		JFFS COLA9	<u>- Act</u>	DATE: 6/28/06	<del></del>
	SCHNAB		<b></b>	JOB:_6165	***********
THOR;	_R. STELI	LER	A CONTRACT OF A	PAGE 6 OF A	<del>*</del>
PTH	DEPTH	UNFILTERED	FILTERED	COMMENTS	<del>, a (.a</del> .
TERS	FEET	FILE NO.	FILE NO.	CASING, WATER, ROCK, ETC	
			689.00 A 20	- NI-LIOVIEND-LIGENT DR MERMANNET FILTER 20-20-MILTO DR MILTO MILLO POC-STRUCTURADIES19-5	
andre and			**************************************		-
00.5	329.72	201			
01.0	331.36	2002	****		
01.5	333.01	201			<del></del>
02.0	334.65	204		,	
02.5	336.29	305		· · · · · · · · · · · · · · · · · · ·	
03.0	337.93	200		A A A A A A A A A A A A A A A A A A A	
03,5	339.67	2007		· · · · · · · · · · · · · · · · · · ·	*** ** * *
04.0	341.21	24			
04.5	342.85	209			
05.0	344.49	210		*	~~~
05.5	346.13	211			
06.0	347,77	312			~~~~~
08.5	349.41	215			
07,0	351.05	214	*.		
07.5	352.69	2:15			
08.0	354.33	216			THE AVERAGE
06,5	355.97	20			
09.0	357.61	218			<del></del>
09.5	359.25	219			<u>····</u> ····
10.0	360.89	220			
10.5	362.53	924			<del></del>
11.0	384.17	201	· · · · · · · · · · · · · · · · · · ·		Ma
11.5	365.81	24.5	······································		<del></del>
12.0	367.45	224-			<del></del>

201	2.38 227	372.38	113.5
22.6	4.02 228	374.02	114.0
<u>914</u>	5.68 224	375.66	114.5
230	7.30 250	377,30	115.0
291	8.94 231	378.94	115.5
212	0.58 232	380.58	116.0
483	2.22 643	382.22	118,5
234	3.86 234	383.66	117.0
1455	5,50 2.55	386,50	117.6
234	7.14 236	387.14	118.0
237 Hit Bortun & 118.7m =>	8.78 237	366,78	118.5
THE SPONSE & 401.5'	1.42	390.42	119.0
и	2.06	392.06	119.5
	3.70	393.70	120.0



# <u>R-AOL</u>ACOUSTIC TELEVIEWER FIELD LOG

SITE:_CONPP COLA		DATE 6 / 22/2006
CLIENT. SCHNABEL		JOB: 6165
AUTHOR R. STELLER		PAGE 1 OF 2
x		
	_OFFICE	
		PHONE:_703-906-1797
CONTACT;	_OFFICE	
10. <u> </u>	<del>*.``</del>	PHONE:
CONTACT:		PHONE
		PHONE:
CONTACT:		PHONE:
		PHONE:
DRILLER		PHONE:
COMPANY:		PHONE:
		B
DIRECTIONS TO SITE:		
x		
	· · · · · · · · · · · · · · · · · · ·	
	a and a substantial and the substantial and the substantial substantia	······································
GENERAL SITE CONDITIONS/LOCATION:		
		an a
	a mananan a an a	
BOREHOLE DESIGNATION: B- 401	LOCATION	
		and the second
COUNTY: RANGE: TO	WNSHIP:	SECTION
BOREHOLE CONSTRUCTION: CASED LINK	CAGEN	7
DIAMETERS AND DEPTH RANGES: 41/4 0 TO	400	то
BOREHOLE TOTAL DEPTH AS DRILLED: 400		n I <u>andres i andres i Maria andres i a</u>
CONDUCTOR CASING?: YES DEPTH TO BO	TTOM OF	Casing; No_
DEPTH TO BEDROCK MA	EDTH TY'L	NATER TABLE.
DEPTH TO BEDROCK:N E BOREHOLE FLUID: WATER; FRESH WATER		
OTHER:	× 80.414 <u></u>	
	THE ONIOE	LAST OFOIL ATTACK
A CONTRACT OF THE ADDRESS AND ADDRESS AND ADDRESS ADDR	inte sinve	LAST CIRCULATION: 22405.



SITE:_CONPP COLA_		- Ac.		_DATE: •/ 1	<u>×6/2006</u>
CLIENT: SCHNABEL			<u></u>	JOB:0165	
AUTHOR:_R. STELLE	R	<u></u>		PAGE 2 OF 2	2
LOGGING CREW:_R. VEHICLE(8) USED AN	STELLER ID MILEAC	<u>e. car</u> Rental_	<u>772.4.</u>	······································	
MOBILIZED FROM: 1	Existent card	CHARL, MAG	DEPART	IRE TIME: 8	<u></u>
ARRIVED ON SITE:	<u>9:00</u>	*	-		
STANDBY TIME:			, CAUSE		
LOGGING STARTED;	12:16		LOGGING	COMPLETED;	
WINCH: COMP			<u></u>	OTHER	
MICROLOGGER	5301	OTHER		<u></u>	, , , , , , , , , , , , , , , , , , ,
TELEVIEWER	OPTICAL	.#5117	ACOUSTI	C #5174 0500	OTHER
PROBE TILT TEST PROBE AZIMUTH TES	81.2° T 140.9*	BRUNTON T	ILT <u>82</u> ° ZIMUTH <u>41</u>	++w	N4104 <u>OZ</u> *
PROBE OFFSET	OPTICAL	. 1.88M(6.17F		C 1.44M(4.72F1	5
CASING STICK-UP	· ·	-	7 7	- <u></u>	~
DEPTH REF. OFFSET				3.22	S.22' ON EXIT.
		T		- <u>Tel</u>	
LOG NAME	START	START	END DEPTH	END TIME	
8401 AL DOWNOI	3.22	15:05	4010	16:69	~
		· · · · · · · · · · · · · · · · · · ·			
······································	<u> </u>				
	1				
MAINTENANCE PERF	ormed o	N SITE			₩ <u>₩</u> ₩ <u>₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩</u>
EQUIPMENT PROBLE	MS OR FA	ILURES:			
••••••••••••••••••••••••••••••••••••••		<del></del>	<del> </del>		
BUGGESTIONS, ADDI	<b>FIONS</b> , CH	ANGES:			
<u>Annon an fir forman an de Angeler e e e e e e e e e e e e e e e e e e</u>	<u></u>	<u></u>	<del></del>		₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩
EOVIsion Geophysical Services	. <i>II</i>	51 Pomona Road, L	înit F. Corona. C	X 92882 - 26 mg	1) 549-1234 Fc (951) 549-1236

GEOVision Report 6165-01 Vol 1 of 2 CCNPP COLA Boring Geophysics rev A 11/14/2006

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#### **CALIPER FIELD LOG** 8-A0

SITE: CONPP COLA	10 - 10 - 10 - 10 - 10 - 10 - 10 - 10	DATE: 6 / 68/2006
CLIENT: SCHNABEL		JOB: 6165
AUTHOR: R. STELLER	*	PAGE 1 OF 2
CONTACT:_RUBEN TARUSELLI	OFFICE_	PHONE:
	CELL	PHONE: 703-906-1797
CONTACT:	OFFICE	PHONE
x		PHONE
CONTACT:		PHONE:
	***	PHONE
CONTACT:		PHONE:
	······································	PHONE
DRILLER:		PHONE;
COMPANY:		PHONE:
a a secon comencia a ser accordancia a provincia a provincia a seconda de se		
GENERAL SITE CONDITIONS/LOCATION:		
BOREHOLE DESIGNATION: 13-401	a alle and a more stars to be	1
	LOCATION:	
	LOCATION	
COUNTY: RANGE: TO	WNSHIP:	SECTION
COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASED UN		SECTION:
COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASED UN	WNSHIP:	
COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASED UN	WNSHIP:	SECTION:
COUNTY:RANGE:TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES:O TO BOREHOLE TOTAL DEPTH AS DRILLED:A00	WNSHIP: CASED Z	
COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES: 41/2 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 400 CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: NA	WNSHIP: CASED	
COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES: 41/2 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 400 CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: NA	WNSHIP: CASED	
COUNTY:RANGE:TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES:4%_ 0 TO BOREHOLE TOTAL DEPTH AS ORILLED:400 CONDUCTOR CASING?: YES DEPTH TO BO	WNSHIP: CASED	
COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES: 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 00 CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: BOREHOLE FLUID: WATER; FRESH WATER	WNSHIP: CASED 400 DTTOM OF C DEPTH TO R MUD	ASINGTO WATER TABLE SALT WATER MUD;
COUNTY:RANGE:TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES:O TO BOREHOLE TOTAL DEPTH AS DRILLED:O CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: BOREHOLE FLUID: WATER; FRESH WATER OTHER:OMG	WNSHIP: CASED 400 DTTOM OF C DEPTH TO R MUD	
COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES: 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 400 CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: BOREHOLE FLUID: WATER; FRESH WATE OTHER: QNG (MADE DEPTH TO BOREHOLE FLUID:	WNSHIP: CASED 400 DTTOM OF C DEPTH TO R MUD	ASINGTO WATER TABLE SALT WATER MUD;
COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES: O TO BOREHOLE TOTAL DEPTH AS DRILLED: O TO CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: BOREHOLE FLUID: WATER; FRESH WATE OTHER: ONG DEPTH TO BOREHOLE FLUID: DEPTH TO BOREHOLE FLUID:	WNSHIP: CASED 400 DTTOM OF C DEPTH TO R MUD	ASINGTO WATER TABLE SALT WATER MUD;
COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES: O TO BOREHOLE TOTAL DEPTH AS ORILLED: A00 CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: BOREHOLE FLUID: WATER; FRESH WATE OTHER: QNS G/DM/DD DEPTH TO BOREHOLE FLUID: LOGGING CREW: R. STELLER C. C. AP-1002 VEHICLE(S) USED AND MILEAGE; RENTAL	WNSHIP: CASED / Acc DTTOM OF C DEPTH TO R MUD / TIME SINC	TOTO ASING; NO WATER TABLE:; SALT WATER MUD; E LAST CIRCULATION: #4 #6
COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES: O TO BOREHOLE TOTAL DEPTH AS DRILLED: A00 CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: BOREHOLE FLUID: WATER; FRESH WATER OTHER: QNG; FRESH WATER OTHER: QNG; FRESH WATER DEPTH TO BOREHOLE FLUID: DEPTH TO BOREHOLE FLUID: DEPTH TO BOREHOLE FLUID: DEPTH TO BOREHOLE FLUID: LOGGING CREW: R. STELLER C. C. ARC-TOPIL VEHICLE(S) USED AND MILEAGE: RENTAL MOBILIZED FROM: <u>C. GRAMETER</u> ARE	WNSHIP: CASED 400 DTTOM OF C DEPTH TO R MUD	TOTO ASING; NO WATER TABLE:; SALT WATER MUD; E LAST CIRCULATION: #4 #6
COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES: O TO BOREHOLE TOTAL DEPTH AS DRILLED: A00 CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: BOREHOLE FLUID: WATER; FRESH WATE OTHER: QNG; FRESH WATE OTHER: QNG; FRESH WATE DEPTH TO BOREHOLE FLUID: LOGGING CREW: R. STELLER C. C. AR-TOR VEHICLE(S) USED AND MILEAGE: RENTAL	WNSHIP: CASED Jac DTTOM OF C DEPTH TO R MUD TIME SINC	TOTO ASING; NO WATER TABLE:; SALT WATER MUD; E LAST CIRCULATION: #4 #6
COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: 4% 0 TO BOREHOLE TOTAL DEPTH AS ORILLED: 400 CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: NN BOREHOLE FLUID: WATER 6 (MARCH OTHER: 0NG (MARCH DEPTH TO BOREHOLE FLUID: 1 DEPTH TO BOREHOLE FLUID: 1 LOGGING CREW: R. STELLER . C. CAR-TON VEHICLE(S) USED AND MILEAGE: RENTAL MOBILIZED FROM: CENAGTON CASE, 100 ARRIVED ON SITE: 9:00	WINSHIP: CASED Z DEPTH TO DEPTH TO R MUD Z TIME SINC	TOTO ASING; NO WATER TABLE:; SALT WATER MUD; E LAST CIRCULATION: #4 #6

**GEOVision Geophysical Services** 1151 Pomoun Road, Unit P, Corona, CA 92582 
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 11/14/2006

SITE:_CCNPP COLA	<u>B-401</u>	DATE: 6 / 20 /2006	······································
CLIENT: SCHNABEL		JOB:_6165	
AUTHOR:_R. STELLER	<u> </u>	PAGE 2 OF 2	

WINCH:	COMPRO	38E	SILVER	<u></u>	0Y0	OTHER_	
MICROLOGGE	R I	5301	OTHER				
<b>CALIPER PRO</b>	3E (	5368	OTHER	2915	<u> </u>		

PROBE OFFSET	12 IN MAX	2.08M(6.82 FT	124 IN MAX
CASING STICK-UP	arms -	<u> </u>	ARMS
DEPTH REF. OFFSET		6.34	S45' ON EXIT

LOG NAME	START DEPTH	START TIME	END DEPTH	END TIME
BADI CHLTBST OI	Ø	h. m. m	9	17.20
BADI CALLUP DI	197.0	17:28	Ø	17:46
BAOI CHUTCHE OL	Ø	17:50	Ø	17155
				,
	1			

CALIBRATIC	DN PLATE S/N 201 [	AS BUILT			
		1.968 IN	3.937 IN T	8.000 IN	
	FILE NAME	(50 MM)	(100 MM)	203.2 MM	
as meas.	6401 GALITESTON	1.97	5.44-	2.00	
AS MEAS.	B401 Chanestor	7.01	3.07	104	
as meas.		·····			
as meas.					
AS MEAS.		<del> </del>	<u> </u>		
AS MEAS.			<u> </u>	<del></del>	

#### MAINTENANCE PERFORMED ON SITE:

#### EQUIPMENT PROBLEMS OR FAILURES:\_

## SUGGESTIONS, ADDITIONS, CHANGES:

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# 8-40 ELOG FIELD LOG

SITE:_CCNPP COLA		DATE: 6/28 /2006
CLIENT: SCHNABEL		IOB: 6165
AUTHOR: R. STELLER		PAGE 1 OF 2
	····	
CONTACT:_RUBEN TARUSELLI	OFFICEI	PHONE:
	Cell	PHONE: 703-906-1797
CONTACT:	_OFFICE_)	PHONE:
	)	PHONE:
CONTACT:		PHONE:
		PHONE
CONTACT:		PHONE:
		HONE
DRILLER:	1	PHONE
COMPANY:		PHONE:
GENERAL SITE CONDITIONS/LOCATION:		
	······································	
	**************************************	
BOREHOLE DESIGNATION &-4-01	LOCATION:	
	₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩	
COUNTY: RANGE: TO	WNSHIP:	SECTION:
BOREHOLE CONSTRUCTION: CASED UN	CASED V	
DIAMETERS AND DEPTH RANGES: 41/2 0 TO	1 400'	70
BOREHOLE TOTAL DEPTH AS DRILLED: 460	<b>)</b> *	8
CONDUCTOR CASING7: YES DEPTH TO B	DITOM OF CA	SING · NO V
DEPTH TO BEDROCK NA	DEPTH TO W	ATER TABLE:
		SALT WATER MUD
OTHER:	· · · · · · · · · · · · · · · · · · ·	
DEPTH TO BOREHOLE FLUID:	TIME SINCE	LAST CIRCULATION PS 42
LOGGING CREW: R. STELLER C. CARTE	<u>6</u>	
VEHICLE(B) USED AND MILEAGE: RENTAL		
MOBILIZED FROM: LEWINGTON PARE, MO.	DEPARTURE	TIME 8:30
ARRIVED ON SITE: 1:00		A ARARAMA <u>n and an and an and an and an an an an</u>
STANDBY TIME:	CAUSE:	
LOGGING STARTED: MISA		MPLETED: 19:14
		anar wave I forther that a start of the second start is the second start of the second start is the second start of the

11/14/2006

Page 258 of 366

SITE:_COMPPO		B - 401	DATE: 6/28 /2008
AUTHOR_R. ST		······································	JOB:_6165 PAGE 2 OF 2
WINCH: (	OMPROBE	SILVER V OYO	OTHER
MICROLOGGER ELOG PROBE		OTHER	
PROBE OFFICE		2 50540 20 50	

PROBE OFFSET	2.50M(8.20 FT)	
CASING STICK-UP	1.5	, 1
DEPTH REF. OFFSET	6:70'	6.75 AT EXIT
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ł	LOG NAME	START DEPTH	START TIME	end Depth	END TIME
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╞	10401 ELAG uf Gi	379,5	18.34	1.65	1914
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ł					
t				<u></u>	
L					

MAINTENANCE PERFORMED ON SITE:

EQUIPMENT PROBLEMS OR FAILURES;

SUGGESTIONS, ADDITIONS, CHANGES:

**GEOVision Geophysical Services** 

1151 Ponuma Road, Unit P. Corona, CA 93883

**Phi (951) 549-1234 Fz (951) 549-1356** 11/14/2006 Page 259 of 366

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GEOVision Report 6165-01 Vol 1 of 2 CCNPP COLA Boring Geophysics rev A



# B-404-BORING GEOPHYSICS FIELD LOG SUMMARY

SITE:_CONPP COLA	8	_DATE: 0 / 17/2006
CLIENT: SCHNABEL		JOB:_6165
AUTHOR: R. STELLER		PAGE 1 OF 2

CONTACT:\_RUBEN TARUSELLI\_\_\_\_\_ PHONE:\_703-906-1797

BOREHOLE CONSTRUCTION: CASED UNCASED_	
DIAMETERS AND DEPTH RANGES:O TO TO TO	
BOREHOLE TOTAL DEPTH AS DRILLED: 200	<del></del>
CONDUCTOR CASING?: YES DEPTH TO BOTTOM OF CASING; NO V	
BOREHOLE FLUID: WATER; FRESH WATER MUD; SALT WATER MUD;	

LOGGING CREW: R. STELLER

LOG TYPE         FILE NAME         DEPTH RANGE         DATE         TIMES           >>=\$F\$e5500 fb         Cb(			*		<u> </u>
			DEPTH RANGE	DATE	THER
Analyce 12. BASKAN DOWNOT 3.1 - (96.0' 0/27/06 12:50- 14:00 Confee next BASKAN DOWNOT 3.1 - (96.0' 0/27/06 14:20- 14:00 Analyce/Grennet BASK CALTERTOL 06 6/27/06 14:20- 14:25 Innersencest E404 CALTERTOL 07 6 6/27/06 14:32- 14:52 Englishing BASK ENGLISHING 28 6/27/06 14:55 - 14:59		adv - 114			
Constrainer BADA CALTERTON OF GALARD 14:20-14:25 Phillipping BADA CALTERTON 1950-0 GALARD 14:32-14:25 Phillipping BADA CALTERTON 1950-0 GALARD 14:32-14:25 Phillipping BADA CALTERTON 1950-0 GALARD 14:32-14:55 BADA BADA CALTERTON 1950-14:55-14:55		BACK AN DOLONT			
CALIFORNIA BAOS GALLIPOL 1950 - 0 6/27/06 14:32 - 14:52 CALIFORNIA 6404 CALIFOSTOZ 0 6/27/06 14:55 - 14:57 ELOS 6404 GLASSION 1955 - 14:59	Canal Per rest	6404 CAL TRUTA			
ELOS DES ELOS DE LA 19 195 - 14:59	springer granne	BLOS CALUPOL			
EAOS BACK SUCCESSION I HE A HAR I LAKE I HAR I H	Sprageones.	6404 CALTESTOZ			
		bang guag way			
	. <u> </u>				CALL 1975B
	·····				
	~~~ <u>~~~~~~~</u>				······································
	*		······································		
					* *** *** *** ************************
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	<u></u>				
				<u> † – – – – – – – – – – – – – – – – – – </u>	
	<u> </u>			<del>┃<sup>┉</sup>╶┈┈╣</del>	The second s
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			· · · · · · · · · · · · · · · · · · ·	╎┈┈┈╴╢	
			**************************************	<del>┆╍╍╸┍╍╸</del> ┟	



# P-S SUSPENSION VELOCITY FIELD LOG

SITE_CALVERT CLIFFS COLA6-404-	DATE: 6/27/06
CLIENT:_SCHNABEL	JOB: 6165
	PAGE 1 OF 5
POUTSON	
CONTACT:	OFFICE PHONE:
MALITS MT.	
CONTACT:	OFFICE PHONE
50171 AT.	PHONE:
CONTACT	PHONE
and and a line as an examp	PHONE
CONTACT:	PHONE:
	PHONE
DRILLER:	PHONE:
COMPANY:	PHONE
DIRECTIONS TO SITE:	
EA#BOREHOLE DESIGNATION: 8-404-	LOCATION
COUNTY:RANGE:T	OWNSHIP:SECTION:
BOREHOLE CONSTRUCTION: CASED U	NCASED
DIAMETERS AND DEPTH RANGES: 412 01 BOREHOLE TOTAL DEPTH AS DRILLED:	240
CONDUCTOR CASING?: YES DEPTH TO I DEPTH TO BEDROCK: MA D	BOTTOM OF CASING; NO_V
BOREHOLE FLUID: WATER; FRESH WATI OTHER:	ER MUD; SALT WATER MUD;
DEPTH TO BOREHOLE FLUID:	IME SINCE LAST CIRCULATION: 1/4. H.L.

GEOVision Geophysical Services 1151 Pomona Road, Sulis P, Corona, CA 92882 Ph (951) 549-1234 Fr (951) 549-1234 GEOVision Report 6165-01 Vol 1 of 2 CCNPP COLA Boring Geophysics rev A 11/14/2006 Page 26 rol 366



SITE: CALVERT CLIFFS COLA 8-404	DATE: 6/21/06-
CLIENT:_SCHNABEL	JOB:_6166
AUTHOR:_R. STELLER	PAGE 2 OF <u>5</u>
LOGGING CREW: & STELLER	
VEHICLE(S) USED AND MILEAGE:PENTE	
MOBILIZED FROM: UPPLANTON PAOK	DEPARTURE TIME: 8: 10
ARRIVED ON SITE: 9:40	
STANDBY TIME:	CAUSE:
LOGGING STARTED: 10-45	LOGGING COMPLETED: /21 07
STANDBY TIME	CAUSE
LOGGING STARTED:	LOGGING COMPLETED:
	ARRIVAL TIME:
	REASON:
BATTERIES CHANGED BEFORE LOGGING: YE	
	19029 RG 160023 160024
RECEIVER S/N 12008 20042	26066 11001 23053 5 2006 1
MAINTENANCE PERFORMED ON SITE:	
	and the second
EQUIPMENT PROBLEMS OR FAILURES:	
<u> </u>	
n an	
SUGGESTIONS, ADDITIONS, CHANGES:	
the state of the second st	
COMMENTS: DODTU DEFEDEN	the tot prevene 1.64 - 16 = 0m
DEPTH DET FOU	T = 0.0 M
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GEOVision Geophysical Services 1151 Pomona Road, Suite P, Corona, CA 82882 Ph (951) 548-1234 Fx (951) 548-1234 GEOVision Report 6165-01 Vol 1 of 2 CCNPP COLA Boring Geophysics rev A 11/14/2006 Page 262 of 366

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	G	EOVISION SU	SPENSION L				
SITE: CALVERT CLIFFS COLA 6-404-				DATE: 6	DATE: 6/21 100		
	_SCHNAE						
	_ _r. steli			PAGE	<u> </u>	JF <del>S</del>	*****
	-				<b>***</b> *********************************	······································	
DEPTH	DEPTH	UNFILTERED	FILTERED	COMMENT	3		
METERS	FEET	FILE NO.	FILE NO.	CASING, W		<b>SK. ETC</b>	
×			······································				
0.5	1.64	601			***** ** *****	· · · · · · · · · · · · · · · · · · ·	
1.0	3.28	<u> </u>				<del></del>	
1.5	4,92	3			······································	· · · · · · · · · · · · · · · · · · ·	
2.0	6.56	4			<del></del>		
2,5	8.20	5			*********		
3.0	9.84	6			**************************************	<del>n an an</del>	
3.5	11.48	1	·····		··· * ******		******
40	13.12						
4.5	14.78	9			*******	······································	* ****
5.0	16.40	L 10			<del>5</del>	**************************************	····
5.5	18.04	4			<del>*************************************</del>		
6.0	19.69	114				<del></del>	
6.5	21.33	<u>h</u>			· · · · · · · · · · · · · · · · · · ·	<del></del>	······
7.0	22.97	14			· · · · · · · · · · · · · · · · · · ·	× ****	·····
7.5	24.61	15			hannan inter	<del>*** ··· * ··· ·</del>	
8.0	26.25	14			********		
8.5	27.89	17			********	······································	
9.0	29,53	14					
9.5	31.17	14			* ****		
10.0	32.81	10				A M. MAR - W.	
10.5	34,45	2			<del>~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~</del>		
11.0	36.09	u			** * ****	**************************************	·····
11.5	37.73	us			<del></del>		
12.0	39.37	24			x		••••••
12.5	41.01	<u>x</u>			· · · · · · · · · · · · · · · · · · ·	<del>*************************************</del>	
13.0	42.65	240			* <u>**</u> *******	<u></u>	<u>·                                     </u>
13.5	44.29	11				**************************************	
14.0	45.93	18					
14.5	47.57	11			****	****	
15.0	49,21	<u>Ao</u>			<del>~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~</del>	<del>****************</del> ***	<del></del>
15.5	50,85	<u>A</u>				<del>,</del>	
<u></u>	52.49	42			······································	**************************************	
16.5	54.13	33			<u> </u>	<del></del>	<del>~~~</del> {

17.0

17.5

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60.70

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11/14/2006

<b>GEOVISION SUSPENSION LOGGING FIELD NOTES</b>						
SITE: CALVERT CLIFFS COLA B- 404				DATE:/27/00		
CLIENT: SCHNABEL				JOB:_6165		
AUTHOR	. R. STEL			PAGE 4 OF 5		
DEPTH	DEPTH	UNFILTERED	FILTERED	COMMENTS		
METERS		FILE NO.	FILE NO.	CASING, WATER, ROCK, ETC		
****	**** * * * * *					
20.5	67.26	41				
21.0	68.90	42				
21.5	70.54	43				
22.0	72.18	AA				
22.5	73,82	15				
23.0	75.46	410	<u> </u>			
23,5	77.10	117	A			
24.0	78.74	10	* · · · · · · · · · · · · · · · · · · ·	* ×		
24.6	80.38	14	······································			
25.0	82.02	50				
25,5	83.66	_ <del>@</del> 1				
26.0	85,30	52	-			
26.5	86.94	33		×		
27.0	88.58	54				
27.5	90.22	95				
28.0	91,88	56				
28.5	93.50	977				
29.0	95.14	<u></u>				
29.5	96.78	<u>a</u>				
30.0	98.43	60	· · · · · · · · · · · · · · · · · · ·			
30.5	100.07	61				
31.0	101.71	61	· · · · · · · · · · · · · · · · · · ·			
31,5	103.35	65				
32.0	104,99	64	······································			
32.5	106.63	65	<u></u>			
	108.27	66				
33.5	109.91	<u></u>				
34.0	111.55	<u></u>				
34.5	113.19	69				
<u>35.0</u> 35.6	114.83	70		× · · · · · · · · · · · · · · · · · · ·		
36.0	116.47	71				
<b>1</b>	<u>118.11</u>	72.				
36.5 37.0	119.75	75	· <u> </u>			
37.5	<u>121.39</u>	74	······································			
37.0	123.03	75	···			
38.5	124.67	76	· · · · · · · · · · · · · · · · · · ·			
<u>39.0</u>	126.31		· · · · · · · · · · · · · · · · · · ·			
39.0 39.5	127.95 128.50	78	M			
<u>39,0</u> 40,0	129.59	71	·			
<u> </u>	131.23	80				

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# **GEOVISION SUSPENSION LOGGING FIELD NOTES**

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SITE: CALVERT CLIFFS COLA	404 DATE	6kn	leta	<b></b>
CLIENT:SCHNABEL	JOB:_816	6 <u> </u>		· · · · · · · · · · · · · · · · · · ·
AUTHOR:_R. STELLER	PAGE	<b>v</b>	OF 6	

		UNFILTERED	FILTERED	COMMENTS
METERS	FEET	FILE NO.	FILE NO.	CASING, WATER, ROCK, ETC

40.5 $324.87$ $34$ 41.6 $324.87$ $34$ 42.0 $324.85$ $324.45$ 42.0 $324.85$ $324.44$ 42.0 $324.85$ $324.44$ 42.0 $324.44$ $85$ 42.0 $324.44$ $85$ 42.0 $324.44$ $85$ 42.0 $141.08$ $86$ 42.0 $144.85$ $142.82$ 42.0 $144.85$ $142.84$ 44.5 $144.85$ $146.22$ 45.6 $144.82$ $91$ 45.6 $146.26$ $71$ 45.6 $156.26$ $71$ 45.6 $156.26$ $71$ 45.7 $152.84$ $45$ 45.8 $152.84$ $45$ 45.9 $152.84$ $45$ 45.0 $157.42$ $77$ 45.1 $152.84$ $72$ 45.2 $157.42$ $67$ 50.4 $162.04$ $162.04$ 50.4 $162.04$ $162.04$	F	<del></del>		· · · · · · · · · · · · · · · · · · ·		
41.5       138.16       6-7         42.0       137.60       5-4         42.0       138.44       6-7         42.0       141.08       5-6         43.0       141.08       5-6         43.0       144.28       97         44.0       144.38       97         44.0       144.38       97         45.1       142.28       1         45.3       147.64       6-         45.4       143.28       71         45.5       152.26       27         45.5       152.26       27         45.5       152.26       27         47.5       155.42       27         48.0       157.42       27         48.0       157.42       27         48.0       157.42       27         48.0       150.12       27         48.0       167.42       167         50.0       167.42       167         51.0       167.22       167         51.4       198.58       167         52.0       172.84       167         53.0       172.84       167         53.0       172.82 <td></td> <td>40.5</td> <td>132.87</td> <td><u>at</u></td> <td></td> <td></td>		40.5	132.87	<u>at</u>		
$42.0$ $137.80$ $8.4$ $42.6$ $138.44$ $8.5$ $43.0$ $144.08$ $8c$ $43.5$ $142.72$ $67$ $44.5$ $142.72$ $67$ $44.5$ $142.72$ $67$ $44.5$ $142.72$ $67$ $44.5$ $142.88$ $85$ $45.6$ $149.287$ $71$ $45.6$ $149.287$ $71$ $45.6$ $149.287$ $71$ $46.6$ $150.827$ $72$ $47.6$ $152.867$ $72$ $47.6$ $152.467$ $74$ $48.6$ $152.427$ $77$ $48.6$ $152.427$ $77$ $48.6$ $152.427$ $77$ $48.0$ $167.427$ $49_6$ $95.90$ $198.987$ $67$ $95.90$ $198.887$ $67$ $95.90$ $198.887$ $67$ $51.0$ $167.427$ $167$ $52.0$ $172.247$ $167$ $52.6$ $172.247$ <td></td> <td><u>· 41,0</u></td> <td>134.51</td> <td></td> <td></td> <td></td>		<u>· 41,0</u>	134.51			
42.5       138.44       8.5         43.0       141.08       \$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$	l		A A A A A A A A A A A A A A A A A A A			
43.0       141.08       25		42.0	137.80	84		
43.5       143.72       97         44.0       144.36       25         44.5       148.00       91         45.6       149.28       71         45.6       149.28       71         46.0       180.28       71         46.1       182.26       71         47.0       184.20       74         47.1       184.20       74         47.2       184.20       74         47.5       185.84       47         48.8       189.12       67         48.9       180.78       77         48.4       189.12       67         48.5       198.26       77         49.0       180.78       57         49.1       187.48       79         49.2       190.79       50         50.0       184.04       43         50.1       184.96       67         51.0       187.32       67         51.0       187.32       67         52.0       170.80       64         52.4       172.24       67         53.5       175.22       67         54.5       178.43 <t< td=""><td></td><td>42,5</td><td>138.44</td><td>85</td><td></td><td></td></t<>		42,5	138.44	85		
44.0         144.36         35           44.5         146.00         91           45.6         147.84         20           45.6         147.84         20           45.6         147.84         20           46.0         150.82         21           46.8         152.86         27           47.0         154.20         7.4           47.8         155.84         45           48.0         167.48         47           48.5         155.12         27           48.5         168.76         48           48.5         168.72         49           48.5         168.72         49           48.5         168.76         44           51.0         167.32         67           51.0         167.32         67           52.0         170.80         164           52.0         170.80         164           52.0         173.86         165           53.0.1         173.86         165           54.0         177.17         105           55.0         180.46         10           55.0         180.46         10 </td <td>Ł</td> <td>43.0</td> <td>141.08</td> <td>06</td> <td></td> <td></td>	Ł	43.0	141.08	06		
44.5       148.00       97         45.0       147.84.       4se         45.1       148.28       71         46.0       150.82       91         46.5       162.86       27         47.8       154.20       74         47.8       154.20       74         47.8       154.20       74         48.5       155.42       97         48.5       155.42       97         48.5       155.42       97         48.5       155.42       97         48.5       155.42       97         48.5       155.42       97         48.5       155.42       97         48.5       155.42       97         49.5       182.40       48         50.5       195.68       161         51.0       167.32       167         51.1       188.98       193         52.2       172.84       165         52.4       172.84       165         52.5       178.81       107         53.5       182.08       114         53.5       182.08       114         53.5       182.57 <td>L</td> <td>43.5</td> <td>142.72</td> <td><b>6</b>7</td> <td></td> <td></td>	L	43.5	142.72	<b>6</b> 7		
45.0       147.84       Qs         45.5       149.28       ¶1         46.0       180.82       ₹1.         46.3       182.86       \$7.         46.4       185.84       \$7.         47.9       184.20       ?4.         47.9       184.20       ?4.         47.9       185.84       \$7.         48.0       187.48       \$7.         48.5       189.84       \$7.         48.5       189.74       \$7.         48.5       189.74       \$7.         48.5       189.74       \$7.         48.5       189.78       \$7.         49.5       185.88       \$7.         50.8       195.88       \$7.         51.5       198.96       \$7.5         52.0       170.60       \$64.         62.5       172.24       \$7.5         53.5       175.82       \$10.         54.0       177.47       \$7.5         55.5       182.08       \$1.         56.5       182.08       \$1.         57.5       189.85       \$1.         57.5       189.85       \$1.         57.5	L	44.0	144.36	250		a a construction of the co
45.5       148.28       ¶1         46.0       150.82       §1.         46.3       152.66       §2.         47.8       154.20       ?4.         47.8       154.20       ?4.         47.8       154.20       ?4.         47.8       154.20       ?4.         47.8       165.64       Q         48.0       167.48       Qg         48.1       167.48       Qg         48.2.1       160.78       Q6         49.5       162.40       44         50.0       164.64       /20.         51.0       167.32       167.         51.0       167.32       167.         52.6       172.24       165.         53.0       173.88       166.         53.5       173.22       167.         54.5       178.22       167.         55.5       178.24       165.         56.5       178.25       167.         57.0       180.45       100.         56.5       182.08       114.         56.5       182.08       114.         57.0       167.37       174.         583.0 </td <td>*</td> <td>44.5</td> <td>146.00</td> <td>8</td> <td></td> <td></td>	*	44.5	146.00	8		
45.0       130.82       \$7.         45.5       182.56       \$7.         47.0       164.20       \$7.         47.0       164.20       \$7.         47.5       185.84       \$7.         48.0       187.48       \$7.         48.5       158.12       \$7.         48.5       180.78       \$7.         48.5       182.40       \$4.         49.5       182.40       \$4.         50.0       184.04       \$70.         51.0       187.48       \$77.         51.0       187.49       \$77.         51.0       167.32       \$67.         52.0       170.80       \$64.         52.1       172.24       \$65.         53.2.1       173.88       \$69.         53.3.5       173.89       \$69.         54.5       178.81       \$67.         54.0       177.17       \$67.         54.1       178.11       \$67.         55.1       182.08       \$11.         56.1       182.09       \$11.         56.1       182.09       \$11.         57.0       187.73       \$184.85	1	45.0	147.84	40		1
46.8       152.56       27         47.0       164.20       76-         47.8       165.84       25         48.0       187.48       29         48.0       187.48       29         48.0       180.76       26         48.0       180.76       26         48.0       180.76       26         48.0       180.76       26         49.5       182.40       44         50.0       194.04       70         51.0       167.32       107         51.1       188.66       70         52.0       170.60       164         52.1       170.60       164         52.2       170.60       164         52.3       172.24       105         53.5       173.82       106         53.5       178.81       107         55.0       180.45       10         55.1       182.08       11         55.3       182.08       11         55.4       182.73       17         55.7       184.65       185.37         57.0       187.01       11         58.0       180.29 </td <td>L</td> <td>45.5</td> <td>149.28</td> <td>11</td> <td></td> <td></td>	L	45.5	149.28	11		
$47.0$ $154.20$ $74$ $47.5$ $155.84$ $Q'$ $48.0$ $167.48$ $Q'_0$ $48.5$ $163.12$ $Q'$ $48.5$ $162.12$ $Q'$ $48.5$ $162.12$ $Q'$ $49.5$ $162.12$ $Q'$ $49.5$ $162.12$ $Q'$ $49.5$ $162.12$ $Q'$ $49.5$ $162.12$ $Q'$ $50.5$ $162.40$ $4y$ $50.5$ $162.64$ $0y$ $51.5$ $168.96$ $0y$ $51.5$ $168.96$ $0y$ $52.5$ $172.24$ $09'$ $53.0$ $173.86$ $04_5$ $53.0$ $173.86$ $04_5$ $53.5$ $172.24$ $109'$ $54.6$ $177.17$ $10''$ $54.5$ $178.81$ $109'$ $55.0$ $180.45$ $10'$ $56.5$ $182.08$ $11''$ $57.0$ $187.01$ $11_*$ $58.0$ $190.29$		46.0	150.92	92		
47.0       164.20       7 4         47.5       165.84       45         48.0       167.48       47         48.5       168.12       2         48.5       168.12       2         48.5       168.12       2         48.5       168.12       2         49.5       168.12       2         49.5       168.12       2         49.5       168.12       2         50.0       164.04       190.         50.1       164.04       190.         50.5       168.98       67         51.0       167.32       167.         51.5       168.96       163.         52.0       172.84       10%         52.0       172.84       10%         53.0       173.88       10%         53.5       178.82       10%         53.5       178.84       10%         54.6       177.17       10%         55.7       180.46       100         55.8       182.09       11         56.5       182.37       11%         57.5       180.85       118         58.0       190.23 <td>Ł</td> <td>46.5</td> <td>152,56</td> <td>275</td> <td></td> <td></td>	Ł	46.5	152,56	275		
47.6       155.84       Qr         48.0       157.48       Qr         48.5       159.12       Qr         48.5       159.12       Qr         49.6       160.76       Qr         49.5       162.40       44         50.5       165.68       Gr         50.5       165.68       Gr         51.0       167.32       (br         51.4       168.98       for         52.0       177.32       (br         52.0       177.32       (br         52.0       177.32       (br         53.0       173.88       for         53.0       173.52       (br         53.5       175.52       (br         54.5       176.81       (pr         55.0       180.45       tO         55.1       182.08       11         56.5       185.37       (l*         57.0       187.01       (l*         58.0       188.73       (l*         58.1       182.37       (l*         58.1       182.37       (l*         58.5       191.93       191.93         58.5       19		47.0	154.20			
48.5       159.12       ? ?         49.0       160.78       26         49.5       162.40       44         50.0       164.04       70         50.1       165.88       167         51.0       167.32       167         51.1.0       167.32       167         52.0       170.60       164         52.0       170.60       164         52.2       172.24       105         53.0       173.88       106         53.4       176.52       107         54.5       176.82       107         54.5       176.82       107         54.5       176.81       10A         55.0       180.45       100         55.1       182.08       [1]         56.3       182.08       [1]         56.3       182.08       [1]         56.3       185.37       [1]?         57.0       187.01       [1]+         58.0       190.29       141         58.1       190.29       141         58.5       191.93       153.7         58.5       191.93       153.7         58.5	Ĺ	47.5	155,84	45		······································
48.5       159.12       ? ?         49.0       160.78       26         49.5       162.40       44         50.0       164.04       70         50.1       165.88       167         51.0       167.32       167         51.1.0       167.32       167         52.0       170.60       164         52.0       170.60       164         52.2       172.24       105         53.0       173.88       106         53.4       176.52       107         54.5       176.82       107         54.5       176.82       107         54.5       176.81       10A         55.0       180.45       100         55.1       182.08       [1]         56.3       182.08       [1]         56.3       182.08       [1]         56.3       185.37       [1]?         57.0       187.01       [1]+         58.0       190.29       141         58.1       190.29       141         58.5       191.93       153.7         58.5       191.93       153.7         58.5	E	48.0	157.48			
49.5     162.40     44       50.0     164.04     /20       60.5     165.68     167       51.0     167.32     (62       61.5     168.95     /63       52.0     170.60     /64       52.2     172.24     /65       53.0     173.68     ////////////////////////////////////	Ľ	48.5	159.12	97	······································	
49.5     162.40     44       50.0     164.04     /20       60.5     165.68     167       51.0     167.32     (62       61.5     168.95     /63       52.0     170.60     /64       52.2     172.24     /65       53.0     173.68     ////////////////////////////////////	E	49.0	160.76		······································	
S0.5         185.68         167           51.0         167.32         167           61.5         168.96         163           52.0         170.60         164           52.5         172.24         165           53.0         173.86         106           53.4         175.52         167           54.5         176.52         167           53.4         176.52         167           54.5         178.81         106           54.5         178.81         10A           55.0         180.45         100           55.5         182.08         11           56.5         185.37         17           57.0         187.01         114           56.5         185.85         114           57.5         188.85         191.93           58.5         191.93         193.57           58.5         191.93         193.57           59.5         195.21         195.21	Ľ	49,5	162.40		······································	
50.5         195.68         167           51.0         167.32         161           51.5         188.96         173           52.0         170.60         164           52.5         172.24         195           53.0         173.88         105           53.0         173.88         105           53.5         175.52         155           54.5         176.52         155           54.5         176.52         155           54.5         178.81         104           55.0         180.45         100           55.5         182.08         11           56.5         182.08         11           56.5         185.37         114           56.5         185.37         114           56.5         185.57         114           57.5         168.85         191.93           58.5         191.93         193.57           58.5         191.93         193.57           59.5         195.21         193.57	Ľ	50.0	164.04	////	· · · · · · · · · · · · · · · · · · ·	
51.5       198.96       /01         52.0       170.60       164         52.5       172.24       /05         53.0       173.88       /06         53.1       175.52       /07         54.5       175.52       /07         54.5       178.81       /04         55.0       180.45       107         54.5       178.81       /04         55.0       180.45       100         55.5       182.08       111         56.5       182.08       111         56.5       182.08       111         56.5       182.08       111         56.5       182.08       111         56.5       182.08       111         56.5       185.37       117         57.5       168.65       114         57.5       168.65       114         58.0       190.29       148         58.5       191.93       193.57         59.5       195.21       195.21	Ŀ	60.5	165.68			
52.0       170.60       /64         52.5       172.24       (65)         53.0       173.68       (06)         53.1       175.52       (07)         54.0       177.17       106         54.5       178.81       (07)         54.5       178.81       (07)         54.5       178.81       (07)         54.5       178.81       (07)         55.0       180.45       100         55.1       182.08       (11)         56.5       183.73       (17)         56.5       183.73       (17)         57.5       188.85       (13)         57.5       188.85       (14)         57.5       188.85       (14)         58.5       191.93       (14)         59.5       195.21       (19.29)		51.0	167.32	10%		
52.5       172.24       105         53.0       173.88       106         53.5       175.52       107         54.0       177.17       105         54.5       178.81       104         55.0       180.45       100         55.5       182.08       11         56.5       182.08       11         56.5       182.08       11         56.5       182.08       11         56.5       182.08       11         56.5       182.09       11         56.5       182.09       11         56.5       182.09       11         56.5       182.09       11         56.5       182.09       11         56.5       182.09       11         56.5       182.09       11         57.0       187.01       11         57.5       188.65       191.92         58.5       191.93       11         58.5       191.93       11         59.5       195.21       195.21	Ľ	<b>51.5</b>	168.96	105		
53.0       173.88       10%         53.5       175.52       107         54.0       177.17       10%         54.5       178.81       10A         55.0       180.45       100         55.5       182.09       [1]         56.0       183.73       [1]         56.5       185.37       [1]         56.5       185.37       [1]         56.5       185.37       [1]         56.5       185.37       [1]         56.5       185.37       [1]         56.5       185.37       [1]         56.5       185.37       [1]         57.0       187.01       [1]         58.5       198.85       [40         58.0       190.29       [40         58.5       191.93       [50.0         59.0       193.87       [40         59.5       195.21       [195.21	L	52.0	170.60	104		
53.5       175.52       (0)         54.0       177.17       10%         54.5       178.81       10A         55.0       180.45       10         55.0       180.45       10         55.1       182.08       [1*         56.5       185.37       [1*         56.5       185.37       [1*]         56.5       185.37       [1*]         56.5       185.37       [1*]         57.0       187.01       [1*]         57.5       188.85       [1*]         58.0       190.29       [1*]         58.5       191.93       [1*]         59.0       193.57       [1*]         58.5       195.21       [1*]		52.5	172,24	105 .		
54.0         177.17         105           54.5         178.81         10A           55.0         180.45         10           55.5         182.08         [1]           56.5         183.73         (1]           56.5         185.37         (1]           56.5         185.37         (1]           56.5         185.37         (1]           56.5         185.37         (1]           56.5         185.37         (1]           57.0         187.01         [1]           57.5         188.65         [J]           58.5         191.93         [J]           58.5         191.93         [J]           59.0         193.57         [J]           59.5         195.21         [J]		53.0	173.88	10%		
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55.0         180.45         10           55.5         182.09         [1]           56.0         183.73         [1]           56.5         185.37         [1]           56.5         185.37         [1]           56.5         185.37         [1]           56.5         185.37         [1]           57.0         187.01         [1]           57.5         188.65         [1]           58.0         190.29         [1]           58.5         191.93         [1]           59.0         193.57         [1]           59.5         195.21         [1]	Ĺ	54.5	178.81			
55.5         182.08         11           58.0         183.73         (1 <sup>4</sup> )           56.5         185.37         (1 <sup>4</sup> )           57.0         187.01         (14)           57.5         188.65         (14)           58.0         190.29         (14)           58.5         191.93         (14)           59.0         193.57         (15)           59.5         195.21         (15)	L	55.0	180.45			The second s
56.0         183.73         (1 <sup>4</sup> )           56.5         185.37         (1 <sup>4</sup> )           57.0         187.01         (14)           57.5         188.65         (14)           57.5         188.65         (14)           58.0         190.29         (14)           58.5         191.03         (17)           59.0         193.57         (195.21)		55.5	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			The second s
56.5         185.37         (/)           57.0         187.01         (1)           57.5         188.85         (1)           58.5         190.29         (1)           58.5         191.03         (1)           59.0         195.21         (1)	E	58.0	183.73	(14.		
57.0         187.01         114         bortom measure           57.5         188.85         410         507.00         6.5         190.29         58.5         191.93         59.0         193.57         59.5         195.21         59.5         195.21         50.5         195.21         50.5         195.21         50.5         195.21         50.5         195.21         50.5         195.21         50.5         195.21         50.5         195.21         50.5         195.21         50.5         195.21         50.5         195.21         50.5         195.21         50.5         195.21         50.5         195.21         50.5         195.21         50.5         195.21         50.5         195.21         50.5         195.21         50.5         195.21         50.5         195.21         50.5         195.21         50.5         195.21         50.5         10.5         10.5         10.5         10.5         10.5         10.5         10.5         10.5         10.5         10.5         10.5         10.5         10.5         10.5         10.5         10.5         10.5         10.5         10.5         10.5         10.5         10.5         10.5         10.5         10.5         10.5         10.5         10.	Ĺ	56.5		(13		
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# 8 - 404- ACOUSTIC TELEVIEWER FIELD LOG

SITE: CONPP COLA		DATE: 6 / 26 /2006
CLIENT: SCHNABEL		JOB: 6165
AUTHOR:_R. STELLER		
CONTACT: RUBEN TARUSELLI	OFFICE	PHONE:
Y	CELL	
	OFFICE	
		PHONE
CONTACT	* *** 2 22 2 ****	PHONE
	<u> </u>	PHONE
CONTACT:		PHONE
		PHONE
NOV ( CD.	*** <b>*</b> **********	
DRILLER:	****	PHONE:
	****	
DIRECTIONS TO SITE:		
GENERAL SITE CONDITIONS/LOCATION:		
BOREHOLE DESIGNATION: 8-404-		*
	WNSHIP:	SECTION:
DIAMETERS AND DEPTH RANGES: 44 0 TO	2.00	<u>.</u> . TO
BOREHOLE TOTAL DEPTH AS DRILLED:		
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DEPTH TO BEDROCK NA	DEPTH TO	
DEPTH TO BEDROCK: NA BOREHOLE FLUID: WATER ; FRESH WATE OTHER:	R MUD	SALT WATER MUD;
	TIMÉ SINCI	LAST CIRCULATION: #2 HR

GEOVision Geophysical Services 1151 Pomona Road, Unit P., Comina, CA 92882 Ph (951) 549-1234 Fz (951) 549-1236



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SITE:_CONPP COLA		<u>5-404</u>	······································	DATE: <u>6 /</u>	
CLIENT: SCHNABEL		<del></del>		JOB:6165	
AUTHOR:_R. STELLE	R <u></u>			PAGE 2 OF	2
LOGGING CREW: R.	stelier				
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	AND A 10 11	**************************************	<u> </u>		- <del> </del>

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**Ph (951) 549-1234 Fx (951) 549-1236** 14/2006 Page 267 of 366

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## B-404 CALIPER FIELD LOG

SITE:_CCNPP COLA	DATE: 6 /240 /2008
CLIENT: SCHNABEL	
AUTHOR:_R. STELLER	PAGE 1 OF 2
	<u></u>
CONTACT:_RUBEN TARUSELLI	OFFICEPHONE:
	CELLPHONE: 703-908-1797
CONTACT	OFFICE PHONE
	PHONE:
CONTACT:	PHONE:
	PHONE
CONTACT:	PHONE
PARTIE & Antonio	PHONE
DRILLER:	PHONE:
COMPANY:	PHONE:
GENERAL SITE CONDITIONS/LOCATION:	
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BOREHOLE DESIGNATION: B-404	OCATION:
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COUNTY:	ANNSHIP:
COUNTY:	ANNSHIP:SECTION: ASEDTOTO TOM OF CASING; NO _/ DEPTH TO WATER TABLE: MUD; SALT WATER MUD;
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COUNTY:	ANNSHIP:SECTION: ASEDTOTO TOM OF CASING; NO _/ DEPTH TO WATER TABLE: MUD; SALT WATER MUD;
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COUNTY:	ANNSHIP:SECTION: ASEDTOTO TOM OF CASING; NO _/ DEPTH TO WATER TABLE: MUD; SALT WATER MUD;
COUNTY:	ANNSHIP:       SECTION:         ASED
COUNTY:	ANNSHIP: SECTION: ASED // 200';TO TTOM OF CASING; NO // DEPTH TO WATER TABLE: MUD _/; SALT WATER MUD; TIME SINCE LAST CIRCULATION: / SHR4

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	B-404	DATE: <u>6 / 24/2006</u>
SITE:_CONPP COLA		JOB:_6165
CLIENT: SCHNABEL	m to be all the theme the state to the	PAGE 2 OF 2
AUTHOR:_R. STELLER	the second se	FMQE2 of B

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## MAINTENANCE PERFORMED ON SITE:\_

## EQUIPMENT PROBLEMS OR FAILURES:\_

#### SUGGESTIONS, ADDITIONS, CHANGES:\_

GEOVISION Geophysical Services IIII Pomona Kood, Unit P. Corona, CA 92822 Ph (951) 549-1234 Fz (951) 549-1236 GEOVISION Report 6165-01 Vol 1 of 2 CCNPP COLA Boring Geophysics rev A 11/14/2006 Page 269 of 366

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## B- 404 ELOG FIELD LOG

SITE:_CONPP COLA		DATE: 6 / 240/2006
CLIENT: SCHNABEL	* * * *	JOB: 6165
AUTHOR:_R. STELLER	······	PAGE 1 OF 2
×		
CONTACT: RUBEN TARUSELLI		_PHONE:
	_CELL	PHONE: 703-906-1797
CONTACT:	_OFFICE	PHONE
×		PHONE
CONTACT:		PHONE:
		PHONE:
CONTACT:		PHONE
		PHONE:
DRILLER:		PHONE:
COMPANY:		PHONE
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GENERAL SITE CONDITIONS/LOCATION:		
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COUNTY:RANGE:TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES:O TO BOREHOLE TOTAL DEPTH AS DRILLED:	WNSHIP; ICASED <u>/</u> D_ <u>200</u> 7	TO
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COUNTY:RANGE:TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES:O TO BOREHOLE TOTAL DEPTH AS DRILLED:O CONDUCTOR CASING?: YESDEPTH TO B DEPTH TO BEDROCK: MA BOREHOLE FLUID: WATER; FRESH WATE OTHER: DEPTH TO BOREHOLE FLUID: LOGGING CREW: R. STELLER VEHICLE(S) USED AND MILEAGE:RENTAL	WNSHIP: CASED / D_200' DEPTH TO R MUD_/ TIME SINCE	TO ASING: NO/_ WATER TABLE ; SALT WATER MUD; LAST CIRCULATION <u>44445</u>
COUNTY:RANGE:TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES:O TO BOREHOLE TOTAL DEPTH AS DRILLED:O CONDUCTOR CASING?: YESDEPTH TO B DEPTH TO BEDROCK:A BOREHOLE FLUID: WATER; FRESH WATE OTHER: DEPTH TO BOREHOLE FLUID: LOGGING CREW: _R. STELLER VEHICLE(S) USED AND MILEAGE: _RENTAL MOBILIZED FROM: PLOA	WNSHIP: CASED / D_200' DEPTH TO R MUD_/ TIME SINCE	I TO ASING; NO/_ WATER TABLE: ; SALT WATER MUD;
COUNTY:RANGE:TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES:O TO BOREHOLE TOTAL DEPTH RANGES:O TO BOREHOLE TOTAL DEPTH AS DRILLED: CONDUCTOR CASING?: YESDEPTH TO B DEPTH TO BEDROCK: DEPTH TO BEDROCK: BOREHOLE FLUID: WATER; FRESH WATE OTHER: DEPTH TO BOREHOLE FLUID: LOGGING CREW: _R. STELLER VEHICLE(S) USED AND MILEAGE: MOBILIZED FROM: ARRIVED ON SITE:	DEPARTUR	TO ASING: NO/_ WATER TABLE ; SALT WATER MUD; LAST CIRCULATION <u>44445</u>
COUNTY:RANGE:TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES:O TO BOREHOLE TOTAL DEPTH AS DRILLED:O CONDUCTOR CASING?: YESDEPTH TO B DEPTH TO BEDROCK:A BOREHOLE FLUID: WATER; FRESH WATE OTHER: DEPTH TO BOREHOLE FLUID: LOGGING CREW: _R. STELLER VEHICLE(S) USED AND MILEAGE: _RENTAL MOBILIZED FROM: PLOA	DEPARTUR CAUSE	TO ASING: NO/_ WATER TABLE ; SALT WATER MUD; LAST CIRCULATION <u>44445</u>

GEOPIsion Geophysical Services 1157 Parmone Read, Unit P. Corners, CA 12812 PA (951) 549-124 April 270 or 360 1236 GEOVision Report 6165-01 Vol 1 of 2 CCNPP COLA Boring Geophysics rev A 11/14/2006 Page 270 or 360 1236

SITE_CONPP COLA_	<u> </u>	<u>- 404</u>		<u> </u>	DATE: 6 / 246/2008	
CLIENT:_SCHNABEL_	· · · · · · · · · · · · · · · · · · ·	1 	······································		JOB: 6165	
AUTHOR:_R. STELLER	<u> </u>			<del></del>	PAGE 2 OF 2	
WINCH: COMP	ROBE	SILVER		t ,	OTHER	
MICROLOGGER	5301	OTHER	······		₩7 8 F 4 Ind 1 <u></u>	
ELOG PROBE	5490 1	OTHER	······································	t		

PROBE OFFSET	2.50M(8.20 FT)	<del></del>
CASING STICK-UP	<u>-1.(' +</u> 4) =	
DEPTH REF. OFFSET	39.4' 39.45	as Synt.

LOG NAME BAOGELOGUPOL	START DEPTH	START	END DEPTH	END
BANGLOGUPOI	195	15:10		15:28
<del>* *</del>	**		-15-115 (A	
······································			92.	ing.
*				
<u> </u>			***	
	·			
×		<u></u>	<u> </u>	

#### MAINTENANCE PERFORMED ON SITE:

EQUIPMENT PROBLEMS OR FAILURES:

SUGGESTIONS, ADDITIONS, CHANGES;

x<sup>Ř</sup>\*



# B-407 BORING GEOPHYSICS FIELD LOG SUMMARY

		DATE: 6 / 16 /2006
CLIENT: SCHNABEL		JOB:_6165 PAGE 1 OF 2
CONTACT:_RUBEN TARUSELLI	x x ,	PHONE:_703-906-1797_

BOREHOLE CONSTRUCTION: CASED UNCASED	
DIAMETERS AND DEPTH RANGES: 47/1 0 TO 200 ; TO	
BOREHOLE TOTAL DEPTH AS DRILLED: 200	
CONDUCTOR CASING? YES DEPTH TO BOTTOM OF CASING; NO	
DEPTH TO BEDROCK: NA	
BOREHOLE FLUID; WATER ; FRESH WATER MUD V : SALT WATER MUD	
BOREHOLE FLUID; WATER; FRESH WATER MUD_V_; SALT WATER MUD;	

LOGGING CREW:\_R. STELLER\_\_\_\_

r				
LOG TYPE	FILE NAME	DEPTH RANGE	DATE	TIMES
STA CONSIDERT	1001-112	1-0'- (85.7'	6/16/06	9:08-10:28
aunpeonett	BADTESTERLOI	Ø	Gille IDea	10+50 - 11°04-
CALINEA	6407 CAL UPOI	1930-0	616100	11:10 - 11:30
Chappents?	6407 TESTCALAR	d.	6/16/06	11:36 - 11:42
Euglomma	BAOT GLOGANOI	142.0-17.6	al 10 100	1:55 - 16:16
DBARTIN	GADT DEN CRONINA	Ø- 182.81	6/16/000	12:53 - 13:37
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· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·		
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	*	***************		
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		······································	- <u>†</u> -	**************************************
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# **P-S SUSPENSION VELOCITY FIELD LOG**

SITE:_CALVERT CLIFFS COLA	7	DATE:	6/16/06
CLIENT:SCHNABEL		JOB: 6165	
AUTHOR:_R. STELLER	600 - 10 - C	PAGE 1 OF	
		PHONE:	
CONTACT;	OFFICE	PHONE:	
	· · · · · · · · · · · · · · · · · · ·	PHONE:	
CONTACT:	×	Phone:	
		PHONE	
CONTACT:		PHONE:	
		PHONE:	
DRILLER:		THE BRANCH PROCESS	
COMPANY:		PHONE:	
		······································	
GENERAL SITE CONDITIONS/LOCATION;		······································	
EAR			
BOREHOLE DESIGNATION: 2-407		M;	<del> </del>
COUNTY: RANGE: 1	TOWNSHIP;		
	NCASED	$\checkmark$	SECTION:
DIAMETERS AND DEPTH RANGES: 4740	NUABEL	<u>.</u>	
BOREHOLE TOTAL DEPTH AS DRILLED: 200		;	<u> </u>
CONDUCTOR CASING?: YES DEPTH TO			
	DEPTH TO V	VALEN TAR	
BOREHOLE FLUID: WATER; FRESH WAT		; Salt V	WATER MUD;
		<del></del>	
DEPTH TO BOREHOLE FLUID: 0	TIME SINCE	LAST CIRC	SULATION: 16 H A

GEOVIsion Geophysical Services 1151 Pomona Road, Suite P. Corona, CA 92882 Ph (951) 549-1234 Fa (951)



I

SITE:_CALVERT CLIFFS COLA B-4-6T	DATE: 6/16/06
CLIENT: SCHNABEL	JOB: 6166
AUTHOR:_R. STELLER	PAGE 2 OF
LOGGING CREW: 2- STELLER	
VEHICLE(S) USED AND MILEAGE	
MOBILIZED FROM: LEKINGTON ANCL	DEPARTURE TIME: 7:05
ARRIVED ON SITE: 7235	A SAMA A MAR AND A A AND A A AND A A A A A A A A A A
STANDBY TIME:	CAUSE:
LOGGING STARTED: 4:00	LOGGING COMPLETED: 12:128
STANDBY TIME:	CAUSE
LOGGING STARTED:	LOGGING COMPLETED:
DEMOBILIZED TO:	ARRIVAL TIME:
ADDITIONAL DEMOB TIME:	REASON:
BATTERIES CHANGED BEFORE LOGGING: Y WINCH COMPROBE INSTRUMENT OYO 12004 15014 RECEIVER S/N 12008 20042 MAINTENANCE PERFORMED ON SITE:	/ES; NO_V; STORED WITH NEW_         GREY       OYO       RG       OTH       1         19029       RG 160023       160024       1         26066       11001       23063       30006       3
EQUIPMENT PROBLEMS OR FAILURES	
SUGGESTIONS, ADDITIONS, CHANGES:	
COMMENTS:	
	······································

SITE: CALVERT CLIFFS COLA 6-401			JSPENSION L	and the trans		
CLIENT: SCHNABEL				JOB: 8185		
AUTHOR		A		DATE: <u>\$7 (8/06</u> JOB:_6165 PAGEOF -5		
				<u></u>		
DEPTH	DEPTH	UNFILTERED	FILTERED	COMMENTS		
METERS	FEET	FILE NO.	FILE NO.	CASING, WATER, ROCK, ETC		
0.5	1,84	1				
1.0	3.28	L.				
1.5	4.92	4				
2.0	6.56	4				
2.5	8.20	<u> </u>				
3.0	9.84	1.6				
3.5	11.48	1				
4.0	13.12	<u> </u>				
4.5	14.76	4	* ****			
5.0	16.40	<u> </u>				
55	18.04	<u>u</u>	<u> </u>			
<u> </u>	18.69	<u>  4</u>				
<u>8.5</u>	21.33	<u>                                       </u>		······································		
<u>7.0</u>	22.97	<u> </u>	· · · · · · · · · · · · · · · · · · ·			
<u>7.5</u> 8.0	24.61 28.25	15				
<u>8.5</u>	27.89	140	······································			
<u> </u>	29.53	11				
<u>8.5</u>	31.17			· · · · · · · · · · · · · · · · · · ·		
10.0	32.81	· · · · · · · · · · · · · · · · · · ·	***			
10.5	34.45	20				
11.0	36.09	24	A A A A A A A A A A A A A A A A A A A			
11.5	37.73	24				
12.0	39,37	24	· · · · · · · · · · · · · · · · · · ·			
12.5	41.01	26				
13.0	42.85	.46				
13.5	44.29	20.				
14.0	45.93	46				
14.5	47,57	24	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			
15.0	49.21	30				
15.5	50,85	X				
16.0	52.49	32	· · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		
18.5	54.13	34				
17.0	56.77	34-				
17.5	57.41	35				
18.0	59.06	34				
18.5	60.70	57				

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19,0

19,5

20.0

62.34

63.98

65.62

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GEOVISION	SUSPENSION LO	<b>JGGING FIELI</b>	D NOTES	
SITE: CALVERT CLIFFS COLA	6-407 -	DATE: 6	116/08	· · · · · · · · · · · · · · · · · · ·
CLIENT;_BCHNABEL		JOB:_6165		· · · · · · · · · · · · · · · · · · ·
AUTHOR:_R. STELLER		PAGE	OF 5	
DEPTH DEPTH UNFILTERED	FILTERED	COMMENTS	**************************************	

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		unitil cred	FILLI CREU	 COMMEN 13	
METERS	FEET	FILE NO.	FILE NO.	CASING, WATER, ROCK, ETC	
			1 ANDRE L'EST		

		A A MARKAN AND A MAR		
20.5	67.26	M		
21.0	68.90	42		
21.5	70.54	45		
22.0	72.18	A		
22.5	73.82	45		
23.0	75.46	Alo		
23.5	77.10	m		
24.0	78.74	ÂN		
24.5	80.38	IA		
25.0	82.02	90		
25.6	83.66	<u>A</u>		
26.0	85.30			
26.5	86.94	<b>A</b>		
27.0	88.58	94-		
27.5	90.22	<b>65</b>		
28.0	91,86	56		and the second
28.5	93,50	61		
29.0	95.14	51		and the second
29.5	96.78	<b>414</b>		
30.0	98.43	60		
30.5	100.07	La		<u>*************************************</u>
31.0	101.71	64		
31.5	103.35	63		
32.0	104.99	WA-		
32.5	106.63	05		
33.0	108.27	64		
33.5	109.91	61	and the second	
34.0	111.55	647		
34.5	113.19	MA		
35.0	114.83	76		
35.5	116.47	น		
36.0	118.11	71.		
36.5	119.75	73	······································	
37.0	121.39	24		
87.5	123.03	15		and and a second s
38.0	124.67	74	······································	
218,5	126.31	71		
29.0	127.95	7/1		A REAL AND AND AND AND A REAL AND A
39.5	129.59	74		
40.0	131,28	90	**************************************	· · · · · · · · · · · · · · · · · · ·
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Geovision Suspensio	n logging field notes
SITE:_CALVERT CLIFFS COLA_B-407	DATE: 6/10/00
CLIENT:	JOB: 6165
AUTHOR: R. STELLER	PAGE A OF 5

10.10

	r	UNFILTERED	FILTERED	COMMENTS	
METERS F		FILE NO.	FILE NO.	CASING, WATER, ROCK, ETC	\$

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40.5	132.87	AL		
41.0	134.51	Pre		
41.5	136,15	03		
42.0	137.80	<u>Å</u>		
42.5	139.44			
43.0	141.08	A6		
43.5	142.72	RI		
44.0	144.36	128	······································	
44.8	146.00	88		
45.0	147,64	94	· · · · · · · · · · · · · · · · · · ·	a and a second
45.5	149.28	<b>A</b> i		
46.0	150.92	ar.		
46.5	152.56	192		
47.0	154,20	194		
47.5	155.64	a\$-		
48.0	157.48	98.	· · · · · · · · · · · · · · · · · · ·	
48.5	159.12	97		
49.0	160.76	48		
49.5	162.40	99		
50,0	164.04	60	<u> </u>	
50.5	165.68	161	······································	
51.0	167.32	102	······································	
51.5	168.96	(03	· · · · · · · · · · · · · · · · · · ·	
52.0	170.60	10+-	······································	
52.5	172.24	<i>rb5</i>	*** *** *** ****	
53.0	173.88	106	· · · · · · · · · · · · · · · · · · ·	
53,5	175.52	62		
54.0	177.17	(OB)		
64.5	178.81	64		
55.0	180,45	uo		
55.5	182.09	<u>ut</u>		
56.0	183.73	W2-		the former of the second se
50.5	185.37			WIT BOTTOM & BELDING 196.5
57.0	187.01			Brown Menucements
57.8	188.65		<u> </u>	WALKE F THINK OF A DE
58.0	190,29			· · · · · · · · · · · · · · · · · · ·
58.5	191.93			
59.0	193.57			and the second
59.5	195.21			
60.0	198.85			
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# B- 407 CALIPER FIELD LOG

SITE: CONPP COLA		DATE: G / 16/2006
CLIENT: BCHNABEL		JOB: 6165
AUTHOR: R. STELLER		PAGE 1 OF 2
		-
CONTACT:_RUBEN TARUSELLI	OFFICE	PHONE
	_CELL	PHONE:_703-906-1797
CONTACT:	_OFFICE_	
	***	PHONE:
CONTACT:	<del></del>	PHONE:
under aller die Verland zu under werten	***************************************	PHONE:
CONTACT:		PHONE:
	·····	PHONE:
DRILLER		PHONE:
COMPANY:	· · · · · · · · · · · · · · · · · · ·	PHONE
GENERAL SITE CONDITIONS/LOCATION;	x	
BOREHOLE DEBIGNATION: 8-467	OCATION:	· · · · · · · · · · · · · · · · · · ·
COUNTY:RANGE:TO	ANSHIP:	SECTION:
BOREHOLE CONSTRUCTION: CASED LINC	Cased V	<u>/</u> 000/1011
DIAMETERS AND DEPTH RANGES: 474 0 TO	2407	то
BUREHULE TO TAL DEPTH AS ORILLED Y 2001	r	
CONDUCTOR CASING?: YES DEPTH TO BO	TTOM OF C	
	DEDTH TO	INATES TADIE.
BOREHOLE FLUID: WATER; FRESH WATER OTHER:;		SALT WATER MUD;
DEPTH TO BOREHOLE, FLUID:	TIME SINC	E LAST CIRCULATION: S AP.
LOGGING CREW: R. STELLER	· · · · · · · · · · · · · · · · · · ·	
VEHICLE(S) USED AND MILEAGE: _RENTAL		
MOBILIZED FROM: LEANSTAN PARE	DEPARTUR	E TIME: 7+0C
ARRIVED ON SITE: 7:35	*	
	CAUSE:	
LOGGING STARTED: 10:58	LOGGING	COMPLETED: 11 42

SITE: CONPP COLA	1/2-00	7		DATE: 14	/2009
CLIENT: SCHNABEL				JOB: 6165	
AUTHOR R STELLER		***************************************		PAGE 2 OF 2	
NOTIONS IS OTHER		***	** * *		
		1			
WINCH: COMPR	OBE	SILVER V	010	OTHER (	
	6301	OTHER	, w i w	<b>**</b> 1 ( )I=0 * <u>- 7</u>	
	5368	OTHER	<del> </del>		
OPLICENT NODE			<del>*************************************</del>		
PROBE OFFSET 1	47 IN 184	2.08M(8.82 FT)	A IN BANK	***	7
CASING STICK-UP	ARMS -	LS	ARMS ~		1
DEPTH REF. OFFSET	- CAMUNA	5-35	- 600704	<del>i siminnisi ing</del>	
MEPINKER WERALI	· · · · · · · · · · · · · · · · · · ·	<u></u>		<del></del>	1
1 1	START	START	END	END	1
	DEPTH	TIME	DEPTH		
A AN AND A A				TIME	•
GAUT TEST CAL ON		102:58	ļ (	11:04	
HAR CHLOPDI	1933	utio	6	ji : 30	1
6407 TES CAL 02	<i>[</i>	<u>11136</u>	<u>Ø</u>	<u> </u>	
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*	~ <u>.</u>				*
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	~ 1				
					-
<b>CALIBRATION PLATE S</b>	/N 201		AS BUILT	· · · · · · · · · · · · · · · · · · ·	1
	: 	1.968 IN	8.997 IN	8.000 IN	1
FILE N	NAME	(50 MM)	(100 MM)	203.2 MM	
AS MEAS. GAOT THEM	CALOL	1.96	5.94	R.00	
AS MEAS. 16467 TEST	CAL02	1.48	3.94	A	
AS MEAS.					
AS MEAS.	······································			<del>`</del>	
AS MEAS.					
AS MEAS.		· · · · · · · · · · · · · · · · · · ·		· ···· ··· · ····	ξ.
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#### MAINTENANCE PERFORMED ON SITE:

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#### EQUIPMENT PROBLEMS OR FAILURES:

#### SUGGESTIONS, ADDITIONS, CHANGES:\_\_

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# 8-407 ELOG FIELD LOG

SITE:_CONPP COLA	<del></del>	DATE: 6 / 16 /2008
CLIENT:_SCHNABEL	·····	JOB:_6165
AUTHOR_R.STELLER		PAGE 1 OF 2
CONTACT:_RUBEN TARUSELLI	OFFICE_	PHONE:
		PHONE: 703-906-1797
CONTACT:	OFFICE	
	·	PHONE:
CONTACT:	**************************************	PHONE:
		_PHONE:
CONTACT:	*** <u>*********************************</u>	PHONE:
	<del></del>	PHONE:
DRILLER: COMPANY:	<del></del>	PHONE:
COMPANY:		PHONE:
BOREHOLE DESIGNATION: B-407	LOCATION:	
COUNTY: RANGE: TO		
CONCINUE GONS INDUMINING CASED IN	CASED 1/	
DIAMETERS AND DEPTH RANGES: 474 0 TO	200	× <b>1723</b>
BOREHOLE TOTAL DEPTH AS DRILLED: 200		× الا
CONDUCTOR CASING?: YES DEPTH TO BO	TTOMOE	
DEPTH TO BEDROCK: NA-	DEPTH TO	
DEPTH TO BEDROCK: <u>NA-</u> BOREHOLE FLUID: WATER; FRESH WATER OTHER:		SALT WATER MUD
DEPTH TO BOREHOLE FLUID:	TIME SINC	ELAST CIRCULATION
LOGGING CREW:_R. STELLER		
VEHICLE(S) USED AND MILEAGE: _RENTAL	* **** **** * ***	
MOBILIZED FROM: LANDER PAR	NEDADTI	THE THE PARTY AND THE PARTY AND THE
ARRIVED ON SITE: 7395	VERMIUN	RE TIME 7405
THE REPORT OF A DESCRIPTION OF A DESCRIP	CAUSE:	
	Fraging (	COMPLETED: 12:20

SITE: CONPP COLA 8-407	DATE: / /2008
CLIENT: SCHNABEL	JOB:_6165
AUTHOR: R. STELLER	PAGE 2 OF 2

WINCH:	COMPROBE	SILVEROYO	_OTHER	·····
MICROLOGGE		OTHER		
ELOG PROBE	5490 <u>/</u>	OTHER		

PROBE OFFSET	2.50M(8.20 FT)	
CASING STICK-UP	-1.to #32.2	3
	*	**************************************

LOG NAME	START DEPTH	START TIME	END DEPTH	END TIME
Shot BLOG afor	1920	[] <u></u>	116	12.1/20
			· · · · · · · · · · · · · · · · · · ·	
· ****				
······································				

#### MAINTENANCE PERFORMED ON SITE.

EQUIPMENT PROBLEMS OR FAILURES:

## SUGGESTIONS, ADDITIONS, CHANGES;



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# B-407 ACOUSTIC TELEVIEWER FIELD LOG

SITE:_CONPP COLA		DATE: 6 / 12008
CLIENT: SCHNABEL		
AUTHOR:_R. STELLER	······································	PAGE 1 OF 2
CONTACT:_RUBEN TARUSELLI	OFFICE	PHONE:
N	CELL	PHONE_703-906-1797
CONTACT:	OFFICE	PHONE
		PHONE
CONTACT:		PHONE:
	and the second s	PHONE
CONTACT:		PHONE
	7 <u> </u>	
ORILLER:	×**** *****	PHONE:
DRILLER:		
	<u> </u>	PHONE
DIRECTIONS TO SITE:		
	······································	
	<u></u>	
	······	
	<del> * * _ ;</del> *	
GENERAL SITE CONDITIONS/LOCATION:		x
	kan ge-	
BOREHOLE DESIGNATION: 8-407	LOCATION	<u> </u>
COUNTY: RANGE: T	OWNSHIP:	SECTION:
BOREHOLE CONSTRUCTION: CASED	NCASED V	
DIAMETERS AND DEPTH RANGES: 4 14 0 T	n 2 <del>00</del>	TOTO
	Les /	
CONDUCTOR CASING?: YES DEPTH TO P	ATTOW OF	
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BOREHOLE FLUID: WATER; FRESH WAT		WATER TABLE
OTHER:		; SALT WATER MUD;
DEPTH TO BOREHOLE FLUID:		
ver in in duriencle fluid; /	TIME SINC	ELAST CIRCULATION: SHES
£		



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SITE:_CONPP COLA_	8-	407		DATE: 6 / 16	1200R
CLIENT: SCHNABEL				JOB: 8165	
AUTHOR: R. STELLER	(		x 200 <sup>×</sup> × x	PAGE 2 OF 2	
and the second se			······································		
LOGGING CREW: R. (	STELLER	*			
VEHICLE(S) USED AN			* <u>****</u> ****	**************************************	<del></del>
MOBILIZED FROM: 1.6	Marthan	PHIL	DEPARTU	RETIME: 7 4	
ARRIVED ON SITE	7:35			· · · · · · · · · · · · · · · · · · ·	
STANDBY TIME:	<u> </u>	······	CAUSE:		
LOGGING STARTED:	12:52			COMPLETED:	· ····································
				www.ccjcl/,	
WINCH: COMPR	<b>20BE</b>	SILVER	ava	OTHER MM	4 MT
MICROLOGGER			N. TE		
		#5117	ACON INTIC	*#E47A	OTHER 2V04
				/#21/# <u></u>	UTHER 24 DB
PROBE TILT TEST	98.S	RELINTON TH	т <i>1</i> 89		
PROBE AZIMUTH TES	TZE		интц <i>аг</i>		
	1 <u>-413 6.53</u>	_DRUNIUN AZI			
PROBE OFFSET		4 0011/0 /7CTA	Lange martie		1 2000 e - 1.5'
CASING STICK-UP	POPINOPL	- 1 <b>.00m(0.17F1)</b>	ACOUSIN	: 1.44M(4.72FT)	<b>3600 G - 1.2</b> .
DEPTH REF. OFFSET	1 '	* * <del>**********************</del> *	1 -	* <del></del>	
DEFINAL, OFFOEL	<u>]</u>		L.		
T	START				*
LOG NAME		START	END	END	
	DEPTH_	TIME	DEPTH	TIME	
840706/Chowon		12-53	181.9	13:57	
	<u>}</u>	· · · · · · · · · · · · · · · · · · ·			
	** *****				
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	<u> </u>				
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MAINTENANCE PERFC	(RMED O	N SITE:			
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		<del></del>	·····		
EQUIPMENT PROBLEM	<b>AS OR FAI</b>	LURE8:			
	<del>*************************************</del>			~~~ <u>~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~</u>	
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SUGGESTIONS, ADDIT	ions, Ch	ANGES:	_		
				······································	<del></del>
			<del></del>	***	**************************************
····· · · · · · · · · · · · · · · · ·	0000 A A	······		<del>~~</del>	tin and and and a set of the



# 8-418 BORING GEOPHYSICS FIELD LOG SUMMARY

orro osubb	PPI A			DATE 6 /24 /2006
SITE_CONPP	· · · · · · · · · · · · · · · · · · ·	*	<u> </u>	JOB: 6165
CLIENT: SCH	NADEL	······································		PAGE 1 OF 2
AUTHOR _R. S	#ICLLER	······································	<u></u>	ga an an an
CONTACT:_R	JBEN TARUSELLI	<u> </u>	<u></u>	PHONE:_703-906-1797_
		ASED UNCAS	en V	
BOREHOLE C	ONSTRUCTION: C	ASEU UNUNO		то
DIAMETERS A	ND DEPTH MANU	ES <u>4'/4</u> 0 TO <u>14</u>		
BOREHOLE I	OTAL DEPTH AS D			a; NO_⊥∕_
CONDUCTOR	CASING?: YES	- DELIU IN BALL		
DEPTH TO BE	DROCK <u>NA</u>			rwater Mud;
BOREHOLE F	LUID: WATER	_; Fresh waigr mi	JU; Onl:	I WAIER MUD
LOGGING CRI	ew:_r. steller,	<u>C.C.NOTEC</u>	<u></u>	2
LOG TYPE	FILE NAME	DEPTH RANGE	DATE	TIMES
MARIGINI, MAR (75	001-114	1.6' - 187.8'	6/22/00	13:63 - 16:44
Assessmenty.	BAIL MA LIFOI	199.4' - 3.5'	to 714 /46	15:51 - 16 149
and the second s	BAIS CONTESTOL	0	6/29/06	16:55-17:09
	SAIBCALLY OI	147.0'-142.0'	salas lota	17:05 - 17:17
	6418CAUTERNA	<u> </u>	6/20 00	8:05- 8:09
(a)-140/2000-A.	BAIB CALUPOZ	MIC - P	10/30/04	9:15 - 9:40
сацарён. Терт	GAIR CALTERDS	4	6/30/06	9141- 9145
<b>ALO</b> S	6418 Gronuppi	197.0' - 20.0	0/30/0%	9:38 - 10:15
		· · · · · · · · · · · · · · · · · · ·		······································
	*			
*	× ×	<u>x</u>		



## **P-S SUSPENSION VELOCITY FIELD LOG**

SITE: CALVERT CLIFFS COLA 8-416	DATE: 6/22/06
CLIENT: SCHNABEL	
AUTHOR:_R. STELLER	PAGE 1 OF
CONTAGT:	OFFICE PHONE:
	PHONE;
CONTACT:	ASSING BLOCKE.
and the second	PHONE:
CONTACT:	PHONE
	PHONE
CONTACT:	PHONE:
	PHONE:
DRILLER:	PHONE
COMPANY:	PHONE
GENERAL SITE CONDITIONS/LOCATION:	
EAN: BOREHOLE DESIGNATION: 15-415	LOCATION:
COUNTY: RANGE 1	TOWNSHIP:SECTION:
BOREHOLE CONSTRUCTION: CASED	INCASED V
DIAMETERS AND DEPTH RANGES: 414 0	TO 2001 ; TO
CONDUCTOR CASING?: YES DEPTH TO	BOTTOM OF CASING; NO
DEPTH TO BEDROCK: NA	DEPTH TO WATER TABLE: ALA
BOREHOLE FLUID: WATER; FRESH WAT OTHER:	ER MUD; SALT WATER MUD;
DEPTH TO BOREHOLE FLUID: 1	TIME SINCE LAST CIRCULATION: - I HAL



SITE: CALVERT CLIFFS COLA 6-418	DATE: 6/29/06
CLIENT: SCHNABEL	JOB: 6165
AUTHOR: R. STELLER	PAGE2 OF 6
LOGGING CREW: R. STELLER, C.	CAROLL
VEHICLE(S) USED AND MILEAGE: 26-374	
MOBILIZED FROM:	DEPARTURE TIME, 15> 30
ARRIVED ON SITE: 15:00	ani Jano Ji, V. Yakatana
STANDBY TIME:	CAUSE:
LOGGING STARTED: VI:55	LOGGING COMPLETED: 15:24-
STANDBY TIME:	CAUSE:
LOGGING STARTED:	LOGGING COMPLETED:
DEMOBILIZED TO:	ARRIVAL TIME:
ADDITIONAL DEMOB TIME:	REASON:
BATTERIES CHANGED BEFORE LOGGING: Y WINCH COMPROBE INSTRUMENT OYO 12004 15014 RECEIVER S/N 12006 20042 MAINTENANCE PERFORMED ON SITE:	ES NOV_; STORED WITH NEW GREY OYO RG OTH M 19029 RG 160023 1 160024 26066 111001 23053 S S
EQUIPMENT PROBLEMS OR FAILURES:	
Manna in a arrive realized in the set of a set of the s	
SUGGESTIONS, ADDITIONS, CHANGES:	и к к к к к к к к к к к к к к к к к к к
Marka and a second s	
COMMENTS: 200 = 15	-1.5 = 0.0 IN EXIT
Mannan Marana and Marana and Andrew	

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GEOVision Geophysical Services 1151 Pomone Road, Suite P, Corona, CA 92882 Ph (051) 549-1234 Fx (951) 549-1236 GEOVision Report 6165-01 Vol 1 of 2 CCNPP COLA Boring Geophysics rev A 11/14/2006 Page 286 of 366

GEOVISION	SUSPENSION LOC	<b>BGING FIELI</b>	) NOTES	
SITE:_CALVERT CLIFFS COLA	<u>B-416 : :</u>	_DATE: <u>6/2</u>	9/06	
CLIENT:SCHNABEL		JOB:_6165	•	······································
AUTHOR: R. STELLER		PAGE2	OF	

DEPTH METERS	DEPTH FEET	UNFILTERED FILE NO.	FILTERED FILE NO,	COMMENTS CASING, WATER, ROCK, ETC
0.6	1.64	00		
1.0	3.28	2		
1.5	4.92	3		
2.0	6.58	4		
2.6	8,20	i ș		
3.0	9.84	6		
3.5	11.48	7		
4.0	13.12	B		
	1	······································	<u> </u>	

	9.69			
3.0	9,84	6		
3.5	11.48	7		
4.0	13.12	8		
4.5	14.76	9	B	
5.0	18.40	10		
5.5	18.04	U .		
6.0	19.69	16		
6.5	21.23	1		
7.0	22.97	10	x	
7.5	24,61	15		
8.0	26.25	16		
8.8	27.89	17		
0.0	29.53			
9.5	31.17	19		
10.0	32.81	<b>%</b>		
10.5	34.45	120		
11.0	36.09	23.		
11.5	37.73	9/3		
12.0	39,37	24		8
12.5	41.01	2.5		
13.0	42.65	24		
13.8	44,29	23		
14.0	45,93	28		
14.5	47.67	21		
15.0	49.21	70		
16.6	50.85	31		
16,0	52,49	32.		
16.5	54.13	37)	····· · ···· · ···· · ··· · ··· · · ··· ·	
17.0	55,77	34		
17.5	57.41	94 <b>7</b>		
18.0	<u>59,06</u>	<u>}/a</u>		
18.5	60,70	72		
19.0	62.34	78		
19.5	63.98	*		
20.0	65.62	k		
	a			

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<b>GEOVISION SUSPENSION LOGGING FIELD NOTES</b>					
SITE:_CA	LVERT CL	IFFS COLA <u>R-4</u>	48	DATE: 6/24/06	
CLIENT: SCHNABEL			JOB: 6165		
		.87		JOB: 6165 PAGEOF	
	· · · · · · · · · · · · · · · · · · ·				
DEPTH		UNFILTERED	FILTERED	COMMENTS	
METERS	FEET	FILE NO.	FILE NO.	CASING, WATER, ROCK, ETC	
· · · · · · · · · · · · · · · · · · ·					
20.5	67.28	<u>4</u> 1			
21.0	68.90	42			
21.5	70.54	43	<u> </u>		
22.0	72.18	<u> 192</u>			
22.5	73.82	45			
23.0	75.46	46	· · · · · · · · · · · · · · · · · · ·		
23.8		47	<u> </u>		
24.0	78.74	4			
24.5	80,38	41	·····	*	
25.0		57			
25,8	83.66	5			
26.0	85.30	<u> </u>	<u> </u>	×	
26.5		67)	<u> </u>		
	88.59	64	·····		
27.5	90.22	<u>sc</u>		·····	
28.0	91,88	<u> 76</u>	· · · · · · · · · · · · · · · · · · ·		
28.5	93,60	57			
29.0	95.14	<u>58</u>	· · · · · · · · · · · · · · · · · · ·		
29.5	96.78	<u>67</u>			
30.0	98.43	60			
30,5	100.07	61	·····	ANTE C. TOTAL TA	
31.0	101,71	62			
31.5	103.35	<u>B</u>			
32.0	104.99	64	<u> </u>		
32.5		165 1			
33.0	108.27	66			
33.6	109.91	67	*		
34.0		66			
34.5	113.19	<u>  4</u>	<u> </u>		
35.0	114.83	20	<u>]</u>		
35.5	116.47	71	<u>}</u>	· · · · · · · · · · · · · · · · · · ·	
38.0	118.11	<u>32</u>	<u> </u>	× ×	
36.5	119.75	71	<u> </u>		
37.0	121.39	74	<u>}</u>		
37.5	123.03	75	·] · · · · · · · · · · · · · · · · · ·		
38.0	124.67	76	<del> </del>		
38.5	126.31		· · · · · · · · · · · · · · · · · · ·		
38.0	127.95	78	<b></b>		
38.5	129.59	74			
40,0	131.23	<u>  Bo</u>			

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GEOVISION	SUSPENSION				
SITE:_CALVERT CLIFFS COLA	<u>B-418</u>	DATE:	6/29	<u> 06</u>	THE OTHER PROPERTY AND
CLIENT:SCHNABEL	<u></u>	JOB:_6165	<u>i</u>		***
AUTHOR:_R. STELLER	<b>,</b>	PAGE	6	<u> </u>	· · · · · · · · · · · · · · · · · · ·

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DEPTH	DEPTH	UNFILTERED	FILTERED	COMMENTS	
METERS	FEET	FILE NO.	FILE NO.	CASING, WATER, R	DCK, ETC

*				
40.5	132.87	8		
41.0	134.51	81		
41.5	136.15	R.a.		
42.0	137.80	84		
42.5	139.44	BC		
43.0	141,08	<u>а</u> ь		
43.5	142.72	87		
44.0	144.36	86	× · · · · · · · · · · · · · · · · · · ·	
44.5	146.00	99		
45.0	147.84	a.		
45.5	149.28	41	]	Mus cause?
48.0	150.92	PE-	i and a channel an	
46,5	152.56	93		8
47.0	154.20	94	T	<b>TATATANA ATAU ATAU ATAU ATAU ATAU ATAU A</b>
47.5	155.84	15		
48.0	157.48	9.		
48.5	159.12	47		a <u>a la di angana an</u>
49.0	160.78	76	<u> </u>	· · · · · · · · · · · · · · · · · · ·
49.5	162.40	99	<u> </u>	an an ann an Anna an An
<u>40.0</u> 50.0	164.04	100	-	
50.5	185.68	loi		
51.0	167.32	Lougany		
<u> </u>	168.96	103		
<u></u> 52.0	170.60	104	· · · · · · · · · · · · · · · · · · ·	
<u>94.0</u> 52.5		A REAL PROPERTY AND A REAL AND A	a and a set of the set	
<u> </u>	172.24	105		
<u> </u>	175.52		(	**************************************
angente a la la median made as	00 - 0 - 0 - 0 - 0 0 - T - 0 - T - 0 - 0	67		
<u>54.0</u>	177.17	109 <u>6</u>	* * * * * * * * * * * * * * * * * * *	
<u>54.5</u>	178.81	10		
<u>55.0</u>	180.45 182.09			······
55.5				
<u> </u>	183.73	112		
<u>58.5</u>	185.37	111		
<u> </u>	187,01	11+	· · · · · · · · · · · · · · · · · · ·	BETTOM IN EASURAMENT?
<u> </u>	188,65		· · · · · · · · · · · · · · · · · · ·	HAT BOTTOM & ST. 2 M.
<u> </u>	190.29			
58.5	191.93			······································
59.0	193.57			
59.6	195.21		<u></u>	
60.0	196.85	<b>L</b>		

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GEOVISION SUSPENSION	LOGGING FIELD NOTES
Y The second sec	DATE: 6/29/06
CLIENT:_SCHNABEL	JOB: 6165
AUTHOR: R. STELLER	PAGE 6 OF 6

DEPTH DEPTH	UNFILTERED		COMMENTS
METERS FEET	FILE NO.	FILE NO.	CASING, WATER, ROCK, ETC

60.5	198.49			
61.0	200.13			T.O. 8200'
61.5	201.77			
62.0	203.41			
62.5	205.05			
63,0	206.69			
63.5	208.33			······································
64.0	209.97			
64.5	211.61			* *
65.0	213.25			
65.6	214.90			
66.0	216.54			
88.5	218.18			
67.0	219.82			
67.5	221.48	······································		
66.0	223.10			
68.6	224.74			
69.0	226.38			
69,5	228.02			
70.0	229.66			
70.5	231,30			
71.0	232.94			
71,5	234.58			
72.0	236.22			
72.5	237.86			
73.0	239,50			
73.5	241.14			
74.0	242.78			
74.5	244.42			
75.0	248.06			
76,6	247.70			
76.0	249.34			
78.5	250.98			
77.0	252,62			
77.5	254.27			
78.0	255.91			
78.5	257.55			
79.0	259.19		· · · · · · · · · · · · · · · · · · ·	
79.5	260.83	······································		
80.0	262.47			

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### 8-418 ACOUSTIC TELEVIEWER FIELD LOG

SITE: CONPP COLA		DATE: 6 / 29/2006
CLIENT: SCHNABEL		JOB: 6165
AUTHOR: R. STELLER		PAGE 1 OF 2
CONTACT: RUBEN TARUSELLI	OFFICE	PHONE: *
	CELL	PHONE: 703-906-1797
		PHONE
and and a set of the s		PHONE
CONTACT:		PHONE:
**************************************	<u> </u>	PHONE
CONTACT:		PHONE:
		PHONE
NOH I ED.	<u></u>	PHONE
ORILLER:		PHONE:
	<u></u>	
DIRECTIONS TO SITE:		
GENERAL SITE CONDITIONS/LOCATION:		
BOREHOLE DESIGNATION: B-418	LOCATION	
COUNTY BANGE TO	MAMSHID-	SECTION:
COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASED UN		
DIAMETERS AND DEPTH RANGES:O TO	7 2m/	_;TO
BOREHOLE TOTAL DEPTH AS DRILLED: 200		
CONDUCTOR CASING?: YES DEPTH TO B	OTTOM	CASING; NO
		WATER TABLE:
BOREHOLE FLUID: WATER; FRESH WATE		
OTHER:		_; OALI WATER MUD;
DEPTH TO BOREHOLE FLUID:	i ime sinci	ELAST CIRCULATION: F 21 R

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SITE:_CONPP COLA_		B-41B		DATE: 6/29	/2006
CLIENT: SCHNABEL	·····			_ JOB:_6166	· · · · · · · · · · · · · · · · · · ·
AUTHOR R. STELLER	1		······································	PAGE 2 OF 2	
		· · · · · · · · · · · · · · · · · · ·		_	
LOGGING CREW:_R.	STELLER	. C. Cher	E <i>1</i>		
VEHICLE(S) USED AN	d Mileag	É RENTAL			······································
MOBILIZED FROM: LA	MINGTON	PAGE, MP	DEPARTU	RE TIME: 11	1190
ARRIVED ON SITE	7:00	· · · · · · · · · · · · · · · · · · ·			
STANDBY TIME:	*		CAUSE:		· · · · · · · · · · · · · · · · · · ·
LOGGING STARTED:	15:51		LOGGING	COMPLETED:	6149
······					~~~ • ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~
WINCH: COMPI	ROBE	SILVER /	OYO	OTHER	
MICROLOGGER	5301	OTHER			× • • • • • • • • • • • • • • • • • • •
TELEVIEWER	OPTICAL	.#5117	ACOUSTIC	C #6474 5500	OTHER
				· · · · · · · · · · · · · · · · · · ·	
PROBE TILT TEST	84	BRUNTON TIL	t <u> </u>	Trobs I	· 15°
PROBE AZIMUTH TES		BRUNTON AZI	MUTH 161		_ 4_ 1
n aranakiyan mumunin arana a	~~ <del>***********************************</del>		****	**************************************	
PROBE OFFSET	OPTICAL	. 1.88M(6.17FT)	ACOUSTIC	21.44M(4.72FT)	*
CASING STICK-UP	Į			- i-ŝ' '	4
DEPTH REF. OFFSET	Į	**************************************	1		uls' on Evit
	Line wat a second as	1	A CHAN AN		
	START	ISTART	END	IEND	k .
LOG NAME	START	START	END DEPTH	END TIME	
	DEPTH	TIME	END DEPTH 3-251	TIME	
LOG NAME			DEPTH		
A A A A A A A A A A A A A A A A A A A	DEPTH	TIME	DEPTH	TIME	
A A A A A A A A A A A A A A A A A A A	DEPTH	TIME	DEPTH	TIME	
A A A A A A A A A A A A A A A A A A A	DEPTH	TIME	DEPTH	TIME	
A A A A A A A A A A A A A A A A A A A	DEPTH	TIME	DEPTH	TIME	
A A A A A A A A A A A A A A A A A A A	DEPTH	TIME	DEPTH	TIME	
6418Au - P 01	DEPTH 199.4		DEPTH	TIME	
A A A A A A A A A A A A A A A A A A A	DEPTH 199.4		DEPTH	TIME	-
6418Au - P 01	DEPTH 199.4		DEPTH	TIME	
MAINTENANCE PERFC	DEPTH 199.4	TIME 15751	DEPTH	TIME	
6418Au - P 01	DEPTH 199.4	TIME 15751	DEPTH	TIME	
MAINTENANCE PERFC	DEPTH 199.4	TIME 15751	DEPTH	TIME	
MAINTENANCE PERFC	DEPTH 199.4	TIME 15751	DEPTH	TIME	
	DEPTH 199.4 DRMED OF	TIME 15:51 	DEPTH	TIME	
MAINTENANCE PERFC	DEPTH 199.4 DRMED OF	TIME 15:51 	DEPTH	TIME	
	DEPTH 199.4 DRMED OF	TIME 15:51 	DEPTH	TIME	
	DEPTH 199.4 DRMED OF	TIME 15:51 	DEPTH	TIME	
	DEPTH 199.4 DRMED OF	TIME 15:51 	DEPTH	TIME	
	DEPTH 199.4 DRMED OF	TIME 15:51 	DEPTH	TIME	

GEOWision Geophysical Survices 1151 Pomona Road, Unit P., Corona, CA 92882 Ph (951) 549-1234 Fz (951) 549-1236



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### B-48 CALIPER FIELD LOG

SITE: CONPP COLA		DATE: 6 / 29 /2006 . 6 / 56 2006
CLIENT: SCHNABEL		JOB: 6165
AUTHOR: R. STELLER	······································	PAGE 1 OF 2
CONTACT:_RUBEN TARUSELLI		PHONE:
	CELL	PHONE: 703-906-1797
CONTACT:	OFFICE	PHONE
and and at a set to make a set of the set of		PHONE:
CONTACT:		PHONE
	· <u>************************************</u>	PHONE:
CONTACT:		PHONE:
		PHONE:
ORILLER:	·····	PHONE
COMPANY:	× ******	PHONE:
	*****	and a sufficient strength and
GENERAL SITE CONDITIONS/LOCATION:	······································	
BOREHOLE DESIGNATION: 8-418	LOCATION;	
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COUNTY: RANGE: TO	WNSHIP:	BECTION:
COUNTY:RANGE:TC BOREHOLE CONSTRUCTION: CASEDUN	WNSHIP; CASED	SECTION:
COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: 44 0 TO	MINSHIP: CASED	BECTION:
COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: 4/4 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 2/4	WNSHIP: CASED CASED CASE CASE CASE	SECTION:
COUNTY:RANGE:TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES:44* 0 TO BOREHOLE TOTAL DEPTH AS DRILLED:24 CONDUCTOR CASING7: YES DEPTH TO B	WNSHIP: CASED_2 D_ <u>245</u> ' D3' OTTOM OF	SECTION: ;TO CASING; NO_V
COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: 4/4 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 2/4	WINSHIP: CASED_ 245' 25' OTTOM OF DEPTH TC R MUD_	SECTION: TO CASING: NO WATER TABLE: WATER TABLE:;
COUNTY:RANGE:TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES:4/4 * 0 TO BOREHOLE TOTAL DEPTH AS DRILLED:2/ CONDUCTOR CASING?: YES DEPTH TO B DEPTH TO BEDROCK: BOREHOLE FLUID: WATER; FRESH WATE	WINSHIP: CASED_ 245' 25' OTTOM OF DEPTH TC R MUD_	SECTION: TO CASING: NO WATER TABLE: WATER TABLE:;
COUNTY:	WINSHIP: CASED_ 245' 25' OTTOM OF DEPTH TC R MUD_	SECTION: ;TO CASING; NO DWATER TABLE:
COUNTY:RANGE:TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES:440 TO BOREHOLE TOTAL DEPTH RANGES:440 TO BOREHOLE TOTAL DEPTH AS DRILLED:24 CONDUCTOR CASING7: YES DEPTH TO B DEPTH TO BEDROCK: BOREHOLE FLUID: WATER; FRESH WATE OTHER: DEPTH TO BOREHOLE FLUID:	TIME SINC	SECTION: TO CASING: NO WATER TABLE: WATER TABLE:;
COUNTY:	TIME SINC	SECTION: TO CASING: NO WATER TABLE: WATER TABLE:;
COUNTY:RANGE:TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES:4/4 * 0 TO BOREHOLE TOTAL DEPTH AS DRILLED:2/2 CONDUCTOR CASING7: YES DEPTH TO B DEPTH TO BEDROCK: BOREHOLE FLUID: WATER; FRESH WATE OTHER: DEPTH TO BOREHOLE FLUID: LOGGING CREW: R. STELLER VEHICLE(S) USED AND MILEAGE:	WINSHIP: CASED_2 D_2AS' DEPTH TO R MUD_2 TIME SINC	SECTION: TO CASING NO <u>V'</u> WATER TABLE: SALT WATER MUD; E LAST CIRCULATION: <u>* 2 A 4</u>
COUNTY:RANGE:TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES:44 * 0 TO BOREHOLE TOTAL DEPTH AS DRILLED:24 CONDUCTOR CASING7: YES DEPTH TO B DEPTH TO BEDROCK: BOREHOLE FLUID: WATER; FRESH WATE OTHER:; FRESH WATE OTHER:; FRESH WATE DEPTH TO BOREHOLE FLUID: LOGGING CREW: R. STELLER; C. CA GETE VEHICLE(S) USED AND MILEAGE:; RENTAL MOBILIZED FROM: <u>VERIAGETER</u> PAGA	WINSHIP: CASED_2 D_2AS' DEPTH TO R MUD_2 TIME SINC	SECTION:
COUNTY:	CASED_2 CASED_2 D_245' DEPTH TC DEPTH TC R MUD_1 TIME SINC	SECTION: TO CASING NO <u>V'</u> WATER TABLE: SALT WATER MUD; E LAST CIRCULATION: <u>* 2 A 4</u>
COUNTY:RANGE:TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES:44 * 0 TO BOREHOLE TOTAL DEPTH AS DRILLED:24 CONDUCTOR CASING7: YES DEPTH TO B DEPTH TO BEDROCK: BOREHOLE FLUID: WATER; FRESH WATE OTHER:; FRESH WATE OTHER:; FRESH WATE DEPTH TO BOREHOLE FLUID: LOGGING CREW: R. STELLER; C. CA GETE VEHICLE(S) USED AND MILEAGE:; RENTAL MOBILIZED FROM: <u>VERIAGETER</u> PAGA	WINSHIP: CASED_2 D_2AS' DEPTH TC R MUD_2 TIME SINC R_ DEPARTU CAUSE:_	SECTION: TO CASING NO <u>V'</u> WATER TABLE: SALT WATER MUD; E LAST CIRCULATION: <u>* 2 A 4</u>

SITE:_CCNPP COLA		DATE: <u>6 / 29 /2006</u> JOB: 6165 PAGE 2 OF 2	<u>6/30/06</u>
WINCH: COMPROBE MICROLOGGER 5301 CALIPER PROBE 5368	SILVER V OYO OTHER OTHER	OTHER	<u></u>

PROBE OFFSET	12 IN MAX 2.08M(6.82 FT	24 IN MAX
The Address and a second a	ARMS1.5	ARMS -
DEPTH REF. OFFSET	5.12	5.35 ON Stor

86.7%s

LOG NAME	START DEPTH	START TIME	END DEPTH	END TIME	
8416CALTERON	197.0'	16:55	- 1 Vas'	17:00	
BAIB CALIFOL	Ø	8:05	<u> </u>	43:09	<u> </u>
BALL CALOPER	192.0'	915		9:40	
CAID CAL TESTOR	<u>                                      </u>	73.001			
	1		<u> </u>	<u> </u>	<u></u>

GALIBRATION PLATE S/N 201		AS BUILT			
		1.968 IN	3.937 IN	8.000 IN	
<u>, ,</u>	FILE NAME	(50 MM)	(100 MM)	203.2 MM	
AS MEAS.	BAIL CALITERTON	1.47	3.91	7.96	
AS MEAS.	SHOCK-TESTOR	1.92	1.94	7.98	
AS MEAS.	6419 CH-TROS 03	2.00	3.94	<u> </u>	
AS MEAS.	*			<del>*************************************</del>	
AS MEAS.					
AS MEAS.					

### MAINTENANCE PERFORMED ON SITE:\_\_

### EQUIPMENT PROBLEMS OR FAILURES:\_\_

### SUGGESTIONS, ADDITIONS, CHANGES:\_\_\_

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### 8-418 ELOG FIELD LOG

SITE: CONPP COLA		DATE: 6 / 3	lo /2008
CLIENT: SCHNABEL		JOB: 6165	
AUTHOR: R. STELLER		PAGE 1 OF	2
	**************************************		
CONTACT:_RUBEN TARUSELLI	OFFICE		
······································	CEL	PHONE: 703	908-1797
CONTACT:	_OFFICE	PHONE:	*****
		PHONE:	
CONTACT:		PHONE:	
		PHONE:	
CONTACT		PHONE:	
x		PHONE:	
DRILLER:		PHONE;	×
COMPANY:		PHONE:	
		······	
GENERAL SITE CONDITIONS/LOCATION:			
BOREHOLE DESIGNATION: 18-4-18	LOCATION:	· * • ** ***********	x
COUNTY: RANGE: TO	WNSHIP;	<u>8</u>	CTION:
BOREHOLE CONSTRUCTION: CASED UNK	CASED V	· · · · · · · · · · · · · · · · · · ·	* <del>200 - 1</del> -
DIAMETERS AND DEPTH RANGES: 41/2 0 TO	200/		то
BOREHOLE TOTAL DEPTH AS DRILLED: 2		······································	an a
CONDUCTOR CASING?: YES DEPTH TO BO	DITTOM OF C	ASING	_: NO /
DEPTH TO BEDROCK	DEPTH TO V	NATER TABL	E: NA
BOREHOLE FLUID: WATER; FRESH WATER	R MUD 🖌 :	SALT WATE	R MUD :
OTHER:			
DEPTH TO BOREHOLE FLUID:	TIME SINCE	LAST CIRCI	ILATION: # 1. AR
		*	
LOGGING CREW:_R. STELLER			
VEHICLE(S) USED AND MILEAGE: _RENTAL		<b></b>	<del>·* · * · · · · · · · · · · · · · · · · </del>
MOBILIZED FROM: LEXING BRONS PARKE MO	DEPARTUR	ETIME: 7	100
ARRIVED ON SITE: 7:30	ana ang ang ang ang ang ang ang ang ang		and all all and a second se
	CAUSE:		
	LOGGINGC		
			. 19).12

GEOVision Geophysical Services IISI Pemona Road, Unit P., Corona, CA 92882 Ph (951) 549-1234 Ps (951) 549-1236

SITE:_CONPP COLA	<u>B-4B</u>	DATE: 6/ 50 /2008	
CLIENT: SCHNABEL		JOB:_6165	
AUTHOR R. STELLER		PAGE 2 OF 2	-

WINCH: COMP	ROBE	SILVER_/OYOOTHER
MICROLOGGER	5301	OTHER
ELOG PROBE	5490 🗹	OTHER

PROBE OFFSET	2.50M(8.20 FT)	
CASING STICK-UP	<u>~1.5 + 346</u> ]	
DEPTH REF. OFFSET	39.5	

LOG NAME	START DEPTH	START	END DEPTH	END
B4185004 aPor	[len.o	1:5%	0.43	10:15
	1			- <u> </u>
		*		
	1			
**************************************			*	

#### MAINTENANCE PERFORMED ON SITE:

EQUIPMENT PROBLEMS OR FAILURES:

SUGGESTIONS, ADDITIONS, CHANGES:

GEOVIsion Geophysical Services

1151 Pamanu Roud, Unit P, Carona, CA 92682

Ph (951) 549-1234 Fx (951) 549-1236

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11/14/2006

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### B-423 BORING GEOPHYSICS FIELD LOG SUMMARY

SITE:_CCNPP COLA	DATE: G / L3 /2008
CLIENT:_SCHNABEL	JOB:_6165
AUTHOR:_R. STELLER	PAGE 1 OF 2

CONTACT:\_RUBEN TARUSELLI

PHONE:\_703-906-1797\_

×	×			
BOREHOLE CONSTRUCTION:	CASED	UNCASED 🖡		
DIAMETERS AND DEPTH RAN			: 	ТО
BOREHOLE TOTAL DEPTH AS	DRILLED;	200'	<u> </u>	· · · · · · · · · · · · · · · · · · ·
CONDUCTOR CASING?: YES,	DEPTH TO	BOTTOM OF CA	Sing : )	NO V
DEPTH TO BEDROCK: No.	·····		·····	·····
BOREHOLE FLUID: WATER	; FRESH WA	TER MUD <u>V</u> ; 8	SALT WATER M	UD:

LOGGING CREW:\_R. STELLER\_\_\_\_

		······································	1	
LOG TYPE	FILE NAME	DEPTH RANGE	DATE	TIMES
DEMARTON	BAPS DEJUPOL	1955-187.0	6/0/04	16:15 - 16:20
OBJINGON	6425 DEL-4902		6/13/00	16:20- 17:12
بمروره ومرو	601 - 113	1.61 - TAS.4!	6/15/00	171 44 - 19158
Church TEST	6493 TEGRENION	6	6/5/00	19:25 - 19:30
Churcetor	ENERTESTEMAL	æ.	6/15/00	14:35 - 19:40
Chutter	BASSCALUPOI	145 - P.	6/13/00-	A147 - 20108
CHARLES M	6425 TEOPL NOS	-2:45	6/15/00	80:11 - 20:15
ELOG	B444 plat up of	200 - 3.51	L 715 106	10:24 - 20:50
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# B-423 -ACOUSTIC TELEVIEWER FIELD LOG

SITE:_CCNPP COLA		DATE: 1. 13 /2006
CLIENT: SCHNABEL	******	JOB: 6165
CLIENT:_SCHNABELAUTHOR:_R. STELLER	*	PAGE 1 OF 2
CONTACT: RUBEN TARUSELLI	OFFICE	DUANE.
		PHONE:_703-906-1797
CONTACT:		PHONE:
NAMES OF A DESCRIPTION OF A DESCRIPTION OF A DESCRIPTIONO		PHONE
CONTACT:		PHONE:
	· · · · · · · · · · · · · · · · · · ·	PHONE
CONTACT:	*****	PHONE:
and the second	And an and a second sec	PHONE
DRILLER:	<del>,</del>	PHONE:
DRILLER:	*	PHONE
	× 94	
DIRECTIONS TO SITE:		
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and a second sec	••• • • • • • • • • • • • • • • • • •	
	*** ******	
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CENEDAL DITE CONDITIONICA CONTINU.		
GENERAL SITE CONDITION6/LOCATION:	****	A RANK AND A
and a second	*	
<sup>1</sup>	* * ** x x	ит и на
BOREHOLE DESIGNATION: 2-423	LOCATION	ă:
COUNTY:RANGE:	TOWNSHIP:	SECTION:
BOREHOLE CONSTRUCTION: CASED	INCASED 7	
DIAMETERS AND DEPTH RANGES: 4-74-0	TO 2001	то то
BUREHULE TOTAL DEPTH AS DRILLED:		
CONDUCTOR CASING?: YES DEPTH TO	BOTTOM OF	CASING : NO
CONDUCTOR CASING?: YES DEPTH TO DEPTH TO BEDROCK: NA	DÉPTH TO	WATER TABLE:
DEPTH TO BEDROCK: NA BOREHOLE FLUID: WATER ; FRESH WAT	rer Mud V	; SALT WATER MUD :
OTHER:		
DEPTH TO BOREHOLE FLUID:	TIME SINC	E LAST CIRCULATION: < S HP.

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SITE:_CONPP COLA_	B-	-423		DATE: 6	/ 13 /2006
CLIENT:_SCHNABEL_		· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	JOB:_616	
AUTHOR: R. STELLE	<u>.</u>	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	PAGË 2 (	
LOGGING CREW:_R.		× · · · · · · · · · · · · · · · · · · ·		× ×	
VEHICLE(S) USED AN			~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~		
MOBILIZED FROM: L		S PARK	DEPARTU	RE TIME_	7:00
ARRIVED ON SITE:	<u>7:30</u>	*****			
STANDBY TIME:	<u></u>	*	CAUSE;	• • • • • • • •	
LOGGING STARTED:_	6415	<del>* •</del> .	LOGGING	COMPLET	ED;
WINCH: COMP		_ Silver	_0Y0	_OTHER_	MANTE
MICROLOGGER	5301		10		
TELEVIEWER	OPTICAL	.#8117	ACOUSTIC	\$ <b>#</b> 5174	_ OTHER Com PRASE.
	<i>.</i>				
PROBE TILT TEST	<u>28</u>	BRUNTON TIL			
PROBE AZIMUTH TES	T <u>_ ¦{* Z</u>	BRUNTON AZ	MUTH	- 1.1.4	H
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PROBE OFFSET	PTICAL	. 1.88M(8.17FT)	ACOUSING		Setul Asters have a
CASING STICK-UP	Î •	·		- <u>1.9"</u> - 1.9	- 1
DEPTH REF. OFFSET			ļ <u></u>		<u>l</u>
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	DEPTH	TIME	DEPTH '	TIME	a a a a a a a a a a a a a a a a a a a
B4239602101	1925	1.1645	100010	16-20	<u> </u>
BARSOWWOL	MS.S	16-12	-7.	17:12	× × ×
13.412.22 W 1-1	<u>119×32</u>		****	11-18	*
			<u> ************************************</u>	***	
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MAINTENANCE PERF	DRMED O	N 8ļTĘ:	* *** ********************************		
EQUIPMENT PROBLE	<b>VIS OR FA</b>	ILURES;	···· · · · · · · · · · · · · · · · · ·	· * * ·	× × × × × × × × × × × × × × × × × × ×
19. 2	ian Amera	<del></del>	<u></u>		
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SUGGESTIONS, ADDI	<b>TIONS, CH</b>	ianges: lu	rout UR	*8 -3-	<sup>1</sup>
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GEO Vision Geophysical Services 1141 Pomona Road, Didt P. Corona, CA 92831 PL (951) 549-1234 Fc (951) 549-1236 GEOVision Report 6165-01 Vol 1 of 2 CCNPP COLA Boring Geophysics rev A 11/14/2006 Page 299 of 366



# **P-S SUSPENSION VELOCITY FIELD LOG**

SITE_CALVERT CLIFFS COLA B-413	DATE: G/13/05
CLIENT:SCHNABEL	JOB: 6165
AUTHOR:_R. STELLER	PAGE 1 OF 5
CONTACT:	OFFICE_PHONE:
	_CELLPHONE:
CONTACT:	OFFICE PHONE:
	PHONE
CONTACT:	PHONE:
	PHONE:
CONTACT:	PHONE
ž	PHONE
DRILLER:	
COMPANY:	PHONE:
GENERAL SITE CONDITIONS/LOCATION:	
EA#	
COUNTY: RANGE:	TOWNSHIP: SECTION:
BOREHOLE CONSTRUCTION: CASEDU DIAMETERS AND DEPTH RANGES:U BOREHOLE TOTAL DEPTH AS DRILLED:	INCASED_/TOTO
CONDUCTOR CASING?: YES DEPTH TO	
	DEPTH TO WATER TABLE:
BOREHOLE FLUID: WATER; FRESH WAT OTHER:	TER MUD; SALT WATER MUD;
DEPTH TO BOREHOLE FLUID:	TIME SINCE LAST CIRCULATION: SHA

GEOVIsion Geophysical Services 1151 Pomone Road, Suite P. Conone, CA 92882, Ph (951) 549-1234, Fx (951) 549-1234 GEOVIsion Report 6165-01 Vol 1 of 2 CCNPP COLA Boring Geophysics rev A 11/14/2006 Page 300 of 366



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888

SITE: CALVERT CLIFFS COLA 8-42	DATE: 6/12/06
CLIENT:_SCHNABEL	JOB: 6166 /
	PAGE 2 OF
	•
LOGGING CREW: 2. STELLES	
VEHICLE(S) USED AND MILEAGE:	
MOBILIZED FROM: LELINGTON PARK	DEPARTURE TIME: 7:00
ARRIVED ON SITE: 7:50	
STANDBY TIME:	CAUSE:
LOGGING STARTED: 1/1:44-	LOGGING COMPLETED: 19158
STANDBY TIME:	CAUSE:
LOGGING STARTED:	LOGGING COMPLETED:
DEMOBILIZED TO:	
ADDITIONAL DEMOB TIME:	REASON:
BATTERIES CHANGED BEFORE LOGGING: Y	
INSTRUMENT OYO 12004 15014	19029 RG 160023 2 160024
RECEIVER S/N 12008 20042	26066 11001 23053 50086
MAINTENANCE PERFORMED ON SITE:	*
TAN MENDING TRANSPORTED AND AND TANK TRANSPORT	· · · ································
EQUIPMENT PROBLEMS OR FAILURES:	T A A A A TOLEVILLE A LA A A A A A A A A A A A A A A A A
	<u>, , , , , , , , , , , , , , , , , , , </u>
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SUGGESTIONS, ADDITIONS, CHANGES;	24 x 2 x 2 x 2 x 2 x 2 x 2 x 2 x 2 x 2 x
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<u>* ***********************************</u>	· · / · · · · · · · · · · · · · · · · ·
COMMENTS: 90001 2000 C. 48m	-55m(19) - 1.93m
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GEOVISION SUSPENSION LOGGING FIELD, NOTES						
SITE:_CALVERT CLIFFS COLA				DATE: 6/13/04		
CLIENT:_SCHNABEL				JOB: 6165		
AUTHOR	_R. STELI			PAGE 3 OF 5		
· · · · ·	N care con	· · · · · ·				
DEPTH	DEPTH	UNFILTERED	FILTERED	COMMENTS		
METERS	FEET	FILE NO.	FILE NO.	CASING, WATER, ROCK, ETC		
. 0.5	1.64		······································			
1.0	3.28	1				
1.5	4.92	3				
2.0	6.50	4				
2.5	8.20	a a a a a a a a a a a a a a a a a a a	<del></del>			
3.0	8.84	6	· · · · · · · · · · · · · · · · · · ·			
<u>3.5</u> 4.0	11.48	2	* ******			
4.5	13.12	<u>b</u> 9	······			
5.0	<u>14.78 .</u> 16.40	10		**************************************		
5.5	18.04	и И	1. ····································	1		
6.0	19.69	12	* ************************************			
6.6	21.33					
7.0	22,97	14	* * **********************************	· · · · · · · · · · · · · · · · · · ·		
7,5	24.61	15				
8.0	26.25					
8.5	27.69	10	* · · · · · · · · · · · · · · · · · · ·			
9.0	29.53					
9.5	31.17	14	*	· · · · · · · · · · · · · · · · · · ·		
10.0	32.81	12	ж <mark>е жанала и кала и к</mark>			
10.5	34.45	21				
11.0	36.09	22	· · · · · · · · · · · · · · · · · · ·	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
11.5	37,78	23		Comment of the second s		
12.0		24	**************************************			
12.5	41.01	ax.				
13.0	42.65	240		A A ANALAM A BURGER A A ANALAM ANALAM A		
13,5	44.29	27				
14.0	45.93	18				
14.5	47.57	24				
15.0	49.21	30				
15.5	50.85	31				
16.0	52.49	32				
16.5	54.13	33				
17.0	55.77	34				
17.5	57,41	×				
18.0	59.06	342				
18,5	60.70	2				
	62.34	10				
19.5	63.98	7				
20.0	65.62	00				

GEOVision Report 6165-01 Vol 1 of 2 CCNPP COLA Boring Geophysics rev A

×	G	EOVISION SUS	PENSION LOG	GING FIELD N	OTES
SITE: CA	LVERT CL	JFF8 COLA	423	DATE: CAN	Øa
CLIENT.	SCHNAR	EL		JOB: 6165	
	R. STELI		<u> </u>	PAGE 4	_OF5
			** <sup>**</sup> ********************************		
DEPTH	DËPTH	UNFILTERED	FILTERED	COMMENTS	<u> </u>
METERS		FILE NO.	FILE NO.	CASING, WATER, R	OCK FTC
	*******				
* * **			* * * * ***** * * * *****	**************************************	**************************************
20.5	67.26	AL.			**************************************
21.0	68.90	an.			******
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22,0	72.18	40			
22.5	73.82	45		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
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24.0	78,74	44			
24.5	80.38	44			
25.0	62.02	50			
25.5	83.66	51			
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# 8-423 CALIPER FIELD LOG

	DATE: 6 / 15 /2006
CLIENT: SCHNABEL	JOB: 6165
AUTHOR: R. STELLER	PAGE 1 OF 2
CONTACT:_RUBEN TARUSELLI	_OFFICEPHONE:
	_CELL PHONE:_703-906-1797
CONTACT:	OFFICE_PHONE
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COMPANY:	PHONE
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### B-425 ELOG FIELD LOG

SITE_CONPP COLA		DATE: 6 / 13 /2006
CLIENT: SCHNABEL		JOB: 6165
AUTHOR:_R. STELLER	*	
CONTACT:_RUBEN TARUSELLI	<b>OFFICE</b>	PHONE:
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COMPANY:		PHONE:
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GEOVIsion Georgent Services 1151 Pomone Road, Unit P. Corona, CA 92492 Ph (951) 549-1234 Fz (951) 549-

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### MAINTENANCE PERFORMED ON SITE:

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# **APPENDIX E**

# BORING GEOPHYSICAL LOGGING FIELD MEASUREMENT PROCEDURES

### PROCEDURE FOR

### **OYO P-S SUSPENSION SEISMIC VELOCITY LOGGING**

#### Background

This procedure describes a method for measuring shear and compressional wave velocities in soil and rock. The OYO P-S Suspension Method is applied by generating shear and compressional waves in a borehole using the OYO P-S Suspension Logger borehole tool and measuring the travel time between two receiver geophones or hydrophones located in the same tool.

#### Objective

The outcome of this procedure is a plot and table of P and  $S_H$  wave velocity versus depth for each borehole. Standard analysis is performed on receiver to receiver data. Data is presented in report format, with ASCII data files and digital records transmitted on diskette.

#### Instrumentation

- 1. OYO Model 170 Digital Logging Recorder or equivalent
- 2. OYO P-S Suspension Logger probe or equivalent, including two sets horizontal and vertical geophones, seismic source, and power supply for the source and receivers
- 3. Winch and winch controller, with logging cable
- 4. Batteries to operate P-S Logger and winch

The Suspension P-S Logger system, manufactured by OYO Corporation, or the Robertson Digital P-S Suspension Probe with the Robertson Micrologger2 are currently the only commercially available suspension logging systems. As shown in Figure 1, these systems consists of a borehole probe suspended by a cable and a recording/control electronics package on the surface.

The suspension system probe consists of a combined reversible polarity solenoid horizontal shear-wave generator ( $S_H$ ) and compressional-wave generator (P), joined to

two biaxial geophones by a flexible isolation cylinder. The separation of the two geophones is one meter, allowing average wave velocity in the region between the geophones to be determined by inversion of the wave travel time between the two geophones. The total length of the probe is approximately 7 meters; the center point of the geophones is approximately 5 meters above the bottom end of the probe.

The probe receives control signals from, and sends the amplified geophone signals to, the instrumentation package on the surface via an armored 4 or 7 conductor cable. The cable is wound onto the drum of a winch and is used to support the probe. Cable travel is measured by a rotary encoder to provide probe depth data.

The entire probe is suspended by the cable and may be centered in the borehole by nylon "whiskers." Therefore, source motion is not coupled directly to the borehole walls; rather, the source motion creates a horizontally propagating pressure wave in the fluid filling the borehole and surrounding the source. This pressure wave produces a horizontal displacement of the soil forming the wall of the borehole. This displacement propagates up and down the borehole wall, in turn causing a pressure wave to be generated in the fluid surrounding the geophones as the soil displacement wave passes their location.

#### **Environmental Conditions**

The OYO P-S Suspension Logging Method can be used in either cased or uncased boreholes. For best results, the uncased borehole must be between 10 and 20 cm in diameter, or 4 to 8 inches. A cased borehole may be as small as 3 inches, if properly grouted (see below) and the grout annulus does not exceed 1 inch.

Uncased boreholes are preferred because the effects of the casing and grouting are removed. It is recommended that the borehole be drilled using the rotary mud method. This method does little damage to the borehole wall, and the drilling fluid coats and seals the borehole wall reducing fluid loss and wall collapse. The borehole fluid is required for the logging, and must be well circulated prior to logging.

If the borehole must be cased, the casing must be PVC and properly installed and grouted. Any voids in the grout will cause problems with the data. Likewise, large grout bulbs used to fill cavities will also cause problems. The grout must be set before testing. This means the grouting must take place at least 48 hours before testing.

For borehole casing, applicable preparation procedures are presented in ASTM Standard D4428/D4428M-91 Section 4.1 (see ASTM website for copy).

#### Calibration

Calibration of the digital recorder is required. Calibration is limited to the timing accuracy of the recorder. GEOVision's Seismograph Calibration Procedure or equivalent should be used. Calibration must be performed on an annual basis.

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#### **Measurement Procedure**

The entire probe is lowered into the borehole to a specific measurement depth by the winch. A measurement sequence is then initiated by the operator from the instrumentation package control panel. No further operator intervention is then needed to complete the measurement sequence described below.

The system electronics activates the SH-wave source in one direction and records the output of the two horizontally oriented geophone axes which are situated parallel to the axis of motion of the source. The source is then activated in the opposite direction, and the horizontal output signals are again recorded, producing a SH-wave record of polarity opposite to the previous record. The source is finally actuated in the first direction again, and the responses of the vertical geophone axes to the resultant P-wave are recorded during this sampling.

The data from each geophone during each source activation is recorded as a different channel on the recording system. The seismograph has at least six channels (two simultaneous recording channels), each with at least a 12 bit 1024 sample record. Newer seismographs may have longer record lengths. The recorded data is displayed on a CRT or LCD display and possibly on paper tape output as six channels with a common time scale. Data is stored on digital media for further processing. Up to 8 sampling sequences can be stacked (averaged) to improve the signal to noise ratio of the signals.

Review of the data on the display or paper tape allows the operator to set the gains, filters, delay time, pulse length (energy), sample rate, and stacking number in order to optimize the quality of the data before recording. In the case of the Model 170, printed data is verified by the operator prior to moving the probe. In the case of the Robertson Micrologger2, storage on the hard disk should be verified from time-to-time, certainly before exiting the borehole.

Typical depth spacing for measurements is 1.0 meters, or 3.3 feet. Alternative spacing is 0.5 meter, or 1.6 feet.

#### **Required Field Records**

- 1) Field log for each borehole showing
  - a) Borehole identification
  - b) Date of test
  - c) Tester or data recorder

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- d) Description of measurement
- e) Any deviations from test plan and action taken as a result
- f) QA Review
- 2) Paper output records are no longer required, since the Micrologger2 cannot generate them. However, data must be stored in at least 2 places prior to leaving the site
- 3) List of record ID numbers (for data on digital media) and corresponding depth
- 4) Diskettes, CDRom, or USB flash drives with backup copies of data on hard disk, labeled with borehole designation, record ID numbers, date, and tester name.

An example Field Log is attached to this procedure.

#### Analysis

Following completion of field work, the recorded digital records are processed by computer using the OYO Corporation software program PSLOG and interactively analyzed by an experienced geophysicist to produce plots and tables of P and  $S_H$  wave velocity versus depth.

The digital time series records from each depth are transferred to a personal computer for analysis. Figure 2 shows a sample of the data from a single depth. These digital records are analyzed to locate the first minima on the vertical axis records, indicating the arrival of P-wave energy. The difference in travel time between these arrivals is used to calculate the P-wave velocity for that 1-meter interval. When observable, P-wave arrivals on the horizontal axis records are used to verify the velocities determined from the vertical axis data. In addition, the soil velocity calculated from the travel time from source to first receiver is compared to the velocity derived from the travel time between receivers.

The digital records are studied to establish the presence of clear SH-wave pulses, as indicated by the presence of opposite polarity pulses on each pair of horizontal records. Ideally, the SH-wave signals from the 'normal' and 'reverse' source pulses are very nearly inverted images of each other. Digital FFT – IFFT lowpass filtering are used to remove the higher frequency P-wave signal from the SH-wave signal.

The first maxima are picked for the 'normal' signals and the first minima are picked for the 'reverse' signals. The absolute arrival time of the 'normal' and 'reverse' signals may vary by +/- 0.2 milliseconds, due to differences in actuation time of the solenoid source caused by constant mechanical bias in the source or by borehole inclination. This variation does not affect the velocity determinations, as the differential time is measured between arrivals of waves created by the same source actuation. The final velocity

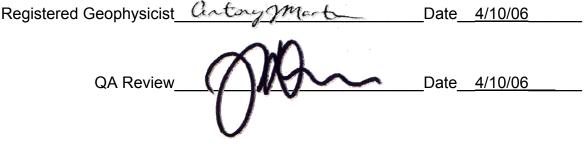
value is the average of the values obtained from the 'normal' and 'reverse' source actuations.

In Figure 2, the time difference over the 1-meter interval of 1.70 millisecond is equivalent to a SH-wave velocity of 588 m/sec. Whenever possible, time differences are determined from several phase points on the  $S_H$ -wave pulse trains to verify the data obtained from the first arrival of the  $S_H$ -wave pulse. In addition, the soil velocity calculated from the travel time from source to first receiver is compared to the velocity derived from the travel time between receivers.

Figure 3 is a sample composite plot of the far normal horizontal geophone records for a range of depths. This plot shows the waveforms at each depth, clearly showing the S-wave arrivals. This display format is used during analysis to observe trends in velocity with changing depth.

Once the proper picks are entered in PSLOG, the picks are transferred to an Excel spreadsheet where Vs and Vp are calculated. The spreadsheet allows output for presentation in charts and tables.

Standard analysis is performed on receiver 1 to receiver 2 data, with separate analysis performed on source to receiver data as a quality assurance procedure.

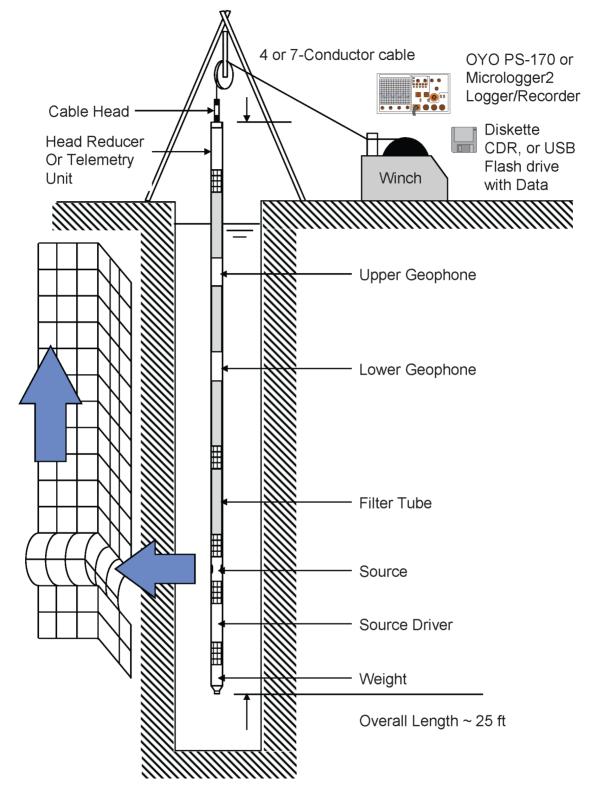


References:

- 1. "In Situ P and S Wave Velocity Measurement", Ohya, S. 1986. Proceedings of In-Situ '86, *Use of In-Situ Tests In Geotechnical Engineering*, an ASCE Specialty Conference sponsored by the Geotechnical Engineering Division of ASCE and co-sponsored by the Civil Engineering Dept of Virginia Tech.
- Guidelines for Determining Design Basis Ground Motions, Report TR-102293, Electric Power Research Institute, Palo Alto, California, November 1993, Sections 7 and 8.
- 3. "Standard test Methods for Crosshole Seismic Testing", ASTM Standard D4428/D4428M-91, July 1991, Philadelphia, PA

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# **OYO SUSPENSION P-S VELOCITY LOGGING SETUP**





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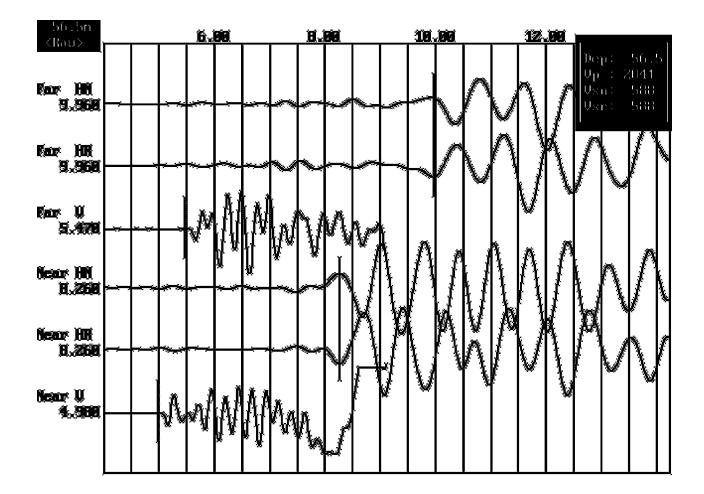


Figure 2. Sample suspension method waveform data showing horizontal normal and reversed (HR and HN), and vertical (V) waveforms received at the near (bottom 3 channels) and far (top 3 channels) geophones. The arrivals in milliseconds for each pick are shown on the left. The box in the upper right corner shows the depth in the borehole and the velocities calculated based on the picks.

 Procedure for OYO P-S Suspension Seismic Velocity Logging

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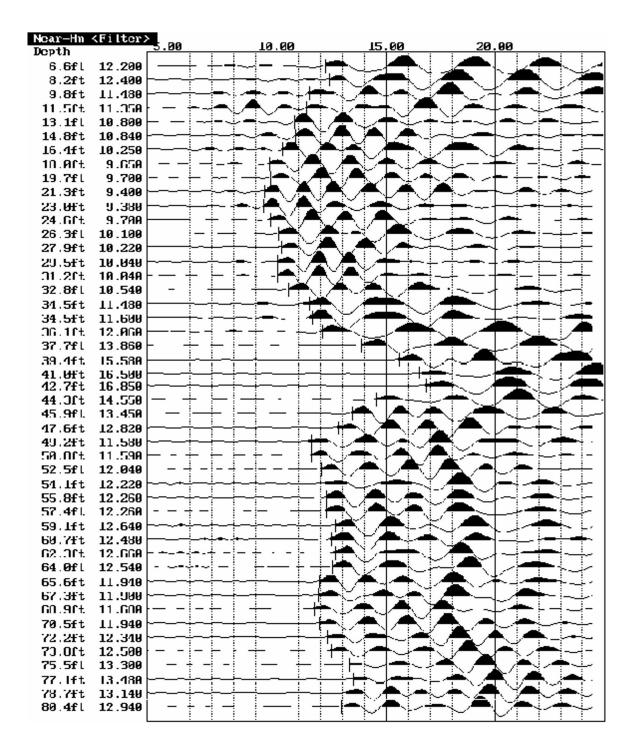


Figure 3. Sample composite waveform plot for normal shear waves received at the near geophone in a single borehole

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### **P-S SUSPENSION VELOCITY FIELD LOG**

SITE:	DATE:
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000174.07	
CONTACT:	OFFICEPHONE:
0017407	PHONE:
CONTACT:	OFFICEPHONE:
0017407	PHONE:
CONTACT:	PHONE:
	PHONE:
CONTACT:	PHONE:
	PHONE:
	PHONE:
COMPANY:	PHONE:
	TION:
EA#: BOREHOLE DESIGNATION:	LOCATION:
COUNTY: RANGE:	TOWNSHIP:SECTION:
BOREHOLE CONSTRUCTION: CAS	
	0 TO;, TO
BOREHOLE TOTAL DEPTH AS DRIL	
	DEPTH TO BOTTOM OF CASING; NO
BOREHOLE FLUID: WATER; F	DEPTH TO WATER TABLE: RESH WATER MUD; SALT WATER MUD;
DEPTH TO BOREHOLE FLUID:	TIME SINCE LAST CIRCULATION:



SITE:	DATE:
CLIENT:	JOB:
AUTHOR:	PAGE 2 OF
LOGGING CREW:	
VEHICLE(S) USED AND MILEAGE:	
MOBILIZED FROM:	DEPARTURE TIME:
ARRIVED ON SITE:	_
STANDBY TIME:	_CAUSE:
LOGGING STARTED:	LOGGING COMPLETED:
STANDBY TIME:	_CAUSE:
LOGGING STARTED:	LOGGING COMPLETED:
	ARRIVAL TIME:
ADDITIONAL DEMOB TIME:	REASON:
WINCH COMPROBE	19029 RG 160023 160024 26066 11001 23053
EQUIPMENT PROBLEMS OR FAILURES:	
SUGGESTIONS, ADDITIONS, CHANGES:	
COMMENTS:	

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DEPTH	DEPTH	UNFILTERED	FILTERED	COMMENTS
METERS	FEET	FILE NO.	FILE NO.	CASING, WATER, ROCK, ETC
0.5	1.64			
1.0	3.28			
1.5	4.92			
2.0	6.56			
2.5	8.20			
3.0	9.84			
3.5	11.48			
4.0	13.12			
4.5	14.76			
5.0	16.40			
5.5	18.04			
6.0	19.69			
6.5	21.33			
7.0	22.97			
7.5	24.61			
8.0	26.25			
8.5	27.89			
9.0	29.53			
9.5	31.17			
10.0	32.81			
10.5	34.45			
11.0	36.09			
11.5	37.73			
12.0	39.37			
12.5	41.01			
13.0	42.65			
13.5	44.29			
14.0	45.93			
14.5	47.57			
15.0	49.21			
15.5	50.85			
16.0	52.49			
16.5	54.13			
17.0	55.77			
17.5	57.41			
18.0 GE	OVi <b>559 BB</b> ort	6165-01 Vol 1 of 2 CCNPP COLA	Boring Geophysics rev A	11/14/2006 Page 320 of 366

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DEPTH	DEPTH	UNFILTERED	FILTERED	COMMENTS
METERS	FEEI	FILE NO.	FILE NO.	CASING, WATER, ROCK, ETC
18.5	60.70			
19.0	62.34			
19.5	63.98			
20.0	65.62			
20.5	67.26			
21.0	68.90			
21.5	70.54			
22.0	72.18			
22.5	73.82			
23.0	75.46			
23.5	77.10			
24.0	78.74			
24.5	80.38			
25.0	82.02			
25.5	83.66			
26.0	85.30			
26.5	86.94			
27.0	88.58			
27.5	90.22			
28.0	91.86			
28.5	93.50			
29.0	95.14			
29.5	96.78			
30.0	98.43			
30.5	100.07			
31.0	101.71			
31.5	103.35			
32.0	104.99			
32.5	106.63			
33.0	108.27			
33.5	109.91			
34.0	111.55			
34.5	113.19			
35.0	114.83			
35.5	116.47			
36.0 GE	OVi <b>\$i¢i8₽₽</b> ₽	6165-01 Vol 1 of 2 CCNPP COLA	Boring Geophysics rev A	11/14/2006 Page 321 of 366

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DEPTH	DEPTH	UNFILTERED	FILTERED	COMMENTS
METERS	FEET	FILE NO.	FILE NO.	CASING, WATER, ROCK, ETC
36.5	119.75			
37.0	121.39			
37.5	123.03			
38.0	124.67			
38.5	126.31			
39.0	127.95			
39.5	129.59			
40.0	131.23			
40.5	132.87			
41.0	134.51			
41.5	136.15			
42.0	137.80			
42.5	139.44			
43.0	141.08			
43.5	142.72			
44.0	144.36			
44.5	146.00			
45.0	147.64			
45.5	149.28			
46.0	150.92			
46.5	152.56			
47.0	154.20			
47.5	155.84			
48.0	157.48			
48.5	159.12			
49.0	160.76			
49.5	162.40			
50.0	164.04			
50.5	165.68			
51.0	167.32			
51.5	168.96			
52.0	170.60			
52.5	172.24			
53.0	173.88			
53.5	175.52			
54.0 GE	OVi <b>\$iøn7</b> ₽ <b>€p</b> ort	6165-01 Vol 1 of 2 CCNPP COLA	Boring Geophysics rev A	11/14/2006 Page 322 of 366

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DEPTH	DEPTH	UNFILTERED	FILTERED	COMMENTS
METERS	FEET	FILE NO.	FILE NO.	CASING, WATER, ROCK, ETC
54.5	178.81			
55.0	180.45			
55.5	182.09			
56.0	183.73			
56.5	185.37			
57.0	187.01			
57.5	188.65			
58.0	190.29			
58.5	191.93			
59.0	193.57			
59.5	195.21			
60.0	196.85			
60.5	198.49			
61.0	200.13			
61.5	201.77			
62.0	203.41			
62.5	205.05			
63.0	206.69			
63.5	208.33			
64.0	209.97			
64.5	211.61			
65.0	213.25			
65.5	214.90			
66.0	216.54			
66.5	218.18			
67.0	219.82			
67.5	221.46			
68.0	223.10			
68.5	224.74			
69.0	226.38			
69.5	228.02			
70.0	229.66			
70.5	231.30			
71.0	232.94			
71.5	234.58			
72.0 GE	0V28668220rt	6165-01 Vol 1 of 2 CCNPP COL	A Boring Geophysics rev A	11/14/2006 Page 323 of 366

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DEPTH	DEPTH	UNFILTERED	FILTERED	COMMENTS
METERS	FEET	FILE NO.	FILE NO.	CASING, WATER, ROCK, ETC
72.5	237.86			
73.0	239.50			
73.5	241.14			
74.0	242.78			
74.5	244.42			
75.0	246.06			
75.5	247.70			
76.0	249.34			
76.5	250.98			
77.0	252.62			
77.5	254.27			
78.0	255.91			
78.5	257.55			
79.0	259.19			
79.5	260.83			
80.0	262.47			
80.5	264.11			
81.0	265.75			
81.5	267.39			
82.0	269.03			
82.5	270.67			
83.0	272.31			
83.5	273.95			
84.0	275.59			
84.5	277.23			
85.0	278.87			
85.5	280.51			
86.0	282.15			
86.5	283.79			
87.0	285.43			
87.5	287.07			
88.0	288.71			
88.5	290.35			
89.0	291.99			
89.5	293.64			
90.0 GE	0V <b>205R28</b> rt	6165-01 Vol 1 of 2 CCNPP COL	A Boring Geophysics rev A	11/14/2006 Page 324 of 366

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DEPTH	DEPTH	UNFILTERED	FILTERED	COMMENTS
METERS		FILE NO.	FILE NO.	CASING, WATER, ROCK, ETC
90.5	296.92			
91.0	298.56			
91.5	300.20			
92.0	301.84			
92.5	303.48			
93.0	305.12			
93.5	306.76			
94.0	308.40			
94.5	310.04			
95.0	311.68			
95.5	313.32			
96.0	314.96			
96.5	316.60			
97.0	318.24			
97.5	319.88			
98.0	321.52			
98.5	323.16			
99.0	324.80			
99.5	326.44			
100.0	328.08			
100.5	329.72			
101.0	331.36			
101.5	333.01			
102.0	334.65			
102.5	336.29			
103.0	337.93			
103.5	339.57			
104.0	341.21			
104.5	342.85			
105.0	344.49			
105.5	346.13			
106.0	347.77			
106.5	349.41			
107.0	351.05			
107.5	352.69			
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DEPTH	DEPTH	UNFILTERED	FILTERED	COMMENTS	
METERS	FEET	FILE NO.	FILE NO.	CASING, WAT	TER, ROCK, ETC
108.5	355.97				
109.0	357.61	1			
109.5	359.25	1			
110.0	360.89				
110.5	362.53				
111.0	364.17				
111.5	365.81				
112.0	367.45	1			
112.5	369.09				
113.0	370.73				
113.5	372.38				
114.0	374.02				
114.5	375.66				
115.0	377.30				
115.5	378.94				
116.0	380.58				
116.5	382.22				
117.0	383.86				
117.5	385.50				
118.0	387.14				
118.5	388.78				
119.0	390.42				
119.5	392.06				
120.0	393.70				
120.5	395.34				
121.0	396.98				
121.5	398.62				
122.0	400.26				
122.5	401.90				
123.0	403.54				
123.5	405.18				
124.0	406.82				
124.5	408.46				
125.0	410.10				
125.5	411.75				
126.0 GE	OVi44ionBR300prt	6165-01 Vol 1 of 2 CCNPP C	COLA Boring Geophysics rev A	11/14/2006	Page 326 of 366

#### PROCEDURE FOR USING THE ROBERTSON GEOLOGGING HI-RESOLUTION ACOUSTIC TELEVIEWER (HIRAT)

#### **Reviewed 2/13/06**

#### Background

The acoustic televiewer is a device for producing a qualitative image of the wall of a borehole. Because it uses ultrasound rather than visible light it is able to work in dirty or opaque borehole fluids, although heavy drilling mud will cause excessive dispersion of the acoustic beam. The picture below shows the sonde's lower nylon section, and one of the bowspring attachments which are used to centralize the sonde in the borehole.



Pulses of ultrasound (0.5 - 1.5MHz) are generated by a piezo-electric resonator. The pulses are transmitted through the oil in which the resonator is immersed, through the wall of the acoustic housing, then propagate through the borehole fluid and are reflected from the wall of the borehole. The reflected energy is picked up by the same transducer, from which is recorded both the *amplitude* of the returned pulse and the *travel-time* which have elapsed. Blanking must be applied to prevent the transducer from registering reflections from the inside surface of the acoustic housing. The material of the housing is chosen so that its acoustic properties are similar to the oil which fills it. The housing is not designed to withstand borehole fluid pressures, but has a piston device to allow equalization between inside and outside pressure.

The *amplitude* of the returned pulse is a function of the acoustic reflectivity of the borehole wall. If the beam strikes a hard borehole wall normally to the surface the energy will be returned to the transducer and a strong return will be recorded. If the formation is softer, then less energy will be reflected. Also, if the surface of the borehole is rough, or effectively missing because of the presence of a fracture or other structure, then energy will be dispersed and a poor return will be recorded.

The **travel-time** is a simple function of the diameter of the borehole and the velocity of sound in the borehole fluid (typically 1.5Km/sec). An A/D converter monitors the output from the transducer once the blanking period has expired and a comparator is used to detect the peak amplitude during the sampling window.

The coaxially-mounted transducer has a planar radiating surface, but the vibration characteristics are such that the acoustic pulse is emitted as a 'pencil' beam. The emitted beam is deflected by a planar mirror so that it leaves the acoustic housing at right angles to the sonde axis. The mirror is rotated to scan the borehole wall. The ultrasound pulses are synchronized with rotation of the mirror so that up to 360 pulses are emitted in every revolution. Because of the time which must elapse for the two-way transit of the borehole fluid, there is an upper limit upon the number of radial samples that may be acquired from a borehole of a particular radius. In larger boreholes, therefore, it may be necessary to reduce the number of radial samples. The sonde is able to operate at 90, 180 or 360 samples per revolution.



Hi-RAT Field Procedure