TE:_CA	LVERT CL	IFFS COLA9	<u>r Acz</u>	DATE:6/288/066	
IENT:	SCHNAB	EL <u></u>		JOB:_6105	
THOR;	_R. STELI	.ER		PAGE 6 OF A	<u> </u>
РТН	DEPTH	UNFILTERED	FILTERED	COMMENTS	**7
TERS	FEET	FILE NO.	FILE NO.	CABING, WATER, ROCK, ETC	
00.5	329.72	201	*		
01.0	331.36	202			
01.5	333.01	201			
02.0	334.65	204			.
02.5	336.29	305			
03.0	337.93	206			
03,5	339.57	207			
04.0	341.21	24			
04.5	342.85	209			
05.0	344.49	210		×	·
05.5	346.13	211			
0.00	347.77	212			
08.5	349.41	215			
07,0	351.05	214	*		
07.5	352,69	215			
06.0	354.33	SIL			
08,5	355.97	201			
0.90	357.61	2/8			
09.5	359.25	249			
10.0	360.89	220			
10.5	362.53	941			
11.0	384.17	9.02			
11.5	365.81	245			<u>ندرند می</u> ر:

A RECEIPTION OF A RECEIPTION O			and the second second	A & AAAA PARAMAR PARA
	*	225	369.09	112.5
		224	370.73	113.0
		2017	372.38	113.5
ания и на		228	374.02	114.0
		7 7A	375.68	114.5
		250	377,30	115.0
and the second state of th		291	378.94	115.5
		292	380.58	116.0
		443	382.22	116.5
		294	383.86	117.0
		285	386,50	117.6
 		234	387.14	118.0
Borner & Ilh 7m =>		231	368,78	118.5
E POILE Q. ANI S!			390.42	119.0
	······································	*	392.06	119.5
			393.70	120.0

-



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

SITE:_CONPP COLA		DATE: 6 / 22/2006
CLIENT: SCHWABEL		JOB: 6165
AUTHOR R. STELLER		PAGE 1 OF 2
x	~ <u></u>	
CONTACT:_RUBEN TARUSELLI	_OFFICE	PHONE:
×	_CELL	PHONE:_703-906-1797
CONTACT:	_OFFICE	PHONE
		PHONE:
CONTACT:		PHONE
		PHONE:
CONTACT:		PHONE:
		PHONE:
DRILLER		PHONE:
COMPANY:		PHONE:
		· · · · · · · · · · · · · · · · · · ·
DIRECTIONS TO SITE:		
	· · · · · · · · · · · · · · · · · · ·	
		u <u>a an an</u>
GENERAL SITE CONDITIONS/LOCATION:		
	and the second secon	·····································
	······································	
······································		
BOREHOLE DESIGNATION: 6-401	LOCATION	
		A CONTRACT OF A CO
COUNTY: RANGE: TO	WNSHIP-	SECTION
BOREHOLE CONSTRUCTION: CASED LINE	CASED	7
DIAMETERS AND DEPTH RANGES: 41/4 0 TO	400	
BOREHOLE TOTAL DEPTH AS DRILLED: 400		
CONDUCTOR CASING?: YES DEPTH TO BO	DITION OF	CASING . NO ./
DEPTH TO BEDROCK MA	Yedth ty i	MATER TADIE.
BOREHOLE FLUID: WATER . EREQUIMATER		
OTHER:	× 00.414 <u></u>	
	THE DINOE	LAST OFOIL ATTACK
A CONTRACT OF THE ADDRESS AND ADDRESS AND ADDRESS ADDR	mie ginve	LAST UNGULATION: 22405.



SITE:_CONPP COLA_	6	- Ac.		_DATE: •/ 1	<u>×6/2006</u>
CLIENT: SCHNABEL			<u></u>	JOB:_6165	
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:	Existent card	CHARL, MAG	DEPART	IRE TIME: <u>8</u>	•- 3 0
ARRIVED ON SITE:	<u>9:00</u>	*	-		
STANDBY TIME:			CAUSE		
LOGGING STARTED,	12:16		LOGGING	COMPLETED;	
WINCH: COMP	ROBE	_SILVER	<u></u>	OTHER	
MICROLOGGER	5301	OTHER		<u></u>	, , , , , , , , , , , , , , , , , , ,
TELEVIEWER	OPTICAL	.#5117	ACOUSTI	C 16174<u>950</u>00	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'	5.22" ON EXIT.
		T		Telesco Constantino de	
LOG NAME	DEPTH	ISTART TIME	END DEPTH	IEND TIME	
8401 AL DOWNOI	3.22	15:05	4010	14:69	~

		· · · · · · · · · · · · · · · · · · ·			
······································	<u> </u>				
	1				
MAINTENANCE PERF	ormed o	N SITE			₩ <u>₩</u> ₩ <u>₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩</u>
EQUIPMENT PROBLE	MS OR FA	ILURES:			
••••••••••••••••••••••••••••••••••••••			 		
BUGGESTIONS, ADDI	FIONS , CH	ANGES:			
<u>Annon an fir forman an de Anno 1999 an an an an an an</u>	<u></u>	<u></u>			₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩
EOVIsion Geoplessical Services	. <i>II</i>	SI Pomona Road. L	înit F. Corona. C	X 92882 - 26 mg	1) \$20,1722 B. 2021) 220 1000

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CALIPER FIELD LOG 8-A0

	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 salaan aanaa a saa ahaa a saa ahaa a ka ka ka ka ka ka ka ka ka ka		
GENERAL SITE CONDITIONS/LOCATION:		
BOREHOLE DESIGNATION: 13-4-01	a alle and a second all a l	1
	Location:	
	LOCATION	
COUNTY: RANGE: TO	WNSHIP:	SECTION
COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASED UN	WNSHIP:	SECTION:
COUNTY:RANGE:TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES:TO TO		SECTION:
COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: 4% 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 400	WNSHIP:	SECTION:
COUNTY:RANGE:TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES:O TO BOREHOLE TOTAL DEPTH AS DRILLED:O CONDUCTOR CASING?: YESDEPTH TO BO		SECTION:
COUNTY:RANGE:TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES:A'/O TO BOREHOLE TOTAL DEPTH AS ORILLED:AOO CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK:N		SECTION: ;TO ASING; NO _^ WATER TABLE:
COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES: 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 400 CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: BOREHOLE FLUID: WATER; FRESH WATER	CASED	SECTION:
COUNTY:	UCATION: CASED / Age DTTOM OF C DEPTH TO R MUD	SECTION:TOTOTOTOTO
COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: 47% OTO BOREHOLE TOTAL DEPTH AS DRILLED: 400 CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: N'A BOREHOLE FLUID: WATER FRESH WATER OTHER: QMG G/M/DP DEPTH TO BOREHOLE FLUID: P	UCATION: WINSHIP: CASED 400 DEPTH TO R MUD TIME SINC	SECTION:
COUNTY:	LOCATION: WNSHIP: CASED 400 DTTOM OF C DEPTH TO R MUD TIME SINC	SECTION:TOTOTOTO
COUNTY:	LOCATION: CASED Z 440 DTTOM OF C DEPTH TO R MUD_Z TIME SINC	SECTION:TOTOTOTO
COUNTY:	UCATION: CASED / CASED / DTTOM OF C DEPTH TO R MUD /	SECTION:
COUNTY:	DEPARTUR	SECTION:
COUNTY:	LOCATION: CASED CASED DITTOM OF C DEPTH TO R MUD TIME SINC	SECTION:TO ASINGTO WATER TABLE: SALT WATER MUD; E LAST CIRCULATION: # 4 H2 E TIME: #30
COUNTY:	DEPARTUR	SECTION:
COUNTY:	DEPARTUR	SECTION:

GEOVision Geophysical Services 1151 Pomoun Road, Unit P, Corona, CA 92582
 Page 256 of 366
 11/14/2006

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

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

PROBE OFFSET	12 IN MAX	2.08M(6.82 F	T124 IN MAX	٦
CASING STICK-UP	arms -	<u> </u>	ARMS	1000
DEPTH REF, OFFSET		<u> </u>	SAS' ON EVIT	

LOG NAME	START DEPTH	START TIME	END DEPTH	END TIME
BADI CHLTEST OI	Ø.	h.11	9	17.20
B401 CALUP D1	197.0	17:28	ø	17:46
BAOI CHATTER OL	Ø	17:50	ø	17155
i - ar ministra and a state of the institution of the state of the	;			,
· · · · · · · · · · · · · · · · · · ·		······································	<u> </u>	

	1			

CALIERATI	ON PLATE S/N 201		AS BUILT	
****		1,968 IN	3.937 IN	8.000 IN
	FILE NAME	(50 MM)	(100 MM)	203.2 MM
AS MEAS.	B401 CALIFORTON	1.97	\$.44	2 0
AS MEAS.	B401 CHLIESTOL	2.01	3.07	104
AS MEAS.				
AS MEAS.				
AS MEAS.		 	*** *********************************	·····
AS MEAS.		a contract of the second s	11	

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 /29 /2006
CLIENT: SCHNABEL		JOB: 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:
CENEDAI GITE COMPANIES CONTION.		
	······································	

BOREHOLE DESIGNATION &- A.M.	I OCATION-	
	₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩	
COUNTY: RANGE: TO	WAISHIP:	SECTION
BOREHOLE CONSTRUCTION: CASED UN	CASED V	AND AND A DOWN AND A DOWN AND A DOWN AND A DOWN
DIAMETERS AND DEPTH RANGES: 44 0 TO	1 400'	70
BOREHOLE TOTAL DEPTH AS DRILLED: 400	· · · · · · · · · · · · · · · · · · ·	
CONDUCTOR CASING?: YES DEPTH TO B	DITOM OF CA	SING · NO V
DEPTH TO BEDROCK: NA	DEPTH TO W	
BOREHOLE FLUID: WATER : FRESH WATER		
OTHER:	· · · · · · · · · · · · · · · · · · ·	
DEPTH TO BOREHOLE FLUID:	TIME SINCE	AST CIRCUITATION OS NO
LOGGING CREW, R. STELLER C. CARTE	<u>6</u>	
VEHICLE(8) USED AND MILEAGE: RENTAL	······································	
MOBILIZED FROM LEWING TON PARE , MO.	DEPARTURE	TIME 8:30
ARRIVED ON SITE: 1:00		A ARARAMA <u>n and an an an an an an a</u>
STANDBY TIME:	CALISE.	
LOGGING STARTED: MISA	LOGGING	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

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SITE:_CONPP COL	\	B - 401	DATE: 6/28 12008
CLIENT: SCHNABE	L		JOB: 6165
AUTHOR R. STELL	ĒR		PAGE 2 OF 2
WINCH: COM MICROLOGGER ELOG PROBE	PROBE 5301_/ 5490_/	Silver / Oyo Other Other	OTHER
PROBE OFFERET	· · · · · · · · · · · · · · · · · · ·		

PROBE OFFSET	2.50M(8.20 FT)	
CASING STICK-UP	ĽŚ.	ا م
DEPTH REF. OFFSET	6.70'	6.75 pr den

هري دمارين

LOG NAME	START DEPTH	START TIME	end Depth	END TIME
Gular Great Conversa				
10401 BLOG WP OI	399.5	18:34	1.65	19114
		*		

*

MAINTENANCE PERFORMED ON SITE:

EQUIPMENT PROBLEMS OR FAILURES;

SUGGESTIONS, ADDITIONS, CHANGES:

GEOVision Geophysical Services

1151 Ponuma Road, Unit P., Corona, CA 93883

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

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



B-404-BORING GEOPHYSICS FIELD LOG SUMMARY

SITE:_CONPP COLA	8	DATE & / £7 more
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: A"L OTO 200" : TO	
BOREHOLE TOTAL DEPTH AS DRILLED: 200	
CONDUCTOR CASING?: YES DEPTH TO BOTTOM OF CASING : NO /	
DEPTH TO BEDROCK: MA	
BOREHOLE FLUID; WATER; FRESH WATER MUD V : SALT WATER MUD	

LOGGING CREW: R. STELLER

LOG TYPE FILE NAME DEPTH RANGE DATE TIMES >>=\$F\$e5500 fb Cb(*		<u> </u>
Subsection B COL - 114 Lot - 187.6 WER/COL ID: 45 - 18:07 Annumber -17. BADE ALL DELEDIT 3.1' - 196.0' a.11'/0' iD: 45 - 18:07 Countees wert BADE CAL TERTON S.1' - 196.0' a.11'/0' iD: 45 - 18:07 Countees wert BADE CAL TERTON S.1' - 196.0' a.11'/0' id: 20 - 14:00 Countees wert BADE CAL TERTON S. a.1'/' id: 21 - 14:00 Countees wert BADE CAL TERTON S. a.1'/' id: 20 - 14:00 Countees wert BADE CAL TERTON S. a.1'/' id: 21 - 14:00 Countees wert BADE CALTERTON S. a.1'/' id: 21 - 14:00 Countees wert BADE CALTERTON S. a.1'/' id: 21 - 14:00 Countees wert BADE CALTERTON 195:0 - 19.2'/ id: 21 - 14:00 id: 25 - 14:00 BADE DADE ELEMENTON 195:0 - 19.2'/ id: 21 - 15:2'// id: 21 - 15:2'//	LOG TYPE	FILE NAME	DEPTH RANGE	DATE	THER
Annumeron Setuktus Summeron Setuktus	SWEPPENSION PS	adv - 114	1.40' - 187.0'	Alto In.	
Counter with Construction Col Construction Col C	hearthe m.	BACK AN DOLONT	3.1' - 146.0'	a lan lac	10:45 - 12:07
Church Main Church MS.O Church Id: 20 - Id: 31 - <thid: -<="" 31="" th=""> <thid: -<="" 31="" td=""><td>Canal Per rest</td><td>GAOF CAL TELTAL</td><td>đ</td><td>La Tra las</td><td>18:10 14:00</td></thid:></thid:>	Canal Per rest	GAOF CAL TELTAL	đ	La Tra las	18:10 14:00
	springer granne	BLOS CALUPOL	1950-1		14:20 - 14:25
	Sprageones.	6404 CALTESTOZ		har in	19:32 - 14:52
		bang guag way	195.0-19.2	6/27/00	14:55 - 14:69
	. <u> </u>				CALL 1975B
			· · · · · · · · · · · · · · · · · · ·		
	·····				
	~~~ <u>~~~~~~~</u>				······································
	*		······································		
					* *** *** *** ************************
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	<u> </u>				THE REAL PROPERTY AND A RE
	<u></u>				
				<u>† – – – – – – – – – – – – – – – – – – –</u>	
	<u> </u>			<del>┃[┉]╶┈┈╣</del>	The second s
	· · · · · · · · · · · · · · · · · · ·			<u>↓ · · · · · · · · · · · · · · · · · · ·</u>	······································
			· · · · · · · · · · · · · · · · · · ·	╎┈┈┈╴╢	
			**************************************	<del>┆╍╍╸┍╍╸</del> ┟	



# P-S SUSPENSION VELOCITY FIELD LOG

SITE_CALVERT CLIFFS COLA6-404-	DATE: 6/27 /06-
CLIENT:_SCHNABEL	JOB: 6165
AUTHOR: R. STELLER	PAGE 1 OF 5
POUTSON	
CONTAGT:	OFFICE PHONE:
278758 FTW 8, 20275.	
	<u>OFFICE</u> PHONE
50171 AT.	PHONE
	PHONE
atoma pro a acore.	PHONE
	PHONE
Versional VV v mentance.	PHONE:
DRILLER:	PHONE:
COMPANY;	PHONE:
GENERAL SITE CONDITIONS/LOCATION:	
EA#BOREHOLE DESIGNATION: 8-404-	LOCATION
COUNTY:RANGE:T	OWNSHIP: SECTION-
BOREHOLE CONSTRUCTION: CASED U	NCASED
DIAMETERS AND DEPTH RANGES: 475-07 BOREHOLE TOTAL DEPTH AS DRULED:	то 2007;тото
CONDUCTOR CASING?: YES DEPTH TO I DEPTH TO BEDROCK: NA	
BOREHOLE FLUID: WATER; FRESH WAT	ER MUD; SALT WATER MUD;
DEPTH TO BOREHOLE FLUID:	IME SINCE LAST CIRCULATION: 1/2. H.L.



SITE: CALVERT CLIFFS COLA 8-404	DATE: 6/21/06-
CLIENT:SCHNABEL	JOB_6165
AUTHOR: R. STELLER	PAGE 2 OF <u>5</u>
LOGGING CREW: & STELLER	
VEHICLE(8) USED AND MILEAGE:PENTE	
MOBILIZED FROM: UNINGTON PAOK	DEPARTURE TIME: 8: 10
ARRIVED ON SITE: 9:40	
STANDBY TIME:	CAUSE:
LOGGING STARTED: 10-45	LOGGING COMPLETED: /2107
STANDBY TIME:	CAUSE
LOGGING STARTED	LOGGING COMPLETED:
DEMOBILIZED TO:	ARRIVAL TIME:
ADDITIONAL DEMOB TIME:	REASON:
WINCH COMPROBE	GREY OYO RG RG OTH / 19029 RG 160023 / 160024 2 26066 11001 23053 Seeta /
EQUIPMENT PROBLEMS OR FAILURES:	
SUGGESTIONS, ADDITIONS, CHANGES;	
COMMENTS: DAPTH DEFECTIV	vie. Ar tot pechene 1.64 - 1.6 = 0 m. T = 0.0 m.

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 LO	dgging fi	eld M	IOTI	S
SITE: CA	LVERT CL	IFFS COLA 6	-A04-	DATE: 0	lan k	Ka	
CLIENT:	SCHNAB	ËL		JOB: 6165	<b></b>		
AUTHOR	R. STEL		****	PAGE	Z	ÔF	<u> </u>
					<b>**</b> *****		······································
DEPTH	DEPTH	UNFILTERED	FILTERED	COMMENT	8		
METERS	FEET	FILE NO.	FILE NO.	CASING. W	Ater. R	IOCK.	ette 🕴
>27.00	· · · · · · ·						
0.5	1.64	0:01			<u></u>	- <u></u>	*****
1.0	3.28	4			<del></del>		
1.5	4,92	1			*****		
2.0	6.56	4			**** * *		
2,5	8.20	5			* 2.2 ⁻²		
3.0	9,84	6			x	<del></del>	· · · · · · · · · · · · · · · · · · ·
3.5	11.48	1	· · · · · · · · · · · · · · · · · · ·		<del></del>		* *****
4.0	13.12	0			<del>X</del>		
4.5	14.78	9			******	**	· · · · · · · · · · · · · · · · · · ·
5.0	16.40	10			*****		
5.5	18.04	A			*****	·	~ <u>~~</u>
6.0	19,69	114					
6.5	21.33	<u>h</u>			<del>*</del>		
7.0	22.97	L14			* <del>***</del>	<del></del>	**************************************
7.5	24.61	15					
8.0	26.25	14			- 18 ⁻	<del> </del>	· · · · · · · · · · · · · · · · · · ·
8.5	27.89	17				<del>- **** *</del>	
9.0	29,53	18			·		
9.5	31.17	.(1				- <del>10</del> <b>1</b>	· · · · · · · · · · · · · · · · · · ·
10.0	32.81	10				<u>~~~~</u> ~~~~	
10.5	34,45	4					
11.0	36,09	11					
11.5	37.73	<u> </u>				····	
12.0	39.37	- 24				<u> </u>	
12.5	41.01	<u> X</u>					
13.0	42.65	14				<u>i 'i-i-i</u>	
	44.29	<u> 11</u>					
14.0	45.93	18					
14.5	47.87	2/				******	
	49,21	<u></u>					
	<u>50,85</u>	<u>x</u>					
<u> </u>	52.49	12			···· · · · · · · · · · · · · · · · · ·		
16.5	<u> </u>	33				·	

55.77

57,41

59,06

60.70

62,34

63.98

65.62

34

35

36

37

78

31

40

17.0

17,5

18.0

18.5

19.0

19.5

20.0

	G	Eovision su	SPENSION L	OGGING FIELD NOTES
SITE: CALVERT CLIFFS COLA 6-404			<u>- 404</u>	DATE: 10/27/86
CLIENT: SCHNABEL			JOB_6165	
AUTHOR	. R. STEL			PAGE4OF5
Прертн	рертн	ILINEI TERED	FILTERED	COMMENTS
METERS	FEET	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	44		
22.5	73,82	15		
23.0	75.46	Åro	<u> </u>	
23,5	77.10	117	A	
24.0	78.74	110	* · · · · · · · · · · · · · · · · · · ·	* ×
24.6	80.38	14	······································	
25.0	82.02	50		
25.5	63.66	_ <del>@</del> 1		
26.0	85,30	<u>. 52</u>	-	
26.5	86.94	33		×
27.0	88.58	54		
27.5	90.22	95		
28.0	91,86	56		
28.5	93.50	977		
29.0	95.14	<u></u>		
29.5	96,78	<u><u> </u></u>		
30.0	98.43	60	· · · · · · · · · · · · · · · · · · ·	
30.5	100.07			
	101.71	61.	· · · · · · · · · · · · · · · · · · ·	
31,5	103.35	65		
32.0	104,99	04	··········	
32.5	108.83		<u></u>	
233.0	108.27			
		<u>. 1/1</u>		
34,0	111.55			
- 0%.3 0E /	113.19			
	114.03			× · · · · · · · · · · · · · · · · · · ·
	110,4/	71		
	110.11			
	178.70		· · · · · · · · · · · · · · · · · · ·	
	121.38		······································	
	104.00		···	
	149-01		· · · · · · · · · · · · · · · · · · ·	
<u>8.00</u>	107.0-		· · · · · · · · · · · · · · · · · · ·	
<u>90 - </u>	127.30 435.55		M	
<u>, 00,0</u> , 10 n	120.08	<u> </u>	·	
<u> </u>	131.23			

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## **GEOVISION SUSPENSION LOGGING FIELD NOTES**

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SITE: CALVERT CLIFFS COLA 5-	404 DATE	<u>6 hn</u>	leta	
CLIENT: SCHNABEL	JOB:_818	5		*
AUTHOR:_R. STELLER	PAGE	ç	OF 6	

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

60.0	198	<u>85</u>			
59.5	195	21			
<u> </u>	193.	57			
<u> </u>		<u>93 (</u>			
<u> </u>	190,	29			
67.5	188	<u>65  </u>			LA BOTAN & 57.1 C
57.0	187,	<u>.01  </u>			BORDIN MEAS AL
56.5	185	37			
56.0	183	73	11-		
55.5	i <u>182</u>	.09	11		a the second
55.0	180	.45	NO		
54.5	178	.81	[04		
54,0	1 177	.17	1078		<u></u>
53.	175	.52	(07		
53.0	) 173	88	10%		
52.	3 172	24	105 .		<u> </u>
52.0	170	60	104		
511	5 168	.96	ltrs.		<u> </u>
51.	2 167	.32	10-		
. 60.	9 165	. <b>6</b> 8	101		
50.	D 164	.04	///////////////////////////////////////		
49,	5 162	2.40	44		an a
49,	0 180	.78	90		
48.	5 159	112	97		
48.	0 157	7.48	90	· · · · · · · · · · · · · · · · · · ·	
47.	515;	i,84	95		
47.	0 15	1.20	96		
46	5 152	2,56	<b>2</b> 73		
46.	0 150	1.92	92		
45.	5 14	9,28	191	*****	
45.	0 14	7.64	40		
44.	5 14	3.00	81		
. 44	0 14	4.36	1 114		······································
43.	5 14	2.72	97		ter in the second s
43.	.0 14	1.08	64		······································
42	5 13	8,44	65		
42	0 13	7.80	84	*	
41	5 13	6.15	83		
• 41	.0 13	4.51	82		
40	5 13	2.87	1 St		
	*****		***		



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## 8 - 404- ACOUSTIC TELEVIEWER FIELD LOG

SITE: CONPP COLA	· · ·	DATE: 6 / 26 /2006
CLIENT: SCHNABEL		JOB: 6165
AUTHOR:_R. STELLER	· · · · · · · · · · · · · · · · · · ·	PAGE 1 OF 2
CONTACT - RUBEN TARUSELLI	OFFICE	PHONE:
Y	CELL	PHONE: 703-906-1797
CONTACT	OFFICE	PHONE
		PHONE
CONTACT	* *** * ***	PHONE
	<u> </u>	PHONE
CONTACT:	NA 710 8.10	PHONE
		BUONE
NON I ED.	*** <b>*</b> ****************	
	· · · · · · · · · · · · · · · · · · ·	
	*****	
DIRECTIONS TO SITE:		
	• • • • •	
Х Хатадарият — Дана Саланият Каталанананананананананананананананананан		
BOREHOLE DESIGNATION: B-404	LOCATION	
	WNSHIP;_	SECTION:
BOREHOLE CONSTRUCTION: CASED UN	CASED	
DIAMETERS AND DEPTH RANGES: 44 0 TO	<u>, 200</u>	TO
BURCHULE I OTAL DEPTITIAS DRULLED; <u></u>		Constant of the Annual Annua
CONDUCTOR CASINGY: YES DEPTH TO B	OTION OF	CASING; NO/
DEPTH TO BEDROCK: NR	DEPTH TO	WATER TABLE
BOREHOLE FLUID: WATER; FRESH WATE OTHER:	r Mud	_; SALT WATER MUD;
DEPTH TO BOREHOLE FLUID:	TIME SINC	ELAST 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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CLIENT: SCHNABEL	SITE;_CONPP COLA		<u>5-404</u>	······	DATE: 6 /	26/2006
AUTHOR: R. STELLER	CLIENT: SCHNABEL	<u></u>	<del></del>	······································	JOB:_6165_	
OGGING CREW, R. STELLER         APHOLE(S) USED AND MILEAGE: RENTAL         ARRIVED ON SITE:         7200         STANDBY TIME:         OGGING STARTED:         12:50         LOGGING COMPLETED:         14:00         STANDBY TIME:         OGGING STARTED:         12:50         LOGGING COMPLETED:         14:00         CAUSE:         OGGING STARTED:         12:50         LOGGING COMPLETED:         14:00         COLOGGER         SS01_Y OTHER         ACOUSTIC #5179(5500)         OTHER         ACOUSTIC #5179(5500)         OTHER         PROBE TILT TEST         0.6         PROBE TILT TEST         0.7         PROBE OFFSET         OPTICAL 1.88M(8.17FT)         ACOUSTIC 1.44M(4.72FT)         -       -         START         EPTH REF. OFFSET         OPTICAL 1.88M(8.17FT)         ACOUSTIC 1.44M(4.72FT)         -       -         START       END         LOG NAME       DEPTH         DEPTH TIME       DEPTH         <	AUTHOR:_R. STELLE	R <u> </u>			PAGE 2 OF	2
ARRIVED ON SITE: 7200 ARRIVED ON SITE: 7200 STANDBY TIME: CAUSE: CAUSE: LOGGING STARTED: 12:50 LOGGING COMPLETED: 14:00 MINCH: COMPROBE SILVER / OYO OTHER MICROLOGGER 5301 / OTHER MICROLOGGER 5301 / OTHER TELEVIEWER OPTICAL #5117 ACOUSTIC #51745500 OTHER TELEVIEWER OPTICAL 1.88M(8.17FT) ACOUSTIC 1.44M(4.72FT) ASING STICKUP START START END END DEPTH REF. OFFSET OPTICAL 1.88M(8.17FT) ACOUSTIC 1.44M(4.72FT) JAS' do evert; LOG NAME DEPTH TIME DEPTH TIME CAUSE AND ALLONG ON SITE: QUIPMENT PROBLEMS OR FAILURES; UGGESTIONS, ADDITIONS, CHANGES;	OGGING CREWA R	steli er				
ACOBILIZED FROM:       LORIANTON 2011       DEPARTURE TIME:       0.200         ARRIVED ON SITE:       7200       CAUSE:       CAUSE:       CAUSE:         COGGING STARTED:       12150       LOGGING COMPLETED:       14100         MINCH:       COMPROBE       SILVER       0YO       OTHER         PROBE TILT TEST       C.9.8       BRUNTON AZIMUTH       FIL4       FROME HAA & 6.6         PROBE OFFSET       OPTICAL 1.88M(8.17FT)       ACOUSTIC 1.44M(4.72FT)       3.15' ox exprt;         ASING STICK-UP       START       START       END       END         LOG NAME       DEPTH       TIME       DEPTH       TIME         LOG NAME       DEPTH       TIME       DEPTH       TIME         LOG NAME       DEPTH <td< td=""><td>/EHICLE(S) USED AI</td><td>ID MILEA</td><td>SE: RENTAL</td><td></td><td></td><td>······································</td></td<>	/EHICLE(S) USED AI	ID MILEA	SE: RENTAL			······································
ARRIVED ON SITE:       7.20         STANDBY TIME:       CAUSE:         LOGGING STARTED:       [2:50]         LOGGING COMPLETED:       [4:40]         MINCH:       COMPROBE         SILVER       OYO         OTHER       OYO         MINCH:       COMPROBE         SILVER       OYO         OTHER       OTHER         MINCH:       COMPROBE         SILVER       OYO         OTHER       OTHER         MINCH:       COMPROBE         SILVER       OYO         OTHER       OTHER         MINCH:       COMPROBE         SILVER       OTHER         PROBE TILT TEST       C. & B         ROBE AZIMUTH TEST ZAL & BRUNTON AZIMUTH       PAPAGE         PROBE OFFSET       OPTICAL 1.88M(8.17FT)         ASING STICK-UP	HOBILIZED FROM: L	CHINGTON	) PAPK	DÉPART	URE TIME: 4	150
STANDBY TIME:       CAUSE:         LOGGING STARTED:       12150         LOGGING STARTED:       12150         MINCH:       COMPROBE         SILVER       OYO         ACCUSTIC #31745550C         OTHER         ACCUSTIC #31745550C         PROBE TILT TEST       C.8. ^o BRUNTON TILT       C*         PROBE TILT TEST       C.8. ^o BRUNTON AZIMUTH       F145         PROBE CHTSET       OPTICAL 1.88M(8.17FT)         ACCUSTIC 1.44M(4.72FT)       -         ASING STICK-UP       -         -       -         MOBE OFFSET       OPTICAL 1.88M(8.17FT)         ACCUSTIC 1.44M(4.72FT)       -         ASING STICK-UP       -         -       -         MOBE OFFSET       OPTICAL 1.88M(8.17FT)         ACCUSTIC 1.44M(4.72FT)       -         ASING STICK-UP       -         -       -         DEPTH REF. OFFSET       OPTICAL 1.88M(8.17FT)         LOG NAME       DEPTH         DEPTH       TIME         DEPTH       TIME         ANME       DEPTH         OUPMENT PROBLEMS OR FAILUREE:         UGGESTIONS, ADDITIONS	ARRIVED ON SITE:	<b>7:8</b>	<b>)</b>	_		· · · · · · · · · · · · · · · · · · ·
OGGING STARTED:       12*55       LOGGING COMPLETED:       14:00         MINCH:       COMPROBE       SILVER       OYO       OTHER         FELEVIEWER       OPTICAL #S117       ACOUSTIC #5176520       OTHER         PROBE AZIMUTH TEST       OPTICAL 1.88M(0.17FT)       ACOUSTIC 1.44M(4.72FT)         ASING STICK-UP	STANDBY TIME:			CAUSE:_	•	
MINCH:       COMPROBE       BILVER       OYO       OTHER         MICROLOGGER       5301_V       OTHER	OGGING STARTED;	2:50	······································	LOGGIN	<b>3 COMPLETED</b>	14:00
MINULT:       CUMPTODESIVEROTOOTOOTHER         TELEVIEWER       OPTICAL #\$117ACOUSTIC #\$1745500 OTHER         PROBE TILT TEST       O. & BRUNTON TILT       O         PROBE AZIMUTH TEST       O. & BRUNTON AZIMUTH       Franke Huda @ 6.6 *         PROBE OFFSET       OPTICAL #\$117ACOUSTIC 1.44M(4.72FT)       Franke Huda @ 6.6 *         PROBE OFFSET       OPTICAL 1.88M(8.17FT)       ACOUSTIC 1.44M(4.72FT)         ASING STICK-UP						
ACOUSTIC #9174(550°)       OTHER	nnun: uump Nedal agged	RUBE	- SILVEK		OTHER	**************************************
ALCOURT PROBLEMS OR FAILURES:	tel polemer		, UINCK	ACOULOT		
PROBE TILT TEST       C.8°       BRUNTON TILT       C°         PROBE AZIMUTH TEST       DITICAL 1.88M(8.17FT)       ACOUSTIC 1.44M(4.72FT)         ASING STICK-UP	······································	1848 I 8448 I	₩₩₩III. 		10 #01/4 <u>030</u> ~	
ROBE A2BAUTH TEST 241.5       BRUNTON AZIMUTH 114*       PARK HAA & 6.5*         ROBE OFFSET       OPTICAL 1.88M(8.17FT)       ACOUSTIC 1.44M(4.72FT)         ASING STICK-UP	ROBE TILT TEST	0,8°	BRUNTON T	lt O°		
ROBE OFFSET       OPTICAL 1.88M(8.17FT)       ACOUSTIC 1.44M(4.72FT)         ASING STICK-UP	ROBE AZIMUTH TES	ST QU. 2"	BRUNTON A	ZIMUTH ZI	40 00	<b>A</b>
ROBE OFFSET       OPTICAL 1.98M(8.17FT)       ACOUSTIC 1.44M(4.72FT)         ASING STICK-UP		×			· · · ·	- 700 C 0.6-
ASING STICK-UP UPTH REF. OFFSET	ROBE OFFSET	OPTICA	_ 1.88M(8.17F1	) ACOUST	C 1.44M(4.72F)	n
BEPTH REF. OFFSET       START       Start <td>ASING STICK-UP</td> <td></td> <td>*</td> <td>Ĩ]</td> <td></td> <td></td>	ASING STICK-UP		*	Ĩ]		
LOG NAME       START       START       END       END         Caracter       DEPTH       TIME       DEPTH       TIME         Caracter       Start       Start       If       If         Caracter       Start       If       If       If         Aintenance       Performed on site:       Start       Start       If         QUIPMENT PROBLEMS OR FAILURES:       Start       Start       If       If         JAGGESTIONS, ADDITIONS, CHANGES:       Start       Start       Start       If	EPTH REF. OFFSET				512	315 00 EVE
LOG NAME       DEPTH       TIME       DEPTH       TIME         Chart Am (Revolution of the state of the sta	²	**************************************			· · · · · · · · · · · · · · · · · · ·	
LOG NAME     DEPTH     TIME       Output     5,11     14,250     14,265       Output     5,11     14,265       AINTENANCE PERFORMED ON SITE:		START	START	END	END	
AINTENANCE PERFORMED ON SITE:	LOG NAME	DEPTH		DEPTH	TIME	
AINTENANCE PERFORMED ON SITE:	Direct an Condi Di	1 <b>* 2 * 1</b> *	11.150	!! <u>!!!_`</u>	14:00	
AINTENANCE PERFORMED ON SITE:	· · · · · · · · · · · · · · · · · · ·	1	······································			
AINTENANCE PERFORMED ON SITE:				**		
AINTENANCE PERFORMED ON SITE:	· · · · · · · · · · · · · · · · · · ·					
AINTENANCE PERFORMED ON SITE:				-		
AINTENANCE PERFORMED ON SITE:				*	<u></u>	-4
QUIPMENT PROBLEMS OR FAILURES:	AINTENANCE PERF	ormed of	N SITE:			
QUIPMENT PROBLEMS OR FAILURES:	······································		· · · · · ·		······································	
JURPMENT PROBLEMS OR FAILURES:						
UGGESTIONS, ADDITIONS, CHANGES:	Hud Men [ Proele	ms or fa	ilures:			
UGGESTIONS, ADDITIONS, CHANGES:		<del>. 11 </del>	ž "ž"			· · · · · · · · · · · · · · · · · · ·
UGGESTIONS, ADDITIONS, CHANGES:		*				
	UGGESTIONS ADDI	tions cu	ANCES-			
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		**** ********		<u> </u>		

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

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



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## B-404 CALIPER FIELD LOG

SITE_CONPP COLA	DATE & /140 mms
CLIENT:_SCHNABEL	JOB: 8185
AUTHOR:_R. STELLER	PAGE 1 OF 2
	<u></u>
CONTACT:_RUBEN TARUSELLI	OFFICE PHONE:
	CELL PHONE: 703-908-1797
CONTACT:	OFFICE PHONE
	PHONE:
CONTACT:	PHONE:
	PHONE
CONTACT	PHONE
PARTIE & Antonio	PHONE
LARGELER:	PHONE:
COMPANY.	PHONE:
GENERAL SITE CONDITIONS/LOCATION:	
the set and the state of the set	
DODELION E DEDIGNIATION. $Q = A Q d_{-}$ .	
BOREHOLE DESIGNATION: B-404	OCATION:
BOREHOLE DESIGNATION: 13-4-04-	OCATION:
BOREHOLE DESIGNATION: B-4-04-	NNSHIP:SECTION:
BOREHOLE DESIGNATION: 13-4-04-	WNSHIP:SECTION:
BOREHOLE DESIGNATION: 3-4-04 I COUNTY: RANGE: TON BOREHOLE CONSTRUCTION: CASED UNC DIAMETERS AND DEPTH RANGES: 4-4-0 TO BOREHOLE TOTAL DEPTH AS DRIVED: 040	OCATION:
BOREHOLE DESIGNATION: 3-4-4-	OCATION:
BOREHOLE DESIGNATION: <u>8-4-4</u> COUNTY: <u>RANGE</u> TO BOREHOLE CONSTRUCTION: CASED UNC DIAMETERS AND DEPTH RANGES: <u>4%</u> 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: <u>26</u> CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK N.	OCATION:
BOREHOLE DESIGNATION: <u>3-4-4</u> COUNTY: <u>RANGE</u> TO BOREHOLE CONSTRUCTION: CASED <u>UNC</u> DIAMETERS AND DEPTH RANGES: <u>4-4</u> 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: <u>246</u> CONDUCTOR CASING?: YES <u>DEPTH TO BO</u> DEPTH TO BEDROCK: <u>N A</u> BOREHOLE FILLID: WATER	OCATION:
BOREHOLE DESIGNATION: <u>8-4-4</u> COUNTY: <u>RANGE</u> TO BOREHOLE CONSTRUCTION: CASED UNC DIAMETERS AND DEPTH RANGES: <u>44</u> 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: <u>46</u> CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: <u>N A</u> BOREHOLE FLUID: WATER ; FRESH WATER OTHER:	ANSHIP:SECTION: ANSHIP:SECTION: CASED/TO 220;TO TO TTOM OF CASING; NO/ DEPTH TO WATER TABLE: MUD; SALT WATER MUD;
BOREHOLE DESIGNATION: 3-4-04 [ COUNTY:RANGE:TON BOREHOLE CONSTRUCTION: CASEDUNC DIAMETERS AND DEPTH RANGES:4/4 0 TO BOREHOLE TOTAL DEPTH AS DRILLED:4 CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: NA BOREHOLE FLUID: WATER; FRESH WATER OTHER: DEPTH TO BOREHOLE FLUID: 9	OCATION:         MNSHIP:       SECTION:         ASED       Image: Section:         ASED       Image: Section:         ASED       Image: Section:         Image: Section:       Image: Section:
BOREHOLE DESIGNATION: <u>3-4-4</u> COUNTY: <u>RANGE</u> TO BOREHOLE CONSTRUCTION: CASED UNC DIAMETERS AND DEPTH RANGES: <u>4-4</u> 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: <u>24</u> CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: <u>N A</u> BOREHOLE FLUID: WATER FRESH WATER OTHER: <u>DEPTH TO BOREHOLE FLUID</u>	OCATION:
BOREHOLE DESIGNATION: <u>8-4-4</u> COUNTY: <u>RANGE</u> TO BOREHOLE CONSTRUCTION: CASED UNC DIAMETERS AND DEPTH RANGES: <u>4</u> ⁴ , 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: <u>4</u> CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: <u>N A</u> BOREHOLE FLUID: WATER FRESH WATER OTHER: DEPTH TO BOREHOLE FLUID: <u>9</u> LOGGING CREW: R. STELLER	ANSHIP:
BOREHOLE DESIGNATION: <u>8-4-4</u> COUNTY: <u>RANGE</u> TO BOREHOLE CONSTRUCTION: CASED UNC DIAMETERS AND DEPTH RANGES: <u>4-4</u> 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: <u>4-4</u> CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: <u>M N</u> BOREHOLE FLUID: WATER FRESH WATER OTHER: DEPTH TO BOREHOLE FLUID: <u>9</u> LOGGING CREW: R. STELLER VEHICLE(S) USED AND MILEAGE: RENTAL	ANSHIP:
BOREHOLE DESIGNATION: <u>3-4-4</u> COUNTY: <u>RANGE</u> TO BOREHOLE CONSTRUCTION: CASED UNC DIAMETERS AND DEPTH RANGES: <u>4-4</u> 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: <u>24</u> CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: <u>N A</u> BOREHOLE FLUID: WATER ; FRESH WATER OTHER: DEPTH TO BOREHOLE FLUID: <u>9</u> LOGGING CREW: R. STELLER VEHICLE(S) USED AND MILEAGE: <u>RENTAL</u> MOBILIZED FROM: <u>LEFAN</u>	DEPARTURE TIME:
BOREHOLE DESIGNATION: <u><u>S-404</u></u> COUNTY: <u>RANGE</u> TO BOREHOLE CONSTRUCTION: CASED <u>UNC</u> DIAMETERS AND DEPTH RANGES: <u>4</u> ^{4/4} 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: <u>24</u> CONDUCTOR CASING?: YES <u>DEPTH TO BO</u> CONDUCTOR CASING?: YES <u>DEPTH TO BO</u> DEPTH TO BEDROCK: <u>M A</u> BOREHOLE FLUID: WATER <u>;</u> FRESH WATER OTHER: DEPTH TO BOREHOLE FLUID: <u></u> LOGGING CREW: R. STELLER VEHICLE(S) USED AND MILEAGE: <u>RENTAL</u> MOBILIZED FROM: <u>LEFANETON MADE</u> ARRIVED ON SITE: <u>9</u> :00	DEPARTURE TIME: 0:30
BOREHOLE DESIGNATION: <u><u>S-404</u></u> COUNTY: <u>RANGE</u> : <u>TOM</u> BOREHOLE CONSTRUCTION: CASED <u>UNC</u> DIAMETERS AND DEPTH RANGES: <u>4</u> % 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: <u>246</u> CONDUCTOR CASING?: YES <u>DEPTH TO BO</u> CONDUCTOR CASING?: YES <u>DEPTH TO BO</u> DEPTH TO BEDROCK: <u>N A</u> BOREHOLE FLUID: WATER FRESH WATER OTHER: <u>DEPTH TO BOREHOLE FLUID</u> : <u>F</u> LOGGING CREW: R. STELLER VEHICLE(S) USED AND MILEAGE: <u>RENTAL</u> MOBILIZED FROM: <u>LEFTAL</u> MOBILIZED FROM: <u>1900</u>	OCATION: MNSHIP: SECTION: ASED // 220 ;TOTO TTOM OF CASINGTO DEPTH TO WATER TABLE: MUD; SALT WATER MUD; TIME SINCE LAST CIRCULATION: * 3 H4-5 DEPARTURE TIME: 8:30 CAUSE:
BOREHOLE DESIGNATION: <u>8-4-04</u> COUNTY: <u>RANGE</u> TO BOREHOLE CONSTRUCTION: CASED UNC DIAMETERS AND DEPTH RANGES: <u>4-4</u> 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: <u>4-4</u> CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: <u>M A</u> BOREHOLE FLUID: WATER ; FRESH WATER OTHER: FRESH WATER OEPTH TO BOREHOLE FLUID: <u>9</u> LOGGING CREW: R. STELLER VEHICLE(S) USED AND MILEAGE: <u>RENTAL</u> MOBILIZED FROM: <u>LEFTANE GAS</u> ARRIVED ON SITE: <u>9:00</u> STANDBY TIME: LOGGING STARTED: <u>14:50</u>	OCATION:         ANISHIP:       SECTION:         ASED       ITO         ASED       ITO         TOM OF CASING       ; NO         DEPTH TO WATER TABLE:       MUD         MUD       ; SALT WATER MUD         TIME SINCE LAST CIRCULATION:       SH4-5         DEPARTURE TIME:       8:50         CAUSE:       LOGGING COMPLETED:

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OTE. PONDO POLA	R-404	DATE: 6 / 24/2006	<del>- 7</del>
SHE: GUNFF WWW		.IOB: 6165	
CLIENT: SCHNABEL			-
AND A PROPERTY AND A			
AUTHOR: R. OTELLEN_	the second se		

WINCH: COMPI	ROBE	SILVER V OYO OTHER
MICROLOGGER	5301	OTHER
CALIPER PROBE	5368	OTHER 2915

PROBE OFFSET	12 IN MAX 2.08M(6.82 FT) 24 IN MAX	
CASING STICK-UP	ARMS - 1.7' ARMS	
DEPTH REF. OFFSET	5.12 SILOONANT	

	START	START	END DEPTH	END TIME
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\$404 CALLIP OI	195	14:32	<u>- "a</u>	14:52-
BANA-CALTESCOZ				
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<u></u>		<u> </u>		

CALIBRATION PLATE S/N 201		AS BUILT			
. 1.2 State State State State State		1,968 IN	3.937 IN	8.000 IN	
<u> </u>	FILE NAME	(50 MM)	(100 MM)	203.2 MM	
AS MEAS.	RADE CONTRACTOR	1.17	1.45	8.04	
AS MEAS.	BANK CANTERTOR	1.94	9.97	7,97	
AS MEAS.					
AS MEAS.		· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	
AS MEAS.					
AS MEAS.	*				

#### 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
¥	* • <i>* * *</i> *****	
CONTACT: RUBEN TARUSELLI	OFFICE_	_PHONE:
	_CELL	PHONE: 703-906-1797
CONTACT:	_OFFICE	PHONE
×		PHONE
CONTACT:		PHONE:
		PHONE:
CONTACT:		PHONE
		PHONE:
DRILLER:		PHONE:
COMPANY:		PHONE
0 <b>0.0</b>		
GENERAL SITE CONDITIONS/LOCATION:		
	··· ···	
	······································	
BOREHOLE DESIGNATION: 8-4-44	LOCATION:	
BOREHOLE DESIGNATION: 8-404	LOCATION;	
BOREHOLE DESIGNATION: 8-4-4-4	LOCATION:	SECTION:
BOREHOLE DESIGNATION: <u>6-404</u> COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASED UN	LOCATION; WNSHIP; CASED	SECTION:
BOREHOLE DESIGNATION: 6-404 COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: 4% 0 TO	LOCATION; WNSHIP; CASED	SECTION:
BOREHOLE DESIGNATION: <u>6-464</u> COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: <u>4%</u> 8 TO BOREHOLE TOTAL DEPTH AS DRILLED: <u>9</u>	LOCATION:	
BOREHOLE DESIGNATION: <u>6-4-4-</u> COUNTY: <u>RANGE</u> TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: <u>4%</u> 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: <u>4</u> CONDUCTOR CASING?: YES DEPTH TO B	LOCATION:	
BOREHOLE DESIGNATION: <u>6-4-4-</u> COUNTY: <u>RANGE</u> TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: <u>4%</u> 0 TO BOREHOLE TOTAL DEPTH RANGES: <u>4%</u> 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: <u>9</u> CONDUCTOR CASING?: YES DEPTH TO B DEPTH TO BEDROCK: <u>MA</u>	LOCATION: WNSHIP: CASED 2020 2020 OTTOM OF C DEPTH TO	
BOREHOLE DESIGNATION: <u>6-464</u> COUNTY: <u>RANGE</u> TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: <u>4%</u> 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: <u>9</u> CONDUCTOR CASING?: YES DEPTH TO B DEPTH TO BEDROCK: <u>NA</u> BOREHOLE FLUID: WATER ; FRESH WATE OTHER	LOCATION: WNSHIP: CASED 200 200 0TTOM OF C DEPTH TO R MUD	
BOREHOLE DESIGNATION: <u>6-404</u> COUNTY: <u>RANGE</u> TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: <u>4%</u> 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: <u>9</u> CONDUCTOR CASING?: YES DEPTH TO B DEPTH TO BEDROCK: <u>MA</u> BOREHOLE FLUID: WATER ; FRESH WATE OTHER:	LOCATION: WNSHIP: CASED 2020 DEPTH TO R MUD	
BOREHOLE DESIGNATION: <u>6-464</u> COUNTY: <u>RANGE</u> TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: <u>4%</u> 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: <u>9</u> CONDUCTOR CASING?: YES DEPTH TO B DEPTH TO BEDROCK: <u>NA</u> BOREHOLE FLUID: WATER ; FRESH WATE OTHER: <u>0</u> DEPTH TO BOREHOLE FLUID: <u>6</u>	LOCATION: WAISHIP: CASED / D_200 DEPTH TO R MUD / TIME SINCE	SECTION:
BOREHOLE DESIGNATION: <u>6-4-4</u> COUNTY: <u>RANGE</u> TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: <u>4%</u> 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: <u>4</u> CONDUCTOR CASING?: YES <u>DEPTH TO B</u> DEPTH TO BEDROCK: <u>NA</u> BOREHOLE FLUID: WATER ; FRESH WATE OTHER: DEPTH TO BOREHOLE FLUID: <u>0</u>	LOCATION: WNSHIP: CASED / Depth to DEPTH to R MUD / TIME SINCE	SECTION:
BOREHOLE DESIGNATION: <u>6-464</u> COUNTY: <u>RANGE</u> TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: <u>4%</u> 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: <u>9</u> CONDUCTOR CASING?: YES DEPTH TO B DEPTH TO BEDROCK: <u>NA</u> BOREHOLE FLUID: WATER ; FRESH WATE OTHER: DEPTH TO BOREHOLE FLUID: <u>0</u> LOGGING CREW: R. STELLER	LOCATION: WINSHIP: CASED 2020 DEPTH TO R MUD TIME SINCE	SECTION:
BOREHOLE DESIGNATION: <u><u><u><u></u></u><u><u><u></u><u><u></u><u><u></u><u></u><u><u><u></u></u><u></u><u><u><u></u></u><u></u><u><u></u><u></u><u><u></u><u></u></u></u></u></u></u></u></u></u></u></u>	LOCATION: WINSHIP: CASED 220' OTTOM OF C DEPTH TO R MUD TIME SINCE	SECTION:TO ASINGTO WATER TABLE:; SALT WATER MUD; LAST CIRCULATION: <u>44:H45</u>
BOREHOLE DESIGNATION: <u><u><u></u><u></u><u><u><u></u><u></u><u><u></u><u><u></u><u><u></u><u></u><u></u><u><u></u><u></u><u></u><u></u><u></u><u><u></u><u></u></u></u></u></u></u></u></u></u></u>	LOCATION: WINSHIP: CASED 7 Depth 7 DEPTH TO R MUD 7 TIME SINCE	SECTION:
BOREHOLE DESIGNATION: <u><u><u></u></u><u><u><u></u><u><u></u><u><u></u><u></u><u><u></u><u><u></u></u><u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u></u></u></u></u></u></u>	LOCATION: WINSHIP: CASED 200 0 DEPTH TO R MUD TIME SINCE	SECTION: TO ASINGTO WATER TABLE: SALT WATER MUD; LAST CIRCULATION: E TIME: <u>Q. 100</u>
BOREHOLE DESIGNATION: <u><u><u><u></u></u><u><u><u></u><u><u></u><u><u></u><u></u><u><u><u></u></u><u></u><u><u><u></u></u><u></u><u><u></u><u></u><u><u></u><u></u></u></u></u></u></u></u></u></u></u></u>	LOCATION: WINSHIP: CASED 200 DEPTH TO R MUD TIME SINCE	SECTION: 

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 / 240/2008	
CLIENT:_SCHNABEL_	· · · · · · · · · · · · · · · · · · ·	1 	······································		JOB:_6165	
AUTHOR:_R. STELLER	<u> </u>			<del></del>	PAGE 2 OF 2	
WINCH: COMPR	ROBE	SII VER		t ,	ATHER	
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	START DEPTH	START TIME	END DEPTH	END TIME
Blockeroguro	<u>  195</u>	15:10		15:28
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			<u> </u>	
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#### MAINTENANCE PERFORMED ON SITE:

EQUIPMENT PROBLEMS OR FAILURES:

SUGGESTIONS, ADDITIONS, CHANGES;

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# B-407 BORING GEOPHYSICS FIELD LOG SUMMARY

		DATE: 6 / 16 /2008
AUTHOR: R. STELLER		PAGE 1 OF 2
CONTACT:_RUBEN TARUSELLI	x x ,	PHONE:_703-906-1797_

BOREHOLE CONSTRUCTION: CASED UNCASED	
NAMETERS AND DEDITIL PARAMETER. AND A PARTY AND AND	
UNAMETERS AND DEPTH RANGES: 471 0 TO 200	
BOREHOLE TOTAL DEPTH AS DRILLED: 200'	
CONDUCTOR CASING?: YES DEPTH TO BOTTOM OF CARING	
NEUTLI TO DEDISORY, AN	
DEPTH TO DEDRUGRE F***	
BOREHOLE FLUID: WATER : FRESH WATER MUD V · SALT WATER MUD	
	ĉ.

LOGGING CREW:_R. STELLER____

·	•	A		
LOG TYPE	FILE NAME	DEPTH RANGE	DATE	TIMES
Station R.S.	COI - 112	1.6'- 957'	in heaters	9:08 - 10:20
aunpeonett	6407TEXCOLOL	Ø	Calles IPEn	MICH - 11204
CALIBER	6407 CAL UPOI	1930 - 0	616/100	$I_{1}$
Charge Test	16407 TESTCA-12	d	Sec/ 10 1000	$H_1 = H_2$
Elech/Gamma	BAOTELEDIOI	1920-126	al in the	1355 - 18.510
DENATION	GADTE DEN COORSON	Ø- 182.8'	16/16/000	12:53 - 13:37
<u> </u>	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		
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- the second second	<del> </del>			



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

SITE_CALVERT CLIFFS COLA 8-40	17	DATE:	6/16/06
CLIENT:SCHNABEL		JOB: 6165	
AUTHOR:_R. STELLER	*****	PAGE 1 OF	
CONTACT:		PHONE:	
		PHONE:	
CONTACT;	<u>OFFICE</u>	PHONE:	
	· · · · · · · · · · · · · · · · · · ·	PHONE:	
CONTACT:	*	PHONE:	
	*****	PHONE:	
CONTACT:		PHONE:	
		PHONE:	
DRILLER:		PHONE:	
COMPANY:	· · · · · · · · · · · · · · · · · · ·	PHONE:	<u> </u>
DIRECTIONS TO SITE:			
GENERAL SITE CONDITIONS/LOCATION:		······································	
FA#			
BOREHOLE DESIGNATION: 2-407		DN;	<del></del>
COUNTY: RANGE	TANARIOLIID	~ ~ ~	
BOREHOLE CONSTRUCTION CARED	I MARYINGI TIP"; INIZAZITEN	···	SECTION;
DIAMETERS AND DEDTH DANGER. AMA	MCABED	<u>.</u> 	
BOREHOLE TOTAL DEDTH AS DOILLED. 904	* <u>===_</u>	<u>, 1978</u>	TTO
CONDUCTOR CASING? VER DEDTUTO			
DEPTH TO BEDBOCK ANT		r casing_	
		VALER TAI	
ATLIED		; SALT \	NATER MUD;
		<del></del>	
	TIME SINCE	LAST CIRC	SULATION: 16 H R

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



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SITE: CALVERT CLIFFS COLA 8-4-51	DATE 10/16/06
CLIENT: SCHNABEL	JOB: 6165
AUTHOR: R. STELLER	PAGE 2 OF 6
LOGGING CREW: 2- STELLER	
VEHICLE(S) USED AND MILEAGE: NO. NO.	
MOBILIZED FROM: LEKINGTEN PACE	DEPARTURE TIME: 7:05
ARRIVED ON SITE: 7235	
STANDBY TIME:	CAUSE
LOGGING STARTED: 9:00	LOGGING COMPLETED: 12 : 29
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         INSTRUMENT       OYO 12004         RECEIVER S/N       12008         MAINTENANCE PERFORMED ON SITE:	GREY       OYO       RG       OTH       OTH         19029       RG       160023       160024       I         25055       11001       23053       30005       I
EQUIPMENT PROBLEMS OR FAILURES:	
SUGGESTIONS, ADDITIONS, CHANGES:	
COMMENTS:	

SITE: CA	LVERT CI	LIFFS COLA B-	DATE: 6/16/06		
CLIENT: SCHNABEL				JOR: 8185	
AUTHOR	R. STEL	LER	onalina a nativa 1911 - 22	PAGE 9 OF 5	
			<u>, a a a a constanta a</u>		
DEPTH	DEPTH	UNFILTERED	FILTERED	COMMENTS	
METERS	FEET	FILE NO.	FILE NO.	CASING, WATER, ROCK, ETC	
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1.5	4.92	4			
2.0	6.56	ě.			
<u> </u>	8.20	5			
<u>9.0</u>	9.84	1.6			
3.5	11.48	12			
4.0	13.12	<u>g</u>	×** · · · · · · · · · · · · · · · · · ·		
4.5	14.76	9	· ·····		
5.0	16.40	<u> </u>			
<u> </u>	18.04	<u>u</u>			
6,0	19.69	<u> </u>			
<u> </u>	21.33	<u> </u>			
<u>7.0</u>	22.97	<u>  /4</u>	· · · · · · · · · · · · · · · · · · ·		
7.5	24.61	15			
8.0	26.25	14			
8.5	27,89	17			
<u> 80</u>	29.53				
<u> </u>	31.17				
10.0	32.81	20			
<u>    10,5                                </u>	34.45	. 21			
<u>11.0</u>	36.09	22			
	37,73	23			
12.0	39.37	24			
<u>    12.5                                </u>	41.01	25			
13.0	42.85	26			
13.5	44.29	21 .			
14.0	45.93	46			
14.5	47.57	24			
15.0	49,21	30			
18.5	50,85	3	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~		
16.0	52.49	122			
16.5	54.13	75			
17.0	55.77	34-			
17.5	57.A1	36			
18.0	59.06	36			
18.5	60.70	1 57			

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GEOVISI	<b>ON SUSPE</b>	nsion log	ging fiel	<u>.D not</u>	ES
SITE:_CALVERT CLIFFS COL	<u>a 6-407</u>	<b>M</b>	DATE:	<u>6/16/06</u>	
CLIENT: SCHNABEL		* * * * * *	JOB:_6165	* * * **	
AUTHOR:_R. STELLER			PAGE d	OF	5
		· · · · · · · · · · · · · · · · · · ·			
DEPTH DEPTH UNFILTE	RED  FIL	TERED	COMMENTS	4.00.000.000 3	

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METERS	FEET	FR.E.NO.	FILE NO.	CASING WATER ROCK ETC	
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20.5	67.26		· ·	
21.0	68.90	42		
21.5	70.54	45		
22.0	72.18	<u>Ar</u>		
22.5	73.82	45		
23.0	75.46	Alo		
23.5	77.10	m		
24.0	78.74	ân		
24.5	80.38	A		
25.0	82.02	50		
25.6	83,69	<u>A</u>		
26.0	85.30			
26.5	86.94	あ		
27.0	88.58	94-		
27.5	90.22	<b>95</b>		A CONTRACTOR OF A CONTRACTOR O
28.0	91.86	56		
28.5	93,50	<u>Gi</u>		
29.0	95.14	51		
29.5	96.78	59		
30.0	98.43	6o	***************************************	
30,5	100.07	21		· · · · · · · · · · · · · · · · · · ·
31.0	101.71	62	<u>,</u>	
31.5	103.35	GA		
32.0	104.99	64-	······································	
32.5	106.63	05		
33.0	108.27	64		
33.5	109.91	61	A REAL AND A	
34.0	111.55	400		
94.5	113.19	60		
35.0	114.83	26		
35.5	116.47	n n		
36.0	118.11	71.	······································	
36.5	119.75	73	······································	and the second
37.0	121.39	74		
87.5	123.03	10		
38.0	124.67	76		· · · · · · · · · · · · · · · · · · ·
28.5	126.31	77		
39.0	127.95	78		
39.5	129.69	74	¥ ***** *****	
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-1.47X.97				

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Geovision Suspensio	n logging field notes
SITE:_CALVERT CLIFFS COLA	DATE: 6/10/00
CLIENT:	JOB: 6165
AUTHOR: R. STELLER	PAGE A OF 5

10.10

DEPTH	DEPTH	UNFILTERED	FILTERED	COMMENTS	, in the second s
METERS	FEET	FILE NO.	FILE NO.	CASING, WATER, ROCK, ETC	

40.5	132.87	AL.		
41.0	134.51	812		
41.5	136,15	<b>8</b> 3		
42.0	137.80	<u> </u>		
42.5	139.44	80		
43.0	141.08	86		
43.5	142.72	Ri		
44.0	144.38	22		
44.5	146.00	88		
45.0	147,64	90		
45.5	149.28	<u>A</u>		
46.0	150.92	ar		
46.5	152.56	19/1		
47.0	154,20	94-		
47.5	155.64	<u>46</u>		
48.0	157,48	98.		
48.5	159.12	97		
49.0	160.76	48		
48.5	162.40	99		
50,0	164.04	(jan	· · · · · · · · · · · · · · · · · · ·	
50.5	165.68	161	· · · · · · · · · · · · · · · · · · ·	
51.0	167.32	102	· · · · · · · · · · · · · · · · · · ·	
51.5	168.96	103	· <u>Are · XX an Xaalaa a</u> ay a	
52.0	170.80	104-	** **** * *** ************************	
52.5	172.24	105		
53.0	173.88	iø4		
53,5	175.52	67		
54.0	177.17	(0)		
64.5	178.81	64		a the state of the
55.0	180,45	LID		
55.5	182.09	ш	· · · · · · · · · · · · · · · · · · ·	
56.0	183.73	112		
56.5	185.37			With Gottom & FL Land har C'
57.0	187.01			Bottom Methodsonder !!
57.5	188.85			and a surface of the state of t
58.0	190,29			· · · · · · · · · · · · · · · · · · ·
58.5	191.93			
59.0	193.57			
59,5	195.21			
60,0	196.85			
A			<del>~~~~~</del>	



# B- 407 CALIPER FIELD LOG

SITE: CONPP GOLA		DATE: 61 16/2006
CLIENT: SCHNABEL		JOB: 6165
AUTHOR R STELLER		PAGE 1 OF 2
		-
CONTACT:_RUBEN TARUSELLI	_OFFICE_	PHONE
	_CELL	PHONE:_703-906-1797
CONTACT:	_OFFICE_	PHONE:
	****	PHONE:
CONTACT:		PHONE:
	**	PHONE:
CONTACT:		PHONE:
and the state of the summary of	****	PHONE:
DRILLER	·	PHONE:
COMPANY:		PHONE:
GENERAL SITE CONDITIONS/LOCATION:	*	
	<u> </u>	
	****	
BOREHOLE DESIGNATION: B-467	OCATION:	
COUNTY: RANGE TOU	<del></del>	
	MNSHIP:	SECTION-
BOREHOLE CONSTRUCTION: CASED LINC	MNSHIP:	SECTION:
BOREHOLE CONSTRUCTION: CASED UNC	WNSHIP: ASED	SECTION:
BOREHOLE CONSTRUCTION: CASED UNC DIAMETERS AND DEPTH RANGES: 474.0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 2001	WNSHIP: ASED V 200 ⁷	SECTION: ;,TO
BOREHOLE CONSTRUCTION: CASED UNC DIAMETERS AND DEPTH RANGES: 474.0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 2007 CONDUCTOR CASING?: YES DEPTH TO BO	WNSHIP: ASED V 2607	SECTION:
BOREHOLE CONSTRUCTION: CASED UNC DIAMETERS AND DEPTH RANGES: 474.0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 2007 CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: N &	WNSHIP: ASED / / 2207	SECTION:
BOREHOLE CONSTRUCTION: CASED UNC DIAMETERS AND DEPTH RANGES: 474.0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 2007 CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: N A BOREHOLE FLUID: WATER ; FRESH WATER OTHER:	WNSHIP: ASED ZED TTOM OF C DEPTH TO MUD	SECTION:TOTOTOTOTO CASING: NO WATER TABLE:; SALT WATER MUD;
BOREHOLE CONSTRUCTION: CASED UNC DIAMETERS AND DEPTH RANGES: 474.0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 2.05* CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: N R BOREHOLE FLUID: WATER; FRESH WATER OTHER: DEPTH TO BOREHOLE FLUID:	WNSHIP: ASED V 2607 TTOM OF C DEPTH TO MUD V TIME SINC	SECTION:
BOREHOLE CONSTRUCTION: CASED UNC DIAMETERS AND DEPTH RANGES: 474.0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 2007 CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: N K BOREHOLE FLUID: WATER; FRESH WATER OTHER: DEPTH TO BOREHOLE FLUID: LOGGING CREW: R. STELLER	WNSHIP: ASED V 260 TTOM OF C DEPTH TO MUD V TIME S/NC	SECTION:TO ;TO CASING: NO WATER TABLE: ; SALT WATER MUD; E LAST CIRCULATION: <u>S NP</u> ;
BOREHOLE CONSTRUCTION: CASED UNC DIAMETERS AND DEPTH RANGES: 474.0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 2.05* CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: N & BOREHOLE FLUID: WATER; FRESH WATER OTHER: DEPTH TO BOREHOLE FLUID: DEPTH TO BOREHOLE FLUID: LOGGING CREW: R. STELLER VEHICLE(S) USED AND MILEAGE: RENTAL	WNSHIP: ASED V 2607 TTOM OF C DEPTH TO MUD V TIME SINC	SECTION:
BOREHOLE CONSTRUCTION: CASED UNC DIAMETERS AND DEPTH RANGES: 474.0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 2007 CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: N & BOREHOLE FLUID: WATER ; FRESH WATER OTHER: DEPTH TO BOREHOLE FLUID: FRESH WATER OTHER: DEPTH TO BOREHOLE FLUID: LOGGING CREW: R. STELLER VEHICLE(S) USED AND MILEAGE: RENTAL MOBILIZED FROM: LENDER	WNSHIP: ASED V 260 TTOM OF C DEPTH TO MUD V TIME SINC	SECTION:
BOREHOLE CONSTRUCTION: CASED UNC DIAMETERS AND DEPTH RANGES: 474.0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 2007 CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: N M BOREHOLE FLUID: WATER ; FRESH WATER OTHER: DEPTH TO BOREHOLE FLUID: LOGGING CREW: R. STELLER VEHICLE(S) USED AND MILEAGE: RENTAL MOBILIZED FROM: LEGNISTICS FACE	WNSHIP: ASED V 260 TTOM OF C DEPTH TO MUD V TIME SINC	SECTION:
BOREHOLE CONSTRUCTION: CASED UNC DIAMETERS AND DEPTH RANGES: 474.0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 2007 CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: N A BOREHOLE FLUID: WATER; FRESH WATER OTHER: DEPTH TO BOREHOLE FLUID: LOGGING CREW: R. STELLER VEHICLE(S) USED AND MILEAGE: _RENTAL MOBILIZED FROM: <u>LESINGTON</u> <u>RACE</u> ARRIVED ON SITE:S	WNSHIP: ASED V 260 TTOM OF C DEPTH TO MUD V TIME SINC	SECTION:
BOREHOLE CONSTRUCTION: CASED UNC DIAMETERS AND DEPTH RANGES: 474.0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 2.06* CONDUCTOR CASING?: YES DEPTH TO BO DEPTH TO BEDROCK: N A BOREHOLE FLUID: WATER; FRESH WATER OTHER:; FRESH WATER OTHER:; FRESH WATER DEPTH TO BOREHOLE FLUID:; LOGGING CREW: R. STELLER VEHICLE(S) USED AND MILEAGE: _RENTAL MOBILIZED FROM: LEGINGTON RACK ARRIVED ON SITE:; 558	WNSHIP: ASED V ZED TTOM OF C DEPTH TO MUD V TIME SINC	SECTION:

SITE: COMPP COLA	1/2-00	7		DATE: 0 / 14	/2009
CLIENT SCHNAREI				JOB: 6165	
AUTHOR P STELLER		***************************************		PAGE 2 OF 2	
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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:
	_CELL	PHONE:_703-906-1797
CONTACT:	_OFFICE_	PHONE:
	·	PHONE:
CONTACT:	**************************************	PHONE:
		PHONE:
CONTACT	*** <u>*********************************</u>	PHONE:
	<del></del>	PHONE:
DRILLER:	<del> </del>	PHONE:
COMPANY:		PHONE:
BOREHOLE DESIGNATION: 8-407	LOCATION:	
COUNTY: RANGE: TO		
BOREHOLE CONSTRUCTION: CASED LINE		
DIAMETERS AND DEPTH RANGES: 474 0 TO	200	× <b>1723</b>
BOREHOLE TOTAL DEPTH AS DRILLED: Qoo		۲ <u>ــــــــــــــــــــــــــــــــــــ</u>
CONDUCTOR CASING?: YES DEPTH TO BO	TTOM OF	
DEPTH TO BEDROCK: NA-	DEPTH TO	
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 MIL PAGE- RENTAL	* **** **** * ***	
MOBILIZED FROM LANDER DAGA	NEDADTI	THE THE TRACE
ARRIVED ON SITE: 725	VERMIUN	
STANDBY TIME:	PALIOE	
LOGGING STARTED: 11:5A	I OCONIO	
	Fragung (	AMMPLETELS 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	r 5301 <u>V</u>	OTHER		
ELOG PROBE	5490 <u>/</u>	OTHER		

PROBE OFFSET	<del>n</del>	2.50M(8.20 FT)	· · · · · · · · · · · · · · · · · · ·
CASING STICK-UP		-1.to \$32.8	×
DEPTH REF. OFFSET		54.5	
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LOG NAME	START DEPTH	START TIME	END DEPTH	end Time
(SHOT BLAG of OR	1920	(1:55	16	121/40
د <u>مراجع میں میں میں میں میں میں میں میں میں میں</u>				

#### 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: G 11. 12008	
CLIENT: SCHNABEL	<del>*****</del>	JOB: 6165	·····
AUTHOR: R. STELLER	······································	PAGE 1 OF 2	<del>8</del>
CONTACT:_RUBEN TARUSELLI	OFFICE	PHONE:	
H Contraction of the second seco	CELL	PHONE: 703-908-1797	<del> 18 -</del>
CONTACT:	OFFICE	PHONE:	<del></del>
		PHONE:	
CONTACT:	·	PHONE:	<del>, ,,,,,,,,,,,,,,</del>
		PHONE	<u> </u>
CONTACT:		PHONE	** *
	7 <del></del>	PHONE	
DRILLER:	×****	Dume:	<del>****</del>
COMPANY:	)	DUME.	<del>~~~</del>
	k <del>−0117</del>		
DIRECTIONS TO SITE:			
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GENERAL SITE CONDITIONS/LOCATION:		<u> </u>	
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0 x	*** <u>***</u>		
BOREHOLE DESIGNATION: K-407	_LOCATION		
COUNTY:RANGE	TOWNSHIP:	SECTION.	
BOREHOLE CONSTRUCTION: CASED	INCASED V	<u></u>	
DIAMETERS AND DEPTH RANGES: 4 14-0	TO 200		
BOREHOLE TOTAL DEPTH AS DRILLED	2057	10	-
CONDUCTOR CASING?: YES DEPTH TO	BOTTOWOS	PADNO	
DEPTH TO BEDROCK VA	ονιιώριψη Νεότιτα		
		WATER TABLE	
OTHER-		_; SALT WATER MUD;	
™ = 1,11±130,			
DEPTH TO PODELIOI E EL UID. 10			,
DEPTH TO BOREHOLE FLUID:	TIME SINC	E LAST CIRCULATION: 5-HZS	<del></del>



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SITE: CONPP COLA	8-	407		DATE 6 / 16	1200R
CLIENT: SCHNABEL				JOB: 8165	
AUTHOR: R. STELLER	(		x 200 [×] × x	PAGE 2 OF 2	
and the second se			······································		
LOGGING CREW: R. (	STELLER	*			
VEHICLE(S) USED AN	D MILEAG	E RENTAL	* <u>****</u> ****	**************************************	<del></del>
MOBILIZED FROM: 1.8	Marthan	Phar	DEPARTU	RETIME 7	
ARRIVED ON SITE:	7:35			· · · · · · · · · · · · · · · · · · ·	
STANDBY TIME:	<u> </u>		CAUSE-		
LOGGING STARTED:	12:52		IOGGING	COMPLETED.	· ····································
				www.ccjcl/,	
WINCH: COMPR	<b>20BE</b>	SILVER	ava	ATUCO MAA	4 MT
MICROLOGGER	5301	OTHER MA	M. W		
TELEVIEWER	OPTICAL	#5117	ACON INTIC	*#E47A	ATURA 21/04
	AND TRANST			/#21/# <u></u>	UTHER 24 DB
PROBE THE 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	Lan Interio		
CASING STICK I ID	POPINOM	- 1 <b>.00m(0.17F1)</b>	ACOUSIN	; 1.44M(4.72FT)	<b>3600 G - 1.2</b> .
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MAINTENANCE PERFC	(RMED O	N SITE:			
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EQUIPMENT PROBLEM	<b>AS OR FAI</b>	LURE8:	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
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SUGGESTIONS, ADDIT	ions, Ch	ANGES:	_		
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			<del></del>	***	**************************************
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# 8-418 BORING GEOPHYSICS FIELD LOG SUMMARY

orro osubb	PPI A			DATE: 6 / 74 /2006
She_gunrr	uula: <u></u>	*	<u> </u>	JOB: 6165
GLIEN (; SAAFI	NADEL	······································		PAGE 1 OF 2
AUTHOR:_r	#ICLLER	······································	<u></u>	ga an ananan an annan
CONTACT:_R	JBEN TARUSELL	<u> </u>	<u></u>	PHONE:_703-906-1797_
		Maraen Iranae	en V	
BOREHOLE C	ONSTRUCTION: U	ASEU UNUNO		• •
DIAMETERS A	ND DEPTH MANU			
BOREHOLE I	OTAL DEPIMADU			а . жа ./
CONDUCTOR	CASINGY: TED	- DELIU IN BALL		
DEPTH TO BE	DROCKC <u>MR</u>			
BOREHOLE F	UID: 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
NASI Control Of	001-114	1.6' - 187.8'	6/22/00	15.63 - 15:44
Lendere. TV.	BAIL MAN AFOI	199.4' - 3.5'	to 174 /46	15:51 - 16 149
CALIFERTER	ALLA COUTESTOL	ø	6/29/06	16:55- 17:09
Caude/Chieres	SAIB CALUS ON	147.0'-162.8'	when the	17:05-17:17
Counter Text	LARCALTOONS .	6	6/20 00	BIOS- BIO9
Car-140-Labora-A.	GHIB CALUPOZ	MO-A	10/30/00	9:15 - 9:40
CHLAPOR TRAT	GAIR CALTERDS	4	6/30/06	9141- 9147
<b>SLO</b> S	6418 Group up by	197.0' - 20.0	0/30/00	9:38 - 10:15
		· · · · · · · · · · · · · · · · · · ·		······································
	*			
*	× ×	<u>x</u>		



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

SITE: CALVERT CLIFFS COLA 8-416	DATE: 6/29/06
CLIENT: SCHNABEL	JOB: 6165
AUTHOR: R. STELLER	PAGE 1 OF
CONTACT:	OFFICE PHONE:
	CELL PHONE;
CONTACT:	OFFICE PHONE:
	PHONE:
CONTACT:	PHONE:
	PHONE:
CONTACT:	PHONE:
	PHONE:
DRILLER:	PHONE:
COMPANY:	PHONE:
GENERAL SITE CONDITIONS/LOCATION:	
BOREHOLE DESIGNATION 15-418	LOCATION:
COUNTY:RANGE:	TOWNSHIP:SECTION:
BOREHOLE CONSTRUCTION: CASEDL DIAMETERS AND DEPTH RANGES:0 BOREHOLE TOTAL DEPTH AS DRILLED: 24	INCASED_VTOTOTO
CONDUCTOR CASING?: YES DEPTH TO	BOTTOM OF CASING NO V
DEPTH TO BEDROCK NA	DEPTH TO WATER TABLE: 44
BOREHOLE FLUID: WATER; FRESH WAT OTHER:	TER MUD; SALT WATER MUD;
DEPTH TO BOREHOLE FLUID	TIME SINCE LAST CIRCULATION: - I HA

CECVIAION Ceophysical Services 1151 Pomone Road, Solte P, Corona, CA 02882 Ph (951) 549-1234 Fr (951)



SITE: CALVERT CLIFFS COLA 6-418	DATE: GIZA ICG
CLIENT: SCHNABEL	JOB: 6165
AUTHOR: R. STELLER	PAGE 2 OF 6
LOCOMB CHEM R. YRELER. C.	CARTORE
VELICI FOR LISED AND MILEAGE CONTA	n an
MORE (ZED) FROM	DEPARTURE TIME: 12130
ADDINED ON RITE: 17:000	
STANDED ON ONE	- CAUSE:
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BTANDOW TRUES	CALKE-
LARADING OTANTELS	Address There
ADDITIONAL DEMOB TIME:	KEASUNG
BATTERIES CHANGED BEFORE LOGGING: Y WINCH COMPROBE INSTRUMENT OYO 12004 15014 RECEIVER S/N 12008 20042 MAINTENANCE PERFORMED ON SITE:	ES
EQUIPMENT PROBLEMS OR FAILURES:	
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SUGGESTIONS, ADDITIONS, CHANGES:	и к к
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COMMENTS: 2540 = 15	-1.5 = 0.0
Mannan Marana and Marana and Anna Anna Anna Anna Anna Anna An	

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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 LOG	<b>JGING FIELL</b>	J NOTES	
SITE:_CALVERT CLIFFS COLA	<u>B-416 : : </u>	_DATE: 6/2	9/06	
CLIENT:SCHNABEL		JOB:_6165	• • • • • • • • • • • • • • • • • • •	••••••••••••••••••••••••••••••••••••••
AUTHOR: R. STELLER		_PAGE?	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>	

3.5       11.48 $\gamma$ 4.0       13.72 $\beta$ 4.5       14.76 $\gamma$ 5.0       16.40 $16$ 5.3       18.04       11         6.0       18.69       1.         8.5       21.33 $r1$ 7.6       22.87       1.4         8.6       21.32 $r1$ 7.6       22.87       1.4         8.6       32.25       1.         8.7       28.25       1.         8.6       32.81       35         8.7       28.25       1.         8.8       31.17       16         8.9       28.25       1.         9.0       28.25       1.         10.9       32.81       2.         11.0       32.81       2.         13.9       34.46       2.4         11.0       38.09       32.         11.1.3       37.73       9.3         12.8       44.26       2.1         13.9       42.65       2.4         13.9       42.65       2.4         13.9       42.65       2.4	3.0	9.84	6		
4.0       13.12 $\beta_1$ 4.4       14.76 $q_1$ 5.0       18.40 $(b_1)$ 6.1       19.88 $(b_1)$ 6.2       21.33 $r_1$ 7.6       22.87 $16^2$ 7.6       22.87 $16^2$ 8.0       28.285 $14^2$ 8.1       35       35         8.0       28.285 $14^2$ 8.5       27.89 $17^2$ 8.0       28.287 $14^2$ 8.1       32.883 $16^2$ 8.3       27.89 $17^2$ 8.4       32.83 $16^2$ 9.5       31.17 $1q_2$ 9.6       38.83 $16^2$ 10.5       39.485 $24^2$ 11.0       32.77 $24^2$ 12.6       39.37 $24^2$ 13.8       42.85 $24^2$ 13.8       42.85 $24^2$ 13.8       42.85 $24^2$ 14.5       47.67 $23$ 15.9       48.21 $79^2$ <	3.5	11.48	7		
4.5       14.78       9         5.0       16.40       10         5.3       18.04       17         6.0       18.68       16         8.5       21.32       17         7.0       22.57       16         8.6       28.25       15         8.6       28.25       15         8.6       28.25       15         8.6       28.25       15         8.6       28.25       14         9.5       31.17       19         10.0       32.81       28         11.5       37.73       29         12.6       38.57       24.4         11.8       37.73       29         12.4       38.57       24.4         11.8       37.73       29         12.4       38.57       24.4         12.5       34.46       24         13.4       42.65       24         14.1       45.85       28         15.5       60.85       1         15.5       60.85       1         15.5       50.86       1         15.5       50.85       1         <	4.0	13.12	8		
5.0       18.40       10         8.3       18.04       11         8.0       18.08       11         8.0       18.08       11         7.0       22.87       14         7.5       24.81       15         8.0       28.25       14         8.1       28.25       14         8.2       28.23       16         9.3       27.89       17         9.4       28.23       16         9.5       31.17       14         10.5       34.46       24         11.0       38.09       25         11.1       38.09       25         11.2       38.37       24         11.3       38.09       25         11.4       37.73       25         11.5       38.37       24         12.6       38.37       24         13.4       42.55       34.45         13.5       62.55       34         13.4       42.55       34         13.5       62.65       34         13.5       62.65       34         14.5       47.57       24	4.5	14.76	9	»	
$\underline{5.4}$ 19.04         1/ $\underline{6.0}$ 19.06         1/ $\underline{8.5}$ 21.23 $\underline{71}$	5.0	18.40	<b>10</b>		
8.0       19.68       11.         8.5       21.33 $r1.$ 7.0       22.87       14.         7.5       24.81       15         8.0       28.25       14.         8.5       27.89       17         8.0       28.83       18         9.0       28.83       18         9.5       31.17       14         10.0       32.81       24         11.0       38.09       15.         11.0       38.09       15.         11.0       38.09       15.         11.0       38.09       15.         11.0       38.09       15.         12.6       34.45       24         13.0       42.65       24.         13.0       42.65       24.         13.0       42.65       24.         15.0       46.33       25.         15.0       46.33       26.         15.0       46.21       39.         15.0       46.23       24.         15.0       46.24       39.         15.0       45.27       24.         15.0       45.24	8.5	18.04	U		
8.5         21.33         r1           7.0         22.87         16-           7.5         24.81         15           8.0         28.25         14           8.5         27.89         17           8.6         27.89         17           9.0         29.23         18           9.5         31.17         14           10.0         32.81         5           11.0         35.09         35           11.0         35.09         35           11.0         35.09         35           11.3         37.73         82           11.4         37.73         82           12.0         39.37         2.4           12.3         41.01         2.5           13.0         42.65         2.4           13.4         44.29         2.7           14.5         47.87         2.4           15.0         49.21         7%           15.0         49.21         7%           15.0         49.21         7%           15.0         49.21         7%           15.5         54.13         5%           16.5	6,0	19.69	16		
7.8       22.97       1.4         7.5       24.81 $35$ 8.0       28.25 $14$ 8.5       27.89 $17$ 8.0       28.83 $16$ 8.5       21.17 $16$ 9.6       28.83 $16$ 9.5       31.17 $16$ 10.0       32.81 $26$ 11.0       36.00 $22$ 11.0       36.00 $22$ 11.0       38.300 $22$ 11.0       38.300 $24$ 12.0       39.37 $24$ 12.1 $28.33$ $24$ 12.2       39.37 $24$ 13.6       42.65 $24$ 13.6       42.65 $24$ 13.5       44.29 $27$ 14.5       47.67 $24$ 15.6       50.86 $31$ 16.0       42.49 $32$ 16.0       52.40 $32$ 17.0       65.77 $24$ 17.1       57.41 $36^{2}$ 18.5	6.5	21.33	8		
7.6 $24.81$ $15$ $8.0$ $28.25$ $16$ $8.8$ $27.88$ $17$ $9.0$ $28.23$ $16$ $8.5$ $31.17$ $18$ $10.0$ $32.81$ $2n$ $11.0$ $34.43$ $2n$ $11.0$ $34.43$ $2n$ $11.0$ $38.08$ $2n$ $11.4$ $37.73$ $9.3$ $11.4$ $37.73$ $9.3$ $11.4$ $37.73$ $9.3$ $11.4$ $37.73$ $9.3$ $11.4$ $37.73$ $9.3$ $11.4$ $37.73$ $9.3$ $11.4$ $37.73$ $9.3$ $11.4$ $37.73$ $9.3$ $12.0$ $39.37$ $2.4$ $12.4$ $41.01$ $2.5$ $13.4$ $44.265$ $2.4$ $14.5$ $47.67$ $2.9$ $14.5$ $47.67$ $2.9$ $14.5$ $62.68$ $91.1$ $16.5$ $62.77$ $2.4$ <	7.0	22.97	14		
$0.0$ $29.25$ $15$ $0.6$ $27.90$ $17^{\circ}$ $0.0$ $29.63$ $16$ $0.5$ $31.17$ $17$ $10.0$ $32.81$ $2n$ $11.0$ $32.81$ $2n$ $11.0$ $32.81$ $2n$ $11.0$ $32.81$ $2n$ $11.5$ $37.73$ $23$ $11.5$ $37.73$ $23$ $11.5$ $37.73$ $23$ $11.5$ $37.73$ $23$ $11.5$ $37.73$ $23$ $11.5$ $37.73$ $23$ $11.5$ $37.73$ $23$ $11.5$ $37.73$ $24$ $12.5$ $41.01$ $2x$ $13.4$ $42.055$ $24$ $13.4$ $42.055$ $24$ $14.5$ $47.67$ $24$ $14.5$ $47.67$ $24$ $14.5$ $47.67$ $24$ $13.5$ $54.13$ $37$ $15.5$ $54.13$ $37$	7.5	24.61	15		
$8.5$ $27.99$ $1^{-7}$ $9.0$ $29.83$ $10$ $6.5$ $31.17$ $10$ $10.0$ $32.81$ $2n$ $10.5$ $34.45$ $2n$ $11.5$ $34.45$ $2n$ $11.6$ $38.09$ $2n$ $11.6$ $38.37$ $2.4$ $12.6$ $41.01$ $2.5$ $12.6$ $41.01$ $2.5$ $13.4$ $42.05$ $2.4$ $13.4$ $42.65$ $2.4$ $13.4$ $42.65$ $2.4$ $13.5$ $44.28$ $2.7$ $14.5$ $47.67$ $2.7$ $14.5$ $47.67$ $2.8$ $14.5$ $46.23$ $2.9$ $14.5$ $46.23$ $2.9$ $14.5$ $50.85$ $31$ $16.0$ $32.49$ $321$ $18.5$ $54.13$ $37$ $14.5$ $57.41$ $34^{-1}$ $18.5$ $60.79$ $32.49$ $18.0.5$ $60.79$ $37$	8.0	26,25	16		
9,0 $29,53$ $16$ $8.5$ $31,17$ $17$ $10.0$ $32,81$ $5a$ $11.5$ $34,485$ $2a$ $11.5$ $34,485$ $2a$ $11.5$ $34,485$ $2a$ $11.5$ $37,73$ $323$ $11.5$ $37,73$ $323$ $11.5$ $37,73$ $323$ $12.6$ $40,537$ $2.4$ $12.5$ $41.01$ $2.8$ $13.4$ $42,655$ $2.4$ $13.4$ $42,655$ $2.4$ $13.4$ $42,655$ $2.4$ $13.4$ $42,655$ $2.4$ $14.0$ $45,853$ $2.8$ $14.0$ $42,655$ $2.4$ $14.0$ $42,655$ $2.4$ $14.0$ $42,655$ $2.4$ $14.0$ $42,655$ $2.4$ $14.0$ $42,655$ $2.4$ $14.0$ $42,655$ $2.4$ $14.0$ $42,655$ $2.4$ $16.0$ $52,449$ $32.4$	8.6	27.89	17		
$9.5$ $31.17$ $14$ $10.0$ $32.81$ $2a$ $10.5$ $34.45$ $2a$ $11.0$ $36.09$ $35.$ $11.3$ $37.73$ $9.3$ $11.8$ $37.73$ $9.3$ $12.0$ $39.37$ $2.4$ $12.0$ $39.37$ $2.4$ $12.5$ $41.01$ $2.5$ $13.4$ $42.65$ $2.4$ $13.4$ $42.65$ $2.4$ $13.4$ $42.65$ $2.4$ $14.0$ $45.93$ $5a$ $14.5$ $47.87$ $2.4$ $15.0$ $49.21$ $3a$ $16.5$ $50.85$ $31$ $16.5$ $50.85$ $31$ $16.5$ $50.85$ $31$ $16.5$ $50.85$ $31$ $17.0$ $57.41$ $34^{-1}$ $18.5$ $60.70$ $37$ $18.5$ $60.89$ $37$ $18.5$ $63.68$ $37$ $18.5$ $63.68$ $37$	9,0	29.53	6		
10.0       32.81 $7_{a}$ 10.5       34.45 $2_{a}$ 11.0       35.08 $2_{b}$ 11.8       37.73 $2_{3}$ 12.0       39.37 $2_{4}$ 12.0       39.37 $2_{4}$ 12.0       39.37 $2_{4}$ 12.4       39.37 $2_{4}$ 13.0 $4_{2.65}$ $2_{4}$ 13.4 $4_{2.65}$ $2_{4}$ 13.5 $4_{4.29}$ $2_{7}$ 14.0 $4_{5.83}$ $2_{8}$ 14.0 $4_{5.83}$ $2_{8}$ 14.5 $4_{7.67}$ $2_{4}$ 15.0 $4_{9.21}$ $\gamma_{6}$ 16.5 $50.85$ $11$ 16.5 $52.49$ $3_{2}$ 16.5 $52.49$ $3_{2}$ 17.0 $55.77$ $2_{4}$ 18.5 $60.70$ $3_{7}$ 18.4 $52.44$ $3_{2}$ 18.5 $63.98$ $3_{2}$ 18.5 $63.98$ $3_{2}$ 18.5 $63.98$ $3_{2}$	9.5	31.17	19		
11.5       34.45       24         11.0       35.09       25         11.5       37.73       24         12.0       39.37       24         12.5       41.01       2.5         13.0       42.65       24         13.8       44.29       2.7         14.0       45.93       28         14.0       45.93       28         14.0       45.93       28         14.0       45.93       28         14.5       47.67       24         15.0       48.21       76         15.0       48.21       76         16.5       50.85       31         16.5       50.85       31         16.5       52.49       32         17.6       52.77       34         17.5       57.41       34         17.5       57.41       34         18.5       60.70       37         18.0       52.44       76         18.5       63.98       71         18.5       63.98       71         18.5       63.98       71         18.5       63.98       71	10.0	32.81	14		
11.0     38.09     32.       11.5     37.73     24       12.0     39.37     24       12.5     41.01     2.5       13.0     42.65     21.       13.8     44.29     2.7       14.0     45.83     29.       14.0     45.83     29.       14.0     45.83     29.       14.5     47.67     24       15.0     48.21     70.       15.5     50.85     31       16.0     52.49     32.       17.0     55.77     3.4       17.5     57.41     34"       18.5     60.70     37       19.0     62.24     76       19.0     62.24     76       19.0     62.24     76       19.0     62.24     76	10.5	34.45	<u>k</u>		
11.5     37.73     93       12.0     39.37     7.4       12.5     41.01     2.5       13.0     42.65     24       13.2     42.65     24       13.5     44.29     2.7       14.0     45.93     2.8       14.5     47.57     2.4       15.0     48.21     76       15.5     50.85     31       16.0     52.49     32       17.0     55.77     3.4       17.5     57.41     34'       18.5     60.70     37       19.0     62.24     76       18.5     63.88     71       19.0     62.24     76       19.0     62.24     76	11.0	38.09	34		
12.0     39.37     2.4       12.5     41.01     2.5       13.0     42.65     21       13.8     44.29     2.7       14.0     45.93     28       14.5     47.67     24       15.0     48.21     76       15.0     48.21     76       15.0     48.21     76       15.5     50.85     31       15.5     50.85     31       16.0     52.49     32       17.0     55.77     3.4       17.1     57.41     36       18.5     60.70     37       19.0     62.34     76       20.0     65.52     40	11.8	37.73	2/3		
$12.5$ $41.01$ $2.5$ $13.0$ $42.65$ $2.4$ $13.5$ $44.29$ $2.7$ $14.0$ $45.83$ $2.9$ $14.4$ $45.83$ $2.9$ $14.5$ $47.67$ $2.4$ $15.0$ $49.21$ $76$ $16.5$ $50.85$ $31$ $16.5$ $50.85$ $31$ $16.5$ $50.85$ $31$ $16.5$ $54.13$ $37$ $17.0$ $55.77$ $3.4$ $17.5$ $57.41$ $34^{-}$ $18.5$ $60.70$ $37$ $18.5$ $60.70$ $37$ $19.0$ $62.34$ $78$ $30.0$ $65.62$ $40$	12.0	39,37	24		8
13.0       42.65       21         13.5       44.29       27         14.0       45.93       29         14.5       47.57       24         15.0       48.21       70         15.0       48.21       70         15.5       50.86       31         16.0       52.49       32         17.0       55.77       3.4         17.5       57.41       34         18.5       60.78       37         18.5       60.78       37         18.5       60.78       37         18.5       60.78       37         18.5       60.78       37         18.5       60.78       37         19.0       62.24       36         19.5       63.58       37         19.0       62.34       36         30.0       66.52       40	12.5	41.01	28		
13.5       44.29       27         14.0       45.93       28         14.5       47.67       24         15.0       49.21       70         18.5       50.85       31         18.5       50.85       31         16.0       52.49       32         16.5       54.13       37         17.0       55.77       3.4         17.5       57.41       34'         18.5       60.70       37         18.5       60.70       37         19.0       62.24       76         19.3       63.98       71         39.00       65.52       40	13.0	42.65	<u>11.</u>		
14.0       45.93       28.         14.5       47.57       24         15.0       48.21       76.         15.5       50.85       31         16.6       52.49       32.         18.5       54.13       37.         17.0       55.77       3.4.         17.5       57.41       34"         18.5       60.70       37         18.5       60.70       37         18.5       60.70       37         19.8       62.24       78         19.9       62.24       78         19.0       62.24       78         19.0       62.24       78         19.0       62.24       78         20.0       65.62       45	13.5	44,29	17		
$14.5$ $47.67$ $24$ $15.0$ $48.21$ $76$ $15.5$ $50.85$ $31$ $16.0$ $52.49$ $32$ $18.5$ $54.13$ $37$ $17.0$ $55.77$ $3.4$ $17.5$ $57.41$ $36^{$	14.0	45,93	29.		
$15.0$ $48.21$ $36$ $15.5$ $50.85$ $31$ $16.0$ $52.49$ $32$ $16.5$ $54.13$ $83$ $17.0$ $55.77$ $34$ $17.5$ $57.41$ $34^{\circ}$ $18.5$ $60.70$ $37$ $18.5$ $60.70$ $37$ $19.0$ $62.34$ $36$ $19.5$ $63.98$ $37$ $20.0$ $66.52$ $46$	14.5	47.57	24		
15.5       50.86 $>1$ 16.0       52.49 $>2$ 15.5       54.13 $>2$ 15.5       54.13 $>2$ 17.0       55.77 $>24$ 17.5       57.41 $>2$ 18.5       60.70 $>2$ 18.5       60.70 $>7$ 19.0       62.24 $>6$ 19.5       63.98 $>7$ 20.0       65.62 $4^{\circ}$	15.0	49.21	76		
16.0       \$2,49       \$2.         16.5       54.13       \$7         17.0       55.77       3.4         17.5       57.41       34         17.5       57.41       34         18.0       59.06       36         18.5       60.70       37         19.0       62.24       36         19.5       63.98       31         20.0       65.52       40	16.6	50.85	31		
16.5     54.13     57       17.0     55.77     3.4       17.5     57.41     34       17.5     57.41     34       18.0     59.06     36       18.5     60.70     37       19.0     62.24     36       19.5     63.98     31       20.0     65.52     40	16,0	52,49	32		
17.0     55.77     3.4       17.5     57.41     3.4       18.0     59.06     3.6       18.5     60.70     3.7       19.0     62.34     36       19.5     63.58     3.7       20.0     65.52     40	16.5	54.13	97		
17.5     57.41     36"       18.0     59.06     36       18.5     60.70     37       19.0     62.34     36       19.5     63.98     37       20.0     65.52     40	17.0	<b>55.77</b>	34		
18.0         59.06         36           18.5         60.70         37           19.0         62.34         36           19.5         63.98         31           20.0         65.52         40	17.5	57.41	<u>*</u>		
18.5         60.70         37           19.0         62.34         36           19.5         63.98         37           20.0         65.52         40	18.0	59,06	<u>Va</u>		
19.0         62.24         76           19.5         63.98         74           20.0         65.52         40	18.5	60,70	<u>77</u>		
19.5 63.98 79 20.0 65.52 Ao	19.0	62.34	***		
20.0 65.52 40	19.5	63.98	<b>N</b>		
	20.0	65.62	<i>/</i> (b)		

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<b>GEOVISION SUSPENSION LOGGING FIELD NOTES</b>					
SITE:_CA	LVERT CL	IFFS COLA R_d	KG *	DATE: 6 /29/000	
CLIENT: SCHNABEL				JOB: 6165	
AUTHOR	R. STELL	.BR		PAGE & OF G	
			~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~		
DEPTH	DEPTH	UNFILTERED	FILTERED	COMMENTS	
METERS	FEET	FILE NO.	FILE NO.	CASING, WATER, ROCK, ETC	
· · · · · · · · · · · · · · · · · · ·	· · · · · ·				
20.6	67.26	4			
21.0	68.90	42			
21.5	70.54	43	· · · · · · · · · · · · · · · · · · ·		
22.0	72.18	1			
22.5	73.82	45	· · · · · · · · · · · · · · · · · · ·		
23.0	75,46	140	· · · · · · · · · · · · · · · · · · ·		
23.5	77,10	47			
24.0	78.74	40			
24.5	80.38	49			
26.0	82.02				
25,8	83.66	<u>P</u>			
26.0	85.30	<u> 91</u>	,	×	
26.5	86.94	67			
27.0	88.58	6+			
27.5	90.22		h		
28.0	91,88				
28.5	93.60	57			
<u>29.0</u>	95.14	98	· · · · · · · · · · · · · · · · · · ·		
29,5	96.78	<u>197</u>	· ·····		
30.0	98.43	60			
30,5	100.07		<u> </u>		
31.0	101.71	<u>62.</u>	· · · · · · · · · · · · · · · · · · ·		
31.5	103.36				
32.0	104.99				
32.5	106.63				
33.0	108.27				
33.6	109.91	1 <u>8/</u> LA	****		
34.0	111.00			· · · · · · · · · · · · · · · · · · ·	
	173.78		<u>                                      </u>		
30.0	1114.00	<u>le</u>	*	· · · · · · · · · · · · · · · · · · ·	
33.5	170.4/			*****	
<u>3810</u>	<u> </u>				
	1 118,78	142	1		
	122.00			а ал на	
	120.40		······································		
	129.01			······································	
	120-01	1.12		an ar inflainn <mark>a na</mark>	
<u> </u>	161.03 19n 20	170			
100-00-00 AN A	1429-020			·····	
L	1 191,59	<b>MCS 1</b>			

ŝ
GEOVISION	SUSPENSION	LOGGING F	ield Ni	<b>OTES</b>	
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> </u>	ingeneter aftek i dasir.	***
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	B		
41.0	134.51	81		
41.5	136.15	84		
42.0	137.60	84		
42.5	139.44	Br		
43.0	141.08	аь		
43.5	142.72	87		
44.0	144.36	68	x 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	
44.6	146.00	99		
48,0	147.64	40		
45,5	149.28	1		Mug cause?
48.0	160.92	92.		
46,5	152.58	93		8
47.0	154.20	94		
47.5	155.84	15		
48.0	157.48	96		
48.5	159.12	97		
49.0	160.78	48		
49.5	162.40	99		
50.0	164.04	100		
50.5	185.68	<u>la</u>	· · · · · · · · · · · · · · · · · · ·	
<u>81.0</u>	167,32	102		
51.5	166,96	<u>(a)</u>		
52.0	170.60	194	anan <del>a da danan a da danan ana da</del> da	
52,5	172.24	805		
53.0	173.68	<u>(06</u>		
53.5	178.52	<u>br</u>		8
<u>54.0</u>	177.17			
54.5	178.81			
55.0	180.45	410		
58.5	162.09			
56.0	183,73		······································	
56.5	185,37	1175		
<u> </u>	187,01	114	······	PTHOM IN EASURAMENT?
57.5	188,65		· · · · · · · · · · · · · · · · · · ·	Hrr Borron & ST.2m.
<u> </u>	190,29			
<u> </u>	181.93		**************************************	
68.0	193.57	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	****	
68.6	195.21		······	
<u>r eao</u>	196,85			

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GEOVISION SUSPENSION	LOGGING FIELD NOTES
SITE: CALVERT CLIFFS COLA 8-418	DATE: 6/29/06
CLIENT:_SCHNABEL	JOB: 6165
AUTHOR: R. STELLER	PAGEVF

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

60.5	198.49			
81.0	200.13	· · · · · · · · · · · · · · · · · · ·		T.O. 8 200'
R1.5	201.77			
62.0	203.41			
62.5	205.05			
63.0	206.69	<b></b>		
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			
68.6	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	238.22			
72.5	237.86			
73.0	239,50			
73.5	241.14			
74.0	242.78			
74.5	244.42		······································	
75.0	246.06		· · · · · · · · · · · · · · · · · · ·	
76.5	247.70	****	·	
76.0	249.34	*****		
78.5	250.98			
77.0	252.62		·	
7.8	254.27	······	· · · · · · · · · · · · · · · · · · ·	
78.0	256.91			
78.5	257.55	·····	·	
70.0	259.19		· · · · · · · · · · · · · · · · · · ·	
79.5	260.83	· · · · · · · · · · · · · · · · · · ·	·····	
0.08	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
CONTACT:	OFFICE	PHONE:
		PHONE
CONTACT		PHONE
**************************************	<u> </u>	PHONE.
CONTACT-		PHONE
		PHONE
NOH I ED.	<u></u>	PHONE*
	<u></u>	
DIRECTIONS TO SITE:		
GENERAL SITE CONDITIONS/LOCATION:		
BOREHOLE DESIGNATION: B-418	LOCATION	
COUNTY BANGE TO	MAMSHID-	RECTION-
ROBEHOLE CONSTRUCTION: CASED		
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VERIA IO BURGAULE PLUID	i ime sinci	LAST CHICULATION F SIR

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SITE:_CONPP COLA_		B-AIB	×	_DATE: 6/29	/2006
CLIENT: SCHNABEL				_ JOB:_6166	· · · · · · · · · · · · · · · · · · ·
AUTHOR: R. STELLER	ξ		······································	PAGE 2 OF 2	
				-	
LOGGING CREW:_R.	STELLER	. C. CAR	E.1		
VEHICLE(S) USED AN	d Mileag	IÉ: RENTAL			······································
MOBILIZED FROM: Le	MINGTON	PARE, MO	DEPARTU	RE TIME: 1	1190
ARRIVED ON SITE	7:00	••••••••••••••••••••••••••••••••••••••			
STANDBY TIME:	*		CAUSE:		
LOGGING STARTED:	19:51	······································	LOGGING	COMPLETED:	6149
—					A C A BANKAN I UK M ABAT
WINCH: COMPI	ROBE	SILVER	OYO	OTHER	
MICROLOGGER	5301	OTHER	· · · · · ·		× • • • • • • • • • • • • • • • • • • •
TELEVIEWER	OPTICAL	.#5117	ACOUSTI	C #6474 5500	OTHER
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PROBE TILT TEST	24	BRUNTON TIL	T8	Trobs I	and pr + 15 ⁻²
PROBE AZIMUTH TES	T 168.4	BRUNTON AZ	MUTH 161		_ 4_ 1
n arangelynnon i an annan alla sa ar	~ <del>************************************</del>		****	**************************************	
PROBE OFFSET	OPTICAL	1.88M(6.17FT)	ACOUSTIC	1.44M(4.72FT)	*
CASING STICK-UP	{			1.8'	9 6
DEPTHREE OFFSET	Į	» <del>*</del>		3.91	LAR' FWLT
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LOG NAME	START	START	END DEPTH	END	
	START DEPTH	START TIME	END DEPTH		
LOG NAME	START DEPTH 199.4	START TIME 15751	END DEPTH 3-25 ¹	END TIME IG: 49	
LOG NAME SaisawwP DI	START DEPTH 199.4	START TIME 15751	END DEPTH 1>25 ¹	END TIME 16-44	
LOG NAME Saisawyp Di	START DEPTH 199.4	START TIME 15751	END DEPTH 3-25 ¹	END TIME Ket 49	
LOG NAME Saisause oi	START DEPTH 199.4	START TIME 15751	END DEPTH 3-25 ¹	END TIME 16+×49	
LOG NAME 6418Au - P DI	START DEPTH 199.4	START TIME 15:51	END DEPTH 3-25 ¹	END TIME 16-49	
LOG NAME Saisause Si	START DEPTH 199.4	START TIME 15:51	END DEPTH 1>25 ¹	END TIME 1644	
	START DEPTH 199.4		END DEPTH 3-25 ¹	END TIME 16+×49	
LOG NAME 6418Au uP ol	START DEPTH 199.4	START TIME 15751	END DEPTH 3-251		
	START DEPTH 199.4	START TIME 15:51	END DEPTH 3-25 ¹	END TIME 16-44	s 
	START DEPTH 199.4	START TIME 15:51			
LOG NAME SAISAUMP DI MAINTENANCE PERFO EQUIPMENT PROBLEM	START DEPTH 199.4 DRMED OF	START TIME 15751			
LOG NAME SAIBAUSP DI MAINTENANCE PERFO EQUIPMENT PROBLEM	ISTART DEPTH 199.4 DRMED OF	START TIME 15:51			
	ISTART DEPTH 199.4 SOR FAI	START TIME 15:51			
	START DEPTH 199.4	START TIME 15:51			
LOG NAME SAISAN P DI MAINTENANCE PERFO EQUIPMENT PROBLEM	ISTART DEPTH 199.4 ORMED OF	START TIME 15751			
LOG NAME SAISAUNP DI MAINTENANCE PERFO EQUIPMENT PROBLEM SUGGESTIONS, ADDIT	ISTART DEPTH 199.4 ORMED OF	START TIME 15:51			
LOG NAME SAISANNP DI MAINTENANCE PERFO EQUIPMENT PROBLEM SUGGESTIONS, ADDIT	ISTART DEPTH 199.4 SORFA	START TIME 15:51			
LOG NAME SAISANNP SI MAINTENANCE PERFO EQUIPMENT PROBLEM SUGGESTIONS, ADDIT	ISTART DEPTH 199.4 IPH 199.4 DRMED OF	START TIME 15:51			
LOG NAME SAISAUMP DI MAINTENANCE PERFO EQUIPMENT PROBLEM SUGGESTIONS, ADDIT	ISTART DEPTH 199.4 IPH 199.6 DRMED OF	START         TIME         157 51         157 51         N SITE:         ILURES:         ANGES:			

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 /2008 . 6 / 56 / 2006
CLIENT SCHNAREL		JOB: 6165
AUTHOR: R. STELLER	······································	PAGE 1 OF 2
CONTACT:_RUBEN TARUSELLI	OFFICE_	PHONE:
	CELL	_PHONE:_703-906-1797
CONTACT:	OFFICE	PHONE
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CONTACT		PHONE
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BOREHOLE DESIGNATION: 8-418	LOCATION;	
BOREHOLE DESIGNATION: 8-418	LOCATION;	SECTION:
BOREHOLE DESIGNATION: 8-418 COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASED	LOCATION; WINSHIP:	BECTION
BOREHOLE DESIGNATION: 8-418 COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: 4/4 * 0 TO	LOCATION: WINSHIP: CASED_2	SECTION:
BOREHOLE DESIGNATION: 8-418 COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: 44 0 TO BOREHOLE TOTAL DEPTH AS DRULED: 24	LOCATION: WINSHIP: CASED D 292	BECTION:
BOREHOLE DESIGNATION: 8-418 COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: 4/4 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 2/ CONDUCTOR CASING?: YES DEPTH TO B	LOCATION: WINSHIP: CASED 2 2.45' 25'	SECTION:
BOREHOLE DESIGNATION: 8-418 COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: 4/4 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 24 CONDUCTOR CASING7: YES DEPTH TO B DEPTH TO BEDROCK: NA	LOCATION: WINSHIP: CASED_ D_ <u>2.45</u> ' DOTTOM OF	SECTION:
BOREHOLE DESIGNATION: 8-418 COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: 4/4 0 TO BOREHOLE TOTAL DEPTH RANGES: 4/4 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 2/4 CONDUCTOR CASING7: YES DEPTH TO B DEPTH TO BEDROCK: NA BOREHOLE FLUID: WATER ; FRESH WATE OTHER:	LOCATION: WINSHIP: CASED_ D_ <u>245</u> D_ DEPTH_TC R MUD_	SECTION:
BOREHOLE DESIGNATION: 8-418 COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: 4/4 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 2/4 CONDUCTOR CASING7: YES DEPTH TO B DEPTH TO BEDROCK: NA BOREHOLE FLUID: WATER FRESH WATE OTHER: DEPTH TO BOREHOLE FLUID: 0	LOCATION: WINSHIP: CASED 2 0 <u>2.45</u> 0 <u>2.45</u> 0 <u>2.45</u> 0 <u>2.45</u> 0 <u>2.45</u> 0 <u>1 <u>6</u> 0 <u>1 6</u> 0 <u>1 7</u> 0 <u>1 7</u> <u>1 </u></u>	SECTION: TO CASING: NO WATER TABLE: WATER TABLE:; E LAST CIRCULATION:# 244
BOREHOLE DESIGNATION: 8-418 COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: 4/4 0 TO BOREHOLE TOTAL DEPTH RANGES: 4/4 0 TO BOREHOLE TOTAL DEPTH RANGES: 2/2 CONDUCTOR CASING?: YES DEPTH TO B DEPTH TO BEDROCK: <u>NA</u> BOREHOLE FLUID: WATER ; FRESH WATE OTHER: DEPTH TO BOREHOLE FLUID: 0	LOCATION: WINSHIP: CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED CASED	SECTION:
BOREHOLE DESIGNATION: 8-418 COUNTY:RANGE:TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES: 4/4 0 TO BOREHOLE TOTAL DEPTH RANGES: 4/4 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 2/2 CONDUCTOR CASINGT: YES DEPTH TO B DEPTH TO BEDROCK: <u>MA</u> BOREHOLE FLUID: WATER; FRESH WATE OTHER: DEPTH TO BOREHOLE FLUID: 0 LOGGING CREW: R. STELLER . C. CA G: CB	LOCATION: WINSHIP: CASED_ D_245' 25' OTTOM OF DEPTH TC R MUD_ TIME SINC	SECTION:
BOREHOLE DESIGNATION: 8-418 COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: 4/4 0 TO BOREHOLE TOTAL DEPTH RANGES: 4/4 0 TO BOREHOLE FLUID: 0 LOGGING CREW: R. STELLER C. CA GETE VEHICLE(S) USED AND MILEAGE: RENTAL	LOCATION: WINSHIP: CASED D 2 245' D 2 7 D 2 7 D 2 D 2 7 D 2 7 D 2 7 D 2 7 D 2 7 D 2 7 D 2 7 D 2 7 D 2 7 D 2 7 D 2 7 D 2 7 D 2 7 D 2 7 D 2 7 D 2 7 D 2 7 7 7 7	SECTION:
BOREHOLE DESIGNATION: 8-418 COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: 4/4 0 TO BOREHOLE TOTAL DEPTH RANGES: 4/4 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 2/2 CONDUCTOR CASING?: YES DEPTH TO B DEPTH TO BEDROCK: NA BOREHOLE FLUID: WATER ; FRESH WATE OTHER: DEPTH TO BOREHOLE FLUID: 0 LOGGING CREW: R. STELLER C. CAGETE VEHICLE(8) USED AND MILEAGE: RENTAL MOBILIZED FROM: USED AND MILEAGE: RENTAL	LOCATION: WINSHIP: CASED 2 DEPTH TO DEPTH TO R MUD 2 TIME SINC	SECTION: TO CASING: NO // WATER TABLE: WATER TABLE:; SALT WATER MUD; E LAST CIRCULATION: 24.2.
BOREHOLE DESIGNATION: 8-418 COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: 4/4 0 TO BOREHOLE TOTAL DEPTH RANGES: 4/4 0 TO BOREHOLE FLUID: 0 LOGGING CREW: R. STELLER C. CA GETE VEHICLE(S) USED AND MILEAGE: RENTAL MOBILIZED FROM: <u>VENANCED PROME</u> ARRIVED ON SITE: 1/3: 00	LOCATION: WINSHIP: CASED 2 DEPTH 7 R MUD 2 TIME SINC	SECTION: 
BOREHOLE DESIGNATION: 8-418 COUNTY:RANGE:TO BOREHOLE CONSTRUCTION: CASEDUN DIAMETERS AND DEPTH RANGES: 4/4 0 TO BOREHOLE TOTAL DEPTH RANGES: 4/4 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 2/4 CONDUCTOR CASINGT: YES DEPTH TO B DEPTH TO BEDROCK: <u>MA</u> BOREHOLE FLUID: WATER; FRESH WATE OTHER:; FRESH WATE OTHER:; FRESH WATE DEPTH TO BOREHOLE FLUID: 0 LOGGING CREW: R. STELLER; C. CAGETE VEHICLE(8) USED AND MILEAGE: RENTAL MOBILIZED FROM: <u>USED AND MILEAGE</u> : RENTAL	LOCATION: WINSHIP: CASED_2 DEPTH 7C DEPTH 7C R MUD_2 TIME SINC R DEPARTU	SECTION: TO CASINGTO CASINGNO_V WATER TABLE: SALT WATER MUD; E LAST CIRCULATION: 244 RE TIME: 12130
BOREHOLE DESIGNATION: 8-418 COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: 4/4 0 TO BOREHOLE TOTAL DEPTH RANGES: 4/4 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: 2/4 CONDUCTOR CASING?: YES DEPTH TO B DEPTH TO BEDROCK: NA BOREHOLE FLUID: WATER ; FRESH WATE OTHER: DEPTH TO BOREHOLE FLUID: 0 LOGGING CREW: R. STELLER ; C. CA GETS VEHICLE(S) USED AND MILEAGE: RENTAL MOBILIZED FROM: <u>VEX.ASCETAD</u> AND ARRIVED ON SITE: 13: 90 STANDBY TIME: LOGGING STARTED: W/ref log. 15'55	LOCATION: WINSHIP: CASED_ D DEPTH TC R MUD_ TIME SINC  DEPARTU CAUSE:	SECTION: 

SITE:_CCNPP COLA CLIENT: SCHNABEL AUTHOR:_R. STELLER		DATE: <u>6 / 29 /2006</u> JOB: 6165 PAGE 2 OF 2	<u>u/sa/05</u>
WINCH: COMPROBE MICROLOGGER 5301 CALIPER PROBE 5368	SILVER V OYO OTHER OTHER	OTHER	<u></u> 22 <u>22</u>

BBABE OFFORT	12 IN MAX 2.08M(6.82	FT 24 IN MAX
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DEPTH REF. OFFSET	5.32'	5-35' MH EVIT

86.7%s

START	START	DEPTH	TIME '	- Inches
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197.0'	11:05	- Alme		Lakala
<u></u>	<u>8:93</u>		9:40	
Ø	4:41		9145	6/90 /04
				4 * * *
	J			<u> </u>
	START DEPTH 0 1977-0' 0 1972-0' 0	START START DEPTH TIME 0 161 55 1977-0' 17:05 0 8:05 1972-0' 9:15 9 9:141	START         START         END           DEPTH         TIME         DEPTH           0         16155         0           1977-0'         17105         \$1625'           0         8295         5           197.0'         9315         0           193.41         0         1	START         START         END         END           DEPTH         TIME         DEPTH         TIME           Image: I

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AS MEAS.	6419 CALTEST 03	12.00	3.94	7.97	
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### 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	/ 50 /2006	
CLIENT: SCHNABEL		JOB: 616	8	
AUTHOR: R. STELLER		PAGĒ 1 C	if 2	······································
	**************************************	•		
CONTACT:_RUBEN TARUSELLI	OFFICE	PHONE:	• · · • • · · · · · · · · · · · · · · ·	
	CELL	PHONE:	703-906-1797	
CONTACT:	_OFFICE	PHONE:		*
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CONTACT:		PHONE:		~~~~
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DRILLER:		PHONE:		*
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GENERAL SITE CONDITIONS/LOCATION:	· · · · · · · · · · · · · · · · · · ·	····· · · · · · · · · · · · · · · · ·		<del></del>
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BOREHOLE DESIGNATION: 18-418	LOCATION:_	· · · · · · · · · · · · · · · · · · ·	x	
COUNTY: RANGE: TO	WNSHIP;		SECTION:	<b></b> -
BOREHOLE CONSTRUCTION: CASED UNI	CASED V	· · · · · · · · · · · · · · · · · · ·		
DIAMETERS AND DEPTH RANGES: 41/2 0 TO	200	× * *	TO	
BOREHOLE TOTAL DEPTH AS DRILLED: 2	'œ'	* 1		×
CONDUCTOR CASING?: YES DEPTH TO BO	DITIOM OF C	ASING	: NO 🖌	
DEPTH TO BEDROCK: NA	DEPTH TO	WATER T/	VELE: NA	
BOREHOLE FLUID: WATER ; FRESH WATER	R MUD 🖌	SALT WA	TER MUD :	
OTHER:				
DEPTH TO BOREHOLE FLUID: 0	TIME SINCE	LAST CIR	CULATION: 4 L BE	2
		*		
LOGGING CREWL R. STELLER		w w w		
VEHICLE(S) USED AND MILEAGE: RENTAL		*****		<u> </u>
MOBILIZED FROM: LEXING MONS PARLY. MO	DEPARTUR	ETME	7:00	
ARRIVED ON SITE: 7:30				
STANDBY TIME:	CAUSE:			
LOGGING STARTED: 9.5B	LOGGING	OMPLETE	DE JANIS	<del></del>
				- <del>Tana</del> nt

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

SITE:_CONPP COLA	<u>B-418</u>	DATE: 6/ 50 /2008
CLIENT: SCHNABEL		JOB:_6165
AUTHOR:_R. STELLER		PAGE 2 OF 2

WINCH:	COMPROBE	SILVER / OYO OTHER
MICROLOGGE	r 5301	OTHER
ELOG PROBE	5490	OTHER

PROBE OFFSET	2.50M(8.20 FT)	
CASING STICK-UP	<u>~1.5 + 3</u> 2.6	
DEPTH REF. OFFSET	<u>39.5</u>	

LOG NAME BAIBELON OPOI	START DEPTH	START TIME 17:58	END DEPTH &A-D	END TIME
		***		

#### 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 / 15 /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	GES: 474 0	TO 2007	: 	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 🖌 ; (	SALT WATER M	UD:

LOGGING CREW:_R. STELLER____

		······································	1	
LOG TYPE	FILE NAME	DEPTH RANGE	DATE	TIMES
DEMARTON	BAPS DEJUPOL	1955-187.0	6/0104	16:15 - 16:20
OBJINGON	6425 DEL-4902	1935-(-11)	6/13/00	16:20- 17:12
بمروره ومرو	601 - 113	1.6 - 125.4	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	6/13/000	A147 - 20108
CHARLES M	6425 TEOPL NOS		6/15/04	80:11 - 20:15
ELOG	B444 plat up of	200 - 3.8'	L 715 106	10:24 - 20:50
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# B-423 -ACOUSTIC TELEVIEWER FIELD LOG

SITE:_CCNPP COLA		DATE: C. 123 /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:
· · · · · · · · · · · · · · · · · · ·		PHONE:
CONTACT:		PHONE:
		PHONE
CONTACT:	¥ ·····	PHONE
		PHONE
DRILLER:	3	PHONE
COMPANY:	x -	PHONE:
GENERAL SITE CONDITIONS/LOCATION:		
BOREHOLE DESIGNATION: 8-423	_LOCATION	
COUNTY: RANGE: 1	OWNSHIP:	SECTION:
BOREHOLE CONSTRUCTION: CASED	INCASED 7	
DIAMETERS AND DEPTH RANGES: 474-0"	TO_2007	то то
BOREHOLE TOTAL DEPTH AS DRILLED:	2.80'	
CONDUCTOR CASING7: YES DEPTH TO	BOTTOM OF	CASING : NO
DEPTH TO BEDROCK: NA	DEPTH TO	WATER TABLE:
BOREHOLE FLUID: WATER; FRESH WAT OTHER:	ER MUD V	SALT WATER MUD
DEPTH TO BOREHOLE FLUID;	TIME SINC	E LAST CIRCULATION: < S HR.

* *



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SITE:_CONPP COLA_	B-	-423		DATE: 6	/ 13 /2006
CLIENT:_SCHNABEL_		· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	JOB:_616	6
AUTHOR: R. STELLE	<u>.</u>	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	PAGË 2 (	)F2
LOGGING CREW:_R.	STELLER	× · · · · · · · · · · · · · · · · · · ·		× ×	
VEHICLE(S) USED AN	d Mileag	E: _RENTAL	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~		
MOBILIZED FROM: L	EXTAND TOPA	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	ROBE	_ Silver	_0Y0	_OTHER_	MANTE
MICROLOGGER	5301	OTHER MØ	<u>112</u>		
TELEVIEWER	OPTICAL	.#8117	ACOUSTIC	\$ <b>#</b> 5174	_ OTHER ComPROSE.
	<i>.</i>				
PROBE TILT TEST	20	BRUNTON TIL	T_ <b>4</b>		
PROBE AZIMUTH TES	T <u>_ ¦{* Z</u>	_ BRUNTON AZ	MUTH	- 1.1.4	H
	Tanana a r		*****		
PROBE OFFSE	PTICAL	. 1.80M(8.17FT)	ACOUSING	; 1.44M <u>(4.7</u>	Setul Asters have a
CASING SHOK-UP	Î •	·			- 1
DEPTH KEF. OFFSEL			ļ <u></u>		<u>l</u>
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	REDTU		ICINU ICINU		a a a a a a a a a a a a a a a a a a a
R MLOGALP AT				<u>    000</u> ⊑    <i>  </i> /∧	<u> </u>
7. 19406 miller	MALC	L North		1 10 <u>1 × 40</u> 1 151 15	× × ×
13.412.22 W 1-1	<u>119×32</u>		****	11-18	*
			<u> ************************************</u>	***	
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· · · · · · · · · · · · · · · · · · ·	*****************	1			
MAINTENANCE PERFORMED ON SITE:					
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-	¹
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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: 6/13/06
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:	PHONE
COMPANY:	PHONE
GENERAL SITE CONDITIONS/LOCATION:	
EA#	
COUNTY: RANGE:	TOWNSHIP: SECTION:
BOREHOLE CONSTRUCTION: CASED	INCASED_/TOTO
BOREHOLE TOTAL DEPTH AS DRILLED:	<u>80</u>
CONDUCTOR CASING?: YES DEPTH TO	BOTTOM OF CASING; NO_Y
DEPTH TO BEDROCK N.P.	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 Voi 1 of 2 CCNPP COLA Boring Geophysics rev A 11/14/2006 Page 300 of 366



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SITE: CALVERT CLIFFS COLA 8-42	DATE: G/M/06
	JOB: 6166 /
	PAGE 2 OF
	•
LOGGING CREW: Q. 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:	ARRIVAL TIME:
ADDITIONAL DEMOB TIME:	REASON:
BATTERIES CHANGED BEFORE LOGGING: Y	
INSTRUMENT OYO 12004 15014	19029 RG 160023 2 160024
RECEIVER S/N 12008 20042	
MAINTENANCE PERFORMED ON SITE:	*
TAX MENDING TO THE PROPERTY OF AND AND TAXES IN THE PARTY	· · · ································
EQUIPMENT PROBLEMS ON 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
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<u>антина л'я ляжной станон то </u>	a a a a a a a a a a a a a a a a a a a
SUGGESTIONS, ADDITIONS, CHANGES;	14 x x x x x x x x x x x x x x x x x x x
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<u>* ***********************************</u>	· · / · · · · · · · · · · · · · · · · ·
COMMENTS: 90704 ZERO C. 9Am	-55m(19) - 1.93m
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	A MARKAN AND AND AND AND AND AND AND AND AND A
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GEOVIsion Geophysical Services 1161 Pomone Road, Suite P, Corona, CA 92862, Ph (951) 549-1234, Fx (951) 549-1236 GEOVIsion Report 6165-01 Vol 1 of 2 CCNPP COLA Boring Geophysics rev A 11/14/2006 Page 301 of 366

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	DÊPTH	UNFILTERED	FILTERED	COMMENTS		
METERS	FEET	FILE NO.	FILE NO.	CASING, WATER, ROCK, ETC		
	1.64		······································			
1.0	3.28					
	4.92	<u> }</u>				
20	6.58					
20	<u> </u>		<del></del>			
	8.04		· · · · · · · · · · · · · · · · · · ·			
3.0		7	* ******			
<u>- 74</u>	13.14		······			
80	<u>19.79.</u> 1 48.40		1	**************************************		
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en en	10.07	<u>и</u> /л	* ************************************			
88	10,00					
70	23.07		* * **********************************	· · · · · · · · · · · · · · · · · · ·		
7.5	24.81					
80	26.25					
8.5	27,89		* · · · · · · · · · · · · · · · · · · ·			
an an	29.53					
9.5	31.17		*	· · · · · · · · · · · · · · · · · · ·		
10.0	32.81	12	ж <mark>е жанала и кала и к</mark>			
10.5	34.45	<b>1</b> 11				
11.0	36.09	n	· · · · · · · · · · · · · · · · · · ·	1		
11.5	37,78	23		Comment of the second s		
12.0	39.37	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	<u>43</u>				
17.0	55.77	34				
17.5	57,41	<b>X</b>				
18.0	59.06	342				
18,5	60.70	2				
	62.34	10				
19.5	63.98					
20.0	65.62	<i>Ø</i>				

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		423	DATE: CAM	Øa	
CLIENT:	SCHNAR	EL		JOB 8185		
AUTHOR: R. STELLER			<u> </u>	PAGE A OF 5		
			** ^{**} ********************************			
DEPTH	DEPTH	UNFILTERED	FILTERED	COMMENTS	<u> </u>	
METERS	FEET	FILE NO.	FILE NO.	CASING, WATER, R	OCK FTC	
	*******					
* * **			• • • • • • • • • • • • • • • • • • •	**************************************		
20.5	67.26	A			**************************************	
21.0	68.90	41			******	
21.5	70.54	A'S.				
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		
23.0	75,46	46			<u>~~~~~~~~~~~~~~~~~~~~~~~~~~~~</u>	
23.5	77.10	h				
24.0	78.74	4				
24.5	80.38	44				
25.0	62.02	50				
25.5	83.66	5				
26,0	85,30	SL.			· · · · · · · · · · · · · · · · · · ·	
26.5	86.94	53		a n.a	******	
27.0	88.58	<b>64</b>				
27,5	90.22	ß				
28.0	91.86	ß				
28.5	93.50	\$7				
29.0	95,14	51				
29.5	96.78	রা				
30.0	98.43	60				
30.5	100.07	61				
31,0	101.71	62	· · · · · · · · ·			
31.5	103.35	63			300.000 1001	
32.0	104.99	64	* * * * * * * * * * * * * * * * * * *			
32.5	106.63	65				
33.0	108,27	660				
33.5	109.91	67				
34.0	111.55	669		· · · · · · ·		
34.5	113.19	A				
35.0	114.83	10	······································			
35.5	118.47	7			· · · · ·	
36.0	118.11	72				
36.5	119.75	03			-	
. 37.0	121.39	74		~~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~		
37.5	123.03	75				
38.0	124.87	76				
38,5	126.31	77	*			
39.0	127.95	78	**		·	
39.5	129.59	2	- ~ ~ · · · · · · · · · · · · · · · · ·	* * *		
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*	G	Eovision sus	Spension L	ogging field notes		
SITE: CALVERT CLIFFS COLA 8-425			DATE: 6/15/05			
CLIENT:	_SCHNAB	EL	*	JOB: 6165		
<b>AUTHOR</b>	_R. STELI	.ER		PAGE 5 OF 5		
	<u> </u>	**************************************				
DEPTH	DEPTH	UNFILTERED	FILTERED	COMMENTS		
METERS	FRET	FILE NO.	FILE NO.	CASING, WATER, ROCK, ETC		
<u> </u>	<u>****</u>	**************************************		AND THE REAL PROPERTY AND		
40.5			** * * * <u>*** ** ***</u>	· · · · · · · · · · · · · · · · · · ·		
44.0	<u>  132.0/</u>   434.54		******			
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43.5	142.72	<b>4</b> n	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
44.0	144.36		***			
44.5	146.00	84	*			
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45.5	149.28	A.	*	NOT		
46.0	150.92	49	**************************************	**************************************		
46.5	152.58	43				
47.0	154.20	94				
47.5	155,84	195				
48.0	157.48	14	* ** *****			
48.5	159.12	11				
49.0	160,76	98				
49.5	162.40	99				
50,0	164.04	(200				
50.6	165.68	101				
51,0	167,32	012				
61,5	168.96	<u>(67)</u>				
52.0	170.60	r04				
52,5	172,24	w.		× *		
53.0	173.88	U.C.				
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54.0	177.17	1019				
-54.5	178.81	109		* * * * * * * * * * * * * * * * * * * *		
<u> </u>	180,45	<u>, , , , , , , , , , , , , , , , , , , </u>				
55.5	182.09		· · · ·	<del></del>		
56.0	183.73	<u>[</u> []]				
	105,37		* * *			
57.0	167.01	** * * * *	<u> </u>	VOTCOM INGERICAMENT		
<u> </u>	108.65	<u></u>	·····	HIT WARDIN CENTO MAL TIPE (98.1		
58.0	190.29	<u> </u>				
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59.0	193.57	· · · · · · · · · · · · · · · · · · ·				
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<u>, on'n</u>	190.93	***	<u>I</u>			

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# 8-423 CALIPER FIELD LOG

SITE:_CCNPP COLA	DATE:69 / 15 /2006
CLIENT: SCHNABEL	JOB: 6165
AUTHOR: R. STELLER	PAGE 1 OF 2
CONTACT:_RUBEN TARUSELLI	_OFFICEPHONE:
	_CELLPHONE:_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:	
	<u>, , , , , , , , , , , , , , , , , , , </u>
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- * *	
BOREHOLE DESIGNATION: B-423	LOCATION:
BOREHOLE DESIGNATION: <u>B-423</u>	LOCATION:
BOREHOLE DESIGNATION: <u>B-423</u> COUNTY: RANGE: TO	LOCATION:
BOREHOLE DESIGNATION: B-423 COUNTY: RANGE: TO BOREHOLE CONSTRUCTION: CASED UN	LOCATION:
BOREHOLE DESIGNATION: <u>B-423</u> COUNTY: <u>RANGE</u> TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: 474-010	LOCATION:
BOREHOLE DESIGNATION: <u>B-423</u> COUNTY: <u>RANGE</u> TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: <u>47/4-</u> 0 TO BOREHOLE TOTAL DEPTH AS DRILLED:	LOCATION:
BOREHOLE DESIGNATION: <u>B-423</u> COUNTY: <u>RANGE</u> : TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: <u>474</u> 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: <u>6</u> CONDUCTOR CASING?: YES DEPTH TO BO	LOCATION:
BOREHOLE DESIGNATION: <u>B-423</u> COUNTY: <u>RANGE</u> TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: <u>47/4</u> 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: <u>6</u> CONDUCTOR CASING7: YES DEPTH TO BO DEPTH TO BEDROCK:	LOCATION:
BOREHOLE DESIGNATION: <u>B - 423</u> COUNTY: <u>RANGE</u> TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: <u>47/4</u> 0 TO BOREHOLE TOTAL DEPTH AS DRILLED; <u>6</u> CONDUCTOR CASING7: YES DEPTH TO BO DEPTH TO BEDROCK: <u>FRESH WATER</u>	LOCATION:
BOREHOLE DESIGNATION: <u>B-423</u> COUNTY: <u>RANGE</u> TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: <u>47/4</u> 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: <u>47/4</u> 0 TO BOREHOLE TOTAL DEPTH TO BE DEPTH TO BEDROCK: <u>5000000000000000000000000000000000000</u>	LOCATION:
BOREHOLE DESIGNATION: <u>B - 423</u> COUNTY: <u>RANGE</u> : <u>TO</u> BOREHOLE CONSTRUCTION: CASED <u>UN</u> DIAMETERS AND DEPTH RANGES: <u>47/4</u> 0 TO BOREHOLE TOTAL DEPTH RANGES: <u>47/4</u> 0 TO BOREHOLE TOTAL DEPTH AS DRILLED; <u>0</u> CONDUCTOR CASING7: YES <u>DEPTH TO BO</u> DEPTH TO BEDROCK: BOREHOLE FLUID: WATER ; FRESH WATE OTHER: <u>DEPTH TO BOREHOLE FLUID</u> :	LOCATION: WNSHIP:
BOREHOLE DESIGNATION: <u>B-423</u> COUNTY: <u>RANGE</u> TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: <u>47/4</u> 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: <u>4</u> CONDUCTOR CASING7: YES DEPTH TO BO DEPTH TO BEDROCK: BOREHOLE FLUID: FRESH WATER OTHER: <u>DEPTH TO BOREHOLE FLUID</u> :	LOCATION:
BOREHOLE DESIGNATION: <u>B - 423</u> COUNTY: <u>RANGE</u> TO BOREHOLE CONSTRUCTION: CASED UN DIAMETERS AND DEPTH RANGES: <u>47/4</u> 0 TO BOREHOLE TOTAL DEPTH AS DRILLED; <u>6</u> CONDUCTOR CASING7: YES DEPTH TO BO DEPTH TO BEDROCK: BOREHOLE FLUID: WATER ; FRESH WATEL OTHER: <u>1000000000000000000000000000000000000</u>	LOCATION: WNSHIP:
BOREHOLE DESIGNATION: <u>B - 423</u> COUNTY: <u>RANGE</u> : <u>TO</u> BOREHOLE CONSTRUCTION: CASED <u>UN</u> DIAMETERS AND DEPTH RANGES: <u>474</u> 0 TO BOREHOLE TOTAL DEPTH AS DRILLED: <u>6</u> CONDUCTOR CASING7: YES <u>DEPTH TO BO</u> DEPTH TO BEDROCK: BOREHOLE FLUID: WATER ; FRESH WATEL OTHER: <u>CONSTRUCTION</u> ; FRESH WATEL OTHER: <u>CONSTRUCTION</u> ; FRESH WATEL DEPTH TO BOREHOLE FLUID: <u>CONSTRUCTION</u>	LOCATION: WN8HIP:
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### B-425 ELOG FIELD LOG

SITE:_CONPP COLA		DATE: 6 / 13 /2006
CLIENT: SCHNABEL		JOB: 6165
AUTHOR:_R. STELLER	* * *	PAGE 1 OF 2
CONTACT: RUBEN TARUSELLI	ÓFFICE	PHONE
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DIAMETERS AND DEPTH RANGES: 43/4 0 TO	2001	,, TO
BOREHOLE TOTAL DEPTH AS DRILLED;	<u>, 10'</u>	
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LOGGING CREW:_R. STELLER	*******	
VEHICLE(S) USED AND MILEAGE: _RENTAL		
MOBILIZED FROM: LEXINGTON PROX-	DEPARTUR	RE TIME: 7:00
ARRIVED ON SITE: 7130		
STANDBY TIME:		
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GEOVIsion Georgent Services 1151 Pomone Road, Unit P. Corona, CA 92492 Ph (951) 549-1234 Fz (951) 549-

CLIENT: SCHNABE		*		JOB; 6165	<u></u>
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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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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:
CLIENT:	JOB:
AUTHOR:	PAGE 1 OF
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CONTACT:	
0017107	
CONTACT:	OFFICEPHONE:
0017107	PHONE:
CONTACT:	PHONE:
	PHONE:
CONTACT:	PHONE:
	PHONE:
DRILLER:	PHONE:
COMPANY:	PHONE:
GENERAL SITE CONDITIONS/LOCA	TION:
BOREHOLE DESIGNATION:	LOCATION:
COUNTY: RANGE:	TOWNSHIP: SECTION:
BOREHOLE CONSTRUCTION: CAS	ED UNCASED
DIAMETERS AND DEPTH RANGES:	0 ТО : ТО
BOREHOLE TOTAL DEPTH AS DRIL	
CONDUCTOR CASING?: YES	DEPTH TO BOTTOM OF CASING : NO
DEPTH TO BEDROCK:	DEPTH TO WATER TABLE:
BOREHOLE FLUID: WATER; F	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:
DEMOBILIZED TO:	ARRIVAL TIME:
ADDITIONAL DEMOB TIME:	REASON:
WINCH COMPROBE	GREY OYO RG OTH 19029 RG 160023 160024 26066 11001 23053
EQUIPMENT PROBLEMS OR FAILURES:	
SUGGESTIONS, ADDITIONS, CHANGES:	
COMMENTS:	

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CLIENT:

DATE:

OF

AUTHOR:

JOB: PAGE

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	FFFI	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> R <b>\$</b> pfort	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>\$iøn∕</b> R <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
# **GEOVISION SUSPENSION LOGGING FIELD NOTES**

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DEPTH	DEPTH			COMMENTS
METERS	FFFT			CASING WATER ROCK FTC
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			
108.0 GE	0V <b>3:54R33</b> ort	6165-01 Vol 1 of 2 CCNPP COLA	Boring Geophysics rev A	11/14/2006 Page 325 of 366

# **GEOVISION SUSPENSION LOGGING FIELD NOTES**

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DEPTH	DEPTH	UNFILTERED	FILTERED	COMMENTS	
METERS	FEET	FILE NO.	FILE NO.	CASING, WAT	FER, 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	<u> </u>			
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	OVidaiopBR300prt	6165-01 Vol 1 of 2 CCNPP C	OLA 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