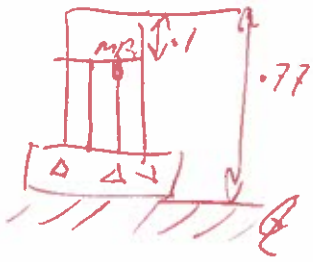
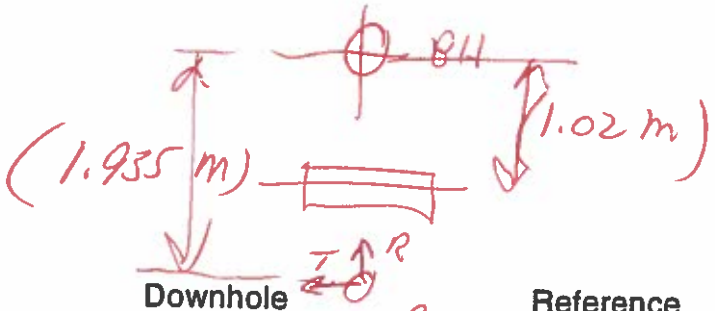
BSU Borehole Engineering Seismology
Preliminary Observations

Date: 4 June 98 [redacted] Type of Phones Oyo 14NZ

1. Name of well A1 URISP
2. Location of well
   X= 10000.00067
   Y= 9999.88612
   Z= 850.22440 (Casing Elevation, CE.)
3. Depth to top of water table (measured from CE) (1.318m) metric Tape
4. Height above ground level to CE .67 m above ℄ 19.534+(1.12) T/D meters
5. Reference Phone offset from borehole 1.935
6. Reference Phone depth below ground level ℄
7. Source Offset from borehole 1.02 m south
8. Sketch of setup





9. Break out box wiring

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

10. Blue box channel settings

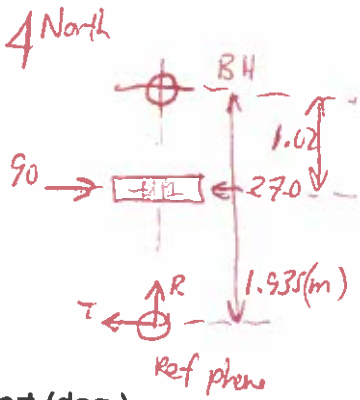
Channel	Component
1	Vertical
2	Longitudinal (radial)
3	Transverse

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole: Well Coord
Casing Elevation: 6 + (.67m)
Azimuth of X-Axis: 90°
Azimuth of Y-Axis: 0°

X = 10000.000 67 m
Y = 9999.88612 m
Z = 850.22940 m
Above $

Reference Phone: Offset 1.93
Azimuth South
Elev.
X= 0
Y= -1.935(m)



Channel Configuration:

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

Reference Polarization:

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

Date: 4 JUNE 98 Location: URISP A1 Well
High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

Wtable 1.318m sub CE

10:35

Shot		Borehole Geophone		Source					Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
1	WA1001	20.0		1.02m	South	6	0	-1.02(m)	270	135
2		20.0							90	135
3	W	19.75								
4		19.75								
5		19.50								
6		19.50								
7		19.25								
8		19.25								
9		19.00								
10		19.00								

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole — Well Coord
Casing Elevation: 6+.67
Azimuth of X-Axis: 90°
Azimuth of Y-Axis: 0°

X = 10000.000 67 m
Y = 9999.88612 m
Z = 850.22940 m
Above ℓ

Reference Phone: Offset ____ Azimuth ____ Elev. ____ X= 0 Y= −1.935

Channel Configuration:

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

Reference Polarization:

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

Date: 4JUNE98 Location: URISP A1 Well
High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

10:44

Shot		Borehole Geophone		Source					Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
11		18.75					0	−1.02 m	270	135
12		18.75							90	135
13		18.50								
14		18.50								
15		18.25								
16		18.25								
17		18.00								
18		18.00								
19		17.75								
20		17.75								

16

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
Casing Elevation: 6 + (.67 m)
Azimuth of X-Axis 90°
Azimuth of Y-Axis 0°

Well coord
X = 10000.00067 m
Y = 9999.88612 m
Z = 850.22440 m

Reference Phone: Offset
Azimuth
Elev.
X= 0
Y= −1.935

Channel Configuration:

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

Reference Polarization:

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

Date: 4JUNE98 Location: URISP A1 Well
High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

10:52

Shot		Borehole Geophone		Source					Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
21		17.50					0	−1.02m	270	135
22		17.50							90	135
23		17.25								
24		17.25								
25		17.00								
26		17.00								
27		16.75								
28		16.75								
29		16.50								
30		16.50								

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole — Well Coord
Casing Elevation: 64.67
Azimuth of X-Axis: 90°
Azimuth of Y-Axis: 0°

X = 10000.00067 m
Y = 9999.88612 m
Z = 850.22940 m above ℄

Reference Phone: Offset ____ Azimuth ____ Elev. ____ X= 0 Y= -1.935

Channel Configuration:

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

Reference Polarization:

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

Date: 4JUNE98 Location: URISP A1 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		16.25					0	-1.02m	270	135
32		16.25							90	135
33		16.00								
34		16.00								
35		15.75								
36		15.75								
37		15.50								
38		15.50								
39		15.25								
40		15.25								

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole: Well Coord
Casing Elevation: G.L. + .67 m
Azimuth of X-Axis: 90°
Azimuth of Y-Axis: 0°

X = 10000.00067 m
Y = 9999.88612 m
Z = 850.22940 m above MSL

Reference Phone: Offset ____ Azimuth ____ Elev. ____ X= 0 Y= -1.935

Channel Configuration:

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

Reference Polarization:

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

Date: 4JUNE98 Location: URISP A1 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		15.00					0	-1.02	270	135
42		15.00							90	135
43		14.75								
44		14.75								
45		14.50								
46		14.50								
47		14.25								
48		14.25								
49		14.00								
50		14.00								

10:59

5 of 16

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole — Well Coord
Casing Elevation: G.L. + .67
Azimuth of X-Axis: 90°
Azimuth of Y-Axis: 0°

X = 10000.00067 m
Y = 9999.88612 m
Z = 850.22940 m above S.L.

Reference Phone: Offset ____ Azimuth ____ Elev. ____ X= 0 Y= -1.935

Channel Configuration:

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

Reference Polarization:

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

Date: 4 JUNE 98 Location: URISP A1 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
51		13.75					0	-1.02m	270	135
52		13.75					"	"	90	135
53		13.50					"	"	"	"
54		13.50					"	"	"	"
55		13.25					"	"	"	"
56		13.25					"	"	"	"
57		13.00					"	"	"	"
58		13.00					"	"	"	"
59		12.75					"	"	"	"
60		12.75					"	"	"	"

11:08

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole — Well Coord
Casing Elevation: G.L. + .67
Azimuth of X-Axis: 90°
Azimuth of Y-Axis: 0°

X = 10000.000 67 m
Y = 9999.88612 m
Z = 850.22940 m

Reference Phone: Offset ____
Azimuth ____
Elev. ____
X= 0
Y= −1.935(m)

Channel Configuration:

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

Reference Polarization:

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

Date: 4 June 98 Location: URISP A1 Well
High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

11:16

Shot		Borehole Geophone		Source					Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
61		12.50					0	−1.02(m	270	135
62		12.50							90	135
63		12.25								
64		12.25								
65		12.00								
66		12.00								
67		11.75								
68		11.75								
69		11.50								
70		11.50								

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole: Well Coord
Casing Elevation: G.L. + .67m
Azimuth of X-Axis: 90°
Azimuth of Y-Axis: 0°

X = 10000.00067 m
Y = 9999.88612 m
Z = 850.22440 m

Reference Phone: Offset ____ Azimuth ____ Elev. ____ X= 0 Y= -1.935m above ℄

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: 4JUNE98 Location: URISP A1 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		11.25					0	-1.02(m)	270	135
72		11.25							90	135
73		11.00								
74		11.00								
75		10.75								
76		10.75								
77		10.50								
78		10.50								
79		10.25								
80		10.25								

11:22

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole — Well Coord
Casing Elevation: 6 + .67(m)
Azimuth of X-Axis: 90°
Azimuth of Y-Axis: 0°

X = 10000.00067 m
Y = 9999.88612 m
Z = 850.22440 m above sl

Reference Phone: Offset ____ Azimuth ____ Elev. ____ X= 0 Y= −1.935(m)

Channel Configuration:

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

Reference Polarization:

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

Date: [redacted] 4JUNE98 Location: URISP A1 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		10.00					0	−1.02(m	270	135
82		10.00							90	135
83		9.75								
84		9.75								
85		9.50								
86		9.50								
87		9.25								
88		9.25								
89		9.00								
90		9.00								

11:30 a.m

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole — Well Coord
Casing Elevation: 6+ .67m
Azimuth of X-Axis: 90°
Azimuth of Y-Axis: 0°

X = 10000.000 67 m
Y = 9999.88612 m
Z = 850.22440 m

Reference Phone: Offset ____ Azimuth ____ Elev. ____ X= 0 Y= -1.935m

Channel Configuration:

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

Reference Polarization:

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

Date: 4JUNE98 Location: URISP A1 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		8.75					0	-1.02m	270	135
92		8.75							90	135
93		8.50								
94		8.50								
95		8.25								
96		8.25								
97		8.00								
98		8.00								
99		7.75								
100		7.75								

11:37a..

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole: Well Coord
Casing Elevation: 6+ .67m
Azimuth of X-Axis: 90°
Azimuth of Y-Axis: 0°

X = 10000.000 67 m
Y = 9999.88612 m
Z = 850.22940 m above SL

Reference Phone: Offset ____
Azimuth ____
Elev. ____
X= 0
Y= -1.935

Channel Configuration:

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

Reference Polarization:

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

Date: 4JUNE98 Location: URISP A1 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		7.50					0	-1.02m	270	135
102		7.50							90	135
103		7.25								
104		7.25								
105		7.00								
106		7.00								
107		6.75								
108		6.75								
109		6.50								
110		6.50								

11:48a.

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole: Well Coord
Casing Elevation: 6 + .67m
Azimuth of X-Axis: 90°
Azimuth of Y-Axis: 0°

X = 10000.00067 m
Y = 9999.88612 m
Z = 850.22940 m

Reference Phone: Offset ____
Azimuth ____
Elev. ____
X= 0
Y= -1.435(m)

Channel Configuration:

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

Above $

Reference Polarization:

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

Date: 4JUNE98 Location: URISP A1 Well
High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

11:53

Shot		Borehole Geophone		Source					Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
111		6.25					0	-1.02(m)	270	135
112		6.25							90	135
113		6.00								
114		6.00								
115		5.75								
116		5.75								
117		5.50								
118		5.50								
119		5.25								
120		5.25								

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole — Well Coord
Casing Elevation: 64 + .67
Azimuth of X-Axis: 90°
Azimuth of Y-Axis: 0°

X = 10000.00067 m
Y = 9999.88612 m
Z = 850.22940 m

Reference Phone: Offset ____ Azimuth ____ Elev. ____ X= 0 Y= −1.935

Channel Configuration:

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

Reference Polarization:

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

Date: [redacted] 4JUNE98 Location: URISP A1 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
121		5.00					0	−1.02(m)	270	135
122		5.00							90	135
123		4.75								
124		4.75								
125		4.50								
126		4.50								
127		4.25								
128		4.25								
129		4.00								
130		4.00								

12:01

Note: changed gain on channels 1, 2, and 3 from Medium to Low

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole — Well Coord
Casing Elevation: 6+.67
Azimuth of X-Axis: 90°
Azimuth of Y-Axis: 0°

X = 10000.00067 m
Y = 9999.88612 m
Z = 850.22940 m above ℄

Reference Phone: Offset ____ Azimuth ____ Elev. ____ X= 0 Y= −1.935 m

Channel Configuration:

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

Reference Polarization:

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

Date: 4 JUNE 98 Location: URISP A1 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
131		3.75					0	−1.02m	270	135
132		3.75							90	135
133		3.50								
134		3.50								
135		3.25								
136		3.25								
137		3.00								
138		3.00								
139		2.75								
140		2.75								

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole — Well Coord
Casing Elevation: 6 +
Azimuth of X-Axis: 90°
Azimuth of Y-Axis: 0°

X = 10000.00067 m
Y = 9999.88612 m
Z = 850.22940 m

Reference Phone: Offset
Azimuth
Elev.
X= 0
Y= −1.935(m)

Channel Configuration:

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

Reference Polarization:

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

Date: [redacted] 4 JUNE 98 Location: URISP A1 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		2.50					0	−1.02(m)	270	135
142		2.50							90	135
143		2.25								
144		2.25								
145		2.00								
146		2.00								
147		1.75								
148		1.75								
149		1.50								
150		1.50								

12:22

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
Casing Elevation: 6+ .67m
Azimuth of X-Axis 90°
Azimuth of Y-Axis 0°

Well coord
X = 10000.000 67 m
Y = 9999.88612 m
Z = 850.22440 m

Reference Phone: Offset
Azimuth
Elev.
X= 0
Y= −1.935 m

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: 4JUNE98 Location: URISP A1 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
151		1.25					0	−1.02m	270	135
152		1.25							90	135
153		1.00								
154		1.00								

Pin 04-170

Down Hole Geophone Field Check List

Project: URISP

Date: 4 June 98 Odometer Start: 14289 Finish: 14308

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 CablesBHGC-1	✓	✓	
Break out Box NO			
Oyo 3-C Reference Phone (Blue)	✓	✓	
Dummy tool	✓	✓	
Pulley/Winch Assem.	✓	✓	
Bison Seismograph	✓	✓	
Vertical Hammer Source NO			
Black Tape	✓	✓	
WD-40	✓	✓	
Observer's Sheets/Note Book	✓	✓	
Rope	✓	✓	
Rock Hammer	✓	✓	
Tape measure (50 m)	✓	✓	
Gloves			
Compass and Maps	✓	✓	
Trigger Switch Toggle Box NO			
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	X		
Tool Box Red	✓	✓	
Trigger Extension Cord NC			
Tripod Head	✓	✓	
Tripod Legs (3)	✓✓✓	✓✓✓	
Batteries (12V car) Need 2			
Jumper Cable for 24V operation			
Railroad Tie Horizontal Hammers NC			
Sand Bags (2)	X		
Shovel			
Pick			
Nails to hold off hammer heads			
24V BAT.	✓	✓	
135° source	✓	✓	