	Figure CB-13-7

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-14

Date(s) Dr ed	**6/16/2016-6/20/2016**	Logged By	**K. Zeiger**	Checked By	**B. Kozlowicz**
Dr ng Method	**HQ-3 Wireline Core**	Dr B t S ze/Type	**3 7/8" HQ Diamond**	Tota Depth of Boreho e	**202.8 feet**
Dr R g Type	**LF-70 Track-Mounted Rig**	Dr ng Contractor	**Ruen Drilling**	NAVD 88 Ground Surface E evat on	**1727-ft**
Groundwater Leve	**91.7-ft 7/16/2016**	Samp ng Methods	**HQ-3 Wireline**	Inc nat on from Hor zonta /Bear ng	**60° / 182°**
Boreho e Comp et on	**1.0-in Sch 40 PVC Piezometer**	Locat on	**Axis 2 North - CFRD Plinth**	Coord nate Locat on	**N 2142028.1 E 6839012.3**

E evat on, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %	Fracture Draw ng Number	L tho ogy	MATERIAL DESCRIPTION	We D agram	Packer Test Interva s	Dr T me, 24 hr [Dr Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	0											0820	**Well: 4-in Steel Stovepipe Box at surface**
	1				NA				CLAYEY GRAVEL w th SAND (GC); dry; redd sh brown; BASALT GRAVEL and COBBLES to 7 n; med um to coarse gra ned SAND; no p ast c ty FINES; abundant organ cs				
1726									COLLUVIUM/LANDSLIDE				**Well: 1-in PVC solid well casing -2.35'-97' in neat cement grout**
	2				NA		NR						Advance 5" HWT casing to 4'
	3				NA								
1724													
	4		1		>10				GRAVEL s zed BASALT w th c ay f ed fractures			0837	90% Water Circulation Return (WCR)
	5	1		33	NA	0						[45]	
1722							NR						
	6				NA								
	7											0841	
					>10							0851	Driller indicates intermittent hard and soft drilling
1720	8	2		40	NA	0						[45]	
	9						NR						
					NA								
	10											0855	
1718												0904	
	11				NA								
		3		33		0	NR					[26]	
	12								W th root ets				
					7				BASALT BOULDER; moderate y weathered; moderate y strong				
1716	13											0911	

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-14

Elevation, feet	Depth, feet	Run No.	Box No.	ROCK CORE Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Well Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	13		1		>10				CLAYEY GRAVEL with SAND (GC); dry; reddish brown; BASALT GRAVEL and COBBLES to 7 in; medium to coarse grained SAND; non plastic fines; abundant organics			0920	Continued 90% WCR Driller indicates intermittent hard and soft drilling
	14				NA				COLLUVIUM/LANDSLIDE *(continued)*				
1714	15	4		20	NA	0	NR					[50]	
	16				NA								
	17												
1712					NA								
	18											0926	
												0945	Pull rods to retrieve stuck inner barrel
	19	5		50	>10	0	NR					[20]	
1710					NA								
	20											0951	
												0956	Driller indicates very soft drilling
	21				>10				BASALT; highly to completely weathered				
		6		33	NA	0	NR					[36]	
1708	22												
					NA								
	23											1001	
									GRAVELLY LEAN CLAY (CL); moist; reddish and gray sh brown			1015	
	24				NA								
1706		7		80		0						[75]	pp=4 5 tsf
	25				NA		NR		BASALT COBBLE; moderately weathered; moderately strong				
												1017	
	26				5							1023	
1704		8		100		0			BASALT COBBLE; moderately weathered; moderately strong			[50]	
	27				NA				CLAYEY GRAVEL with SAND (GC); reddish and yellowish brown; BASALT GRAVEL and COBBLES				pp=4 5 tsf
	28						NR					1026	
												1031	
		9		84	>10	0							
1702	29								Highly weathered; weak corestone (crushed)				

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-14

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Weld Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	29	9	1	84	>10	0			CLAYEY GRAVEL with SAND (GC); reddish and yellowish brown; BASALT GRAVEL and COBBLES COLLUVIUM/LANDSLIDE *(continued)*			[150]	Continued 90% WCR pp=4.5 tsf
	30				NA		NR		Without COBBLES			1032	
			2									1042	Driller indicates very soft drilling
1700	31	10		16	NA	0	NR					[75]	
	32				NA								
	33											1044	
1698					NA							1049	No recovery placed at top of run at Driller's suggestion
	34						NR						
					NA								
	35												
1696		11		64	NA	0						[300]	
	36								BASALT; yellowish brown; completely weathered; extremely weak clayey with healed fractures and rock fabric RESIDUAL SOIL/LANDSLIDE				
					NA								
	37								With GRAVEL/BRECCIA casts				
					>10								
1694	38											1050	
					NA				CLAYEY GRAVEL with SAND (GC); yellowish to dark yellowish brown; subangular BASALT GRAVEL to 2"; low to medium plastic FINES SLIDE PLANE			1100	Advance 5" HWT casing to 14'
	39	12		80		0						[150]	
					NA								
	40						NR					1101	
1692					NA							1150	
	41												
					NA								
	42	13		24		0	NR					[75]	
					NA								
1690	43											1152	
					NA		NR					1220	Very fast drilling 43'-44'
	44	14		72		0							
					NA				1: 30°, J, MW, C +Sd, Pa, P , SR? BASALT; yellowish brown; highly weathered; very weak				
	45						1						

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-14

Sheet 4 of 13

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Well Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1688	45		2						BASALT; yellowish brown; high weathered; very weak; occasionally crushed; porphyritic				Continued 90% WCR
		14		72	>10	0			SLIDE PLANE			[75]	
	46								Crushed; possible slickensided plane				
					>10								
	47												
1686					>10								
	48											1224	Bottom of Run 14 crushed from removal from shoe
												1230	
					NA								
	49						NR		Possible slickensided plane				
					NA								
1684	50	15		49		0			Becomes dark yellowish brown; high weathered; weak; intensely fractured to crushed; phaneritic; Fe&Mn stained fractures			[27]	
					NA		1 2		1: 60°, J, N, Fe+Mn, Su, P , SR				
	51						2 3		2: 70°, J, N, Fe+Mn, Su, Wa, SR				
					5		1		3: 90°, J, N, Fe+Mn, Su, Wa, SR				
							4		4: 40° 50°, J, N, No, No, St, R				
1682	52						1						
							1						
					5		4					1240	
			3				1					1249	
	53						2		1: 60°, J, N, Fe+Mn, Su, Wa, SR				
							2 2		2: 10°, J, N, Fe+Mn, Su, P , SR				
					8		2 3		3: 80°, J, N, Fe+Mn, Su, St, R				
							4		4: 40°, J, N MW, Fe+Mn+Sd, Su+Sp, P , SR				
	54						4 4		5: 50°, J, N, Fe+Mn, Su+Sp, P , SR				
1680					3		4						
		16		72		0						[31]	
	55						5		Becomes high to completely weathered; extreme to very weak; crushed				
					NA								
	56						NR						
1678					NA								
	57											1258	
					>10				Becomes yellowish brown; extreme weak; clayey; occasionally crushed			1309	
	58								1: 50°, B, MW, C , F , P , SR (contact)				
					>10								
1676	59	17		100		18			Crushed			[76]	
					>10								
	60						1						
					1				BASALT; dark green shale gray; slightly weathered; strong; high fractured; aphanitic to porphyritic				
	61						2		mv			1312	

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-14

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Weld Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1674	61		3		4		1 2 3		BASALT; dark green sh gray; s ght y weathered; strong; h gh y fractured; aphan t c to porphoryt c mv *(continued)*			1331	Continued 90% WCR
	62	18		100	2	43	2 4		Becomes mott ed w th dusky red 1: 15°, J, N, No, No, St, R 2: 35°, J, N, Fe+Mn, Su, Wa, SR 3: 60°, J, T, Fe+Mn, Su, Wa P , SR 4: 60°, J/V?, T, H+Uk, Wa			[25]	
	63						3 1					1336	PL 16763 psi
1672					>10		2 1		Moderate y weathered; ntense y fractured			1347	
	64				2		3		1: 20° 80°, J, MW, Fe+Mn, Su, St, R 2: 75°, J, MW, Sd, Pa, P , ? 3: 40°, J, ?, Fe+Mn, Su+Sp, Wa, SR 4: 60°, J, N, Fe+Mn, Su, P , SR				
	65	19		100		20	4 5		Becomes h gh y to ntense y fractured 5: 65°, J, N, Fe+Mn, Su, P , SR 6: 60° 80°, J, N, Fe+Mn, Su, Wa, SR (poss b y mechan ca from shoe remova)			[23]	
					4		3 3						
1670	66						3 6						
					9		6					1356	
	67						1 2 1 3		1: 60°, J, N, No, No, St, R 2: 30°, J, N, Fe, Sp, St, R 3: 50°, J, N, Fe+Mn, Su, St Ir, R 4: 55°, J, N, Fe+Mn+Sd, Su+Pa, P , SR 5: 70° 85°, J, N, Fe+Mn, Su, P Wa, SR			1403	
			4		5		4						
1668	68	20		90		0	4 4		Moderate y weathered			[22]	
					7								
	69						5		Moderate y weathered around fractures				
					NA		NR					1411	
												1417	
	70						1						
1666					4		2		1: 85°, J, MW, Fe+Mn, Su, Wa, SR 2: 15°, J, N, No, No, St, R 3: 70°, J, T, H+Uk, F ?, Wa, ? 4: 50°, J, MW, Sd, Pa, P , SR 5: 90°, J, N, Fe+Mn, Su, P , SR 6: 15°, J, N, Fe+Mn, Su, Wa, SR				
	71	21		100		0	3 4 3 4					[15]	
					4		5						
							6						
	72											1428	
					4		1 1					1449	Wireline repair
1664	73						1		1: 40° 55°, J, N, Fe+Mn, Su, Wa, SR 2: 50°, J, N, Fe+Mn, Su, P , SR 3: 85°, J, N, Fe+Mn, Su, P , SR 4: 85°, J, MW, Fe+Mn, Su, Wa St, R				
					1		2						
	74	22		100		19	3 1		Becomes s ght y to moderate y weathered; moderate y strong; aphan t c to phaner t c			[15]	
					7		1 1						
1662	75						1						
							4					1502	
					6		1 2		1: 85°, J, N, Fe+Mn, Su, Wa St, SR R 2: 35°, J, N, Fe+Mn, Sp, P Wa, SR 3: 30°, J, N, Fe+Mn, Su, P , S 4: 45°, J, W, Sd+Fe+Mn, Su, Wa, SR			1508	
	76						2						
		23		100	>10	20	3					[12]	
	77						4		Crushed				

PT #1

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-14

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Well Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	77								5: 70°, J, N, Fe+Mn, Su, St, R 6: 50°, J, N, Fe+Mn, Su, Wa, SR				Continued 90% WCR
1660		23	4	100	7	20	5 6		BASALT; dark green sh gray and dusky red; s ght y to moderate y weathered; moderate y strong to strong; ntense y fractured; aphan t c to porphoryt c. H gh y weathered a ong fractures w th sma Ca c te d sso ut on ves c es from 76.9' 77.6'			1518	
	78						1		mv *(continued)*			1525	UC 5840 psi
					6		1 2 3		1: 20°, J, N, Fe+Mn, Su+Sp, P , S 2: 85°, J, N, No, No, P , SR 3: 30°, J, MW, Fe+Mn, Su, Wa, SR				
	79						4 5		4: 30°, J, N, No, No, P St, SR 5: 30°, J, N, Fe+Mn, Su, Wa, SR 6: 80°, J, N, No?, No?, P , SR				*Rock does not meet soundness criteria for RQD calculation
1658		24		100	8	10*	5 5 5					[18]	
	80						5 6						
					>10		6 5						
	81						5						
					NA				Becomes h gh y to oca y ntense y fractured			1539	
1656	82		5				1 2					1549	
		25		100	4	0			1: 30°, J, N, No, No, P , SR 2: 40°, J, N, Mn+Fe, Su, Wa St, R 3: 70°, J, N, Mn+Fe, Su, P , SR			[13]	
											PT #2	1554	End of day 6/16/2016
	83						3 1 2					0913	Begin day 6/17/2016 AM water level=10 0'
					2		3		1: 10°, J, N, Fe+Mn, Su, Wa St, R 2: 10°, J, N, No, No, P , SR				
	84						3 3		Aphan t c to porphoryt c 3: 25°, J, N, Fe+Mn, Su, P , SR 4: 30°, J, MW, Sd+Fe+Mn, Su+Pa, Wa St, R				
1654					5		4		Becomes aphan t c				
	85						3		5: 75°, J, N, Fe+Mn, Su, P , SR 6: 30° 40°, J, T, Fe+Mn, Su, Wa St, R 7: 40°, Sh, MW, Sd+C +Mn+Fe, Pa+Su, P , SR 8: 35° 40°, J, MW, Sd+Fe+Mn, Sp+Su, P , SR				
		26		100	4	29	5 6					[21]	
	86						7		Crushed				
1652					7		8 8						
	87						6		Becomes dark b u sh gray; s ght y weathered; strong; h gh y fractured 9: 30°, J, N, No, No, P , SR (poss b y mechan ca)				
					1		3						
	88						9					0928	
					1		1		1: 30°, J, N, Mn, Su+Sp, P , S 2: 50°, J, N, Fe, Su, P , S 3: 10° 15°, J, N, Fe, Su+Sp, Wa St, SR 4: 75°, J, N, Fe+Mn, Su, P , S 5: 20°, J, N, Fe+Mn, Su, P , S 6: 25°, J, MW, Sd+Fe, Su+Pa, P , SR 7: 40°, J, N, No, No, P , SR			0936	
1650	89						2						
					3		3 1						
	90						1 2						
		27		100	3	47	3					[15]	
	91						1 4						
1648					5		5						
	92						5 6						
					3		6 1						
	93						1 7					0956	

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-14

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Well Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	93		5		0		1 1		BASALT; dark redd sh gray; s ght y weathered; strong; h gh y fractured; aphan t c to phaner t c			1007	Continued 90% WCR
1646									mv *(continued)*				**Well: Bentonite pellets seal 93'-94'**
	94				5		2 3		1: 40°, J, MW, Fe, Su, Wa, SR 2: 40°, J, N, Mn, Su, P , SR 3: 20° 50°, J, N, Fe+Mn, Su, St, R				
	95	28		100		34	4 1		4: 85°, J, N, Fe+Mn, Su, P , SR 5: 30°, J, N, Fe+Mn, Su, Wa, SR 6: 65°, J, N, Fe+Mn, Su, P , S SR 7: 40°, J, N, Uk, F ?, P , SR			[21]	
					4		5						
1644							6						
	96		6				6 6						**Well: #2/12 Sand filter pack 94'-109.8'**
					4		6						
							3						
	97						6					1019	
							7					1027	Driller indicates hard drilling for Run 29
					4		1 1		1: 65°, J, N, No, No, P , S SR 2: 10° 15°, J, N, No, No, P , S SR 3: 20°, J, N, No, No, St, R				
							2						
1642	98						1						
					1		3						
	99	29		100		86						[15]	**Well: 1-in PVC 0.020 slotted well casing 97'-107'**
					1		2						
	100												
1640					1		M						
							1 2					1042	
	101											1048	
							2		Intense y fractured				
					6		3		1: 70°, J, VN, No, No, P , SR 2: 20° 40°, J, N, No, No, P , S				
		30		100		20						[20]	
	102						3 4		3: 60°, J/Fo, N, Ca, Sp, P , S 4: 5°, J, N, No, No, Wa St, SR R				
					4		5		5: 60°, Fo				
1638							5					1054	
	103						3		Becomes aphan t c to porphoryt c			1221	
							1						
					0		1		1: 50°, Fo 2: 10° 20°, J, N, No, No, P , SR 3: 50° 55°, J, N, No, No, P Wa, SR 4: 65°, J, N, No, No, Wa P , SR 5: 55° 90°, J, N, No, No, Wa, SR 6: 70°, J, N, No, No, Wa, SR				
	104						1						
					2		2 3						
1636	105	31		100		68	4					[16]	
							5						
					1								
	106												
					1								
	107						2						
1634							6					1239	
					2							1257	Advance 5" HWT casing to 25'
	108						1						
		32		100		74	2						
					2		2		1: 50°, Fo 2: 10°, J, N, No, No, Wa, SR				
	109						2 1 3						

PT #3

Report GEO CORE OAK C BMP WELL File N D AECOM ROCK CORE GPJ 1/30/2017 CB-14

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-14

Elevation, feet	Depth, feet	Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Well Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	109		6						BASALT; dark redd sh gray; s ght y weathered; strong; h gh y fractured; phaner t c; fo ated				Continued 90% WCR
1632			7		3		3 4		mv *(continued)*				
	110	32		100		74	4		3: 70°, J, N, No, No, P , S			[16]	**Well: Bentonite pellets 109.8'-115'**
					2		5		4: 45° 55°, J, N, No, No, P , SR				
							5		5: 45°, J, N, No, No, Wa, SR				
	111								6: 75°, J, N, No, No, Wa St, SR (poss b y mechan ca due to shoe remova)				
					2		4						
1630	112												
					1		4						
												1317	
	113						6/M					1333	
					1								
	114						1		1: 60°, J, N, Ca, Pa, P , SR				
1628		33		100	2	63			2: 40°, J, N, No, No, St, R				
									3: 45°, J, N, Ca+Fe, Pa+Su, P , S			[15]	
	115						2		4: 70°, J, N, No, No, P , SR				
									5: 70°, J, N, Ca, Pa, P , SR				
					4		2 4		6: 10°, J, N, No, No, St, SR				
	116								7: 10° 20°, J, N, No, No, Wa St, R				
							3 5						
					5		6					1348	Bottom of Run 33
1626							7		Becomes very dark green sh gray; very strong; w th			1355	crushed from removal from shoe
	117						1		abundant Ca c te; no onger fo ated				
							2		1: 15°, J, N, No, No, St, R				**Well: Neat cement grout 115'-202.8'**
					1		3		2: 10°, J, N, Ca, Sp, P , S				
							4		3: 40° 50°, V, N MW, H+Ca, F , Ir P , ?				
	118	34		100		100	3		4: 20°, J, N, No, No, P Wa, SR			[14]	
					2								
							4						
1624	119						3						
					0		4 3						
												1408	
	120						4					1424	Advance 5" HWT casing to 30'
					1		1		1: 30° 50°, V, MW, H+Ca, F , P				
							2		2: NA, V, N MW, H+Ca, F , Ir				
	121						3		3: 30°, J, N, Fe+Mn+Ca, Su+Sp. P +St, SR				
1622		35		100		94			4: 20° 30°, J, N, Ca, Sp, Wa P , SR			[14]	
					1		2						
	122						1 4						
					2		1						
							4		Becomes h gh y to moderate y fractured			1438	End of day 6/17/2016
	123		8				1				PT #4	0850	Begin day 6/18/2016
							4/M						AM water level=45 2'
1620					0		1						
							1 1		1: 30°, V, W, H+Ca, F , P +St				
	124	36		100		100	2		2: 70°, V, W, H+Ca, F , P +St				
							3		3: 40°, J, N, No, No, Wa, SR			[19]	
					2								
	125						1						

AECOM

Project: Proposed Water Storage Project
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Log of Rock Core Boring CB-14

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Weld Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	125	36	8	100	1	100	4		BASALT; very dark green sh gray; s ght y weathered to fresh; very strong; moderate y fractured; phaner t c; abundant Ca c te ve ns				Continued 90% WCR
1618	126				0		1 1 5 6 7		mv *(continued)* 4: 5°, J, N, Ca, Su+Sp, P , S+S k 5: 70°, J, T, H+Uk, Pa, Wa 6: 15°, J, T, H+Uk, Pa, Wa 7: 55°, J, N, Ca, Sp, Wa, SR R			[19]	
	127				1		1 1 M		Becomes h gh y fractured				
1616	128				1		2 1 3 1 3		Part a y d sso ved Ca c te ve ns 1: 30°, V, MW W, H+Ca, F , St+P 2: 40°, V, W, H+Ca, Pa, Wa, R? 3: 15°, J, N, Ca+Fe, Sp+Su, Wa P , SR 4: 80°, J/V, N, Ca, Pa, P , SR 5: 15°, J/V, N, Ca, Pa, P , SR 6: 70°, J, N, Ch?, Pa, P , S+S k				
	129				2								50% WCR
	130	37		100	3	82	1 3					[18]	
1614	131				2		3 1 6 1		Becomes h gh y to moderate y fractured				
	132				0		1					0951	
1612	133				0		1 1 1		1: 70°, V, MW, H+Ca, F , P , St				
	134				2		1 1 2		Becomes h gh y fractured 2: 80°, J, N, Ca, Su, P , S+S k 3: 5°, J, N, Ca, Su, P , S+S k 4: 30°, V, MW, Ca, Pa, Wa St, R 5: 60°, J, N, Ca, Sp, Wa St, R 6: 70°, J, N, Ca, Sp, Wa, SR				
1610	135	38		100	1	75	3 3 1					[16]	
	136				3		4 1 5						
	137		9		1		1 6					1011	
1608	138				1		1 2 1		1: 45°, V, MW, H+Ca, F , P +St 2: 30°, J, N, Ca, Sp, P , SR 3: 20° 25°, J, N, No, No, Wa St, R			1017	
	139				2		1 1 3 1						
1606	140	39		100	0	82	3 1 1		Moderate y fractured			[12]	
	141												

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-14

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Well Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	141		9				4		BASALT; very dark green sh gray; fresh; very strong; h gh y fractured; phaner t c; abundant Ca c te ve ns and nodu es. Becomes dark redd sh brown; aphan t c and porphoryt c; w th no Ca c te at fracture 4 (141.2')				
1604	142	39		100	1	82	M		mv *(continued)*				
							5		4: 80°, J, N, No, No, P , SR 5: 5° 10°, J, N, No, No, Wa, SR (poss b y mechan ca)		PT #5	1043	
	143				2		1					1220	Pump 1 bag of paper into hole to improve WCR
							1						
							1		1: 20°, J, N W, H+Ca, F , P 2: 35°, J, N, Ca, Sp, P , S				
							2		3: 20°, J, N, No, No, Wa, SR				
	144						3		4: 25°, J, N, No, No, P , S				
1602					1		2		Becomes moderate y fractured				
	145	40		100		98						[14]	
					1		1						
	146						2						
					0								
1600	147						4						
					1		1						
							M					1242	
	148											1259	
					0								
1598	149						1		1: 65° 70°, J, VN, No, No, P +St, SR				
					1		2		2: 40°, Fo/B (f ow band ng) 3: 65°, J, N, No, No, Wa St, SR				
	150						1						
		41		100	1	100						[14]	
							M						
1596	151				0		M						
			10										
	152				1		2						
	153						3					1321	
											PT #6	1353	Advance 5" HWT casing to 40' by pushing soft ground did not need to be drilled
					0		1						
1594							1		1: 50°, Fo/B (f ow band ng)				
	154						1		2: 60°, J, VN, Ca, Sp, P , SR				
					1		2		3: 30°, J, T, No, No, St, R (poss b y mechan ca)				
							1						
	155						1						
		42		100	1	82	1					[14]	
1592							2		Becomes h gh y fractured				
	156						2						
					2								
							3						
	157												

Report GEO CORE OAK C BMP WELL File N D AECOM ROCK CORE GPJ 1/30/2017 CB-14

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-14

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Well Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	157		10				5		5: 30°, J, VN, No, No, Wa, SR (poss b y mechan ca from shoe remova)				
		42		100	3	82	5		6: 80°, J, VN, No, No, P , SR (poss b y mechan ca from shoe remova)				
1590	158						6 M		BASALT; dark redd sh gray; fresh; very strong; h gh y fractured; phaner t c; w th f ow band ng/fo at on mv *(continued)*			1415 1427	
					3		1		1: 10°, J, VN, Ca, Sp, P , S				
	159						1 2		2: 45°, Fo/B (f ow band ng) 3: 25°, J, VN, Ca, Sp, P , S				
					1		2		4: 70°, J, VN, Ca, Sp, P , S				
	160						3		5: 10° 40°, J, VN, No, No, Wa+St, R				0% WCR
1588		43		100	1	88						[11]	
	161						3 4						
					1								
	162						5		Becomes moderate y fractured				
					1								
1586	163						M				PT #7	1453 0939	End of day 6/18/2016 Begin day 6/20/2016
					0		1		1: 45°, Fo/B (f ow band ng)				AM water level=78 5'
	164								2: 30°, J, MW, Ca, Sp, P , SR 3: 10°, J, N, No, No, Wa, SR				Pump 1 bag of paper into hole to improve WCR
					1		2						
			11				1						
1584	165						1						
		44		100	0	100						[15]	
	166						3 2						
					2		1						
	167												
1582					0		1						
	168						M					0958 1005	
					1		1		1: 60°, Fo/B (f ow band ng)				
	169						2		2: 5°, J, N, No, No, Wa, SR 3: 60°, V/J, N, Ca, Sp, P , SR				10% WCR
					1		1		4: 10°, J, N, No, No, P , S				
1580	170						1 3		5: 30°, J, N, Ca, Sp, P , SR				
		45		100	1	100	4					[13]	
	171						5						
					0		1						
							1						
1578	172						5						
					1		M						
							M				PT #8	1029	
	173						M					1035	

Report GEO CORE OAK C BMP WELL File N D AECOM ROCK CORE GPJ 1/30/2017 CB-14

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-14

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Weld Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	173		11		0		M		BASALT; dark redd sh gray; fresh; very strong; h gh y to moderate y fractured; phaner t c; w th f ow band ng mv *(continued)*				0% WCR
1576	174						1		W th t ght Ca c te ve ns 1: 70°, J, N, Ca, Sp, P , S 2: 15°, J, N, No, No, St, R 3: 20°, J, N, No, No, P , SR 4: 65°, V, T, H+Ca, F , Wa 5: 40°, J, N, No, No, St, R				
	175	46		100	3	96	2 1					[13]	
	176				2		3 1						
1574	177				2		1 1						
	178		12		1		5					1058	
							4 M					1106	
	179				0		1		1: 40°, Fo/B (f ow band ng) 2: 40°, V, MW, H+Ca, F , Wa St 3: 60° 80°, V, T, H+Ca, F , Wa Ir				
1572	180	47		100	0	78	2					[11]	
							3						
	181				4		4 4		4: 10° 30°, J, N, Ca, Sp, Wa P , SR 5: 70°, J, N, Ca, Sp, P , SR 6: 20°, J, N, No, No, P , SR 7: 75°, J/V, MW, Ca, Pa, Ir St, R 8: 30°, J, N, No, No, P , SR				
1570							5						
	182				1		3						
							7						
	183				3		6						
							5 8					1134	
									Becomes dark green sh gray; no f ow band ng 1: 60°, J, N, No, No, P , SR 2: 10°, J, N, No, No, P St, SR R 3: 20°, J, N, No, No, P , SR			1422	HWT casing falling during hole advancement
1568	184				1		1						
							2						
	185				3		3 1						
		48		100	1	100	3					[14]	
	186												
1566					0								
	187						4		Becomes porphoryt c w th abundant Ca c te 4: 40°, J, N, Ca, Sp, Wa, SR 5: NA, V, N W, H+Ca, F , Ir 6: 65°, J, MW, No, No, St, R				
					2		5						
							6					1444	
	188											1502	
1564		49		100	0	100	2		1: 65°, J, MW, No, No, St, R				
	189												

PT #9

Report GEO CORE OAK C BMP WELL File N D AECOM ROCK CORE GPJ 1/30/2017 CB-14

AECOM

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-14

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	RQD, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Weld Diagram	Packer Test Intervals	Drill Time, 24 hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
	189		12		0		2		BASALT; dark green sh gray; fresh; very strong; h gh y to moderate y fractured; porphoryt c w th abundant Ca c te nodu es				Continued 0% WCR
	190				0		2		mv *(continued)*				
1562		49		100	0	100						[13]	
	191						3		2: NA, V, MW W, H+Ca, F , Ir 3: 10°, J, N, No, No, Wa, SR				
			13		1								
	192						M						
					0								
1560	193											1527	
					2		1		1: 40°, J, N, No, No, Wa, SR			1534	
	194						1		2: 85°, J, N, Ca, Sp, Wa, SR 3: NA, V, MW, H+Ca, F , Ir				
					1		2		4: 60°, J/V, W, Ca, Pa, Wa St, R				
1558	195	50		100		76	3					[12]	
					0		3						
	196						4						
					2		M						
	197						1						
1556					1							1557	
	198						2		1: 90°, J, MW?, No, No, P , SR			1605	
					0				2: 20°, J, N, No, No, Wa, SR 3: 30°, J, N, No, No, Wa, SR				
	199								4: 50°, J, N, No, No, P , SR 5: NA, V, W, H+Ca, F , Ir				
1554		51		100	0	100			6: 35°, J, N, No, No, Wa P , SR (mechan ca ?)			[10]	
	200						3 4						
					2								
	201						5						
					1		6					1628	
1552	202	52		100		77	1		1: 15°, J, N, No, No, Wa, SR			1631	
					2		2		2: 70°, J, N, No, No, P , SR			[13]	
	203											1637	End of day 6/20/2016
									TOTAL DEPTH = 202.8 FEET **Caliper and Televiewer performed 6/21/2016; Piezometer Installation performed on 6/22/2016**				Begin day 6/21/2016 AM water level=91 1'
	204												
1550													
	205												

Report GEO CORE OAK C BMP WELL File N D AECOM ROCK CORE GPJ 1/30/2017 CB-14

AECOM

Depth 4.0’ to 30.5’

Depth 30.5’ to 52.5’

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-14 Boxes 1 and 2	Figure CB-14-1

Depth 52.5’ to 68.4’

Depth 68.4’ to 81.7’

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-14 Boxes 3 and 4	Figure CB-14-2

Depth 81.7’ to 95.8’

Depth 95.8’ to 109.5’

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-14 Boxes 5 and 6	Figure CB-14-3

Depth 109.5’ to 122.8’

Depth 122.8’ to 137.2’

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-14 Boxes 7 and 8	Figure CB-14-4

Depth 137.2’ to 151.7’

Depth 151.7’ to 164.5’

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-14 Boxes 9 and 10	Figure CB-14-5

Depth 164.5’ to 177.7’

Depth 177.7’ to 191.5’

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-14 Boxes 11 and 12	Figure CB-14-6

Depth 191.5’ to 202.8’

AECOM	Nevada Irrigation District Centennial Dam Project Project Number 60503855	Rock Core Photos Boring CB-14 Box 13	Figure CB-14-7

Project: Proposed Water Storage Project
Project Location: Nevada and Placer Counties, CA
Project Number: 60393322/60503855

Log of Rock Core Boring CB-15

Date(s) Dr ed	**7/11/2016-7/15/2016**	Logged By	**B. Kozlowicz**	Checked By	**D. Simpson**
Dr ng Method	**HQ-3 Wireline Core**	Dr B t S ze/Type	**3 7/8" HQ Diamond 8-9 face discharge**	Tota Depth of Boreho e	**209.9 feet**
Dr R g Type	**LF-70 Helicopter MOB Rig**	Dr ng Contractor	**Ruen Drilling**	NAVD 88 Ground Surface E evat on	**1610-ft**
Groundwater Leve	**8-ft 7/15/2016**	Samp ng Methods	**HQ-3 Wireline**	Inc nat on from Hor zonta /Bear ng	**45° / 177°**
Boreho e Comp et on	**Neat cement grout to within ~20' of surface**	Locat on	**Axis 2 South - CFRD Plinth at riverbed**	Coord nate Locat on	**N 2141786.6 E 6839122.3**

E evat on, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %	Fracture Draw ng Number	L tho ogy	MATERIAL DESCRIPTION	Packer Test Interva s	Dr T me, 24 hr [Dr Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1610	0								GRAVEL and COBBLES w th SAND (GW); subrounded to rounded ALLUVIUM		0945	
	1											
	2											Advance 5" HWT casing to 8'
1608	3											
	4											
	5											
1606	6											
	7											
	8		1								1059	
1604		1		100	NA	0	1 1		1: 30° 40°, J, N, Mn+Fe, Sp, P lr, SR R BASALT; med um gray; moderate y to oca y h gh y weathered; moderate y strong; ntense y fractured; aphan t c		[9]	
	9	2		100	>6	0			mv		1106 1111	
	10				>6						[10] 1117 1124	
	11				>6							
1602									Becomes s ght y to oca y moderate y weathered; strong; h gh y fractured; w th 10° 60°, J, N, Mn+Fe, Su, P , SR and rregu ar 70° 90° from 10' 11.5'			
	12	3		98	5	11					[19]	
	13											PL: 16758 psi

Report GEO CORE OAK C B MAP File N D AECOM ROCK CORE GPJ 1/30/2017 CB-15

AECOM