

ORIGINAL

BSU Borehole Engineering Seismology Preliminary Observations

Date: 29 May 96

Type of Phones Beastuff / 010

4 Sand Bags SH

1. Name of well RSMW 11

2. Location of well
X= 9695.413m

Y= 10150.76m

Z= 819.3352 (Casing Elevation, CE.)

3. Depth to top of water table (measured from CE) 14.05ft

Dummy Tool
4.01m
+1.12

4. Height above ground level to CE 0.90m

5. Reference Phone offset from borehole 3.28m 0° AZ

6. Reference Phone depth below ground level 0.1m

7. Source Offset from borehole 1.30m

8. Sketch of setup

24.465m T/D
+1.12m

9. Break out box wiring

Downhole			Reference		
B	D	F	B	D	F
A	C	E	A	C	E

10. Blue box channel settings

Channel	Component
<u>1</u>	Vertical
<u>2</u>	Longitudinal (radial)
<u>3</u>	Transverse

251

Reference Phone: Offset 3.28 m
Azimuth 0°
Elev. -0.10 m
X = 0
Y = +3.28

Channel Configuration:	Borehole Phone	Reference Phone
V=Channel 1	V=Channel 4	
R=Channel 2	R=Channel 5	
T=Channel 3	T=Channel 6	

Reference Polarization:	Azi.(deg.)	Vert.(deg.)
V	0	0
R	0	90
T	270	90

Date: 29 MAY 96 Location: RMW 11 [CAPITAL STATION] T 270
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
 [X = 9695.413 m Y = 10150.76 m Z = 819.3352 above 0 MP]

Shot			Borehole Geophone			Source					Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical		
1	RSMW000A	25.0		1.30m	0°		0	+1.30m	270	90		
2		25.0							90	90		
3		24.75							270	90		
4		24.75							90	90		
5		24.50							270	90		
6		24.50							90	90		
7		24.25							270	90		
8		24.25							90	90		
9		24.00							270	90		
10		24.00							90	90		

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 90m Above
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. -1m below
 X= 0
 Y= +3.28

Channel Configuration:
 Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization:
 V 0
 R 0
 T 270

Vert. (deg.)
0
90
90

Date: 29 MAY 96 Location: RSMW 11 [CAPITAL STATION]

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
[X = 9695.413 m Y = 10150.76 m Z = 819.3352 Above MP]

Shot		Borehole Geophone		Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Vertical
11		23.75		1.30	0°				270 40
12		23.75							90 90
13		23.50							270 90
14		23.50							90 90
15		23.25							270 90
16		23.25							90 90
17		23.00							270 90
18		23.00							50 90
19		22.75							270 90
20		22.75							90 90

11/16

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.9m Above
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset 3.28m
 Azimuth 0°
 Elev. -10m below
 X=
 Y=

Channel Configuration:
 Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization:
 V 0
 R 0
 T 270
 Vert.(deg.)
0
90
90

Date: 29 MAY 96 Location: RSMW 11 [CAPITAL STATION]

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
X = 9695.413 m Y = 10150.76 m Z = 819.3352 Above MP

Shot		Borehole Geophone		Source				Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
21		22.50		1.30	0°				270	90
22		22.50							90	90
23		22.25							270	90
24		22.25							90	90
25		22.00							270	90
26		22.00							90	90
27		21.75							270	90
28		21.75							90	90
29		21.50							270	90
30		21.50							90	90

11:24

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.9m A
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth 0°
 Elev. 10m
 X= 0
 Y= 43.28

Channel Configuration: Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 29 MAY 96 Location: RSMW 11 [CAPITAL STATION]
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
[X = 9695.413 m Y = 10150.76 m Z = 819.3352 above MP]

Shot		Borehole Geophone		Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Vertical
31		21.25		1.30	0°				270 90
32		21.25							90 90
33		21.00							270 90
34		21.00							90 90
35		20.75							270 90
36		20.75							90 90
37		20.50							270 90
38		20.50							90 90
39		20.25							270 90
40		20.25							90 90

11:53

(A)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.90m
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset 3.28
 Azimuth 0°
 Elev. -1.10m
 X= 0
 Y= +3.28

Channel Configuration:
 Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 29 MAY 96 Location: R5mw11 [CAPITAL STATION]
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
[X = 9695.413 m Y = 10150.76 m Z = 819.3352 m MP]

Shot		Borehole Geophone		Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Vertical
41		20.00		1.30	0°				270 90
42		20.00							90 90
43		19.75							270 90
44		19.75							90 90
45		19.50							270 90
46		19.50							90 90
47		19.25							270 90
48		19.25							90 90
49		19.00							270 90
50		19.00							90 90

11:58

(5)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.90 m Above
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10 m b
 X= 0
 Y= +3.28

Channel Configuration: Borehole Phone Reference Phone
 V=Channel 1 V=Channel 4 Vert.(deg.)
 R=Channel 2 R=Channel 5 0
 T=Channel 3 T=Channel 6 90
 Reference Polarization: Azi.(deg.)
 V 0
 R 0
 T 270

Date: 29 MAY 96 Location: R5mw11 [CAPITAL STATION]
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
X = 9695.413 m Y = 10150.76 m Z = 819.3352 above MP

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
51		18.75							270	90
52		18.75							90	90
53		18.50							270	90
54		18.50							90	90
55		18.25							270	90
56		18.25							90	90
57		18.00							270	90
58		18.00							90	90
59		17.75							270	90
60		17.75							90	90

11.47

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.9m A
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset
 Azimuth
 Elev. 10m 6/w
 X= 0
 Y= 3.28m

Channel Configuration:
 Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization:
 V 0
 R 0
 T 270
 Azi.(deg.)
 Vert.(deg.)
0
90
90

Date: 29 MAY 96 Location: RSMW 11 [CAPITAL STATION]
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
X = 9695.413 m Y = 10150.76 m Z = 819.3352 above MP

Shot		Borehole Geophone			Source					Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical	
G1		17.50		1.30	0°				270	90	
G2		17.50							90	90	
G3		17.25							270	90	
G4		17.25							90	90	
G5		17.00							270	90	
G6		17.00							90	90	
G7		16.75							270	90	
G8		16.75							90	90	
G9		16.50							270	90	
7C		16.50							90	90	

11:55

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.90m ABV
 Azimuth of X-Axis: 90°
 Azimuth of Y-Axis: 0°

Reference Phone: _____ Offset: _____
 Azimuth: _____
 Elev.: -1.10m 6/10
 X= 0
 Y= +3.28

Channel Configuration:
 Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Phone
 V=Channel 4
 R=Channel 5
 T=Channel 6

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 29 MAY 96 Location: RSMW 11 [CAPITAL STATION]

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
X = 9695.413 m Y = 10150.76 m Z = 819.3352 m MP

Shot		Borehole Geophone			Source				Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical	
71		16.25		1.30 m	0°				270	90	
72		16.25							90	90	
73		16.00							270	90	
74		16.00							90	90	
75		15.75							270	90	
76		15.75							90	90	
77		15.50							270	90	
78		15.50							90	90	
79		15.25							270	90	
80		15.25							90	90	

12:05

(8)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.90m ABV
 Azimuth of X-Axis: 90°
 Azimuth of Y-Axis: 0°

Reference Phone: Offset _____
 Azimuth 0°
 Elev. -0.10m 65L
 X= 0
 Y= 73.28

Channel Configuration:
 Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization:
 V 0
 R 0
 T 270

Vert.(deg.)
0
90
90

Date: 29 MAY 96 Location: RSMW 11 [CAPITAL STATION]
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
[X = 9695.413 m Y = 10150.76m Z = 819.3352 m MP]

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
81		15.00		1.30	0°				270	90
82		15.00							90	90
83		14.75							270	90
84		14.75							90	90
85		14.50							270	90
86		14.50							90	90
87		14.25							270	90
88		14.25							90	90
89		14.00							270	90
90		14.00							90	90

12:17

AUTOFAIR

(9)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.90 m Above
 Azimuth of X-Axis: 90°
 Azimuth of Y-Axis: 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. -0.16 ft
 X= 0
 Y= 43.28

Channel Configuration:
 Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 29 MAY 96 Location: R5MW11 [CAPITAL STATION]

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
[X = 9695.413 m Y = 10150.76 m Z = 819.3352 Above MP]

Shot			Borehole Geophone			Source					Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical		
91		13.75		1.30	0°				270	90		
92		13.75							90	90		
93		13.50							270	90		
94		13.50							90	90		
95		13.25							270	90		
96		13.25							90	90		
97		13.00							270	90		
98		13.00							90	90		
99		12.75							270	90		
100		12.75							90	90		

12:30

10 R/cw

5 R/cw

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.90m Above
 Azimuth of X-Axis: 90°
 Azimuth of Y-Axis: 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10m 6/1w
 X= 0
 Y= 43.28

Channel _____ Borehole Phone _____
 Configuration: V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 29 MAY 96 Location: RS MW 11 [CAPITAL STATION]
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
 [X = 9695.413 m Y = 10150.76 m Z = 819.3352 Above MP]

Shot			Borehole Geophone			Source					Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical		
101		12.50		1.30	0°				270	90		
102		12.50							90	90		
103		12.25							270	90		
104		12.25							90	90		
105		12.00							270	90		
106		12.00							90	90		
107		11.75							270	90		
108		11.75							90	90		
109		11.50							270	90		
110		11.50							90	90		

12:40

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.90m above
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10m below
 X= 0
 Y= 43.28

Channel Configuration:
 Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization:
 V=Channel 5
 R=Channel 6
 T=Channel 7

Azi.(deg.)
 V 0
 R 0
 T 270

Vert.(deg.)
0
90
90

Date: 29 MAY 96 Location: RSMW 11 [CAPITAL STATION]

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
[X = 9695.413 m Y = 10150.76 m Z = 819.3552 m MP]

Shot		Borehole Geophone			Source				Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical	
111		11.25		1.30	0°				270	90	
112		11.25							90	90	
113		11.00							270	90	
114		11.00							90	90	
115		10.75							270	90	
116		10.75							90	90	
117		10.50							270	90	
118		10.50							90	90	
119		10.25							270	90	
120		10.25							90	90	

12:45

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.90m ABU
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 0.1m BLW
 X= 0
 Y= 43.28

Channel Configuration: Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 29 MAY 96 Location: RMW 11 [CAPITAL STATION]
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
[X = 9695.413 m Y = 10150.76m Z = 819.3352 Abu & MP]

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
121		10.00		1.30m	0°				270	90
122		10.00							90	90
123		9.75							270	90
124		9.75							90	90
125		9.50							270	90
126		9.50							90	90
127		9.25							270	90
128		9.25							90	90
129		9.00							270	90
130		9.00							90	90

12:50

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.90m above
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 0.1 m below
 X= 0
 Y= +3.28m

Channel Configuration: Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0
 R 0
 T 270

Date: 29 MAY 96 Location: RSMW 11 [CAPITAL STATION]

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
[X = 9695.413 m Y = 10150.76 m Z = 819.3352 m MP]

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
131		8.75		1.30m	0°				270	90
132		8.75							90	90
133		8.50							270	90
134		8.50							90	90
135		8.25							270	90
136		8.25							90	90
137		8.00							270	90
138		8.00							90	90
139		7.75							270	90
140		7.75							90	90

12:57

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.90m above
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10m below
 X= 0
 Y= 43.28

Channel Configuration: Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 29 MAY 96 Location: RMW 11 [CAPITAL STATION]
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
[X = 9695.413 m Y = 10150.76 m Z = 819.3352 above MP]

Shot		Borehole Geophone		Source					Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
141		7.50		1.30m	0°				270	90
142		7.50							90	90
143		7.25							270	90
144		7.25							90	90
145		7.00							270	90
146		7.00							90	90
147		6.75							270	90
148		6.75							90	90
149		6.50							270	90
150		6.50							90	90

Gain Test
13:03

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.90 m above
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. ~810 m below
 X= 0
 Y= 13.28

Channel Configuration:
 Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization:
 V 0
 R 0
 T 270

Vert.(deg.)
0
90
90

Date: 29 MAY 96 Location: RSMW 11 [Capital Station]

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
[X = 9695.413 m Y = 10150.76 m Z = 819.3352 above MP]

Shot		Borehole Geophone			Source			Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Vertical
151		6.25		1.30	0°				90
152		6.25							90
153		6.00							90
154		6.00							90
155		5.75							90
156		5.75							90
157		5.50							90
158		5.50							90
159		5.25							90
160		5.25							90

13:11

(16)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.90m Above
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10m below
 X= 0
 Y= +3.28

Channel Configuration:
 Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 29 MAY 96 Location: R5Mw11 [CAPITAL STATION]

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
[X = 9695.413 m Y = 10150.76 m Z = 819.3352 Above MP]

Shot		Borehole Geophone		Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Vertical
161		5.00		1.30m	0°				270 90
162		5.00							90 90
163		4.75							270 90
164		4.75							90 90
165		4.50							270 90
166		4.50							90 90
167		4.25							270 90
168		4.25							90 90
169		4.00							270 90
170		4.00							70 90

13:18

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.90m Above
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 0.1m Below
 X= 0
 Y= +3.28

Channel Configuration:
 Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 29 MAY 96 Location: RSMW 11 [CAPITAL STATION]
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
[X = 9695.413 m Y = 10150.76 m Z = 819.3352 Above MP]

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
171		3.75		1.30m	0°				270	90
172		3.75							90	90
173		3.50							270	90
174		3.50							90	90
175		3.25							270	90
176		3.25							90	90
177		3.00							270	90
178		3.00							90	90
179		2.75							270	90
180		2.75							90	90

13:24

(18)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.90m Above
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset
 Azimuth
 Elev. 10m below
 X= 0
 Y= 3.28m

Channel Borehole Phone Reference Phone
 Configuration: V=Channel 1 V=Channel 4
 R=Channel 2 R=Channel 5
 T=Channel 3 T=Channel 6

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 29 MAY 96 Location: R5MW11 [CAPITAL STATION]
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
[X = 9695.413 m Y = 10150.76 m Z = 819.3352 m MP]

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
181		2.50		1.30m	0°				270	90
182		2.50							90	90
183		2.25							270	90
184		2.25							90	90
185		2.00							270	90
186		2.00							90	90
187		1.75							270	90
188		1.75							90	90
189		1.50							270	90
190		1.50							90	90

13131

(19)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole,
Casing Elevation: 0.90m above
Azimuth of X-Axis 90°
Azimuth of Y-Axis 0°

Reference Phone: Offset _____
Azimuth _____
Elev. 10m below
X= 0
Y= 3.28

Channel Configuration:
Borehole Phone
V=Channel 1
R=Channel 2
T=Channel 3

Reference Polarization:
V 0 Azi.(deg.) 0 Vert.(deg.) 0
R 0 90
T 270 90

Date: 29 MAY 96 Location: R5MW11 [CAPITAL STATION]
High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
[X = 9695.413 m Y = 10150.76 m Z = 819.3552 m]

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
191		1.25		1.30m	0°				270	90
192		1.25							90	90
193		1.00							270	90
194		1.00							90	90
195		0.75							270	90
196		0.75							90	90
197										
198		25.0							0	180
199		24.75							0	180
199		24.50							0	180

13:38
70°
SW
13.9
14:07
P

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.90m above
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10m below
 X= 0
 Y= 3.28

Channel Configuration:
 Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Phone
 V=Channel 4
 R=Channel 5
 T=Channel 6

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 29 MAY 96 Location: RSMW 11 [CAPITAL STATION]
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
[X = 9695.413 m Y = 10150.76 m Z = 819.3352 m above MP]

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
200		24.25		1.30m	0°				0	180
201		24.00							0	180
202		23.75							0	180
203		23.50							0	180
204		23.25							0	180
205		23.00							0	180
206		22.75							0	180
207		22.50							0	180
208		22.25							0	180
209		22.00							0	180

14:10

(21)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.90m Above
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10m below
 X= 0
 Y= 3.28

Channel Borehole Phone Reference Phone
 Configuration: V=Channel 1 V=Channel 4
 R=Channel 2 R=Channel 5
 T=Channel 3 T=Channel 6

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 29 MAY 96 Location: RSMW 11 [CAPITAL STATION]
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
X = 9695.413 m Y = 10150.76 m Z = 819.3352 Above MP

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
210		21.75		1.30m	0°				0	180
211		21.50							0	180
212		21.25							0	180
213		21.00							0	180
214		20.75							0	180
215		20.50							0	180
216		20.25							0	180
217		20.00							0	180
218		19.75							0	180
219		19.50							0	180

14:19

156/mw
106/mw

(22)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.90 m Above
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10 m below
 X = 0
 Y = 3.28

Channel Borehole Phone Reference Phone
 Configuration: V=Channel 1 V=Channel 4
 R=Channel 2 R=Channel 5
 T=Channel 3 T=Channel 6

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 29 MAY 96 Location: RSMW 11 [Capital Station]
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
 [X = 9695.413 m Y = 10150.76 m Z = 819.3352 m MP]

Shot			Borehole Geophone			Source					Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical		
220		19.25		1.30m	0°				0	180		
221		19.00							0	180		
222		18.75							0	180		
223		18.50							0	180		
224		18.25							0	180		
225		18.00							0	180		
226		17.75							0	180		
227		17.50							0	180		
228		17.25							0	180		
229		17.00							0	180		

14:28

(23)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.90 m Above
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 1.10 m below
 X= 0
 Y= 3.28

Channel Configuration:
 Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 29 MAY 96 Location: RSMW 11 [CAPITAL STATION]
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
X = 9695.413 m Y = 10150.76 m Z = 819.3352 Above MP

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
230		16.75		1.30n	0°				0	180
231		16.50							0	180
232		16.25							0	180
233		16.00							0	180
234		15.75							0	180
235		15.50							0	180
236		15.25							0	180
237		15.00							0	180
238		14.75							0	180
239		14.50							0	180

14135

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.90m above
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth 010m below
 Elev. 0
 X= _____
 Y= 3.28

Channel Configuration:
 Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization:
 V 0 Azi.(deg.) 0 Vert.(deg.) 0
 R 0
 T 270

Date: 29 MAY 96 Location: RSMW 11 [Capital Station]
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
X = 9695.413 m Y = 10150.76 m Z = 819.3352 above MP

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
240		14.25		1.30m	0°				0	180
241		14.00							0	180
242		13.75							0	180
243		13.50							0	180
244		13.25							0	180
245		13.00							0	180
246		12.75							0	180
247		12.50							0	180
248		12.25							0	180
249		12.00							0	180

14:43

(25)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.90m Above
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 0.10m below
 X= 0
 Y= 3.28

Channel Configuration: Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 29 MAY 96 Location: R5MW 11 [CAPITAL STATION]
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
[X = 9695.413 m Y = 10150.76 m Z = 819.3352 above MP]

Shot		Borehole Geophone		Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Vertical
250		11.75		1.30m	0°				180
251		11.50							180
252		11.25							180
253		11.00							180
254		10.75							180
255		10.50							180
256		10.25							180
257		10.00							180
258		9.75							180
259		9.50							180

14:50

1066m
766m

(26)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.90m Above
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset
 Azimuth
 Elev. 10m below
 X= 0
 Y= 43.28

Channel Borehole Phone Reference Phone
 Configuration: V=Channel 1 V=Channel 4
 R=Channel 2 R=Channel 5
 T=Channel 3 T=Channel 6

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 29 MAY 96 Location: RSMW 11 [CAPITAL STATION]

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
[X = 9695.413 m Y = 10150.76 m Z = 819.3352 Above MP]

Shot			Borehole Geophone		Source					Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical	
260		9.25		1.30m	0°				0	180	
261		9.00							0	180	
262		8.75							0	180	
263		8.50							0	180	
264		8.25							0	180	
265		8.00							0	180	
266		7.75							0	180	
267		7.50							0	180	
268		7.25							0	180	
269		7.00							0	180	

15:01

(27)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.90m below
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset
 Azimuth
 Elev. 10m below
 X= 0
 Y= +3.28

Channel Configuration: Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 29 MAY 96 Location: R5MW11 [CAPITAL STATION]

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
[X = 9695.413 m Y = 10150.76 m Z = 819.3352 above MP]

Shot		Borehole Geophone		Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Vertical
270		6.75		1.50m	0°				180
271		6.50							180
272		6.25							180
273		6.00							180
274		5.75							180
275		5.50							180
276		5.25							180
277		5.00							180
278		4.75							180
279		4.50							180

15:07

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.90m Above
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10m below
 X= 0
 Y= 3.28

Channel Configuration: Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 29 MAY 96 Location: 25MW11 [CAPITAL STATION]
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
[X = 9695.413 m Y = 10150.76 m Z = 819.3352 Above MP]

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
280		4.25		1.30m	0°				0	180
281		4.00							0	180
282		3.75							0	180
283		3.50							0	180
284		3.25							0	180
285		3.00							0	180
286		2.75							0	180
287		2.50							0	180
288		2.25							0	180
289		2.00							0	180

1/ gain
m 15174

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.90 m Above
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset
 Azimuth
 Elev. 10 m below
 X= 0
 Y= +3.28

Channel Configuration:
 Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 29 MAY 96 Location: R5MW11 [Capital Station]
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
[X = 9695.413 m Y = 10150.76 m Z = 819.3352 Above MP]

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
290		1.75		1.30m	0°				0	180
291		1.50							0	180
292		1.25							0	180
293		1.00							0	180
294		0.75							0	180
1										
0										
1										
2										
3										

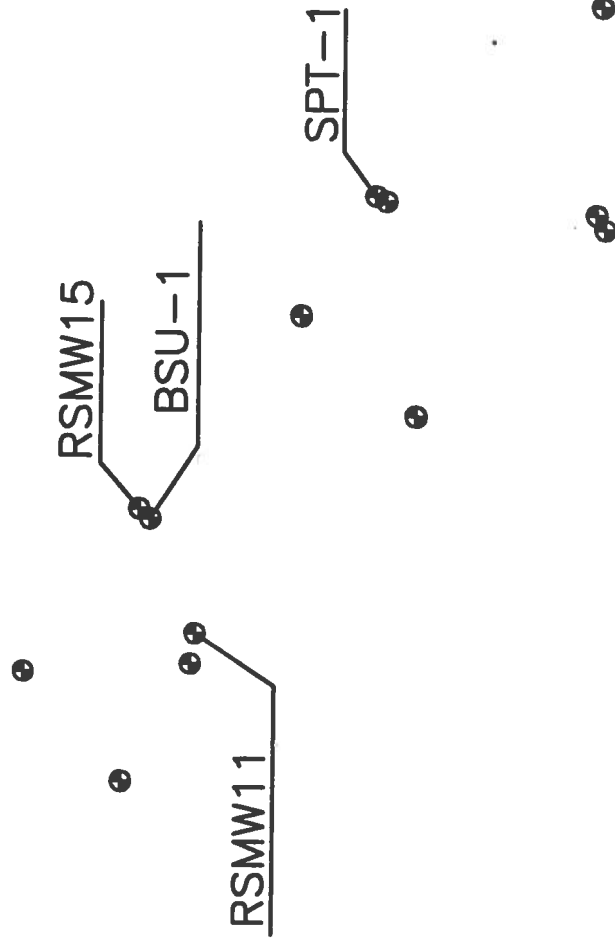
(30)

15:22
 15:24 5 min
 15:27

15:27

6.0

9500 E + 10300 N



+ 9800 N

Capital Station

28May96 P.M.

Down Hole Geophone Field Check List

Project: CAPSTN

8:59 AM

17:00

BLUE VAN

Date: 29 May 96

Odometer Start: 4770

Return

Finish: 4775.6

OFFICE

Item	Out	In	Comment
BHG-2 Borehole Geophone	✓	✓	
BHGC-1 Geophone Controller (Blue)	✓	✓	
Cable: Spool to BHGC-1	✓	✓	
Cable: BHGC-1 to Bison	✓	✓	
Ban./Alligator Power Cables BHGC-1	✓	✓	
Break out Box	✓	✓	
Oyo 3-C Reference Phone (Blue)	✓	✓	
Dummy tool	✓	✓	
Pulley/Winch Assem.	✓	✓	
Bison Seismograph		✓	
Vertical Hammer Source	✓	✓	
Black Tape	✓	✓	
WD-40	✓	✓	
Observer's Sheets/Note Book	✓	✓	
Rope	✓	✓	
Rock Hammer	✓	✓	
Tape measure (50 m)	✓	✓	
Gloves			
Compass and Maps	✓	✓	
Trigger Switch Toggle Box			Don't Take
Gas Card & Keys	✓	✓	
Water Table Logging Probe	✓	✓	

Lincoln Street and Garage

Item	Out	In	Comment
Bison Cable Box (yellow) Power Cable ✓ Trigger Cables ✓ Black Tape	✓	✓	
Bison Tool Box (grey) Paper for bison Miscl. Electronics/Safety			Need more NOT Taken <u>PAPER</u>
Tool Box			
Trigger Extension Cord	✓✓✓✓		
Tripod Head	✓	✓	
Tripod Legs (3)	✓✓✓✓		
Batteries (12V car) Need 2	✓✓✓✓		
Jumper Cable for 24V operation	✓	✓	
Railroad Tie Horizontal Hammers	✓	✓	
Sand Bags (2)	✓	✓	
Shovel	✓	✓	
Pick	✓	✓	
Nails to hold off hammer heads	✓	✓	
Hose Clamps (Spare)		✓	
Emery Paper			
Warren's well keys	✓	✓	
Steel Wool	✓	✓	