

BSU Borehole Engineering Seismology Preliminary Observations

Date: 21 May 98 Type of Phones 010⁽¹⁴⁾ NZ

1. Name of well UR15P X3

2. Location of well
X= 10017.37210

Y= 9963.71066

Z= 849.79799 (Casing Elevation, CE.)

3. Depth to top of water table (measured from CE) (3.7 ft) = 1.1278 m

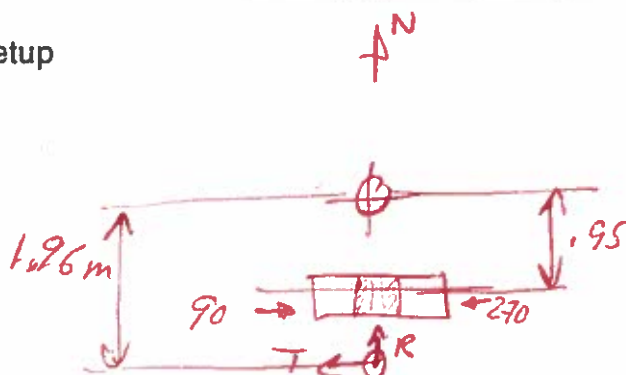
4. Height above ground level to CE (.629 - .119) = .51

5. Reference Phone offset from borehole 1.96

6. Reference Phone depth below ground level 0

7. Source Offset from borehole 0.95 m S

8. Sketch of setup



$$19.73 + 1.12 = 20.85$$

T/D

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

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 67.51
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0

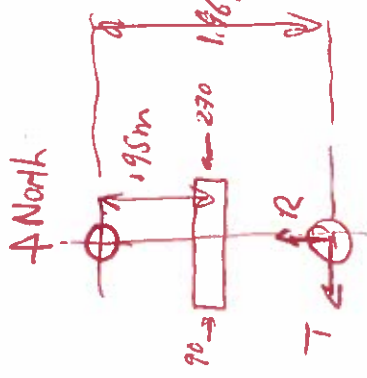
Well Coord.
 X = 10017.3721 m
 Y = 9963.71066 m
 Z = 849.79799 m

Reference Phone:
 Azimuth _____
 Elev. _____
 X = 0
 Y = -1.96

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

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

Date: 21 MAY 98 Location: URISP X3 Well
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500



Shot		Borehole Geophone		Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Vertical
	WLX3000	20.25					0	-1.95	135
	2	20.25					1	1	135
	3	20.0					1	1	270
	4	20.0					1	1	90
	5	19.75					1	1	270
	6	19.75					1	1	90
	7	19.50					1	1	270
	8	19.50					1	1	90
	9	19.25					1	1	270
	10	19.25					1	1	90

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole Well Coord. Reference Phone: Offset
 Casing Elevation: 67.51 X = 10017.3721 m Azimuth
 Azimuth of X-Axis: 90° Y = 9963.71066 m Elev. 0
 Azimuth of Y-Axis: 0 Z = 849.79799 m X = 0
 Channel Borehole Phone Reference Phone: Azi.(deg.) Vert.(deg.)
 Configuration: V=Channel 1 V 0
 R=Channel 2 R 0
 T=Channel 3 T 270
 Date: 21 MAY 98 Location: URISP X3 Well
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
11	WLX3000J	19.0				0	0	-95	270	135
12		19.0							90	
13		18.75							270	
14		18.75							90	
15		18.50							270	
16		18.50							90	
17		18.25							270	
18		18.25							90	
19		18.00							270	
20		18.00							90	

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole Well Coord. Reference Phone: Offset
 Casing Elevation: 6' + .51 Azimuth
 Azimuth of X-Axis 90° Elev.
 Azimuth of Y-Axis 0 X= 0
 Y= -1.96

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

Date: 21 MAY 98 Location: URISP X3 Well
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

Shot			Borehole Geophone			Source					Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical		
21	WLX3000J	17.75				6	0	-95	270	135		
22		17.75							90			
23		17.50							270			
24		17.50							90			
25		17.25							270			
26		17.25							90			
27		17.0							270			
28		17.0							90			
29		16.75							270			
30		16.75							90			

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole Well Coord. Reference Phone: Offset
 Casing Elevation: 67.51 Azimuth 0
 Azimuth of X-Axis 90° Elev. 0
 Azimuth of Y-Axis 0 X= 0
 Y= -1.96

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

Date: 21 MAY 98 Location: URISP X3 Well
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev,	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
31	WLX3(noo)	16.50				0	0	- .95	270	135
32		16.50							90	
33		16.25							270	
34		16.25							90	
35		16.0							270	
36		16.0							90	
37		15.75							270	
38		15.75							90	
39		15.50							270	
40		15.50							90	

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole Well Coord. Reference Phone: Offset
 Casing Elevation: 6' + .51 Azimuth
 Azimuth of X-Axis 90° Elev.
 Azimuth of Y-Axis 0 X= 0
 Y= -1.96

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

Date: 21 MAY 98 Location: URISP X3 Well
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
41	WLX3000J	15.25				6	0	- .95	270	135
42		15.25							90	
43		15.0							270	
44		15.0							90	
45		14.75							270	
46		14.75							90	
47		14.50							270	
48		14.50							90	
49		14.25							270	
50		14.25							90	

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole Well Coord. Reference Phone: Offset
 Casing Elevation: 6' + 51 Azimuth
 Azimuth of X-Axis: 90° Elev. 6
 Azimuth of Y-Axis: 0 X = -1.96
 Y = -1.96
 Channel Borehole Phone Reference Phone
 Configuration: V=Channel 1 V=Channel 4 Azi.(deg.) Vert.(deg.)
 R=Channel 2 R=Channel 5 0 90
 T=Channel 3 T=Channel 6 270 90

Date: 21 MAY 98 Location: URISP X3 Well
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

Shot		Borehole Geophone			Source			Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Vertical
51	WLX3000J	14.0					0	-1.96	135
52		14.0						-1.96	90
53		13.75							270
54		13.75							90
55		13.50							270
56		13.50							90
57		13.25							270
58		13.25							90
59		13.0							270
60		13.0							90

rod stuck
 13.6
 reclamp @ 13.50

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole Well Coord. Reference Phone: Offset
 Casing Elevation: 6' + 5' Azimuth
 Azimuth of X-Axis 90° Elev.
 Azimuth of Y-Axis 0 X = 0
 Y = -1.96

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

Date: 21 MAY 98 Location: URISP X3 Well
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev,	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
61	WLX3000J	12.15				6	0	-95	270	135
62		12.75							90	
63		12.50							270	
64		12.50							90	
65		12.25							270	
66		12.25							90	
67		12.0							270	
68		12.0							90	
69		11.75							270	
70		11.75							90	

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole Well Coord. Reference Phone: Offset
 Casing Elevation: 67.5 X = 10017.3721 m Azimuth
 Azimuth of X-Axis: 90° Y = 9963.71066 m Elev. 0
 Azimuth of Y-Axis: 0 Z = 849.79799 m X = -1.96 Y = 0
 Channel Borehole Phone Reference Phone
 Configuration: V=Channel 1 V=Channel 4 Azl.(deg.) Vert.(deg.)
 R=Channel 2 R=Channel 5 0 90
 T=Channel 3 T=Channel 6 270 90

Date: 21 MAY 98 Location: URISP X3 Well
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
71	WLB3000J	11.50				0	0	-95	270	135
72		11.50							90	
73		11.25							270	
74		11.25							90	
75		11.0							270	
76		11.0							90	
77		10.75							270	
78		10.75							90	
79		10.50							270	
80		10.50							90	

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 67.51
 Azimuth of X-Axis: 90°
 Azimuth of Y-Axis: 0

Well Coord. Reference Phone: Offset
 X = 10017.3721 m
 Y = 9963.71066 m
 Z = 849.79799 m
 CE 1000

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

Date: 21 MAY 98 Location: URISP X3 Well
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
81	WLX3000J	10.25				6	0	- .95	270	135
82		10.25							90	
83		10.0							270	
84		10.0							90	
85		9.75							270	
86		9.75							90	
87		9.50							270	
88		9.50							90	
89		9.25							270	
90		9.25							90	

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole Well Coord. Reference Phone: Offset
 Casing Elevation: 67.51 X = 10017.3721 m Azimuth 0
 Azimuth of X-Axis 90° Y = 9963.71066 m Elev. 0
 Azimuth of Y-Axis 0 Z = 849.79799 m X = 0
 Channel Borehole Phone Reference Phone: Azi.(deg.) Vert.(deg.)
 Configuration: V=Channel 1 V=Channel 4 0 0
 R=Channel 2 R=Channel 5 90
 T=Channel 3 T=Channel 6 90

Date: 21 MAY 98 Location: URISP X3 Well
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
91	WLX3000	9.0					0	- .95	270	135
92		9.0							90	
93		8.75							270	
94		8.75							90	
95		8.50							270	
96		8.50							90	
97		8.25							270	
98		8.25							90	
99		8.0							270	
100		8.0							90	

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole Well Coord. Reference Phone: Offset
 Casing Elevation: 67.151 X = 10017.3721 m Azimuth
 Azimuth of X-Axis: 90° Y = 9963.71066 m Elev. 0
 Azimuth of Y-Axis: 0 Z = 849.79799 m X = 0
 Channel Borehole Phone Reference Phone Azi.(deg.) Vert.(deg.)
 Configuration: V=Channel 1 V=Channel 4 0 0
 R=Channel 2 R=Channel 5 0 90
 T=Channel 3 T=Channel 6 270 90

Date: 21 MAY 98 Location: URISP X3 Well
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev,	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
101	WLX3000J	7.75				0	0	-95	270	135
102		7.75							90	
103		7.50							270	
104		7.50							90	
105		7.25							270	
106		7.25							90	
107		7.0							270	
108		7.0							90	
109		6.75							270	
110		6.75							90	

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 67.51
 Azimuth of X-Axis: 90°
 Azimuth of Y-Axis: 0

Well Coord.
 X = 10017.3721 m
 Y = 9963.71066 m
 Z = 849.79799 m ^(CF)

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:
 V 0
 R 0
 T 270

Azi.(deg.)
 V 0
 R 90
 T 90

Date: 21 MAY 98 Location: URISP X3 Well

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
111	WLX3000J	6.50				7	0	-1.95	270	135
112		6.50							90	
113		6.25							270	
114		6.25							90	
115		6.0							270	
116		6.0							90	
117		5.75							270	
118		5.75							90	
119		5.50							270	
120		5.50							90	

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole Well Coord. Reference Phone: Offset
 Casing Elevation: 67 X = 10017.3721 m Azimuth 6
 Azimuth of X-Axis 90° Y = 9963.71066 m Elev. 6
 Azimuth of Y-Axis 0 Z = 849.79799 m X = 0
 Channel Borehole Phone Reference Phone Azimuth 0
 Configuration: V=Channel 1 V=Channel 4 Vert.(deg.) 0
 R=Channel 2 R=Channel 5 90
 T=Channel 3 T=Channel 6 90
 Date: 21 MAY 98 Location: URISP X3 Well
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

Shot		Borehole Geophone		Source				Source Polarization	
Rec	File	Depth	Elev,	Offset	Azimuth	Elev.	X	Y	Vertical
121	WLX3000J	5.25				2	0	-1.95	135
122		5.25							
123		5.0							
124		5.0							
125		4.75							
126		4.75							
127		4.50							
128		4.50							
129		4.25							
130		4.25							

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole Well Coord. Reference Phone: Offset
 Casing Elevation: 67.51 X=10017.3721 m Azimuth 0
 Azimuth of X-Axis 90° Y=9963.71066 m Elev. 0
 Azimuth of Y-Axis 0 Z=849.79799 m X= 0
CE AP AP AP Y= -1.96

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

Date: 21 MAY 98 Location: URISP X3 Well
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

Shot		Borehole Geophone		Source			Source Polarization	
Rec	File	Depth	Elev,	Offset	Azimuth	Elev.	X	Y
131	WLX9000J	4.0				6.1	0	-95
132		4.0						90
133		3.75						270
134		3.75						90
135		3.50						270
136		3.50						90
137		3.25						270
138		3.25						90
139		3.00						270
140		3.00				0		90

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole Well Coord. Reference Phone: Offset
 Casing Elevation: 67.5' X = 10017.3721 m Azimuth
 Azimuth of X-Axis: 90° Y = 9963.71066 m Elev. 0
 Azimuth of Y-Axis: 0 Z = 849.79799 m X = 0
 Channel Borehole Phone Reference Phone Azi.(deg.) Vert.(deg.)
 Configuration: V=Channel 1 V=Channel 4 0
 R=Channel 2 R=Channel 5 0
 T=Channel 3 T=Channel 6 270

Date: 21 MAY 98 Location: URISP X3 Well
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
141	WLX3000J	2.75					0	-95	270	135
142		2.75							90	
143		2.50							270	
144		2.50							90	
145		2.25							270	
146		2.25							90	
147		2.0							270	
148		2.0							90	
149		1.75							270	
150		1.75							90	

Coordinate System Origin at Borehole Well Coord. Reference Phone: Offset

Casing Elevation: 6' + .51 X = 10017.3721 m Azimuth

Azimuth of X-Axis: 90° Y = 9963.71066 m Elev. 20

Azimuth of Y-Axis: 0 Z = 849.79799 m X = -1.96 Y =

Channel Borehole Phone Reference Polarization: Azl. (deg.) Vert. (deg.)

Configuration: V = Channel 1 V 0 0

R = Channel 2 R 0 90

T = Channel 3 T 270 90

Date: 21 MAY 98 Location: URISP X3 Well

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

Date: 21 MAY 98 Location: UR15P X3 well

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

[illegible]

Down Hole Geophone Field Check List

Project: URISP X3-Well

Date: 21 May 98

Odometer Start: 14160

Finish: 14179.2

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 <i>NO</i>			
Oyo 3-C Reference Phone (Blue)	✓	✓	
Dummy tool	✓	✓	
Pulley/Winch Assem.	✓	✓	
Bison Seismograph	✓	✓	
Vertical Hammer Source <i>NO</i>			
Black Tape	✓	✓	
WD-40	✓	✓	
Observer's Sheets/Note Book	✓	✓	
Rope	✓	✓	
Rock Hammer	✓	✓	
Tape measure (50 m)	✓	✓	
Gloves	✓	✓	
Compass and Maps	✓	✓	
Trigger Switch Toggle Box <i>NO</i>			
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 <i>NO</i> Miscl. Electronics/Safety			
Tool Box <i>Red</i>	✓	✓	
Trigger Extension Cord <i>NO</i>			
Tripod Head	✓	✓	
Tripod Legs (3)	✓	✓	
Batteries (12V car) Need 2			
Jumper Cable for 24V operation			
Railroad Tie Horizontal Hammers <i>NO</i>			
Sand Bags (2)			
Shovel			
Pick			
Nails to hold off hammer heads	✓		
<i>135° source</i>	✓	✓	
<i>24V B&J</i>	✓	✓	