

ORIGINAL

BSU Borehole Engineering Seismology Preliminary Observations

Date: 14 JUNE 96

Type of Phones Geostuff / c/o

1. Name of well SPT - 1

2. Location of well

X= 9920.3039 m

Y= 10059.94938 m

Z= 820.94663 (Casing Elevation, CE.)

3. Depth to top of water table (measured from CE) 18.65 ft sub CE

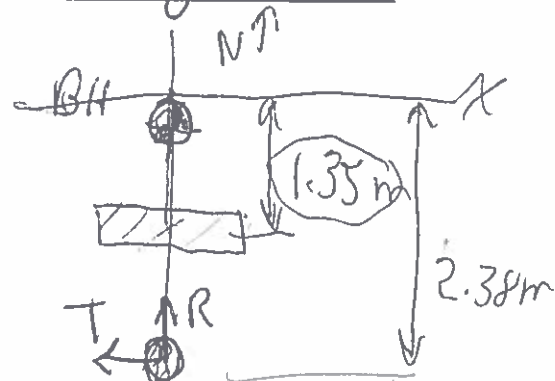
4. Height above ground level to CE +1.75m

5. Reference Phone offset from borehole ~~17.35m~~ -2.38m = y

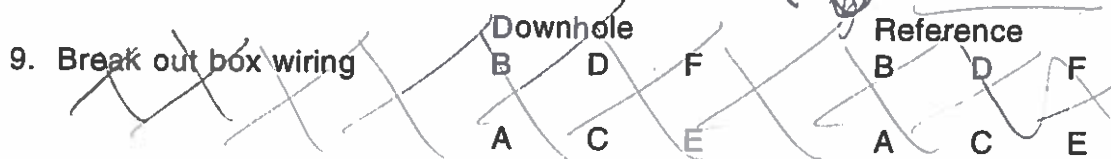
6. Reference Phone depth below ground level 0.1m

7. Source Offset from borehole -1.35m = y

8. Sketch of setup



9. Break out box wiring



10. Blue box channel settings

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

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.75 m Above
 Azimuth of X-Axis: 90°
 Azimuth of Y-Axis: 0°

Reference Phone: 2.38

Offset: 2.38
 Azimuth: 180°
 Elev.: 10m below
 X = 0
 Y = -2.38m

Channel Configuration:
 Borehole Phone
 V=Channel 4
 R=Channel 5
 T=Channel 6

Reference Polarization:
 V 0
 R 0
 T 270

Azi.(deg.)
0
90
90

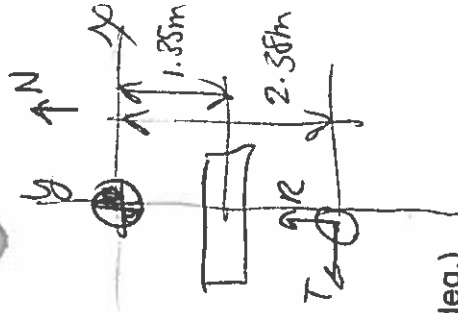
Date: 14 JUNE 96 Location: SPT-1 CAPSTN

High Cut 1000 Low Cut 4 Sample Int. 0.002 Number of Samples 2500
X = 9920.3039m Y = 10059.94938m Z = 820.746637

Shot		Borehole Geophone			Source			Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Vertical
1	SPT00001	20.00		1.35m	180°		0	-1.35	90
2		20.00		1					90
3		19.75							90
4		19.75							90
5		19.50							90
6		19.50							90
7		19.25							90
8		19.25							90
9		19.00							90
10		19.00							90

10:17

①



BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.75 m Above 0
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10m below 0
 X= 0
 Y= 2.38

Channel Configuration:
 Borehole Phone
 V=Channel 4
 R=Channel 2
 T=Channel 3

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

Date: 14 JUNE 96 Location: SPT-1 CORSTN

High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500
X = 9920.3039m Y = 10059.94938m Z = 820.746637

Shot		Borehole Geophone		Source					Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
11		18.75		1.35	180°				270	90
12		18.75							90	90
13		18.50							270	90
14		18.50							90	90
15		18.25							270	90
16		18.25							90	90
17		18.00							270	90
18		18.00							90	90
19		17.75							270	90
20		17.75							90	90

10:26

58/aw

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 175 m Above 0
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10 m below 0
 X= 0
 Y= 2.38

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: 14 JUNE 96 Location: SPT-1 CAPSTN
 High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500
X = 9920.3039 m Y = 10059.94938 m Z = 820.746637

Shot		Borehole Geophone			Source			Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Vertical
21		17.50		1.35	180				90
22		17.50							90
23		17.25							90
24		17.25							90
25		17.00							90
26		17.00							90
27		16.75							90
28		16.75							90
29		16.50							90
30		16.50							90

10:32

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.75 m Above CL
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10m below CL
 X= 0
 Y= 2.38

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

Reference Polarization:
 V=Channel 4
 R=Channel 5
 T=Channel 6
 Azi.(deg.) 0
 Vert.(deg.) 0
90
90

Date: 14 JUNE 96 Location: SPT-1 CAPSTN

High Cut 1000 Low Cut 4 Sample Int. 0.002 Number of Samples 2500
X = 9920.3039m Y = 10059.94938m Z = 820.746637

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
<u>31</u>		<u>16.25</u>		<u>1.35</u>	<u>180</u>				<u>270</u>	<u>90</u>
<u>32</u>		<u>16.25</u>							<u>90</u>	<u>90</u>
<u>33</u>		<u>16.00</u>							<u>270</u>	<u>90</u>
<u>34</u>		<u>16.00</u>							<u>90</u>	<u>90</u>
<u>35</u>		<u>15.75</u>							<u>270</u>	<u>90</u>
<u>36</u>		<u>15.75</u>							<u>90</u>	<u>90</u>
<u>37</u>		<u>15.50</u>							<u>270</u>	<u>90</u>
<u>38</u>		<u>15.50</u>							<u>90</u>	<u>90</u>
<u>39</u>		<u>15.25</u>							<u>270</u>	<u>90</u>
<u>40</u>		<u>15.25</u>							<u>90</u>	<u>90</u>

10:37

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BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 75 m Above CL
 Azimuth of X-Axis: 90°
 Azimuth of Y-Axis: 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10 m below CL
 X = 0
 Y = 2.38

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

Reference Polarization:
 V _____
 R _____
 T _____

Azi.(deg.)
0
90
90

Date: 14 JUNE 96 Location: SPT-1 CORSTN

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
X = 9920.3039m Y = 10059.94938m Z = 820.746637

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
41		15.00		1.35	180°				270	90
42		15.00							90	90
43		14.75							270	90
44		14.75							90	90
45		14.50							270	90
46		14.50							90	90
47		14.25							270	90
48		14.25							90	90
49		14.00							270	90
50		14.00		0					90	90

10:43

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.75 m Above ϕ
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10m below ϕ
 X= 0
 Y= 2.38

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

Reference Polarization:
 V _____
 R _____
 T _____

Azi.(deg.)
0
90
90

Date: 14 JUNE 96 Location: SPT-1 CORSTN

High Cut 1000 Low Cut 4 Sample Int. 0.002 Number of Samples 2500
X = 9920.3039m Y = 10059.94938m Z = 820.746637

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
51		13.75		1.35	180				270	90
52		13.75							90	90
53		13.50							270	90
54		13.50							90	90
55		13.25							270	90
56		13.25							90	90
57		13.00							270	90
58		13.00							90	90
59		12.75							270	90
60		12.75							90	90

10:48

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BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.75 m Above ϕ
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10m below ϕ
 X= 0
 Y= 2.38

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

Date: 14 JUNE 96 Location: SPT-1 CARSTN

High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500
X = 9920.3039m Y = 10059.94938m Z = 820.746637

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
61		12.50		1.35	180				270	90
62		12.50		1	1				90	90
63		12.25		1	1				270	90
64		12.25		1	1				90	90
65		12.00		1	1				270	90
66		12.00		1	1				90	90
67		11.75		1	1				270	90
68		11.75		1	1				90	90
69		11.50		1	1				270	90
70		11.50		1	1				90	90

10:53

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BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 75 m Above
 Azimuth of X-Axis: 90°
 Azimuth of Y-Axis: 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10 m below
 X= 0
 Y= 2.38

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

Reference Polarization:
 V _____
 R _____
 T _____

Azi.(deg.)
0
90
90

Date: 14 JUNE 96 Location: SPT-1 CORSTN
 High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500
X = 9920.3039 m Y = 10059.74938 m Z = 820.746637

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
71		11.25		1.35	180				270	90
72		11.25							90	90
73		11.00							270	90
74		11.00							90	90
75		10.75							270	90
76		10.75							90	90
77		10.50							270	90
78		10.50							90	90
79		10.25							270	90
80		10.25							90	90

10:59

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 75 m Above 0
 Azimuth of X-Axis: 90°
 Azimuth of Y-Axis: 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10 m below 0
 X= 0
 Y= 2.38

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

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

Date: 14 JUNE 96 Location: SPT-1 CORSTN
 High Cut 1000 Low Cut 4 Sample Int. 0.002 Number of Samples 2500
X = 9920.3039 m Y = 10059.94938 m Z = 820.746637

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
81		10.00		1.35	180				270	90
82		10.00							90	90
83		9.75							270	90
84		9.75							90	90
85		9.50							270	90
86		9.50							90	90
87		9.25							270	90
88		9.25							90	90
89		9.00							270	90
90		9.00							90	90

11:04

(9)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 75 m Above ϕ .
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10m below ϕ
 X= 0
 Y= 2.38

Channel Configuration:
 Borehole Phone
 V=Channel 4
 R=Channel 2
 T=Channel 3

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

Date: 14 JUNE 96 Location: SPT-1 CapSTN

High Cut 1000 Low Cut 4 Sample Int. 0.002 Number of Samples 2500
X = 9920.3039m Y = 10059.74938m Z = 820.746637

Shot		Borehole Geophone		Source					Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
91		8.75		1.35	180				270	90
92		8.75							90	90
93		8.50							270	90
94		8.50							90	90
95		8.25							270	90
96		8.25							90	90
97		8.00							270	90
98		8.00							90	90
99		7.75							270	90
100		7.75							90	90

11:09
11:36

(10)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: .75 m Above ϕ
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. .10m below ϕ
 X= 0
 Y= 2.38

Channel Configuration:
 Borehole Phone
 V=Channel 4
 R=Channel 5
 T=Channel 6

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

Date: 14 JUNE 96 Location: SPT-1 CORSTN

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
X = 9920.3039m Y = 10059.74938m Z = 820.746637

Shot		Borehole Geophone		Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Vertical
101		7.50		1.35	180				270 90
102		7.50							90 90
103		7.25							270 90
104		7.25							90 90
105		7.00							270 90
106		7.00							90 90
107		6.75							270 90
108		6.75							90 90
109		6.50							270 90
110		6.50							90 90

11:41

(11)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.75 m Above ϕ .
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10m below ϕ
 X= 0
 Y= 2.38

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

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

Date: 14 JUNE 96 Location: SPT-1 CapSTN

High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500
X = 9920.3039m Y = 10059.94938m Z = 820.746637

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
111		6.25		1.35	180				270	90
112		6.25							90	90
113		6.00							270	90
114		6.00							90	90
115		5.75							270	90
116		5.75							90	90
117		5.50							270	90
118		5.50							90	90
119		5.25							270	90
120		5.25							90	90

11.46

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BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.75 m Above ϕ
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10 m below ϕ
 X= 0
 Y= 2.38

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: 14 JUNE 96 Location: SPT-1 CORSTN

High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500
X = 9920.3039 m Y = 10059.94938 m Z = 820.746637

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
121		5.00		1.35	180°				270	90
122		5.00							90	90
123		4.75							270	90
124		4.75							90	90
125		4.50							270	90
126		4.50							90	98
127		4.25							270	90
128		4.25							90	90
129		4.00							270	90
130		4.00							90	90

11:51

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BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 275 m Above G
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10 m below G
 X= 0
 Y= 2.38

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

Reference Polarization:
 V=Channel 4
 R=Channel 5
 T=Channel 6
 Azi.(deg.)
 V 0
 R 0
 T 270
 Vert.(deg.)
 V 0
 R 90
 T 90

Date: 14 JUNE 96 Location: SPT-1 CORSTN

High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500
X = 9920.3039 m Y = 10059.94938 m Z = 820.746637

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
131		3.75		1.35	180°				270	90
132		3.75							90	90
133		3.50							270	90
134		3.50							90	90
135		3.25							270	90
136		3.25							90	90
137		3.00							270	90
138		3.00							90	90
139		2.75							270	90
140		2.75							90	90

11:55

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 275 m Above 0
 Azimuth of X-Axis: 90°
 Azimuth of Y-Axis: 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10 m below 0
 X= 0
 Y= 2.38

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: 14 JUNE 96 Location: SPT-1 CapSTN
 High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500
X = 9920.3039 m Y = 10059.94938 m Z = 820.746637

Shot		Borehole Geophone			Source			Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Vertical
141		2.50		1.35	180				90
142		2.50							90
143		2.25							90
144		2.25							90
145		2.00							90
146		2.00							90
147		1.75							90
148		1.75							90
149		1.50							90
150		1.50							90

12.107

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BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole

Casing Elevation: 75 m Above 0

Azimuth of X-Axis 90°

Azimuth of Y-Axis 0°

Reference Phone: Offset

Azimuth

Elev. 10 m below 0

X= 0

Y= 2.38

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.)

V

0

R

0

T

270

Vert.(deg.)

0

90

90

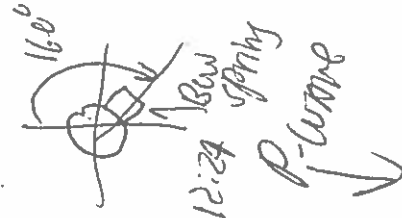
Date: 14 JUNE 96 Location: SPT-1 CARSTN

High Cut 1000 Low Cut 4 Sample Int. 0.002 Number of Samples 2500

X = 9920.3039 m Y = 10059.94938 m Z = 820.746637

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
151		1.25		7.35	180				270	90
152		1.25							90	90
153		1.00							270	90
154		1.00							90	90
155		0.75							270	90
156		0.75							90	90
157		20.00							0	180
158		19.75							0	180
159		19.50							0	180

12:09



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BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: -75 m Above ϕ .
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10 m below ϕ
 X= 0
 Y= 2.38

Channel Configuration: Borehole 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: 14 JUNE 96 Location: SPT-1 CORSTN
 High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500
X = 9920.3039 m Y = 10059.74938 m Z = 820.746637

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
160		19.25		1.35	180				0	180
161		19.00							0	180
162		18.75							0	180
163		18.50							0	180
164		18.25							0	180
165		18.00							0	180
166		17.75							0	180
167		17.50							0	180
168		17.25							0	180
169		17.00							0	180

12:31

Tool Stack

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.75 m Above 0
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10 m below 0
 X= 0
 Y= 2.38

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

Reference Polarization:
 V=Channel 4
 R=Channel 5
 T=Channel 6
 Azi.(deg.)
 V 0
 R 0
 T 270
 Vert.(deg.)
 V 0
 R 90
 T 90

Date: 14 JUNE 96 Location: SPT-1 CORSTN
 High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500
X = 9920.3039 m Y = 10059.74938 m Z = 820.746637

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
170		16.75		1.35	180				0	180
171		16.50			1				0	180
172		16.25							0	180
173		16.00							0	180
174		15.75							0	180
175		15.50							0	180
176		15.25							0	180
177		15.00							0	180
178		14.75							0	180
179		14.50							0	180

12:40

178

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 75 m Above 0
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10 m below 0
 X= 0
 Y= 2.38

Channel Configuration: Borehole 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: 14 JUNE 96 Location: SPT-1 CARSTN
 High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500
X = 9920.3039 m Y = 10059.94938 m Z = 820.746637

Shot		Borehole Geophone			Source					Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical	
180		14.25		1.35	180°				0	180	
181		14.00							0	180	
182		13.75							0	180	
183		13.50							0	180	
184		13.25							0	180	
185		13.00							0	180	
186		12.75							0	180	
187		12.50							0	180	
188		12.25							0	180	
189		12.00							0	180	

12:45

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: .75 m Above 0
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10 m below 0
 X= 0
 Y= 2.38

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

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

Date: 14 JUNE 96 Location: SPT-1 CORSTN
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
X = 9920.3039 m Y = 10059.94938 m Z = 820.746637

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
190		11.75		1.35	180°				0	180
191		11.50							0	180
192		11.25							0	180
193		11.00							0	180
194		10.75							0	180
195		10.50							0	180
196		10.25							0	180
197		10.00							0	180
198		9.75							0	180
199		9.50							0	180

12:50

(20)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.75 m Above ϕ .
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10 m below ϕ
 X= 0
 Y= 2.38

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

Reference Polarization:
 V _____
 R _____
 T _____

Azi.(deg.)
0
90
90

Date: 14 JUNE 96 Location: SPT-1 CORSTN

High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500
X = 9920.3039 m Y = 10059.94938 m Z = 820.746637

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
200		9.25		1.35	180°				0	180
201		9.00							0	180
202		8.75							0	180
203		8.50							0	180
204		8.25							0	180
205		8.00							0	180
206		7.75							0	180
207		7.50							0	180
208		7.25							0	180
209		7.00							0	180

12:55

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.75 m Above ϕ
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10 m below ϕ
 X= 0
 Y= 2.38

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: 14 JUNE 96 Location: SPT-1 CAPSTN

High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500
X = 9920.3039 m Y = 10059.94938 m Z = 820.746637

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
210		6.75		1.35	180°				0	180
211		6.50							0	180
212		6.25							0	180
213		6.00							0	180
214		5.75							0	180
215		5.50							0	180
216		5.25							0	180
217		5.00							0	180
218		4.75							0	180
219		4.50							0	180

13.06

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.75 m Above 0.
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 0.10 m below 0
 X= 0
 Y= 2.38

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: 14 JUNE 96 Location: SPT-1 CAPSTN
 High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500
X = 9920.3039 m Y = 10059.94938 m Z = 820.746637

Shot		Borehole Geophone			Source			Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Vertical
220		4.25		1.35	180			0	180
221		4.00						0	180
222		3.75						0	180
223		3.50						0	180
224		3.25						0	180
225		3.00						0	180
226		2.75						0	180
227		2.50						0	180
228		2.25						0	180
229		2.00						0	180

13:05

(23)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 75 m Above ϕ .
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10 m below ϕ
 X = 0
 Y = 2.38

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: 14 JUNE 96 Location: SPT-1 CapSTN
 High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500
X = 9920.3039 m Y = 10059.94938 m Z = 820.746637

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
1	REC10001	20.0		1.35	180°				0	180
2		19.5							0	180
3		19.0							0	180
4		18.5							0	180
5		18.0							0	180
6		17.5							0	180
7		17.0							0	180
8		16.5							0	180
9		16.0							0	180
10		15.5							0	180

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 75 m Above ϕ .
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10 m below ϕ
 X= 0
 Y= 2.38

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

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

Date: 14 JUNE 96 Location: SPT-1 CORSTN

High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500
X = 9920.3039 m Y = 10059.94938 m Z = 820.746637

Shot		Borehole Geophone			Source					Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical	
11	1000	15.0		1.35	180°				0	180	
12		14.5							0	180	
13		14.0							0	180	
14		13.5							0	180	
15		13.0							0	180	
16		12.5							0	180	
17		12.0							0	180	
18		11.5							0	180	
19		11.0							0	180	
20		10.5							0	180	

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 75 m Above ϕ
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10m below ϕ
 X= 0
 Y= 2.38

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: 14 JUNE 96 Location: SPT-1 CORSTN
 High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500
X = 9920.3039m Y = 10059.94938m Z = 820.746637

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
21		10.0		1.35	180°				0	180
22		9.5		1.35	180°				0	180
23		9.0							0	180
24		8.5							0	180
25		8.0							0	180
26		7.5							0	180
27		7.0							0	180
28		6.5							0	180
29		6.0							0	180
30		5.5							0	180

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
Casing Elevation: 75
Azimuth of X-Axis 90°
Azimuth of Y-Axis 0°

Reference Phone: _____

Offset _____

Azimuth _____

Elev. _____

X = _____

Y = 2.38

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

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

Date: 14 JUNE 96 Location: SPT-1 CAPSTN

High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500
 $X = 9920.3089m$ $Y = 10059.94938m$ $Z = 820.9463m$

[illegible]

Down Hole Geophone Field Check List

Project: CAPSTN

8:00 AM — 15:00

Date: 14 June 96

Odometer Start: _____ Finish: _____

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			Leave
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 <i>None</i>			
Compass and Maps	✓	✓	
Trigger Switch Toggle Box			Leave
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	✓	✓	
Tool Box			left
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)	8	8	
Shovel	✓	✓	
Pick	✓	✓	
Nails to hold off hammer heads	✓	✓	
Electric Drill & Bits	✓	✓	
Well Keys	✓		