

## **APPENDIX A**

# **SUSPENSION VELOCITY MEASUREMENT QUALITY ASSURANCE SUSPENSION SOURCE TO RECEIVER ANALYSIS RESULTS**

## Plant Vogtle Boreholes B-1002 & B-1002A Source to Receiver and Receiver to Receiver Analysis

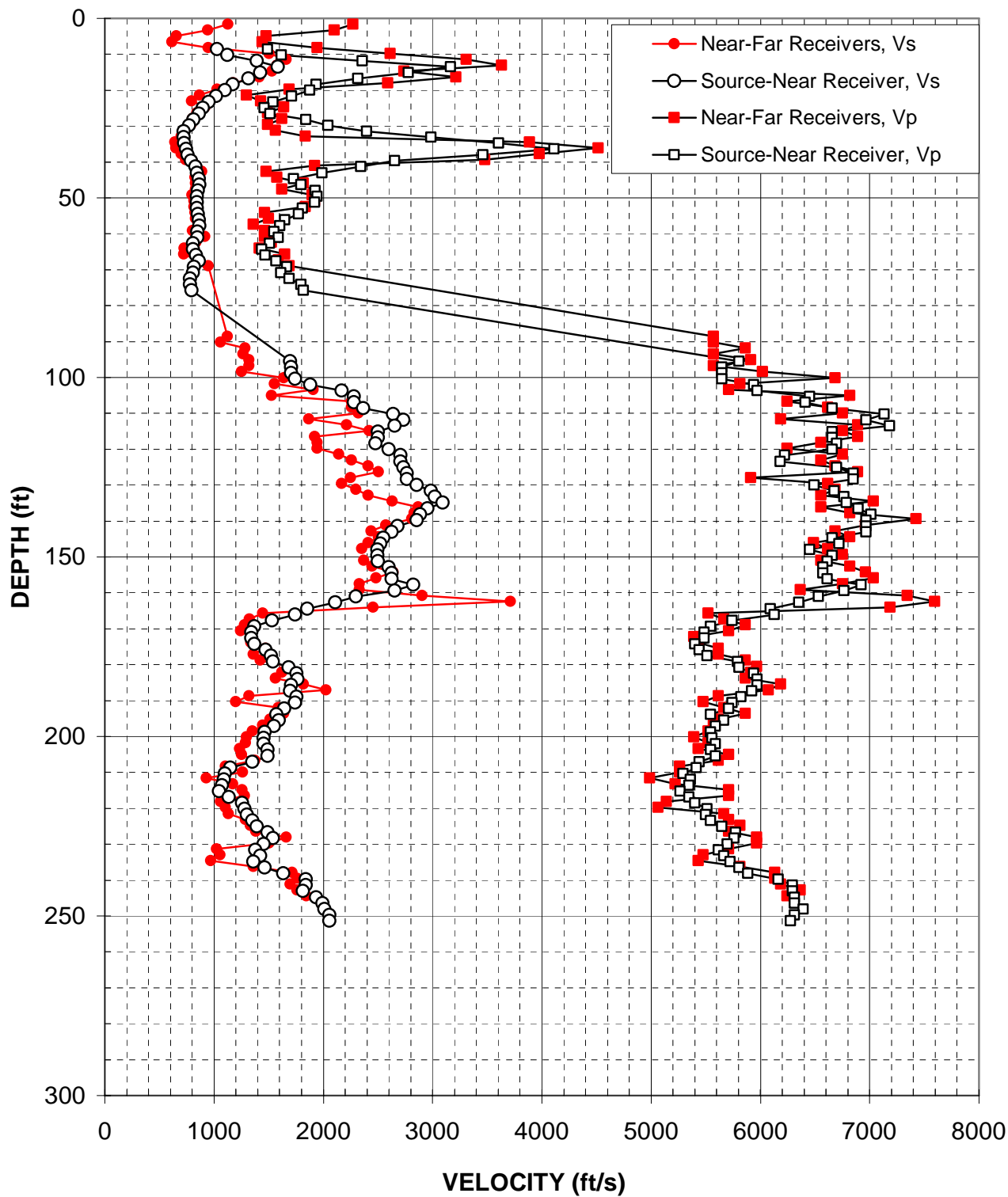


Figure A-1. Boring B-1002 and B-1002A, R1 - R2 high resolution analysis  
and S - R1 quality assurance analysis P- and  $S_H$ -wave data



Depth (ft)	V <sub>s</sub> (ft/sec)	V <sub>p</sub> (ft/sec)	Depth (ft)	V <sub>s</sub> (ft/sec)	V <sub>p</sub> (ft/sec)	Depth (ft)	V <sub>s</sub> (ft/sec)	V <sub>p</sub> (ft/sec)
8.5	1030	1490	108.6	2360	6660	190.6	1740	5740
10.2	1120	1620	110.2	2640	7130	192.3	1640	5710
11.8	1390	2360	111.9	2740	6970	193.9	1570	5540
13.5	1580	3170	113.5	2650	7180	195.5	1590	5660
15.1	1420	2780	115.2	2500	6660	197.2	1550	5590
16.7	1320	2320	116.8	2500	6660	198.8	1460	5540
18.4	1170	1940	118.4	2480	6700	200.5	1460	5560
20.0	1100	1880	120.1	2600	6660	202.1	1460	5590
21.7	1020	1710	121.7	2710	6220	203.7	1490	5540
23.3	950	1540	123.4	2710	6180	205.4	1490	5590
24.9	900	1460	125.0	2740	6700	207.0	1350	5440
26.6	860	1510	126.6	2760	6850	208.7	1150	5410
28.2	810	1840	128.3	2760	6850	210.3	1100	5290
29.9	770	2040	129.9	2860	6490	211.9	1090	5360
31.5	720	2400	131.6	2990	6680	213.6	1080	5350
33.1	720	2990	133.2	3020	6760	215.2	1050	5260
34.8	730	3600	134.8	3090	6790	216.9	1140	5350
36.4	740	4110	136.5	2950	6900	218.5	1260	5400
38.1	760	3460	138.1	2890	7010	220.1	1280	5510
39.7	790	2650	139.8	2860	6970	221.8	1300	5500
41.3	830	2340	141.4	2680	6970	223.4	1350	5540
43.0	840	1990	143.0	2630	6970	225.1	1390	5650
44.6	860	1730	144.7	2550	6660	226.7	1490	5770
46.3	870	1800	146.3	2520	6720	228.4	1540	5760
47.9	850	1930	148.0	2500	6450	230.0	1460	5690
49.5	850	1940	149.6	2500	6660	231.6	1380	5620
51.2	850	1920	151.3	2500	6610	233.3	1420	5660
52.8	850	1810	152.9	2600	6570	234.9	1360	5730
54.5	850	1770	154.5	2630	6570	236.6	1460	5810
56.1	860	1650	156.2	2630	6610	238.2	1630	5890
57.7	870	1600	157.8	2820	6920	239.8	1840	6170
59.4	850	1550	159.5	2650	6760	241.5	1840	6300
61.0	850	1590	161.1	2300	6530	243.1	1810	6300
62.7	810	1510	162.7	2110	6350	244.8	1940	6310
64.3	810	1440	164.4	1850	6090	246.4	1990	6310
66.0	840	1470	166.0	1740	6130	248.0	2010	6390
67.6	860	1570	167.7	1530	5740	249.7	2060	6310
69.2	820	1660	169.3	1370	5540	251.3	2060	6280
70.9	810	1610	170.9	1340	5490			
72.5	780	1690	172.6	1340	5490			
74.2	780	1800	174.2	1370	5400			
75.8	790	1820	175.9	1470	5440			
95.5	1700	5810	177.5	1520	5510			
97.1	1710	5650	179.1	1540	5790			
98.8	1710	5650	180.8	1680	5810			
100.4	1740	5650	182.4	1750	5940			
102.0	1880	5940	184.1	1770	5970			
103.7	2170	5970	185.7	1710	5970			
105.3	2280	6450	187.3	1700	5920			
107.0	2280	6410	189.0	1750	5820			

Table A-1. Boring B-1002 and B-1002A, S - R1 quality assurance analysis P- and S<sub>H</sub>-wave data

### Plant Vogtle Borehole B-1003 Source to Receiver and Receiver to Receiver Analysis

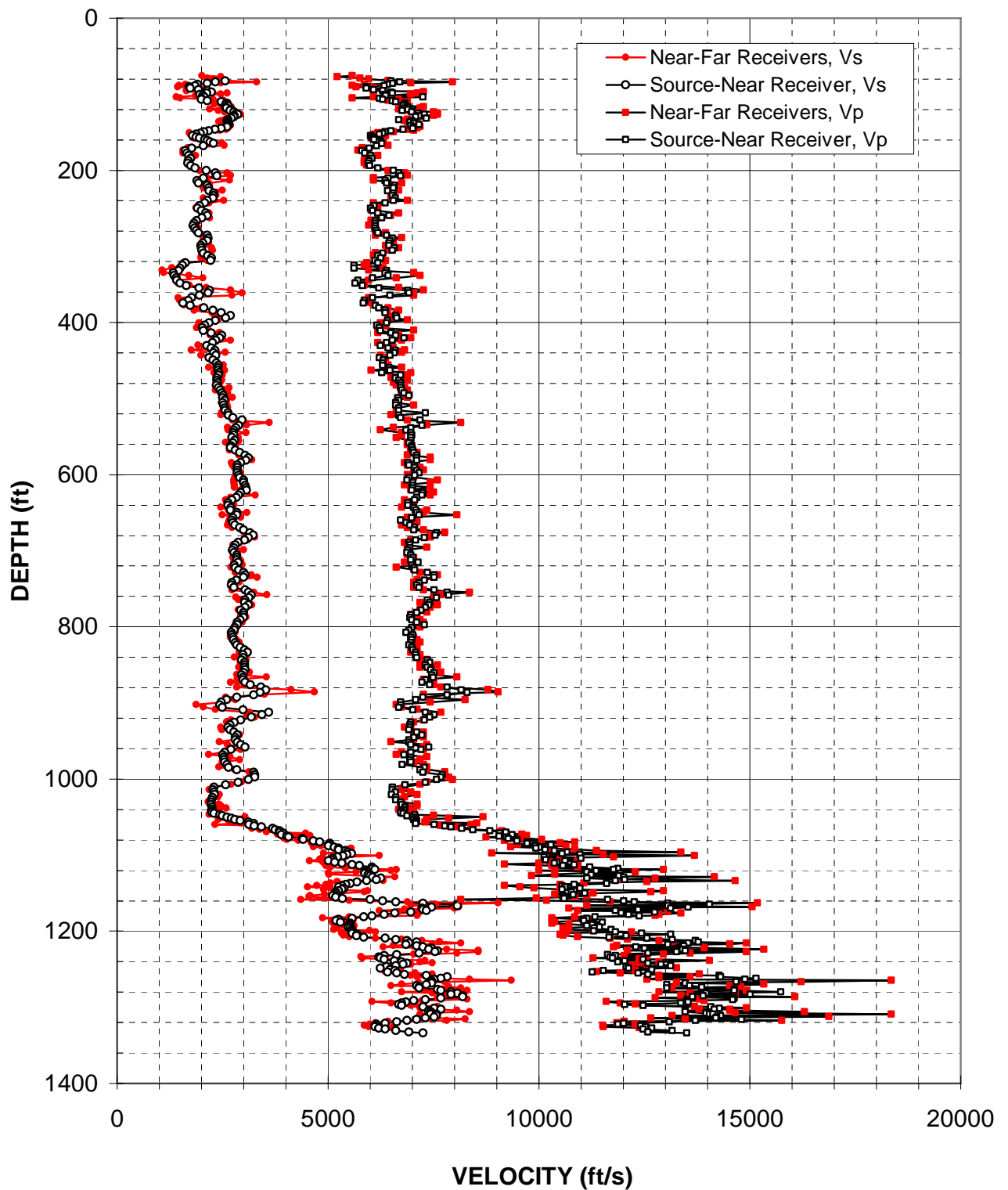


Figure A-2. Boring B-1003, R1 - R2 high resolution analysis  
and S - R1 quality assurance analysis P- and  $S_H$ -wave data

Depth (ft)	V <sub>s</sub> (ft/sec)	V <sub>p</sub> (ft/sec)	Depth (ft)	V <sub>s</sub> (ft/sec)	V <sub>p</sub> (ft/sec)	Depth (ft)	V <sub>s</sub> (ft/sec)	V <sub>p</sub> (ft/sec)
82.4	2560	6490	164.4	2290	6280	328.4	1500	5620
84.0	2330	6700	167.7	2040	6150	331.7	1460	6390
85.6	2140	6530	170.9	1770	5970	335.0	1330	6350
87.3	1910	6410	174.2	1620	5810	338.3	1360	6430
88.9	1850	6330	177.5	1650	5870	341.5	1400	6060
90.6	1720	5900	180.8	1700	6010	344.8	1410	5710
92.2	1730	5900	184.1	1740	6040	348.1	1500	5650
93.8	1930	6080	187.3	1690	5970	351.4	1650	5820
95.5	2130	6300	190.6	1680	5950	354.7	1940	6200
97.1	2240	6490	193.9	1750	5990	357.9	2200	6900
98.8	2120	6530	197.2	1850	6180	361.2	2160	6920
100.4	1960	6330	200.5	2120	6550	364.5	1960	6470
102.0	2030	6370	203.7	2330	6680	367.8	1770	6060
103.7	2070	7260	207.0	2360	6720	371.1	1690	5870
105.3	2000	6220	210.3	2040	6430	374.3	1560	5840
107.0	2000	6300	213.6	1900	6350	377.6	1730	6130
108.6	2140	6530	216.9	1940	6390	380.9	2060	6200
110.2	2480	6610	220.1	2130	6570	384.2	2270	6350
111.9	2600	6830	223.4	2170	6550	387.5	2480	6350
113.5	2570	6830	226.7	2190	6410	390.8	2690	6610
115.2	2630	6790	230.0	2290	6550	394.0	2570	6630
116.8	2580	6900	233.3	2290	6530	397.3	2330	6410
118.4	2590	6830	236.6	2270	6590	400.6	2180	6390
120.1	2700	6900	239.8	2130	6550	403.9	2080	6170
121.7	2670	6760	243.1	2080	6350	407.2	2020	6220
123.4	2770	6990	246.4	1960	6090	410.4	2050	6240
125.0	2830	7130	249.7	1900	6010	413.7	2230	6490
126.6	2860	7280	253.0	1990	6060	417.0	2480	6610
128.3	2780	7160	256.2	2100	6180	420.3	2440	6810
129.9	2770	7080	259.5	2130	6450	423.6	2350	6530
131.6	2710	7330	262.8	2010	6280	426.8	2260	6390
133.2	2630	6680	266.1	1890	6130	430.1	2120	6240
134.8	2610	6990	269.4	1830	6110	433.4	2230	6430
136.5	2620	6940	272.6	1800	6130	436.7	2330	6590
138.1	2630	7040	275.9	1840	6110	440.0	2290	6570
139.8	2660	7160	279.2	1890	6150	443.2	2350	6470
141.4	2620	6970	282.5	1930	6180	446.5	2180	6220
143.0	2610	7040	285.8	2130	6390	449.8	2270	6310
144.7	2470	7010	289.0	2160	6530	453.1	2360	6300
146.3	2320	6790	292.3	2130	6470	456.4	2400	6300
148.0	2180	6490	295.6	2030	6450	459.7	2390	6450
149.6	2060	6350	298.9	1990	6450	462.9	2390	6470
151.3	1980	6300	302.2	1990	6570	466.2	2410	6280
152.9	1870	6220	305.5	2010	6530	469.5	2400	6720
154.5	1800	6010	308.7	2050	6300	472.8	2370	6590
156.2	1870	6040	312.0	2150	6180	476.1	2370	6680
157.8	1950	6060	315.3	2240	6260	479.3	2380	6720
159.5	2080	6090	318.6	2220	6110	482.6	2360	6720
161.1	2130	6240	321.9	1620	6180	485.9	2400	6720
162.7	2200	6220	325.1	1550	5620	489.2	2450	6740

Table A-2. Boring B-1003, S - R1 quality assurance analysis P- and S<sub>H</sub>-wave data

Depth (ft)	V <sub>s</sub> (ft/sec)	V <sub>p</sub> (ft/sec)	Depth (ft)	V <sub>s</sub> (ft/sec)	V <sub>p</sub> (ft/sec)	Depth (ft)	V <sub>s</sub> (ft/sec)	V <sub>p</sub> (ft/sec)
492.5	2480	6810	659.8	2730	6720	823.8	2840	6920
495.7	2520	6920	663.1	2740	6850	827.1	2920	6990
499.0	2510	6660	666.3	2790	6940	830.4	3020	7010
502.3	2560	6680	669.6	2900	7060	833.7	3090	7080
505.6	2510	6610	672.9	3000	7040	836.9	2990	7080
508.9	2530	6610	676.2	3150	7570	840.2	2990	7110
512.1	2560	6680	679.5	3230	7550	843.5	2950	7360
515.4	2570	6680	682.7	3110	7280	846.8	3020	7410
518.7	2630	7310	686.0	3020	7080	850.1	3020	7310
522.0	2650	6680	689.3	2870	6920	853.4	3020	7360
525.3	2740	6720	692.6	2810	6940	856.6	3040	7440
528.5	2970	7180	695.9	2770	6940	859.9	3000	7520
535.1	2890	7230	699.2	2740	6900	863.2	2950	7460
538.4	2810	6970	702.4	2770	6880	866.5	2990	7490
541.7	2770	6850	705.7	2840	6970	869.8	2990	7310
545.0	2760	6970	709.0	2840	7010	873.0	3040	7230
548.2	2770	6990	712.3	2840	6970	876.3	3170	7410
551.5	2720	6970	715.6	2870	7130	879.6	3420	7830
554.8	2790	6970	718.8	2780	6990	882.9	3530	8160
558.1	2740	6920	722.1	2810	7040	886.2	3390	8290
562.3	2700	6990	725.4	2890	7060	889.4	3250	7830
564.6	2690	6990	728.7	3000	7360	892.7	2840	7260
567.9	2810	7010	732.0	3040	7520	896.0	2590	7080
571.2	2900	7040	735.2	3000	7520	899.3	2470	6720
574.5	3040	7110	738.5	2820	7280	902.6	2440	6720
577.8	3110	7110	741.8	2730	7160	905.8	2490	6680
581.0	3060	7110	745.1	2710	7110	909.1	2990	7010
584.3	2940	6900	748.4	2770	7160	912.4	3600	7310
587.6	2860	6920	751.6	3040	7520	915.7	3440	7520
590.9	2860	7060	754.9	3110	7830	919.0	3190	7410
594.2	2860	7110	758.2	3190	7860	922.2	2940	7280
597.4	2860	7160	761.5	3130	7570	925.5	2780	6970
600.7	2890	7060	764.8	3040	7360	929.1	2670	6940
604.0	2900	6920	768.0	3020	7410	932.1	2630	6940
607.3	3000	6880	771.3	3110	7390	935.4	2670	6920
610.6	3000	7010	774.6	3040	7310	938.7	2770	7110
613.9	3040	7010	777.9	2940	7210	941.9	2860	7230
617.1	3060	7010	781.2	3000	7110	945.2	2810	7040
620.4	3070	6990	784.5	3000	6970	948.5	2810	6920
623.7	2940	7260	787.7	3000	6940	951.8	2860	6920
627.0	2890	7230	791.0	2920	6990	955.1	2940	6970
630.3	2820	7110	794.3	2860	7110	958.3	3040	7390
633.5	2730	7060	797.6	2860	7280	961.6	2700	7210
636.8	2630	6900	800.9	2790	6990	964.9	2560	6970
640.1	2630	6900	804.1	2780	6920	968.2	2510	6810
643.4	2700	7040	807.4	2710	6850	971.5	2530	6970
646.7	2690	7080	810.7	2730	7010	974.7	2540	6940
649.9	2840	7110	814.0	2740	6970	978.0	2560	6970
653.2	2840	7160	817.3	2760	6990	981.3	2610	6760
656.5	2740	6990	820.5	2810	6970	984.6	2650	7280

Table A-2, continued. Boring B-1003, S - R1 quality assurance analysis P- and S<sub>H</sub>-wave data

Depth (ft)	V <sub>s</sub> (ft/sec)	V <sub>p</sub> (ft/sec)	Depth (ft)	V <sub>s</sub> (ft/sec)	V <sub>p</sub> (ft/sec)	Depth (ft)	V <sub>s</sub> (ft/sec)	V <sub>p</sub> (ft/sec)
987.9	2840	7180	1096.1	5460	10660	1178.2	6330	12120
991.1	3250	7260	1097.8	5560	10560	1179.8	6040	12380
994.4	3270	7710	1099.4	5440	10980	1181.4	5850	11330
997.7	3270	7680	1101.1	5350	10190	1183.1	5570	11140
1001.0	3110	7570	1102.7	5230	10130	1184.7	5250	11050
1004.3	2870	7310	1104.3	5110	11000	1186.4	5200	11070
1007.6	2580	6830	1106.0	5080	10170	1188.0	5300	11510
1010.8	2300	6530	1107.6	5010	10620	1189.6	5530	11290
1014.1	2280	6530	1109.3	5160	10430	1191.3	5510	11260
1017.4	2300	6590	1110.9	5330	10370	1192.9	5510	11140
1020.7	2310	6510	1112.5	5570	10840	1194.6	5490	11430
1024.0	2260	6610	1114.2	5740	10580	1196.2	5530	11310
1027.2	2240	6610	1115.8	6040	11210	1197.8	5570	11720
1030.5	2230	6720	1117.5	6060	11880	1199.5	5570	11300
1033.8	2230	6740	1119.1	6110	11770	1201.1	5570	11820
1037.1	2250	6830	1120.7	5920	11360	1202.8	5570	12440
1040.4	2250	6810	1122.4	5870	11140	1204.4	5690	13130
1042.0	2240	6740	1124.0	5870	11930	1206.0	5680	12070
1043.6	2250	6720	1125.7	5950	11240	1207.7	5850	11660
1045.3	2300	6790	1127.3	6010	11900	1209.3	6350	12560
1046.9	2440	7060	1128.9	6060	12010	1211.0	6610	13160
1048.6	2490	6880	1130.6	6260	11140	1212.6	6880	13710
1050.2	2610	7010	1132.2	6150	12040	1214.2	7110	13790
1051.8	2710	7080	1133.9	5920	11820	1215.9	6920	13540
1053.5	2790	7040	1135.5	5690	11610	1217.5	6850	13060
1054.8	2920	7110	1137.1	5530	11610	1219.2	7110	13430
1056.8	3110	7080	1138.8	5420	10840	1220.8	7260	12290
1058.4	3250	7080	1140.4	5330	10560	1222.4	7460	12500
1060.0	3130	7520	1142.1	5250	10620	1224.1	7390	13400
1061.7	3260	7770	1143.7	5380	10980	1225.7	7600	13470
1063.3	3420	7920	1145.3	5330	10560	1227.4	7550	13260
1065.0	3690	8180	1147.0	5250	10840	1229.0	7160	12590
1066.6	3750	8440	1148.6	5190	10770	1230.6	6630	11640
1068.2	3850	8840	1150.3	5200	11090	1232.3	6330	11820
1069.9	3860	9220	1151.9	5160	10820	1233.9	6200	11690
1071.5	3940	9070	1153.5	5110	10580	1235.6	6240	11740
1073.2	3900	9360	1155.2	5190	10580	1237.2	6330	12470
1074.8	4020	9060	1156.8	5350	10600	1238.9	6570	12040
1076.4	4070	9230	1158.5	6010	11640	1240.5	6740	11880
1078.1	4390	9280	1160.1	6300	12010	1242.1	6880	12590
1079.7	4420	9480	1161.8	6610	12270	1243.8	6790	12900
1081.4	4650	9480	1163.4	7260	13060	1245.4	6610	13130
1083.0	4800	9720	1165.0	8070	14050	1247.1	6390	12070
1084.7	5050	9720	1166.7	8070	13060	1248.7	6240	12120
1086.3	5060	10290	1168.3	7460	13540	1250.3	6470	12680
1087.9	5010	9930	1170.0	7230	13130	1252.0	6580	11530
1089.6	5150	10010	1171.6	7260	12350	1253.6	6410	11260
1091.2	5250	9930	1173.2	7330	11820	1255.3	6630	12350
1092.9	5250	10150	1174.9	6970	12740	1256.9	6810	12590
1094.5	5410	10370	1176.5	6580	11960	1258.5	7330	14280

Table A-2, continued. Boring B-1003, S - R1 quality assurance analysis P- and S<sub>H</sub>-wave data

Depth (ft)	V <sub>s</sub> (ft/sec)	V <sub>p</sub> (ft/sec)
1260.2	7830	14320
1261.8	7680	15140
1263.5	7520	14890
1265.1	7460	14680
1266.7	7440	14680
1268.4	7460	13470
1270.0	7330	13030
1271.7	7110	13570
1273.3	7160	13860
1274.9	7160	13030
1276.6	7600	14640
1278.2	7680	14640
1279.9	7920	15740
1281.5	8070	13970
1283.1	7920	15010
1284.8	8200	13900
1286.4	8200	13640
1288.1	7680	14640
1289.7	7310	14590
1291.3	7040	13500
1293.0	6850	13540
1294.6	6740	13360
1296.3	6680	12040
1297.9	6740	12470
1299.5	7260	14080
1301.2	7520	14280
1302.8	7680	14160
1304.5	7390	13470
1306.1	7440	13470
1307.7	7460	13970
1309.4	7440	14050
1309.4	7570	14120
1311.0	7570	14320
1312.7	7520	14220
1314.3	7310	14200
1316.0	7110	14800
1317.6	6880	13710
1319.2	6630	13100
1320.9	6350	12010
1322.5	6150	11880
1324.2	6110	12410
1325.8	6110	12530
1327.4	6200	12680
1329.1	6350	12470
1330.7	6610	13160
1332.4	6920	12590
1334.0	7260	13500

Table A-2, continued. Boring B-1003, S - R1 quality assurance analysis P- and S<sub>H</sub>-wave data

### Plant Vogtle Borehole B-1004 Source to Receiver and Receiver to Receiver Analysis

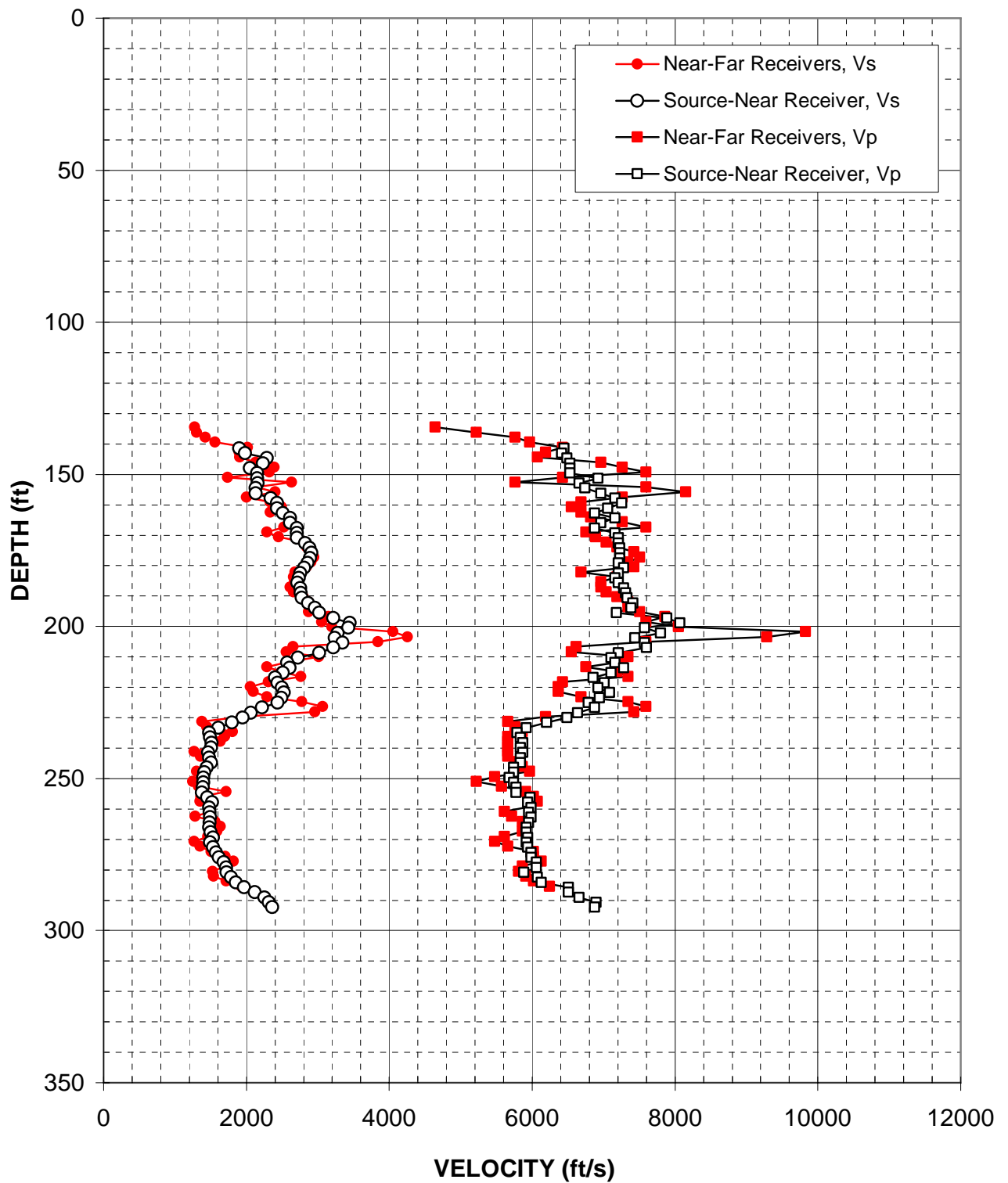


Figure A-3. Boring B-1004, R1 - R2 high resolution analysis  
and S - R1 quality assurance analysis P- and S<sub>H</sub>-wave data

Depth (ft)	V <sub>s</sub> (ft/sec)	V <sub>p</sub> (ft/sec)	Depth (ft)	V <sub>s</sub> (ft/sec)	V <sub>p</sub> (ft/sec)
141.4	1900	6450	223.4	2490	6940
143.0	1980	6410	225.1	2440	6790
144.7	2290	6490	226.7	2220	6880
146.3	2230	6530	228.4	2070	6630
148.0	2050	6530	230.0	1950	6490
149.6	2150	6530	231.6	1800	6200
151.3	2150	6920	233.3	1610	5920
152.9	2160	6660	234.9	1480	5790
154.5	2130	6740	236.6	1490	5840
156.2	2130	6970	238.2	1510	5870
157.8	2340	7160	239.8	1510	5840
159.5	2430	7260	241.5	1460	5870
161.1	2430	7060	243.1	1480	5840
162.7	2510	6880	244.8	1510	5840
164.4	2610	7160	246.4	1440	5740
166.0	2610	6970	248.0	1410	5740
167.7	2710	6880	249.7	1400	5680
169.3	2710	7160	251.3	1400	5740
170.9	2710	7210	253.0	1390	5770
172.6	2820	7210	254.6	1380	5770
174.2	2890	7230	256.2	1450	5970
175.9	2910	7230	257.9	1520	5940
177.5	2890	7230	259.5	1480	5990
179.1	2860	7210	261.2	1480	5950
180.8	2810	7280	262.8	1490	5990
182.4	2760	7210	264.4	1490	5950
184.1	2740	7160	266.1	1480	5920
185.7	2710	7210	267.7	1500	5920
187.3	2760	7280	269.4	1540	5940
189.0	2760	7310	271.0	1490	5920
190.6	2780	7330	272.6	1540	5940
192.3	2860	7410	274.3	1570	5990
193.9	2960	7390	275.9	1620	5990
195.5	3020	7180	277.6	1690	6060
197.2	3220	7890	279.2	1720	6060
198.8	3450	8070	280.8	1720	5890
200.5	3430	7570	282.5	1780	6080
202.1	3280	7800	284.1	1850	6130
203.7	3240	7440	285.8	1970	6510
205.4	3350	7570	287.4	2120	6510
207.0	3220	7600	289.0	2250	6660
208.7	3020	7210	290.7	2320	6900
210.3	2720	7110	292.3	2360	6880
211.9	2570	7160			
213.6	2610	7280			
215.2	2510	7110			
216.9	2400	6850			
218.5	2440	7010			
220.1	2500	6920			
221.8	2520	7080			

Table A-3. Boring B-1004, S - R1 quality assurance analysis P- and S<sub>H</sub>-wave data



### Plant Vogtle Borehole C-1005A Source to Receiver and Receiver to Receiver Analysis

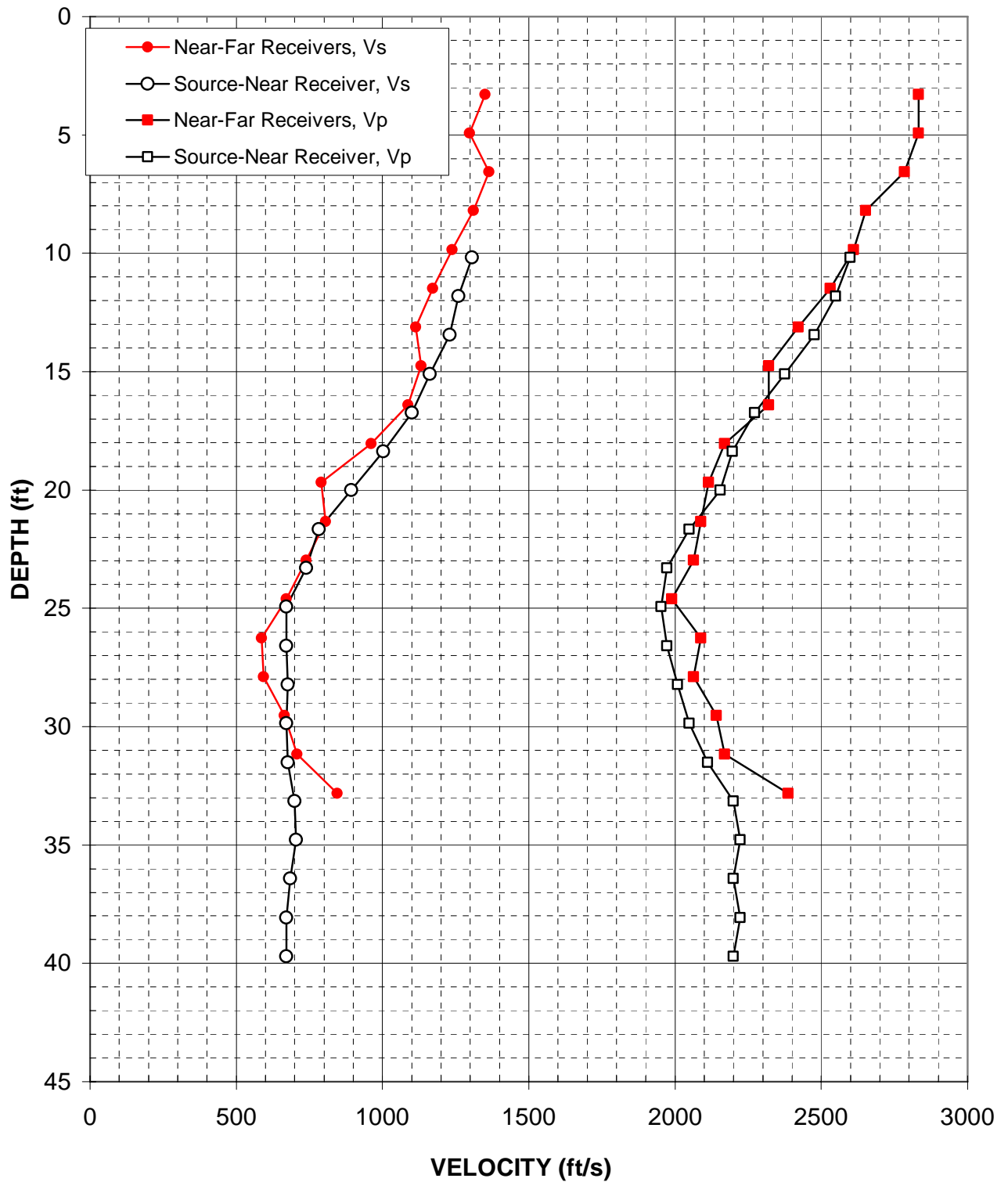


Figure A-4. Boring C-1005A, R1 - R2 high resolution analysis  
and S - R1 quality assurance analysis P- and S<sub>H</sub>-wave data

Depth (ft)	V <sub>s</sub> (ft/sec)	V <sub>p</sub> (ft/sec)
10.2	1310	2600
11.8	1260	2550
13.5	1230	2480
15.1	1160	2380
16.7	1100	2270
18.4	1000	2200
20.0	890	2150
21.7	780	2050
23.3	740	1970
24.9	670	1950
26.6	670	1970
28.2	680	2010
29.9	670	2050
31.5	680	2110
33.1	700	2200
34.8	700	2220
36.4	690	2200
38.1	670	2220
39.7	670	2200

Table A-4. Boring C-1005A, S - R1 quality assurance analysis P- and S<sub>H</sub>-wave data

**APPENDIX B**

**OYO 170 VELOCITY LOGGING SYSTEM**

**NIST TRACEABLE**

**CALIBRATION PROCEDURE**

# **CALIBRATION PROCEDURE FOR GEOVision SEISMIC RECORDER/LOGGER**

Reviewed 10/10/05

## **Objective**

The timing/sampling accuracy of seismic recorders or data loggers is required for several GEOVision field procedures including Seismic Refraction, Downhole Seismic Velocity Logging, and P-S Suspension Logging. This procedure describes the method for measuring the timing accuracy of a seismic data logger, such as the OYO Model 170 or the Geometrics Strataview. The objective of this procedure is to verify that the timing accuracy of the recorder is accurate to within 1%.

## **Frequency of Calibration**

The calibration of each GEOVision seismic data logger is twelve (12) months. In the case of rented seismic data loggers, calibration must be performed prior to use.

## **Test Equipment Required**

The following equipment is required. Item #2 must have current NIST traceable calibration.

1. Function generator, Krohn Hite 5400B or equivalent
2. Frequency counter, HP 5315A or equivalent
3. Test cables, from item 1 to item 2, and from item 1 to subject data logger.

## **Procedure**

This procedure is designed to be performed using the accompanying Seismograph Calibration Data Sheet with the same revision number. All data must be entered and the procedure signed by the technician performing the test.

1. Record all identification data on the form provided.
2. Connect function generator to data logger (such as OYO Model 170) using test cable
3. Connect the function generator to the frequency counter using test cable.

4. Set up generator to produce a 100.0 Hz, 0.25 volt (amplitude is approximate, modify as necessary to yield less than full scale waveforms on logger display) peak square wave or sine wave. Verify frequency using the counter and initial space on the data sheet.
5. Initialize data logger and record a data record of at least 0.1 second using a 100 microsecond sample period.
6. Measure the recorded square wave frequency by measuring the duration of 9 cycles of data. This measurement can be made using the data logger display device, or by printing out a paper tape. If a paper tape can be printed, the resulting printout must be attached to this procedure. Record the data in the space provided.
7. Repeat steps 5 and 6 three more times using separate files.

### Criteria

The duration for 9 cycles in any file must be 90.0 milliseconds plus or minus 0.9 milliseconds, corresponding to an average frequency for the nine cycles of 100.0 Hz plus or minus 1 Hz (obtained by dividing 9 cycles by the duration in milliseconds).

If the results are outside this range, the data logger must be marked with a GEOVision REJECT tag until it can be repaired and retested.

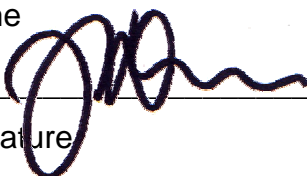
If results are acceptable affix label indicating the initials of the person performing the calibration, the date of calibration, and the due date for the next calibration (12 months).

### Procedure Approval

Approved by:

\_\_\_\_\_  
John G. Diehl

Name

\_\_\_\_\_  


Signature

\_\_\_\_\_  
President

Title

\_\_\_\_\_  
October 10, 2005

Date

Client Approval (if required):

\_\_\_\_\_  
Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date





# Calibration Report

11562 Knott Avenue, Suite 3, Garden Grove, CA 92841  
Ph. (714) 901-5659 Fax (714) 901-5649

Customer: **GeoVision. Corona, CA 92882**

Account: **15214**

Instrument: **BG9697 Suspension Logger**

Mfg: <b>OYO Geospace</b>	Model: <b>03331-0000</b>	Serial #: <b>19029</b>
Size:	Resltn:	Cust Ctrl:

P.O.:	Dept.:	Location:
Report Date: <b>04/15/2005</b>	Report #: <b>Tmp0002</b>	Job #: <b>L23242</b>

Work Performed: **Inspected, cleaned, and calibrated.**

Parts Replaced:

Received Condition: **In tolerance**

Returned Condition: **In tolerance**

## Functions Tested:

Frequency @ 100Hz

Square Wave Pass

Sine Wave Pass

See attached data


Unless otherwise noted

Pass/Fail Criteria is

Based on published

Mfr. tolerances

Control	Standard Used	Instr. Model	Due Date	NIST Trace Ref
<b>AG2886</b>	<b>Frequency Synthesizer</b>	<b>3325A</b>	<b>10/12/2005</b>	<b>T1700</b>

Environmental:	<b>71 Deg F / 40% Rh</b>	Test Date:	<b>04/11/2005</b>
Uncertainty:	<b>&lt;4:1</b>	Cycle:	<b>12</b>
Cal Procedure:	<b>Cust. Supplied</b>	Due Date:	<b>04/11/2006</b>
Technician:	<b>Jim Williams</b>	Quality Approval:	

BQ9697



## SEISMOGRAPH CALIBRATION DATA SHEET REV 7/11/02

## INSTRUMENT DATA

SYSTEM MFR: 040  
SERIAL NO.: 1029  
BY: MICRO PRECISION CAL.MODEL NO.: 3331 A  
CALIBRATION DATE: 4/11/05  
DUE DATE: 4/11/06COUNTER MFR: TEMA  
SERIAL NO.: MB00006378  
BY: MICRO PRECISION CAL.MODEL NO.: 72 - 5085  
CALIBRATION DATE: 4/8/05  
DUE DATE: 4/8/06FCTN GEN MFR: HP  
SERIAL NO.: 1748A 18000  
BY: MICRO PRECISION CAL.MODEL NO.: 3325 A  
CALIBRATION DATE: 10/12/04  
DUE DATE: 10/12/05

## SYSTEM SETTINGS:

GAIN:  
FILTER:  
RANGE:  
DELAY:  
STACK: 1 (STD)  
PULSE:  
DISPLAY:  
SYSTEM: DATE = CORRECT DATE & TIME10  
20 KHZ  
100 MSEC  
0 MSEC  
1  
1.0 MSEC  
VARIABLE  
4/11/05

## PROCEDURE:

SET FREQUENCY TO 100.0 HZ SQUAREWAVE WITH AMPLITUDE APPROXIMATELY 0.25 VOLT PEAK. RECORD BOTH ON DISKETTE AND PAPER TAPE. ANALYZE AND PRINT WAVEFORMS FROM ANALYSIS UTILITY. ATTACH PAPER COPIES OF PRINTOUT AND PAPER TAPES TO THIS FORM. AVERAGE FREQUENCY MUST BE BETWEEN 99.0 AND 101.0 HZ.

AS FOUND 100.0 AS LEFT 100.0

WAVEFORM	FILE NO	FREQUENCY	TIME FOR 9 CYCLES Hn	TIME FOR 9 CYCLES Hr	TIME FOR 9 CYCLES V	AVERAGE FREQ.
SQUARE	001	100.0	90.0	90.0	90.0	100.0
SQUARE	002	100.0	90.0	90.0	90.0	100.0
SINE	003	100.0	90.1	90.0	90.0	100.0
SINE	004	100.0	90.0	90.0	90.0	100.0

CALIBRATED BY:

Jim Williams  
NAME4/11/05  
DATEJ. Williams  
SIGNATURE

2/2

**APPENDIX C**

**OYO MODEL 170**

**SUSPENSION VELOCITY LOGGING**

**FIELD MEASUREMENT PROCEDURE**



## 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, 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 OYO 170 and winch

The Model 170 Suspension P-S Logging system, manufactured by OYO Corporation, is currently the only commercially available suspension system. As shown in Figure 1, the System 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 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 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 borehole must be between 10 and 20 cm in diameter, or 4 to 8 inches.

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 Model 170 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.

## 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 Model 170 has six channels (two simultaneous recording channels), each with a 12 bit 1024 sample record. The recorded data is displayed on a CRT display and on paper tape output as six channels with a common time scale. Data is stored on 3.5-inch floppy diskettes 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 displayed data on the CRT 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. Final printed data is verified by the operator prior to moving the probe.

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
  - d) Description of measurement
  - e) Any deviations from test plan and action taken as a result
  - f) QA Review

- 2) Paper output records for each measurement as backup showing depth and ID number
- 3) List of record ID numbers (for data on diskette) and corresponding depth
- 4) Diskettes 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, PSLOG automatically calculates both  $V_s$  and  $V_p$  for each depth. The program allows spreadsheet output for presentation in either charts or tables or both.

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.

Registered Geophysicist *Antony Martin* Date 6/20/00

QA Review *[Signature]* Date 6/20/00

#### References:

1. Guidelines for Determining Design Basis Ground Motions, Report TR-102293, Electric Power Research Institute, Palo Alto, California, November 1993, Sections 7 and 8.
2. The P-S Velocity Logging Method, R.L. Nigbor and T. Imai, XIII ICSMFE, 1994, New Delhi, India / XIII CIMSTF, 1994, New Delhi, India
3. "Standard test Methods for Crosshole Seismic Testing", ASTM Standard D4428/D4428M-91, July 1991, Philadelphia, PA

# OYO SUSPENSION P-S VELOCITY LOGGING SETUP

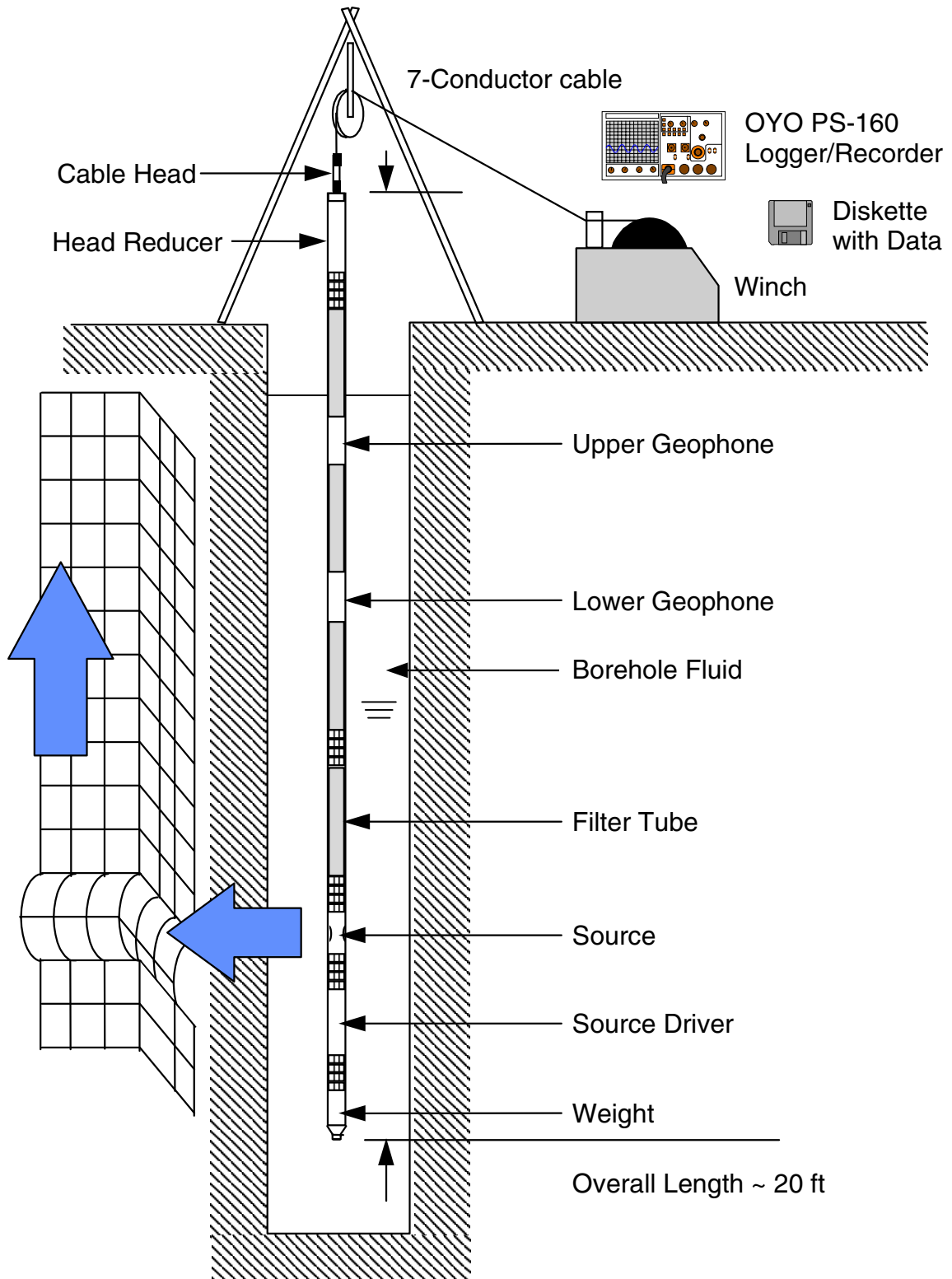


Figure 1. Suspension PS logging method setup

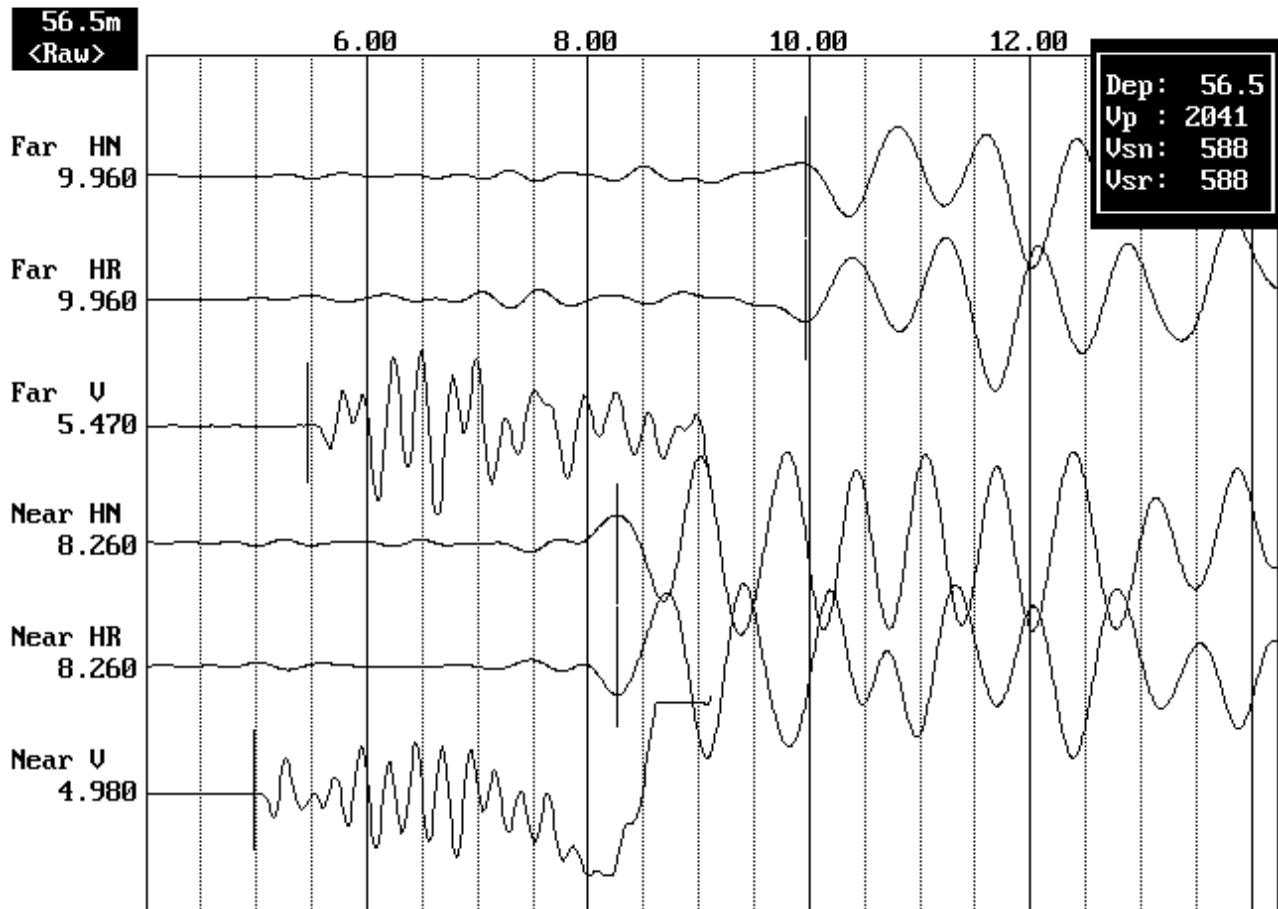


Figure 2. Sample suspension method waveform data showing horizontal normal and reversed (HR and HN), and vertical (V) waveforms received at the near (bottom 3 channels) and far (top 3 channels) geophones. The arrivals in milliseconds for each pick are shown on the left. The box in the upper right corner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

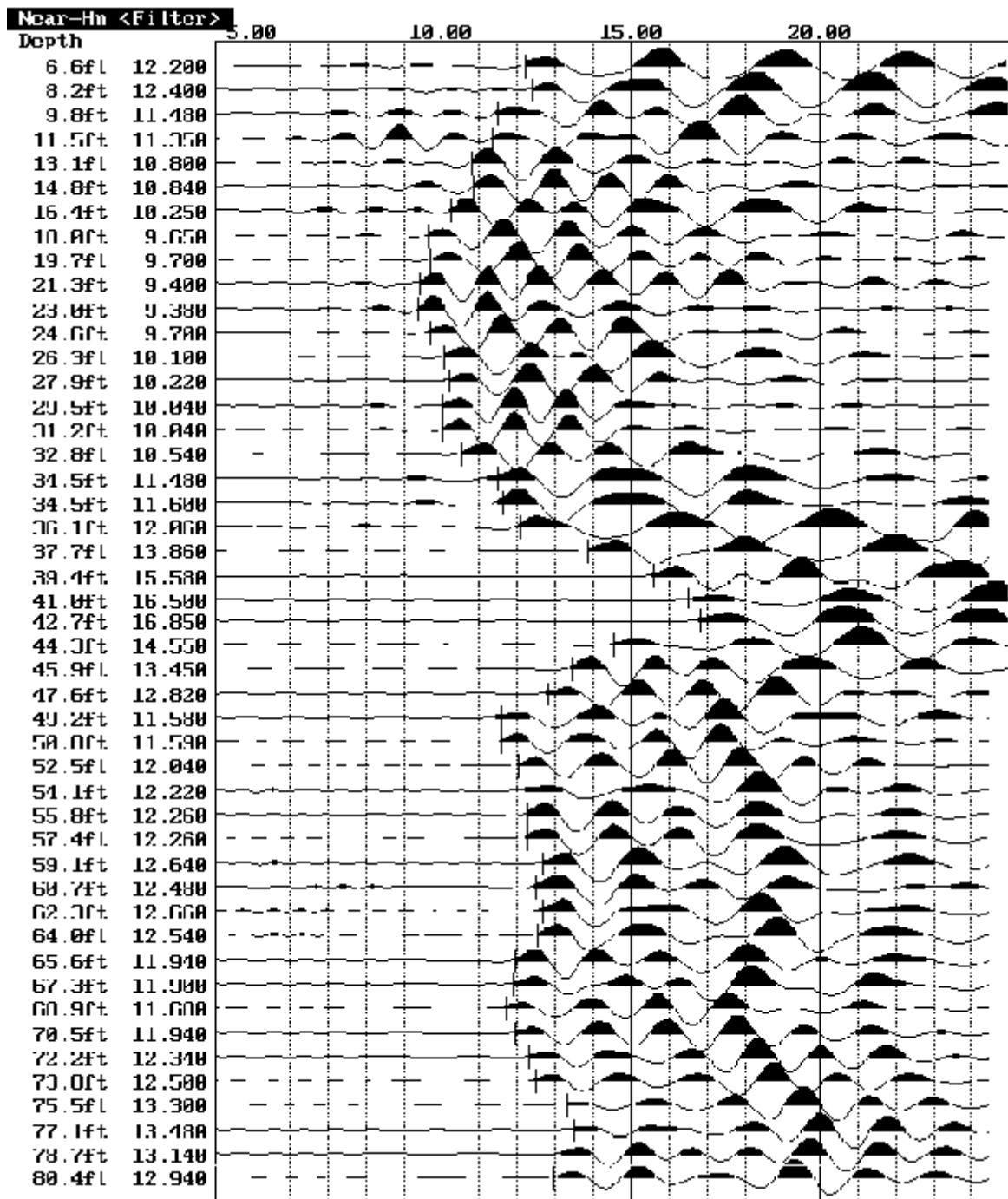


Figure 3. Sample composite waveform plot for normal shear waves received at the near geophone in a single borehole



**APPENDIX D**

**OYO MODEL 170**

**SUSPENSION VELOCITY LOGGING**

**FIELD DATA SHEETS**



## P-S SUSPENSION VELOCITY FIELD LOG

SITE: VOGTLE B-1002 run 1 DATE: 9 / 22 / 05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 1 OF 6

CONTACT: _____	_OFFICE_	PHONE: _____
		PHONE: _____
CONTACT: _____	_OFFICE_	PHONE: _____
		PHONE: _____
CONTACT: _____		PHONE: _____
		PHONE: _____
CONTACT: _____		PHONE: _____
		PHONE: _____
DRILLER: _____		PHONE: _____
COMPANY: _____		PHONE: _____

DIRECTIONS TO SITE: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

GENERAL SITE CONDITIONS/LOCATION: \_\_\_\_\_  
 \_\_\_\_\_

EA#: \_\_\_\_\_  
 BOREHOLE DESIGNATION: B-1002 LOCATION: \_\_\_\_\_  
 COUNTY: \_\_\_\_\_ RANGE: \_\_\_\_\_ TOWNSHIP: \_\_\_\_\_ SECTION: \_\_\_\_\_  
 BOREHOLE CONSTRUCTION: CASED \_\_\_\_\_ UNCASD ☒  
 DIAMETERS AND DEPTH RANGES: 5" 0 TO 133.5'; 4" 133.5' TO 260'  
 BOREHOLE TOTAL DEPTH AS DRILLED: 260  
 CONDUCTOR CASING?: YES ☒ DEPTH TO BOTTOM OF CASING 88.5'; NO \_\_\_\_\_  
 DEPTH TO BEDROCK: NA DEPTH TO WATER TABLE: ≈ 80'  
 BOREHOLE FLUID: WATER \_\_\_\_\_; FRESH WATER MUD ☒; SALT WATER MUD \_\_\_\_\_;  
 OTHER: \_\_\_\_\_  
 DEPTH TO BOREHOLE FLUID: \_\_\_\_\_ TIME SINCE LAST CIRCULATION: 1/2 HR.



SITE: VOGTLE B-1002 PHN1 DATE: 9/22/05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 2 OF 6

LOGGING CREW: R. STELLER  
 VEHICLE(S) USED AND MILEAGE: RED \_\_\_\_\_; BLUE \_\_\_\_\_; WHITE RENTAL  
 MOBILIZED FROM: \_\_\_\_\_ DEPARTURE TIME: \_\_\_\_\_  
 ARRIVED ON SITE: 10:00  
 STANDBY TIME: \_\_\_\_\_ CAUSE: \_\_\_\_\_  
 LOGGING STARTED: \_\_\_\_\_ LOGGING COMPLETED: \_\_\_\_\_  
 STANDBY TIME: \_\_\_\_\_ CAUSE: \_\_\_\_\_  
 LOGGING STARTED: \_\_\_\_\_ LOGGING COMPLETED: \_\_\_\_\_  
 DEMOBILIZED TO: \_\_\_\_\_ ARRIVAL TIME: \_\_\_\_\_  
 ADDITIONAL DEMOB TIME: \_\_\_\_\_ REASON: \_\_\_\_\_

BATTERIES CHANGED BEFORE LOGGING: YES \_\_\_\_\_; NO \_\_\_\_\_; STORED WITH NEW ☒  
 WINCH COMPROBE \_\_\_\_\_ SILVER ☒ OYO \_\_\_\_\_  
 INSTRUMENT 12004 \_\_\_\_\_ 15014 \_\_\_\_\_ 19029 ☒  
 GEOPHONE \_\_\_\_\_

MAINTENANCE PERFORMED ON SITE: NONE

EQUIPMENT PROBLEMS OR FAILURES: NONE

SUGGESTIONS, ADDITIONS, CHANGES: NONE

COMMENTS: REF TO RECEIVER MID-POINT 0.0 ↓ 0.2 ↑

# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1002 Run #1 DATE: 9/22/05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 3 OF 6

DEPTH METERS	DEPTH FEET	UNFILTERED FILE NO.	FILTERED FILE NO.	COMMENTS 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	59.06			
18.5	60.70			
19.0	62.34			
19.5	63.98			
20.0	65.62			

# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1002 Run 1 DATE: 9/22/05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 4 OF 6

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

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	001		
27.5	90.22	2		
28.0	91.86	3		
28.5	93.50	4		
29.0	95.14	5		
29.5	96.78	6		
30.0	98.43	7		
30.5	100.07	8		
31.0	101.71	9		
31.5	103.35	10		
32.0	104.99	11		
32.5	106.63	12		
33.0	108.27	13		
33.5	109.91	14		
34.0	111.55	15		
34.5	113.19	16		
35.0	114.83	17		
35.5	116.47	18		
36.0	118.11	19		
36.5	119.75	20		
37.0	121.39	21		
37.5	123.03	22		
38.0	124.67	23		
38.5	126.31	24		
39.0	127.95	25		
39.5	129.59	26		
40.0	131.23	27		

# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1002 Run 1 DATE: 9/22/05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 5 OF 6

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

40.5	132.87	28		4" DIA ↓
41.0	134.51	29		
41.5	136.15	30		$S_H = 800 \text{ m/s}$
42.0	137.80	31		
42.5	139.44	32		
43.0	141.08	33		
43.5	142.72	34		
44.0	144.36	35		
44.5	146.00	36		
45.0	147.64	37		CAUGHT PROBE ↓
45.5	149.28	38		
46.0	150.92	39		
46.5	152.56	40		
47.0	154.20	41		
47.5	155.84	42		
48.0	157.48	43		BOTTOM OF MARL?
48.5	159.12	44		
49.0	160.76	45		$V_s = 830$
49.5	162.40	46		
50.0	164.04	47		
50.5	165.68	48		
51.0	167.32	49		
51.5	168.96	50		
52.0	170.60	51		
52.5	172.24	52		
53.0	173.88	53		
53.5	175.52	54		
54.0	177.17	55		
54.5	178.81	56		
55.0	180.45	57		
55.5	182.09	58		
56.0	183.73	59		
56.5	185.37	60		
57.0	187.01	61		
57.5	188.65	62		
58.0	190.29	63		
58.5	191.93	64		
59.0	193.57	65		
59.5	195.21	66		
60.0	196.85	67		

# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1002 Run 1 DATE: 9/22/05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 6 OF 6

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

60.5	198.49	68		
61.0	200.13	69		
61.5	201.77	70		
62.0	203.41	71		
62.5	205.05	72		
63.0	206.69	73		
63.5	208.33	74		
64.0	209.97	75		
64.5	211.61	76		
65.0	213.25	77		
65.5	214.90	78		
66.0	216.54	79		
66.5	218.18	80		
67.0	219.82	81		
67.5	221.46	82		
68.0	223.10	83		
68.5	224.74	84		
69.0	226.38	85		
69.5	228.02	86		
70.0	229.66	87		
70.5	231.30	88		
71.0	232.94	89		
71.5	234.58	90		
72.0	236.22	91		
72.5	237.86	92		
73.0	239.50	93		
73.5	241.14	94		
74.0	242.78	95		
74.5	244.42			EXPECTED BOTTOM MEASUREMENT
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			DRIVER T.D. @ 260'
80.0	262.47			



## P-S SUSPENSION VELOCITY FIELD LOG

SITE: VOGTLE B-1002 Run 2 DATE: 9 / 23 / 05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 1 OF 3

CONTACT: _____	OFFICE PHONE: _____
	PHONE: _____
CONTACT: _____	OFFICE PHONE: _____
	PHONE: _____
CONTACT: _____	PHONE: _____
	PHONE: _____
CONTACT: _____	PHONE: _____
	PHONE: _____
DRILLER: _____	PHONE: _____
COMPANY: _____	PHONE: _____

DIRECTIONS TO SITE: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

GENERAL SITE CONDITIONS/LOCATION: \_\_\_\_\_  
 \_\_\_\_\_

EA#: \_\_\_\_\_  
 BOREHOLE DESIGNATION: B-1002 LOCATION: \_\_\_\_\_

COUNTY: \_\_\_\_\_ RANGE: \_\_\_\_\_ TOWNSHIP: \_\_\_\_\_ SECTION: \_\_\_\_\_  
 BOREHOLE CONSTRUCTION: CASED \_\_\_\_\_ UNCASD \_\_\_\_\_  
 DIAMETERS AND DEPTH RANGES: 4" 0 TO 70'; \_\_\_\_\_ TO \_\_\_\_\_  
 BOREHOLE TOTAL DEPTH AS DRILLED: 70'  
 CONDUCTOR CASING?: YES \_\_\_\_\_ DEPTH TO BOTTOM OF CASING \_\_\_\_\_; NO ☒  
 DEPTH TO BEDROCK: NA DEPTH TO WATER TABLE: \_\_\_\_\_  
 BOREHOLE FLUID: WATER \_\_\_\_\_; FRESH WATER MUD ☒; SALT WATER MUD \_\_\_\_\_;  
 OTHER: \_\_\_\_\_  
 DEPTH TO BOREHOLE FLUID: \_\_\_\_\_ TIME SINCE LAST CIRCULATION: 1 1/2 HR





SITE: VOGTLE B-1002 Run 2 DATE: 9/23/05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 2 OF 3

LOGGING CREW: R. STELLER  
 VEHICLE(S) USED AND MILEAGE: RED \_\_\_\_\_; BLUE \_\_\_\_\_; WHITE \_\_\_\_\_  
 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: \_\_\_\_\_

BATTERIES CHANGED BEFORE LOGGING: YES \_\_\_\_\_; NO ☒; STORED WITH NEW \_\_\_\_\_  
 WINCH \_\_\_\_\_ COMPROBE \_\_\_\_\_ SILVER ☒ OYO \_\_\_\_\_  
 INSTRUMENT \_\_\_\_\_ 12004 \_\_\_\_\_ 15014 \_\_\_\_\_ 19029 ☒  
 GEOPHONE \_\_\_\_\_

MAINTENANCE PERFORMED ON SITE: NONE

EQUIPMENT PROBLEMS OR FAILURES: NONE

SUGGESTIONS, ADDITIONS, CHANGES: NONE

COMMENTS: NOT ACTUALLY B-1002; A SECOND BORING  
WAS DRILLED ADJACENT TO B-1002, AS THE  
CASING IN B-1002 COULD NOT BE REMOVED.

# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1002 Run 2 DATE: 9/23/05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 3 OF 3

DEPTH METERS	DEPTH FEET	UNFILTERED FILE NO.	FILTERED FILE NO.	COMMENTS CASING, WATER, ROCK, ETC
0.5	1.64	101		
1.0	3.28	102		
1.5	4.92	103		
2.0	6.56	104		
2.5	8.20	105		
3.0	9.84	106		
3.5	11.48	107		
4.0	13.12	108		
4.5	14.76	109		
5.0	16.40	110		
5.5	18.04	111		
6.0	19.69	112		
6.5	21.33	113		
7.0	22.97	112		
7.5	24.61	115		
8.0	26.25	116		
8.5	27.89	117		
9.0	29.53	118		
9.5	31.17	119		
10.0	32.81	120		
10.5	34.45	121		
11.0	36.09	122		
11.5	37.73	123		
12.0	39.37	120		
12.5	41.01	125		
13.0	42.65	126		
13.5	44.29	127		
14.0	45.93	128		
14.5	47.57	129		
15.0	49.21	130		
15.5	50.85	131		
16.0	52.49	132		
16.5	54.13	133		EXPECTED DEEPEST MEASUREMENT
17.0	55.77			
17.5	57.41			
18.0	59.06			
18.5	60.70			
19.0	62.34			
19.5	63.98			
20.0	65.62			DRAWN T.D. @ 70'



## P-S SUSPENSION VELOCITY FIELD LOG

SITE: VOGTLE B-1002 A DATE: 10 / 5 /05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 1 OF 4

CONTACT: _____	_OFFICE_ PHONE: _____
	PHONE: _____
CONTACT: _____	_OFFICE_ PHONE: _____
	PHONE: _____
CONTACT: _____	PHONE: _____
	PHONE: _____
CONTACT: _____	PHONE: _____
	PHONE: _____
DRILLER: _____	PHONE: _____
COMPANY: _____	PHONE: _____

DIRECTIONS TO SITE: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

GENERAL SITE CONDITIONS/LOCATION: \_\_\_\_\_  
 \_\_\_\_\_

EA#: \_\_\_\_\_  
 BOREHOLE DESIGNATION: B-1002 A LOCATION: \_\_\_\_\_  
 COUNTY: \_\_\_\_\_ RANGE: \_\_\_\_\_ TOWNSHIP: \_\_\_\_\_ SECTION: \_\_\_\_\_  
 BOREHOLE CONSTRUCTION: CASED \_\_\_\_\_ UNCASD ☒  
 DIAMETERS AND DEPTH RANGES: 4" 0 TO 105'; \_\_\_\_\_ TO \_\_\_\_\_  
 BOREHOLE TOTAL DEPTH AS DRILLED: 105'  
 CONDUCTOR CASING?: YES \_\_\_\_\_ DEPTH TO BOTTOM OF CASING \_\_\_\_\_; NO ☒  
 DEPTH TO BEDROCK: NA DEPTH TO WATER TABLE: \_\_\_\_\_  
 BOREHOLE FLUID: WATER \_\_\_\_\_; FRESH WATER MUD ☒; SALT WATER MUD \_\_\_\_\_;  
 OTHER: \_\_\_\_\_  
 DEPTH TO BOREHOLE FLUID: \_\_\_\_\_ TIME SINCE LAST CIRCULATION: 1/2 HR



SITE: VOGTLE B-1002 A DATE: 10 / 5 /05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 2 OF 4

LOGGING CREW: R. STELLER  
 VEHICLE(S) USED AND MILEAGE: RED \_\_\_\_\_; BLUE \_\_\_\_\_; WHITE RENTAL  
 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: \_\_\_\_\_

BATTERIES CHANGED BEFORE LOGGING: YES \_\_\_\_\_; NO ☒; STORED WITH NEW \_\_\_\_\_  
 WINCH \_\_\_\_\_ COMPROBE \_\_\_\_\_ SILVER ☒ OYO \_\_\_\_\_  
 INSTRUMENT 12004 \_\_\_\_\_ 15014 \_\_\_\_\_ 19029 ☒  
 GEOPHONE \_\_\_\_\_

MAINTENANCE PERFORMED ON SITE: NONE

EQUIPMENT PROBLEMS OR FAILURES: NONE

SUGGESTIONS, ADDITIONS, CHANGES: NONE

COMMENTS: REF TO RECEIVER MID POINT 0.0m ↓ 0.0m ↑

# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1002 ADATE: 10/15 /05

CLIENT: MACTEC

JOB: 5492

AUTHOR: R. STELLER

PAGE 3 OF 4

DEPTH METERS	DEPTH FEET	UNFILTERED FILE NO.	FILTERED FILE NO.	COMMENTS 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	201		
15.5	50.85	202		
16.0	52.49	203		
16.5	54.13	204		
17.0	55.77	205		
17.5	57.41	206		
18.0	59.06	207		
18.5	60.70	208		
19.0	62.34	209		
19.5	63.98	210		
20.0	65.62	211		

# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1002 A DATE: 12/5 /05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 4 OF 4

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

20.5	67.26	212		
21.0	68.90	213		
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			EXPECTED DEEPEST MEASUREMENT
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			DRIVER T.D. @ 105'
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	118.11			
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			



## P-S SUSPENSION VELOCITY FIELD LOG

SITE: VOGTLE B-1003 Run 1 DATE: 10/3/05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 1 OF 19

CONTACT: _____	_OFFICE_ PHONE: _____
	PHONE: _____
CONTACT: _____	_OFFICE_ PHONE: _____
	PHONE: _____
CONTACT: _____	PHONE: _____
	PHONE: _____
CONTACT: _____	PHONE: _____
	PHONE: _____
DRILLER: _____	PHONE: _____
COMPANY: _____	PHONE: _____

DIRECTIONS TO SITE: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

GENERAL SITE CONDITIONS/LOCATION: \_\_\_\_\_  
 \_\_\_\_\_

EA#: \_\_\_\_\_  
 BOREHOLE DESIGNATION: B-1003 LOCATION: \_\_\_\_\_

COUNTY: \_\_\_\_\_ RANGE: \_\_\_\_\_ TOWNSHIP: \_\_\_\_\_ SECTION: \_\_\_\_\_

BOREHOLE CONSTRUCTION: CASED \_\_\_\_\_ UNCASD ☒

DIAMETERS AND DEPTH RANGES: 5" 0 TO 1074'; \_\_\_\_\_ TO \_\_\_\_\_

BOREHOLE TOTAL DEPTH AS DRILLED: 1074'

CONDUCTOR CASING?: YES ☒ DEPTH TO BOTTOM OF CASING 38'; NO 6" Pvc SCH 40

DEPTH TO BEDROCK: 1049' DEPTH TO WATER TABLE: \_\_\_\_\_

BOREHOLE FLUID: WATER \_\_\_\_\_; FRESH WATER MUD ☒; SALT WATER MUD \_\_\_\_\_;

OTHER: \_\_\_\_\_

DEPTH TO BOREHOLE FLUID: \_\_\_\_\_ TIME SINCE LAST CIRCULATION: 1 hr





SITE: VOGTLE B-1003 Run 1 DATE: 10 / 3 /05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 2 OF 19

LOGGING CREW: R. STELLER  
 VEHICLE(S) USED AND MILEAGE: RED \_\_\_\_\_; BLUE \_\_\_\_\_; WHITE RENTAL  
 MOBILIZED FROM: \_\_\_\_\_ DEPARTURE TIME: \_\_\_\_\_  
 ARRIVED ON SITE: 08:00  
 STANDBY TIME: \_\_\_\_\_ CAUSE: \_\_\_\_\_  
 LOGGING STARTED: 12:00 LOGGING COMPLETED: 16:30  
 STANDBY TIME: \_\_\_\_\_ CAUSE: \_\_\_\_\_  
 LOGGING STARTED: \_\_\_\_\_ LOGGING COMPLETED: \_\_\_\_\_  
 DEMOBILIZED TO: \_\_\_\_\_ ARRIVAL TIME: \_\_\_\_\_  
 ADDITIONAL DEMOB TIME: \_\_\_\_\_ REASON: \_\_\_\_\_

BATTERIES CHANGED BEFORE LOGGING: YES ☒; NO \_\_\_\_\_; STORED WITH NEW \_\_\_\_\_  
 WINCH \_\_\_\_\_ COMPROBE \_\_\_\_\_ SILVER ☒ OYO \_\_\_\_\_  
 INSTRUMENT 12004 \_\_\_\_\_ 15014 \_\_\_\_\_ 19029 ☒  
 GEOPHONE \_\_\_\_\_

MAINTENANCE PERFORMED ON SITE: NONE

EQUIPMENT PROBLEMS OR FAILURES: NONE

SUGGESTIONS, ADDITIONS, CHANGES: NONE

COMMENTS: Run 1 REF TO CABLE HEAD 2.0m ↓ 1.81m ↑



# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1003 Run 7 DATE: 10 / 3 /05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 3 OF 19

DEPTH METERS	DEPTH FEET	UNFILTERED FILE NO.	FILTERED FILE NO.	COMMENTS 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	59.06			
18.5	60.70			
19.0	62.34			
19.5	63.98	001		Grout To 64'
20.0	65.62	002		Time = 12:14

# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1003 Run 1 DATE: 10/3 /05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 4 OF 19

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

20.5	67.26	3		
21.0	68.90	4		
21.5	70.54	5		
22.0	72.18	6		
22.5	73.82	7		
23.0	75.46	8		
23.5	77.10	9		
24.0	78.74	10		
24.5	80.38	11		
25.0	82.02	12		
25.5	83.66	13		
26.0	85.30	14		
26.5	86.94	15		MAIL TOP @ 86'
27.0	88.58	16		CASE AT 88'
27.5	90.22	17		
28.0	91.86	18		
28.5	93.50	19		
29.0	95.14	20		
29.5	96.78	21		
30.0	98.43	22		
30.5	100.07	23		
31.0	101.71	24		
31.5	103.35	25		
32.0	104.99	26		
32.5	106.63	27		
33.0	108.27	28		
33.5	109.91	29		
34.0	111.55	30		
34.5	113.19	31		
35.0	114.83	32		
35.5	116.47	33		
36.0	118.11	34		
36.5	119.75	35		
37.0	121.39	36		
37.5	123.03	37		
38.0	124.67	38		
38.5	126.31	39		
39.0	127.95	40		
39.5	129.59	41		
40.0	131.23	42		

# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1003 Run 1 DATE: 10/3 /05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 5 OF 19

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

40.5	132.87	43		
41.0	134.51	44		
41.5	136.15	45		
42.0	137.80	46		
42.5	139.44	47		
43.0	141.08	48		
43.5	142.72	49		
44.0	144.36	50		
44.5	146.00	503		
45.0	147.64	504		
45.5	149.28	505		BOTTOM OF MAEL
46.0	150.92	506		
46.5	152.56	507		
47.0	154.20	508		
47.5	155.84	509		
48.0	157.48	510		SHIFT TO 1m SPACING ↓
48.5	159.12			
49.0	160.76	511		
49.5	162.40			
50.0	164.04	512		
50.5	165.68			
51.0	167.32	513		
51.5	168.96			
52.0	170.60	514		
52.5	172.24			
53.0	173.88	515		
53.5	175.52			
54.0	177.17	516		
54.5	178.81			
55.0	180.45	517		
55.5	182.09			
56.0	183.73	518		
56.5	185.37			
57.0	187.01	519		
57.5	188.65			
58.0	190.29	520		
58.5	191.93			
59.0	193.57	521		
59.5	195.21			
60.0	196.85	522		

# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1003 Run 1 DATE: 10/3 /05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 6 OF 19

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

60.5	198.49			
61.0	200.13	523		
61.5	201.77			
62.0	203.41	524		
62.5	205.05			
63.0	206.69	525		
63.5	208.33			
64.0	209.97	526		
64.5	211.61			
65.0	213.25	527		
65.5	214.90			
66.0	216.54	528		
66.5	218.18			
67.0	219.82	529		
67.5	221.46			
68.0	223.10	530		
68.5	224.74			
69.0	226.38	531		
69.5	228.02			
70.0	229.66	532		
70.5	231.30			
71.0	232.94	533		
71.5	234.58			
72.0	236.22	534		
72.5	237.86			
73.0	239.50	535		
73.5	241.14			
74.0	242.78	536		
74.5	244.42			
75.0	246.06	537		
75.5	247.70			
76.0	249.34	538		
76.5	250.98			
77.0	252.62	539		
77.5	254.27			
78.0	255.91	540		
78.5	257.55			
79.0	259.19	541		
79.5	260.83			
80.0	262.47	542		

# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1003 Run 1 DATE: 10/3/05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 7 OF 19

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

80.5	264.11			
81.0	265.75	543		
81.5	267.39			
82.0	269.03	544		
82.5	270.67			
83.0	272.31	545		
83.5	273.95			
84.0	275.59	546		
84.5	277.23			
85.0	278.87	547		
85.5	280.51			
86.0	282.15	548		
86.5	283.79			
87.0	285.43	549		
87.5	287.07			
88.0	288.71	550		
88.5	290.35			
89.0	291.99	551		
89.5	293.64			
90.0	295.28	552		
90.5	296.92			
91.0	298.56	553		
91.5	300.20			
92.0	301.84	554		
92.5	303.48			
93.0	305.12	555		
93.5	306.76			
94.0	308.40	556		
94.5	310.04			
95.0	311.68	557		
95.5	313.32			
96.0	314.96	558		
96.5	316.60			
97.0	318.24	559		
97.5	319.88			
98.0	321.52	560		
98.5	323.16			
99.0	324.80	561		
99.5	326.44			
100.0	328.08	562 600		TIME = 13:40 NEW DISK (2) & PAPER

# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1003 Run 1 DATE: 10/3 /05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 8 OF 19

DEPTH METERS	DEPTH FEET	UNFILTERED FILE NO.	FILTERED FILE NO.	COMMENTS CASING, WATER, ROCK, ETC
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100.5	329.72			
101.0	331.36	601		
101.5	333.01			
102.0	334.65	602		
102.5	336.29			
103.0	337.93	603		
103.5	339.57			
104.0	341.21	604		
104.5	342.85			
105.0	344.49	605		
105.5	346.13			
106.0	347.77	606		
106.5	349.41			
107.0	351.05	607		
107.5	352.69			
108.0	354.33	608		
108.5	355.97			
109.0	357.61	609		
109.5	359.25			
110.0	360.89	610		
110.5	362.53			
111.0	364.17	611		
111.5	365.81			
112.0	367.45	612		
112.5	369.09			
113.0	370.73	613		
113.5	372.38			
114.0	374.02	614		
114.5	375.66			
115.0	377.30	615		
115.5	378.94			
116.0	380.58	616		
116.5	382.22			
117.0	383.86	617		
117.5	385.50			
118.0	387.14	618		
118.5	388.78			
119.0	390.42	619		
119.5	392.06			
120.0	393.70	620		



# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1003 Run 1 DATE: 10/3 /05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 9 OF 19

DEPTH METERS	DEPTH FEET	UNFILTERED FILE NO.	FILTERED FILE NO.	COMMENTS CASING, WATER, ROCK, ETC
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120.5	395.34			
121.0	396.98	621		
121.5	398.62			
122.0	400.26	622		
122.5	401.90			
123.0	403.54	623		
123.5	405.18			
124.0	406.82	624		
124.5	408.46			
125.0	410.10	625		
125.5	411.75			
126.0	413.39	626		
126.5	415.03			
127.0	416.67	627		
127.5	418.31			
128.0	419.95	628		
128.5	421.59			
129.0	423.23	629		
129.5	424.87			
130.0	426.51	630		
130.5	428.15			
131.0	429.79	631		
131.5	431.43			
132.0	433.07	632		
132.5	434.71			
133.0	436.35	633		
133.5	437.99			
134.0	439.63	634		
134.5	441.27			
135.0	442.91	635		
135.5	444.55			
136.0	446.19	636		
136.5	447.83			
137.0	449.48	637		
137.5	451.12			
138.0	452.76	638		
138.5	454.40			
139.0	456.04	639		
139.5	457.68			
140.0	459.32	640		

# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1003 Run 1 DATE: 10/3/05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 10 OF 19

DEPTH METERS	DEPTH FEET	UNFILTERED FILE NO.	FILTERED FILE NO.	COMMENTS CASING, WATER, ROCK, ETC
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140.5	460.96			
141.0	462.60	641		
141.5	464.24			
142.0	465.88	642		
142.5	467.52			
143.0	469.16	643		
143.5	470.80			
144.0	472.44	644		
144.5	474.08			
145.0	475.72	645		
145.5	477.36			
146.0	479.00	646		
146.5	480.64			
147.0	482.28	647		
147.5	483.92			
148.0	485.56	648		
148.5	487.20			
149.0	488.85	649		
149.5	490.49			
150.0	492.13	650		
150.5	493.77			
151.0	495.41	651		
151.5	497.05			
152.0	498.69	652		
152.5	500.33			
153.0	501.97	653		
153.5	503.61			
154.0	505.25	654		
154.5	506.89			
155.0	508.53	655		
155.5	510.17			
156.0	511.81	656		
156.5	513.45			
157.0	515.09	657		
157.5	516.73			
158.0	518.37	658		
158.5	520.01			
159.0	521.65	659		
159.5	523.29			
160.0	524.93	<del>660</del>		

SKIPPED 160 m READING.

TIME = 14:16



# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1003 Run 1 DATE: 10/3/05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 11 OF 19

DEPTH METERS	DEPTH FEET	UNFILTERED FILE NO.	FILTERED FILE NO.	COMMENTS CASING, WATER, ROCK, ETC
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160.5	526.57			
161.0	528.22	660		
161.5	529.86			
162.0	531.50	661		
162.5	533.14			
163.0	534.78	662		
163.5	536.42			
164.0	538.06	663		
164.5	539.70			
165.0	541.34	664		
165.5	542.98			
166.0	544.62	665		
166.5	546.26			
167.0	547.90	666		
167.5	549.54			
168.0	551.18	667		
168.5	552.82			
169.0	554.46	668		OVERSHOT - DATA @ 169.3 m
169.5	556.10			
170.0	557.74	669		
170.5	559.38			
171.0	561.02	671		FILE # 670 SKIPPED TO
171.5	562.66			MATCH FILE # WITH DEPTH
172.0	564.30	672		
172.5	565.94			
173.0	567.59	673		
173.5	569.23			
174.0	570.87	674		
174.5	572.51			
175.0	574.15	675		
175.5	575.79			
176.0	577.43	676		
176.5	579.07			
177.0	580.71	677		
177.5	582.35			
178.0	583.99	678		
178.5	585.63			
179.0	587.27	679		
179.5	588.91			
180.0	590.55	680		

# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1003 Run 1 DATE: 10/3/05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 12 OF 19

DEPTH METERS	DEPTH FEET	UNFILTERED FILE NO.	FILTERED FILE NO.	COMMENTS CASING, WATER, ROCK, ETC
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180.5	592.19			
181.0	593.83	681		
181.5	595.47			
182.0	597.11	682		
182.5	598.75			
183.0	600.39	683		
183.5	602.03			
184.0	603.67	684		
184.5	605.31			
185.0	606.96	685		
185.5	608.60			
186.0	610.24	686		
186.5	611.88			
187.0	613.52	687		
187.5	615.16			
188.0	616.80	688		
188.5	618.44			
189.0	620.08	689		
189.5	621.72			
190.0	623.36	690		
190.5	625.00			
191.0	626.64	691		
191.5	628.28			
192.0	629.92	692		
192.5	631.56			
193.0	633.20	693		
193.5	634.84			
194.0	636.48	694		
194.5	638.12			
195.0	639.76	695		
195.5	641.40			
196.0	643.04	696		
196.5	644.69			
197.0	646.33	697		
197.5	647.97			
198.0	649.61	698		
198.5	651.25			
199.0	652.89	699		
199.5	654.53			
200.0	656.17	700		

# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1003 Run 1 DATE: 10 / 3 /05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 13 OF 19

DEPTH METERS	DEPTH FEET	UNFILTERED FILE NO.	FILTERED FILE NO.	COMMENTS CASING, WATER, ROCK, ETC
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200.5	657.81			
201.0	659.45	701		NEW DISK (3) & PAPER
201.5	661.09			TIME = 14:41
202.0	662.73	702		
202.5	664.37			
203.0	666.01	703		
203.5	667.65			
204.0	669.29	704		
204.5	670.93			
205.0	672.57	705		
205.5	674.21			
206.0	675.85	706		
206.5	677.49			
207.0	679.13	707		
207.5	680.77			
208.0	682.41	708		
208.5	684.06			
209.0	685.70	709		
209.5	687.34			
210.0	688.98	710		
210.5	690.62			
211.0	692.26	711		
211.5	693.90			
212.0	695.54	712		
212.5	697.18			
213.0	698.82	713		
213.5	700.46			
214.0	702.10	714		
214.5	703.74			
215.0	705.38	715		
215.5	707.02			
216.0	708.66	716		
216.5	710.30			
217.0	711.94	717		
217.5	713.58			
218.0	715.22	718		
218.5	716.86			
219.0	718.50	719		
219.5	720.14			
220.0	721.78	720		

# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1003 Run 1 DATE: 0 / 3 /05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 14 OF 19

DEPTH METERS	DEPTH FEET	UNFILTERED FILE NO.	FILTERED FILE NO.	COMMENTS CASING, WATER, ROCK, ETC
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220.5	723.43			
221.0	725.07	721		
221.5	726.71			
222.0	728.35	722		
222.5	729.99			
223.0	731.63	723		
223.5	733.27			
224.0	734.91	724		
224.5	736.55			
225.0	738.19	725		
225.5	739.83			
226.0	741.47	726		
226.5	743.11			
227.0	744.75	727		
227.5	746.39			
228.0	748.03	728		
228.5	749.67			
229.0	751.31	729		
229.5	752.95			
230.0	754.59	730		
230.5	756.23			
231.0	757.87	731		
231.5	759.51			
232.0	761.15	732		
232.5	762.80			
233.0	764.44	733		
233.5	766.08			
234.0	767.72	734		
234.5	769.36			
235.0	771.00	735		
235.5	772.64			
236.0	774.28	736		
236.5	775.92			
237.0	777.56	737		
237.5	779.20			
238.0	780.84	738		
238.5	782.48			
239.0	784.12	739		
239.5	785.76			
240.0	787.40	740		

# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1003 Run 1 DATE: 10/3/05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 15 OF 19

DEPTH METERS	DEPTH FEET	UNFILTERED FILE NO.	FILTERED FILE NO.	COMMENTS CASING, WATER, ROCK, ETC
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240.5	789.04			
241.0	790.68	741		
241.5	792.32			
242.0	793.96	742		
242.5	795.60			
243.0	797.24	743		
243.5	798.88			
244.0	800.52	744		
244.5	802.17			
245.0	803.81	745		
245.5	805.45			
246.0	807.09	746		
246.5	808.73			
247.0	810.37	747		
247.5	812.01			
248.0	813.65	748		
248.5	815.29			
249.0	816.93	749		
249.5	818.57			
250.0	820.21	750		
250.5	821.85			
251.0	823.49	751		
251.5	825.13			
252.0	826.77	752		
252.5	828.41			
253.0	830.05	753		
253.5	831.69			
254.0	833.33	754		
254.5	834.97			
255.0	836.61	755		
255.5	838.25			
256.0	839.90	756		
256.5	841.54			
257.0	843.18	757		
257.5	844.82			
258.0	846.46	758		
258.5	848.10			
259.0	849.74	759		
259.5	851.38			
260.0	853.02	760		

# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1003 Run 1 DATE: 10/ 3 /05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 16 OF 19

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

260.5	854.66			
261.0	856.30	761		
261.5	857.94			
262.0	859.58	762		
262.5	861.22			
263.0	862.86	763		
263.5	864.50			
264.0	866.14	764		
264.5	867.78			
265.0	869.42	765		
265.5	871.06			
266.0	872.70	766		
266.5	874.34			
267.0	875.98	767		
267.5	877.62			
268.0	879.27	768		
268.5	880.91			
269.0	882.55	769		
269.5	884.19			
270.0	885.83	770		
270.5	887.47			
271.0	889.11	771		
271.5	890.75			
272.0	892.39	772		
272.5	894.03			
273.0	895.67	773		
273.5	897.31			
274.0	898.95	774		
274.5	900.59			
275.0	902.23	775		
275.5	903.87			
276.0	905.51	776		
276.5	907.15			
277.0	908.79	777		
277.5	910.43			
278.0	912.07	778		
278.5	913.71			
279.0	915.35	779		
279.5	916.99			
280.0	918.64	780		



# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1003 Run 1 DATE: 10/3 /05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 17 OF 19

DEPTH METERS	DEPTH FEET	UNFILTERED FILE NO.	FILTERED FILE NO.	COMMENTS CASING, WATER, ROCK, ETC
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280.5	920.28			
281.0	921.92	781		OVERSHOT DEPTH: DATA @ 281.1 m
281.5	923.56			
282.0	925.20	782		
282.5	926.84			
283.0	928.48	783		
283.5	930.12			
284.0	931.76	784		
284.5	933.40			
285.0	935.04	785		
285.5	936.68			
286.0	938.32	786		
286.5	939.96			
287.0	941.60	787		
287.5	943.24			
288.0	944.88	788		
288.5	946.52			
289.0	948.16	789		
289.5	949.80			
290.0	951.44	790		
290.5	953.08			
291.0	954.72	791		
291.5	956.36			
292.0	958.01	792		
292.5	959.65			
293.0	961.29	793		
293.5	962.93			
294.0	964.57	794		
294.5	966.21			
295.0	967.85	795		
295.5	969.49			
296.0	971.13	796		
296.5	972.77			
297.0	974.41	797		
297.5	976.05			
298.0	977.69	798		
298.5	979.33			
299.0	980.97	799		
299.5	982.61			
300.0	984.25	800		

# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1003 Run 1 DATE: 10/3 /05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 18 OF 19

DEPTH METERS	DEPTH FEET	UNFILTERED FILE NO.	FILTERED FILE NO.	COMMENTS CASING, WATER, ROCK, ETC
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300.5	985.89			
301.0	987.53	801		NEW DISK (4) & PAPER
301.5	989.17			TIME = 15:36
302.0	990.81	802		
302.5	992.45			
303.0	994.09	803		
303.5	995.73			
304.0	997.38	804		
304.5	999.02			
305.0	1000.66	805		
305.5	1002.30			
306.0	1003.94	806		
306.5	1005.58			
307.0	1007.22	807		
307.5	1008.86			
308.0	1010.50	808		
308.5	1012.14			
309.0	1013.78	809		
309.5	1015.42			
310.0	1017.06	810		
310.5	1018.70			
311.0	1020.34	811		
311.5	1021.98			
312.0	1023.62	812		
312.5	1025.26			
313.0	1026.90	813		
313.5	1028.54			
314.0	1030.18	814		
314.5	1031.82			
315.0	1033.46	815		RETURN TO 0.5 m SPACING.
315.5	1035.10	816		
316.0	1036.75	817		
316.5	1038.39	818		
317.0	1040.03	819		
317.5	1041.67	820		
318.0	1043.31	821		
318.5	1044.95	822		
319.0	1046.59	823		
319.5	1048.23	824		
320.0	1049.87	825		TRIASSIC CONTACT @ 1049'



# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1003 Run 1 DATE: 10/3/05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 19 OF 19

DEPTH METERS	DEPTH FEET	UNFILTERED FILE NO.	FILTERED FILE NO.	COMMENTS CASING, WATER, ROCK, ETC
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320.5	1051.51	826		
321.0	1053.15	827		
321.5	1054.79	828		
322.0	1056.43	829		
322.5	1058.07	830		
323.0	1059.71	831		EXPECTED BOTTOM MEASUREMENT
323.5	1061.35	832		
324.0	1062.99			HI BOTTOM @ 323.8m.
324.5	1064.63			TIME = 15:50
325.0	1066.27			
325.5	1067.91			
326.0	1069.55			
326.5	1071.19			
327.0	1072.83			
327.5	1074.48			DRILLER T.D. @ 1074'
328.0	1076.12			
328.5	1077.76			
329.0	1079.40			
329.5	1081.04			
330.0	1082.68			
330.5	1084.32			
331.0	1085.96			
331.5	1087.60			
332.0	1089.24			
332.5	1090.88			
333.0	1092.52			
333.5	1094.16			
334.0	1095.80			
334.5	1097.44			
335.0	1099.08			
335.5	1100.72			
336.0	1102.36			
336.5	1104.00			
337.0	1105.64			
337.5	1107.28			
338.0	1108.92			
338.5	1110.56			
339.0	1112.20			
339.5	1113.85			
340.0	1115.49			



## P-S SUSPENSION VELOCITY FIELD LOG

SITE: VOGTLE B-1003 Run 2 DATE: 11/10 /05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 1 OF 78

CONTACT: _____	_OFFICE_ PHONE: _____
	PHONE: _____
CONTACT: _____	_OFFICE_ PHONE: _____
	PHONE: _____
CONTACT: _____	PHONE: _____
	PHONE: _____
CONTACT: _____	PHONE: _____
	PHONE: _____
DRILLER: _____	PHONE: _____
COMPANY: _____	PHONE: _____

DIRECTIONS TO SITE: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

GENERAL SITE CONDITIONS/LOCATION: \_\_\_\_\_  
 \_\_\_\_\_

EA#: \_\_\_\_\_  
 BOREHOLE DESIGNATION: B-1003 LOCATION: \_\_\_\_\_

COUNTY: \_\_\_\_\_ RANGE: \_\_\_\_\_ TOWNSHIP: \_\_\_\_\_ SECTION: \_\_\_\_\_  
 BOREHOLE CONSTRUCTION: CASED \_\_\_\_\_ UNCASD ☒  
 DIAMETERS AND DEPTH RANGES: 5" 0 TO 1338'; \_\_\_\_\_ TO \_\_\_\_\_  
 BOREHOLE TOTAL DEPTH AS DRILLED: 1338  
 CONDUCTOR CASING?: YES ☒ DEPTH TO BOTTOM OF CASING 1054'; NO \_\_\_\_\_  
 DEPTH TO BEDROCK: 1044 DEPTH TO WATER TABLE: \_\_\_\_\_  
 BOREHOLE FLUID: WATER \_\_\_\_\_; FRESH WATER MUD ☒; SALT WATER MUD \_\_\_\_\_  
 OTHER: \_\_\_\_\_  
 DEPTH TO BOREHOLE FLUID: \_\_\_\_\_ TIME SINCE LAST CIRCULATION: 3 HR



SITE: VOGTLE B-1003 Run 2 DATE: 11/10/05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 2 OF 78

LOGGING CREW: R. STELLER  
 VEHICLE(S) USED AND MILEAGE: RED \_\_\_\_\_; BLUE \_\_\_\_\_; WHITE RENTAL  
 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: \_\_\_\_\_

BATTERIES CHANGED BEFORE LOGGING: YES ☒; NO \_\_\_\_\_; STORED WITH NEW \_\_\_\_\_  
 WINCH \_\_\_\_\_ COMPROBE \_\_\_\_\_ SILVER ☒ OYO \_\_\_\_\_  
 INSTRUMENT 12004 15014 19029 ☒  
 GEOPHONE \_\_\_\_\_

MAINTENANCE PERFORMED ON SITE: NONE

EQUIPMENT PROBLEMS OR FAILURES: NONE

SUGGESTIONS, ADDITIONS, CHANGES: NONE

COMMENTS: DEPTH REFERENCE TO CABLE COURSE - SEE SKETCH  
ON PAGE 8

# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1003 run 2 DATE: 11 / 10 / 05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 3 OF 58

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

320.5	1051.51			
321.0	1053.15	001		
321.5	1054.79	2		
322.0	1056.43	3		
322.5	1058.07	4		
323.0	1059.71	5		
323.5	1061.35	6		
324.0	1062.99	7		
324.5	1064.63	8		
325.0	1066.27	9		
325.5	1067.91	10		
326.0	1069.55	11		
326.5	1071.19	12		
327.0	1072.83	13		
327.5	1074.48	14		
328.0	1076.12	15		
328.5	1077.76	16		
329.0	1079.40	17		
329.5	1081.04	18		
330.0	1082.68	19		
330.5	1084.32	20		
331.0	1085.96	21		
331.5	1087.60	22		
332.0	1089.24	23		
332.5	1090.88	24		
333.0	1092.52	25		
333.5	1094.16	26		
334.0	1095.80	27		
334.5	1097.44	28		
335.0	1099.08	29		
335.5	1100.72	30		
336.0	1102.36	31		
336.5	1104.00	32		
337.0	1105.64	33		
337.5	1107.28	34		
338.0	1108.92	35		
338.5	1110.56	36		
339.0	1112.20	37		
339.5	1113.85	38		
340.0	1115.49	39		

**GEOVISION SUSPENSION LOGGING FIELD NOTES**

SITE: VOGTLE B-1003 Run 2 DATE: 11/10/05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 4 OF 78

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

340.5	1117.13	40		
341.0	1118.77	41		
341.5	1120.41	42		
342.0	1122.05	43		
342.5	1123.69	44		
343.0	1125.33	45		
343.5	1126.97	46		
344.0	1128.61	47		
344.5	1130.25	48		
345.0	1131.89	49		
345.5	1133.53	50		
346.0	1135.17	51		
346.5	1136.81	52		
347.0	1138.45	53		
347.5	1140.09	54		
348.0	1141.73	55		
348.5	1143.37	56		
349.0	1145.01	57		
349.5	1146.65	58		
350.0	1148.29	59		
350.5	1149.93	60		
351.0	1151.57	61		
351.5	1153.22	62		
352.0	1154.86	63		
352.5	1156.50	64		
353.0	1158.14	65		
353.5	1159.78	66		
354.0	1161.42	67		
354.5	1163.06	68		
355.0	1164.70	69		
355.5	1166.34	70		
356.0	1167.98	71		
356.5	1169.62	72		
357.0	1171.26	73		
357.5	1172.90	74		
358.0	1174.54	75		
358.5	1176.18	76		
359.0	1177.82	77		
359.5	1179.46	78		
360.0	1181.10	79		

# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1003 Run 2 DATE: 11/10/05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 5 OF 78

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

360.5	1182.74	80		
361.0	1184.38	81		
361.5	1186.02	82		
362.0	1187.66	83		
362.5	1189.30	84		
363.0	1190.94	85		
363.5	1192.59	86		
364.0	1194.23	87		
364.5	1195.87	88		
365.0	1197.51	89		
365.5	1199.15	90		
366.0	1200.79	91		
366.5	1202.43	92		
367.0	1204.07	93		
367.5	1205.71	94		
368.0	1207.35	95		
368.5	1208.99	96		
369.0	1210.63	97		
369.5	1212.27	98		
370.0	1213.91	99		
370.5	1215.55	100		
371.0	1217.19	101		
371.5	1218.83	102		
372.0	1220.47	103		
372.5	1222.11	104		
373.0	1223.75	105		
373.5	1225.39	106		
374.0	1227.03	107		
374.5	1228.67	108		
375.0	1230.31	109		
375.5	1231.96	110		
376.0	1233.60	111		
376.5	1235.24	112		
377.0	1236.88	113		
377.5	1238.52	114		
378.0	1240.16	115		
378.5	1241.80	116		
379.0	1243.44	117		
379.5	1245.08	118		
380.0	1246.72	119		



# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1003 Run 2 DATE: 11 / 10 / 05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 6 OF 78

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

380.5	1248.36	120		
381.0	1250.00	121		
381.5	1251.64	122		
382.0	1253.28	123		
382.5	1254.92	124		
383.0	1256.56	125		
383.5	1258.20	126		
384.0	1259.84	127		
384.5	1261.48	128		
385.0	1263.12	129		
385.5	1264.76	130		
386.0	1266.40	131		
386.5	1268.04	132		
387.0	1269.69	133		
387.5	1271.33	134		
388.0	1272.97	135		
388.5	1274.61	136		
389.0	1276.25	137		
389.5	1277.89	138		
390.0	1279.53	139		
390.5	1281.17	140		
391.0	1282.81	141		
391.5	1284.45	142		
392.0	1286.09	143		
392.5	1287.73	144		
393.0	1289.37	145		
393.5	1291.01	146		
394.0	1292.65	147		
394.5	1294.29	148		
395.0	1295.93	149		
395.5	1297.57	150		
396.0	1299.21	151		
396.5	1300.85	152		
397.0	1302.49	153		
397.5	1304.13	154		
398.0	1305.77	155		
398.5	1307.41	156		
399.0	1309.06	157		
399.5	1310.70	158		
400.0	1312.34	159		

# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1003 Run 2 DATE: 11 / 10 / 05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 7 OF 78

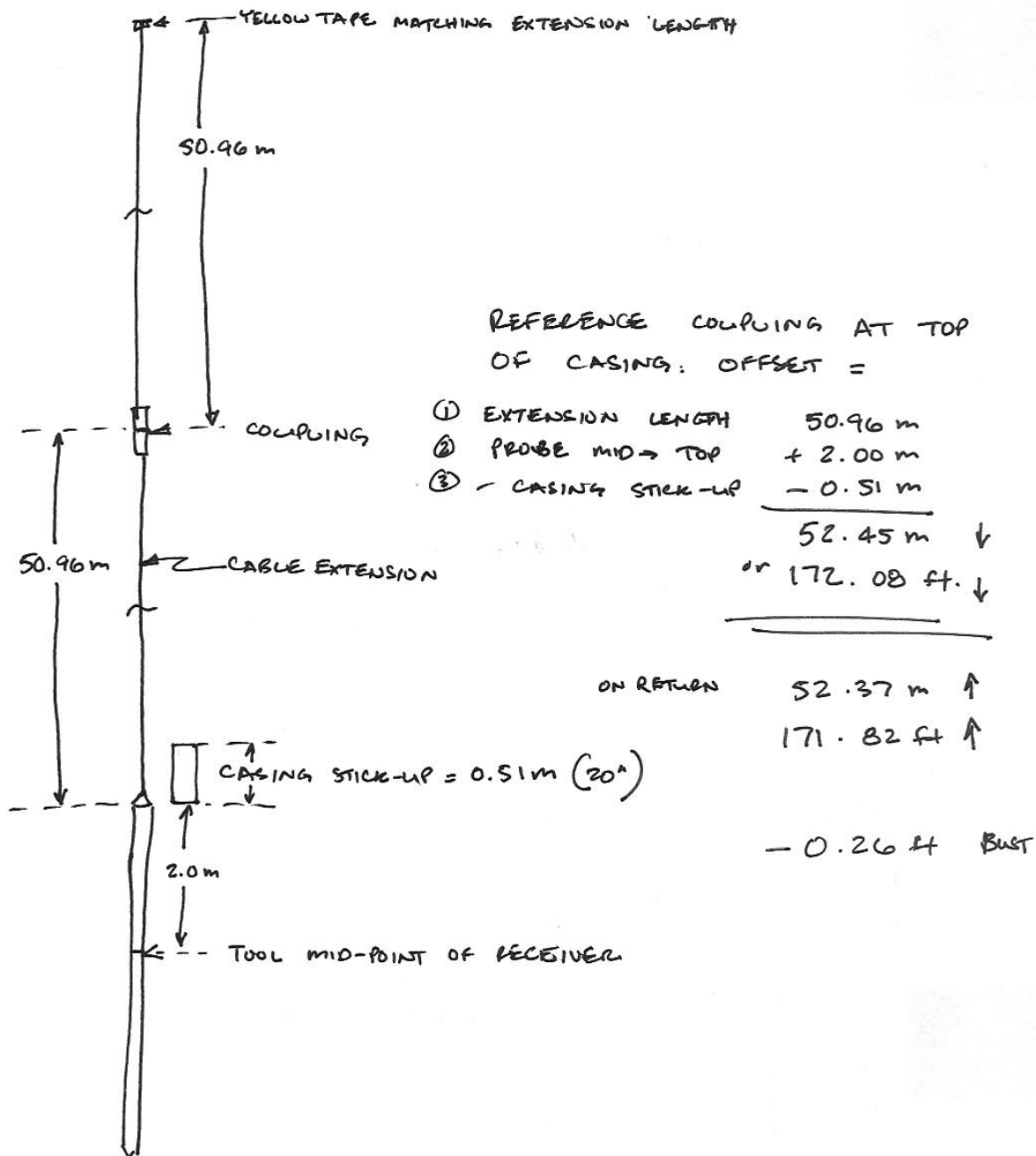
DEPTH METERS	DEPTH FEET	UNFILTERED FILE NO.	FILTERED FILE NO.	COMMENTS CASING, WATER, ROCK, ETC
-----------------	---------------	------------------------	----------------------	--------------------------------------

400.5	1313.98	160		
401.0	1315.62	161		
401.5	1317.26	162		TIME = 12:22
402.0	1318.90			
402.5	1320.54			
403.0	1322.18			DEEPEST EXPECTED MEASURE.
403.5	1323.82			
404.0	1325.46			
404.5	1327.10			
405.0	1328.74			
405.5	1330.38			
406.0	1332.02			
406.5	1333.66			
407.0	1335.30			
407.5	1336.94			
408.0	1338.58			DRIVER T.D. @ 1338'
408.5	1340.22			
409.0	1341.86			
409.5	1343.50			
410.0	1345.14			
410.5	1346.78			
411.0	1348.43			
411.5	1350.07			
412.0	1351.71			
412.5	1353.35			
413.0	1354.99			
413.5	1356.63			
414.0	1358.27			
414.5	1359.91			
415.0	1361.55			
415.5	1363.19			
416.0	1364.83			
416.5	1366.47			
417.0	1368.11			
417.5	1369.75			
418.0	1371.39			
418.5	1373.03			
419.0	1374.67			
419.5	1376.31			
420.0	1377.95			



## P-S SUSPENSION VELOCITY FIELD LOG

SITE: VOGTLE B-1003 Run 2 DATE: 11 / 10 / 05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 8 OF 8





## P-S SUSPENSION VELOCITY FIELD LOG

SITE: VOGTLE B-1003 Run 3 DATE: 11 / 11 /05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 1 OF 45

CONTACT: _____	OFFICE PHONE: _____
	PHONE: _____
CONTACT: _____	OFFICE PHONE: _____
	PHONE: _____
CONTACT: _____	PHONE: _____
	PHONE: _____
CONTACT: _____	PHONE: _____
	PHONE: _____
DRILLER: _____	PHONE: _____
COMPANY: _____	PHONE: _____

DIRECTIONS TO SITE: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

GENERAL SITE CONDITIONS/LOCATION: \_\_\_\_\_  
 \_\_\_\_\_

EA#: \_\_\_\_\_  
 BOREHOLE DESIGNATION: B-1003 LOCATION: \_\_\_\_\_  
 COUNTY: \_\_\_\_\_ RANGE: \_\_\_\_\_ TOWNSHIP: \_\_\_\_\_ SECTION: \_\_\_\_\_  
 BOREHOLE CONSTRUCTION: CASED \_\_\_\_\_ UNCASD ☒  
 DIAMETERS AND DEPTH RANGES: 5" 0 TO 1338'; \_\_\_\_\_ TO \_\_\_\_\_  
 BOREHOLE TOTAL DEPTH AS DRILLED: 1338'  
 CONDUCTOR CASING?: YES ☒ DEPTH TO BOTTOM OF CASING 1054'; NO \_\_\_\_\_  
 DEPTH TO BEDROCK: 1049' DEPTH TO WATER TABLE: \_\_\_\_\_  
 BOREHOLE FLUID: WATER \_\_\_\_\_; FRESH WATER MUD ☒; SALT WATER MUD \_\_\_\_\_;  
 OTHER: \_\_\_\_\_  
 DEPTH TO BOREHOLE FLUID: \_\_\_\_\_ TIME SINCE LAST CIRCULATION: 340



SITE: VOGTLE B-1003 Run 3 DATE: 11 / 11 / 05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 2 OF 45

LOGGING CREW: R STELLER  
 VEHICLE(S) USED AND MILEAGE: RED \_\_\_\_\_; BLUE \_\_\_\_\_; WHITE RENTAL  
 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: \_\_\_\_\_

BATTERIES CHANGED BEFORE LOGGING: YES \_\_\_\_\_; NO ☒; STORED WITH NEW \_\_\_\_\_  
 WINCH \_\_\_\_\_ COMPROBE \_\_\_\_\_ SILVER ☒ OYO \_\_\_\_\_  
 INSTRUMENT 12004 \_\_\_\_\_ 15014 \_\_\_\_\_ 19029 ☒  
 GEOPHONE \_\_\_\_\_

MAINTENANCE PERFORMED ON SITE: NONE

EQUIPMENT PROBLEMS OR FAILURES: NONE

SUGGESTIONS, ADDITIONS, CHANGES: NONE

COMMENTS: DEPTH REFERENCE TO CABLE COUPLER -  
SEE SKETCH ON PAGE 5

# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1003 Run 3 DATE: 11 / 11 /05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 3 OF 45

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

380.5	1248.36			
381.0	1250.00			
381.5	1251.64			
382.0	1253.28			
382.5	1254.92			
383.0	1256.56			
383.5	1258.20			
384.0	1259.84			
384.5	1261.48			
385.0	1263.12			
385.5	1264.76			
386.0	1266.40			
386.5	1268.04			
387.0	1269.69			
387.5	1271.33			
388.0	1272.97			
388.5	1274.61			
389.0	1276.25			
389.5	1277.89			
390.0	1279.53			
390.5	1281.17			
391.0	1282.81			
391.5	1284.45			
392.0	1286.09			
392.5	1287.73			
393.0	1289.37			
393.5	1291.01			
394.0	1292.65			
394.5	1294.29			
395.0	1295.93			
395.5	1297.57			
396.0	1299.21			
396.5	1300.85			
397.0	1302.49	301		Time = 11:42
397.5	1304.13	302		
398.0	1305.77	303		
398.5	1307.41	304		
399.0	1309.06	305		
399.5	1310.70	306		
400.0	1312.34	307		

# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1003 Run 3 DATE: 11 / 11 /05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 4 OF 4-5

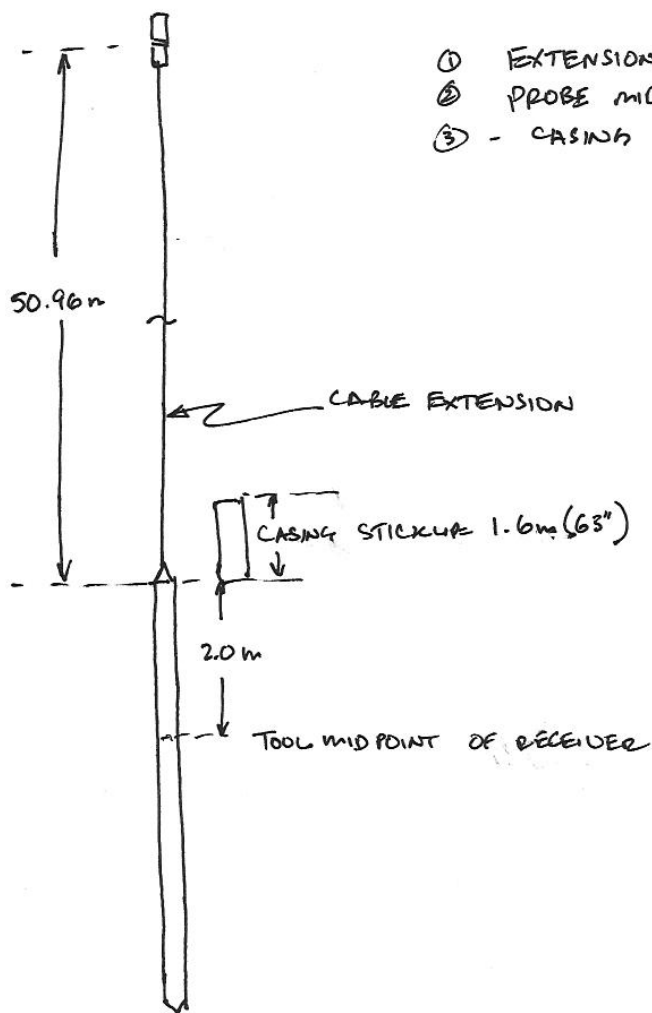
DEPTH METERS	DEPTH FEET	UNFILTERED FILE NO.	FILTERED FILE NO.	COMMENTS CASING, WATER, ROCK, ETC
-----------------	---------------	------------------------	----------------------	--------------------------------------

400.5	1313.98	308		
401.0	1315.62	309		
401.5	1317.26	310		
402.0	1318.90	311		
402.5	1320.54	312		
403.0	1322.18	313		DEEPEST EXPECTED MEASURE
403.5	1323.82	314		
404.0	1325.46	315		
404.5	1327.10	316		TIME = 11:57
405.0	1328.74			
405.5	1330.38			
406.0	1332.02			
406.5	1333.66			
407.0	1335.30			
407.5	1336.94			
408.0	1338.58			DRILLER T.D. @1338'
408.5	1340.22			
409.0	1341.86			
409.5	1343.50			
410.0	1345.14			
410.5	1346.78			
411.0	1348.43			
411.5	1350.07			
412.0	1351.71			
412.5	1353.35			
413.0	1354.99			
413.5	1356.63			
414.0	1358.27			
414.5	1359.91			
415.0	1361.55			
415.5	1363.19			
416.0	1364.83			
416.5	1366.47			
417.0	1368.11			
417.5	1369.75			
418.0	1371.39			
418.5	1373.03			
419.0	1374.67			
419.5	1376.31			
420.0	1377.95			

## P-S SUSPENSION VELOCITY FIELD LOG

SITE: VOGTLE B-1003 Run 3 DATE: 11 / 11 / 05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 5 OF 5

REFERENCE COUPLING AT TOP  
 OF CASING : DEPTH OFFSET =



- ① EXTENSION LENGTH 50.96 m
- ② PROBE MIDPOINT → TOP 2.00 m
- ③ - CASING STICK-UP 1.6 m

51.36 m ↓  
 168.5 ft ↓

ON RETURN: 51.20 ↑  
 167.98 ↑

- 0.5 ft BUST



## P-S SUSPENSION VELOCITY FIELD LOG

SITE: VOGTLE B-1004 DATE: 10 / 4 /05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 1 OF 5

CONTACT: _____	OFFICE PHONE: _____
	PHONE: _____
CONTACT: _____	OFFICE PHONE: _____
	PHONE: _____
CONTACT: _____	PHONE: _____
	PHONE: _____
CONTACT: _____	PHONE: _____
	PHONE: _____
DRILLER: _____	PHONE: _____
COMPANY: _____	PHONE: _____

DIRECTIONS TO SITE: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

GENERAL SITE CONDITIONS/LOCATION: \_\_\_\_\_  
 \_\_\_\_\_

EA#: \_\_\_\_\_  
 BOREHOLE DESIGNATION: B-1004 LOCATION: \_\_\_\_\_  
 COUNTY: \_\_\_\_\_ RANGE: \_\_\_\_\_ TOWNSHIP: \_\_\_\_\_ SECTION: \_\_\_\_\_  
 BOREHOLE CONSTRUCTION: CASED \_\_\_\_\_ UNCASD ☒  
 DIAMETERS AND DEPTH RANGES: 4" 0 TO 302'; \_\_\_\_\_ TO \_\_\_\_\_  
 BOREHOLE TOTAL DEPTH AS DRILLED: 302'  
 CONDUCTOR CASING?: YES ☒ DEPTH TO BOTTOM OF CASING 135'; NO \_\_\_\_\_  
 DEPTH TO BEDROCK: NA DEPTH TO WATER TABLE: \_\_\_\_\_  
 BOREHOLE FLUID: WATER \_\_\_\_\_; FRESH WATER MUD ☒; SALT WATER MUD \_\_\_\_\_  
 OTHER: \_\_\_\_\_  
 DEPTH TO BOREHOLE FLUID: \_\_\_\_\_ TIME SINCE LAST CIRCULATION: 1/2 HR



SITE: VOGTLE B-1004 DATE: 10/4/05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 2 OF 5

LOGGING CREW: R. STELLER  
 VEHICLE(S) USED AND MILEAGE: RED \_\_\_\_\_; BLUE \_\_\_\_\_; WHITE RENTAL  
 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: \_\_\_\_\_

BATTERIES CHANGED BEFORE LOGGING: YES \_\_\_\_\_; NO ☒; STORED WITH NEW \_\_\_\_\_  
 WINCH \_\_\_\_\_ COMPROBE \_\_\_\_\_ SILVER ☒ OYO \_\_\_\_\_  
 INSTRUMENT 12004 \_\_\_\_\_ 15014 \_\_\_\_\_ 19029 ☒  
 GEOPHONE \_\_\_\_\_

MAINTENANCE PERFORMED ON SITE: NONE

EQUIPMENT PROBLEMS OR FAILURES: NONE

SUGGESTIONS, ADDITIONS, CHANGES: NONE

COMMENTS: DEPTH REFERENCE TO RECOVER MID POINT 0.06 0.01



# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1004 DATE: 10/ 4 /05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 3 OF 5

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

40.5	132.87			
41.0	134.51	201		CASE TO 135'
41.5	136.15	2		
42.0	137.80	3		
42.5	139.44	4		
43.0	141.08	5		
43.5	142.72	6		
44.0	144.36	7		
44.5	146.00	8		
45.0	147.64	9		
45.5	149.28	10		
46.0	150.92	11		
46.5	152.56	12		
47.0	154.20	13		
47.5	155.84	14		
48.0	157.48	15		
48.5	159.12	16		
49.0	160.76	17		
49.5	162.40	18		
50.0	164.04	19		
50.5	165.68	20, 21	22, 23	USE RECORD #20.
51.0	167.32	24		
51.5	168.96	25		
52.0	170.60	26		
52.5	172.24	27		
53.0	173.88	28		
53.5	175.52	29		
54.0	177.17	30		
54.5	178.81	31		
55.0	180.45	32		
55.5	182.09	33		
56.0	183.73	34		
56.5	185.37	35		
57.0	187.01	36		
57.5	188.65	37		
58.0	190.29	38		
58.5	191.93	39		
59.0	193.57	40		
59.5	195.21	41		
60.0	196.85	42		

# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE B-1004 DATE: 9/ /05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 4 OF 5

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

60.5	198.49	43		
61.0	200.13	44		
61.5	201.77	45		
62.0	203.41	46		
62.5	205.05	47		
63.0	206.69	48		
63.5	208.33	49		
64.0	209.97	50		
64.5	211.61	51		
65.0	213.25	52		
65.5	214.90	53		
66.0	216.54	54		
66.5	218.18	55		
67.0	219.82	56		
67.5	221.46	57		
68.0	223.10	58		
68.5	224.74	59		
69.0	226.38	60		
69.5	228.02	61		
70.0	229.66	62		
70.5	231.30	63		
71.0	232.94	64		
71.5	234.58	65		
72.0	236.22	66		
72.5	237.86	67		
73.0	239.50	68		
73.5	241.14	69		
74.0	242.78	70		
74.5	244.42	71		
75.0	246.06	72		
75.5	247.70	73		
76.0	249.34	74		
76.5	250.98	75		
77.0	252.62	76		
77.5	254.27	77		
78.0	255.91	78		
78.5	257.55	79		
79.0	259.19	80		
79.5	260.83	81		
80.0	262.47	82		

# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE 13-1004

DATE: 10/4/05

CLIENT: MACTEC

JOB: 5492

AUTHOR: R. STELLER

PAGE 5 OF 5

DEPTH METERS	DEPTH FEET	UNFILTERED FILE NO.	FILTERED FILE NO.	COMMENTS CASING, WATER, ROCK, ETC
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80.5	264.11	83		
81.0	265.75	84		
81.5	267.39	85		
82.0	269.03	86		
82.5	270.67	87		
83.0	272.31	88		
83.5	273.95	89		
84.0	275.59	90		
84.5	277.23	91		
85.0	278.87	92		
85.5	280.51	93		
86.0	282.15	94		
86.5	283.79	95		
87.0	285.43	96		EXPECTED DEEPEST MEASURE
87.5	287.07			
88.0	288.71			
88.5	290.35			
89.0	291.99			
89.5	293.64			
90.0	295.28			
90.5	296.92			
91.0	298.56			
91.5	300.20			
92.0	301.84			DRILLER T.D. @ 302'
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			



## P-S SUSPENSION VELOCITY FIELD LOG

SITE: VOGTLE C-1005A DATE: 10/6 /05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 1 OF 3

CONTACT: _____	_OFFICE_ PHONE: _____
	PHONE: _____
CONTACT: _____	_OFFICE_ PHONE: _____
	PHONE: _____
CONTACT: _____	PHONE: _____
	PHONE: _____
CONTACT: _____	PHONE: _____
	PHONE: _____
DRILLER: _____	PHONE: _____
COMPANY: _____	PHONE: _____

DIRECTIONS TO SITE: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

GENERAL SITE CONDITIONS/LOCATION: \_\_\_\_\_  
 \_\_\_\_\_

EA#: \_\_\_\_\_  
 BOREHOLE DESIGNATION: C-1005A LOCATION: \_\_\_\_\_  
 COUNTY: \_\_\_\_\_ RANGE: \_\_\_\_\_ TOWNSHIP: \_\_\_\_\_ SECTION: \_\_\_\_\_  
 BOREHOLE CONSTRUCTION: CASED \_\_\_\_\_ UNCASD \_\_\_\_\_  
 DIAMETERS AND DEPTH RANGES: 4" 0 TO 60' 40"; \_\_\_\_\_ TO \_\_\_\_\_  
 BOREHOLE TOTAL DEPTH AS DRILLED: 40' 60"  
 CONDUCTOR CASING?: YES \_\_\_\_\_ DEPTH TO BOTTOM OF CASING \_\_\_\_\_; NO ✓  
 DEPTH TO BEDROCK: NA DEPTH TO WATER TABLE: \_\_\_\_\_  
 BOREHOLE FLUID: WATER \_\_\_\_\_; FRESH WATER MUD ✓ SALT WATER MUD \_\_\_\_\_;  
 OTHER: \_\_\_\_\_  
 DEPTH TO BOREHOLE FLUID: \_\_\_\_\_ TIME SINCE LAST CIRCULATION: 1/2 HR



SITE: VOGTLE C-1005 A DATE: 10 / 6 /05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 2 OF 3

LOGGING CREW: R. STELLER  
 VEHICLE(S) USED AND MILEAGE: RED \_\_\_\_\_; BLUE \_\_\_\_\_; WHITE RENTAL  
 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: \_\_\_\_\_

BATTERIES CHANGED BEFORE LOGGING: YES ☒; NO \_\_\_\_\_; STORED WITH NEW \_\_\_\_\_  
 WINCH \_\_\_\_\_ COMPROBE \_\_\_\_\_ SILVER ☒ OYO \_\_\_\_\_  
 INSTRUMENT 12004 \_\_\_\_\_ 15014 \_\_\_\_\_ 19029 ☒  
 GEOPHONE \_\_\_\_\_

MAINTENANCE PERFORMED ON SITE: NONE

EQUIPMENT PROBLEMS OR FAILURES: NONE

SUGGESTIONS, ADDITIONS, CHANGES: NONE

COMMENTS: DEPTH REF AT MID POINT OF RECEIVER. 0.0↓ 0.0↑

# GEOVISION SUSPENSION LOGGING FIELD NOTES

SITE: VOGTLE C-6005A DATE: 10/6 /05  
 CLIENT: MACTEC JOB: 5492  
 AUTHOR: R. STELLER PAGE 3 OF 3

DEPTH METERS	DEPTH FEET	UNFILTERED FILE NO.	FILTERED FILE NO.	COMMENTS CASING, WATER, ROCK, ETC
0.5	1.64			
1.0	3.28	01		
1.5	4.92	2		
2.0	6.56	3		
2.5	8.20	4		
3.0	9.84	5		
3.5	11.48	6		
4.0	13.12	7		
4.5	14.76	8		
5.0	16.40	9		
5.5	18.04	10		
6.0	19.69	11		
6.5	21.33	12		
7.0	22.97	13		
7.5	24.61	14		
8.0	26.25	15		
8.5	27.89	16		
9.0	29.53	17		
9.5	31.17	18		
10.0	32.81	19		
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			EXPECTED BOTTOM MEASUREMENT.
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	59.06			
18.5	60.70			
19.0	62.34			
19.5	63.98			
20.0	65.62			DRAWN T.D. @60'