

02161N02

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole

Casing Elevation: 66 m above G.L.

Reference Phone: 180

Offset: 2.10 m

Well Coord: X = (10003.66) m Y = (10006.34) m Z = (850.32) m

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

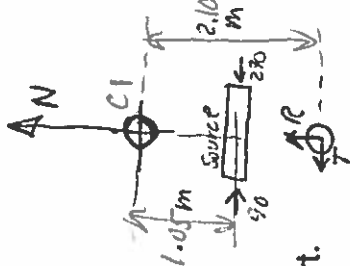
Reference Phone V=Channel 4 R=Channel 5 T=Channel 6

Location: URISP C1 well

Date: 14 Nov 97

High-Cut 1000 Hz Low-Cut 4 Hz Sample Int. 0.002

Number Samples 2500



Shot		Borehole Phone			Source			Source Polarization		
Rec.	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
1	WLC1001	20.25		1.05	180°		0(m)	-1.05(m)	270	135°
2	0002	20.25							90	
3	0003	20.00							270	
4	0004	20.00							90	
5	0005	19.75							270	
6	0006	19.75							90	
7	0007	19.50							270	
8	0008	19.50							90	
9	0009	19.25							270	
10	0010	19.25							90	

reclaim pool

WLC1010

Water table = 10.29 feet sub m.p.(CE)

+897.1836 m elev

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole

Casing Elevation: 66 m above G.L.

Azimuth x-axis: 90°

Azimuth y-axis: 0°

Well Coord: X = (10003.66)m Y = (10006.34)m Z = (850.32)m

Channel

Borehole Phone

V=Channel 1

R=Channel 2

T=Channel 3

Reference Phone

V=Channel 4

R=Channel 5

T=Channel 6

Ref. Polarization:

V

R

T

Vert.

0

90

90

Reference Phone: Offset: 2.10 m

Azimuth 180

Elev. .06 m below G.L.

X = 0 m

Y = -2.10 m

Above 27 CE

Date: 14 Nov 97

High-Cut 1000 Hz

Location: URISP C1 well

Low-Cut 4 Hz

Sample Int. .002

Number Samples 2500

Shot		Borehole Phone			Source			Source Polarization		
Rec.	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
11	0011	19.00					0	-1.05	270	135°
12	0012	19.00							90	
13	0013	18.75							270	
14	0014	18.75							90	
15	0015	18.50							270	
16	0016	18.50							90	
17	0017	18.25							270	
18	0018	18.25							90	
19	0019	18.00							270	
20	0020	18.00							90	

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
Casing Elevation: 66 m above G.L.  
Azimuth x-axis: 90°  
Azimuth y-axis: 0°

Reference Phone: Offset:        m

Azimuth         
Elev. .06 m below G.L.  
X = 0 m  
Y = -2.10 m

Well Coord: X = (1000.3.66) m Y = (1000.6.34) m Z = (850.32) m

Channel Borehole Phone

V=Channel 1  
R=Channel 2  
T=Channel 3

Reference Phone

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

Ref. Polarization: Az

V 0  
R 0  
T 270  
Vert. 0  
90  
90

Date: 14 Nov 97

Location: URISP C1 well

High-Cut 1000 HZ Low-Cut 4 Hz Sample Int. .0002

Number Samples 2500

Shot		Borehole Phone			Source			Source Polarization		
Rec.	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
21	0021	17.75					0	-1.05m	270	135°
22	0022	17.75							90	
23	0023	17.50							270	
24	0024	17.50							90	
25	0025	17.25							270	
26	0026	17.25							90	
27	0027	17.00							270	
28	0028	17.00							90	
29	0029	16.75							270	
30	0030	16.75							90	

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
Casing Elevation: 66 m above G.L.  
Azimuth x-axis: 90°  
Azimuth y-axis: 0°

Reference Phone: Offset: \_\_\_\_\_ m

Azimuth 06 m below G.L.  
Elev. 06  
X = 0 m  
Y = -2.10 m

Well Coord: X = (1000.3.66) m Y = (1000.6.34) m Z = (850.32) m

Channel Borehole Phone

V=Channel 1  
R=Channel 2  
T=Channel 3

Reference Phone

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

Ref. Polarization: Az

V 0  
R 0  
T 270

Date: 14 Nov 97

High-Cut 1000 Hz

Location: URISP C1 well

Low-Cut 4 Hz Sample Int. .0002

Number Samples 2500

Shot		Borehole Phone			Source			Source Polarization		
Rec.	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
<del>31</del> 31	0031	16.50					0	-1.05	270	1350
32	0032	16.50							90	
33	0033	16.25							270	
34	0034	16.25							90	
35	0035	16.00							270	
36	0036	16.00							90	
37	0037	15.75							270	
38	0038	15.75							90	
39	0039	15.50							270	
40	0040	15.50					0	N	270	

WLC10040

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 66 m above G.L.  
 Azimuth x-axis: 90°  
 Azimuth y-axis: 0°

Reference Phone: 06 m  
 Offset: 0 m  
 Azimuth 06 m below G.L.  
 Elev. 06 m  
 X = 0 m  
 Y = -2.10 m

Well Coord: X = (1000.3.66) m Y = (1000.6.34) m Z = (850.32) 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

Ref. Polarization: Az  
 V 0  
 R 0  
 T 270  
 Vert. 0  
90  
90

Date: 14 Nov 97

Location: URISP C1 well

Number Samples 2500

High-Cut 1000 Hz Low-Cut 4 Hz Sample Int. .0002

Shot		Borehole Phone			Source			Source Polarization		
Rec.	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
411	0041	15.25					0	-1.08(m)	270	135°
42	0042	15.25							90	
43	0043	15.00							270	
44	0044	15.00							90	
45	0045	14.75							270	
46	0046	14.75							90	
47	0047	14.50							270	
48	0048	14.50							90	
49	0049	14.25							270	
50	0050	14.25						V	90	V

WLC10050

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole

Casing Elevation: 0.66 m above G.L.

Azimuth x-axis: 90°

Azimuth y-axis: 0°

Well Coord: X = (10003.66) m Y = (10006.34) m Z = (850.32) m

Channel Borehole Phone

V=Channel 1

R=Channel 2

T=Channel 3

Reference Phone

V=Channel 4

R=Channel 5

T=Channel 6

Reference Phone: Offset:        m

Azimuth       

Elev. 0.06 m below G.L.

X = 0 m

Y = -2.10 m

Ref. Polarization:

V 0

R 0

T 270

Vert. 0

90

90

Date: 14 Nov 97

High-Cut 1000 Hz

Location: URISP C1 well

Low-Cut 4 Hz Sample Int. 0.002

Number Samples 2500

Shot		Borehole Phone			Source			Source Polarization		
Rec.	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
51	0051	14.00					0	-1.05 m	270	135°
52	0052	14.00							96	
53	0053	13.75							270	
54	0054	13.75							90	
55	0055	13.50							270	
56	0056	13.50							90	
57	0057	13.25							270	
58	0058	13.25							90	
59	0059	13.00							270	
60	0060	13.00					0		90	✓

WLC10060

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole

Casing Elevation: 66 m above G.L.

Azimuth x-axis: 90°

Azimuth y-axis: 0°

Well Coord: X = (1000.3.66) m Y = (1000.6.34) m Z = (850.32) m

Channel Borehole Phone

V=Channel 1

R=Channel 2

T=Channel 3

Reference Phone

V=Channel 4

R=Channel 5

T=Channel 6

Reference Phone: Offset:          m

Azimuth         

Elev. 006 m below G.L.

X = 0 m

Y = -2.10 m

Ref. Polarization:

V 0

R 0

T 270

Vert.

0

90

90

Date: 14 NOV 97

High-Cut 1000 HZ

Location: URISP C1 well

Low-Cut 4 HZ Sample Int. .0002

Number Samples 2500

Shot		Borehole Phone			Source			Source Polarization		
Rec.	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
61	0061	12.75					0	-1.05m	270	135°
62	0062	12.75							90	
63	0063	12.50							270	
64	0064	12.50							90	
65	0065	12.25							270	
66	0066	12.25							90	
67	0067	12.00							270	
68	0068	12.00							90	
69	0069	11.75							270	
70	0070	11.75							90	

WLC10070

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole

Casing Elevation: 166 m above G.L.

Azimuth x-axis: 90°

Azimuth y-axis: 0°

Well Coord: X = (10003.66) m Y = (10006.34) m Z = (850.32) 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 Phone: Offset:        m

Azimuth       

Elev. 006 m below G.L.

X = 0 m

Y = -2.10 m

Ref. Polarization:

V 0

R 0

T 270

Vert.

0

90

90

Date: 14 NOV 97

High-Cut 1000 HZ

Location: URISP C1 well

Low-Cut 4 HZ Sample Int. .0002

Number Samples 2500

Shot		Borehole Phone			Source			Source Polarization		
Rec.	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
71	0071	11.50					0	-1.05(m)	270	135°
72	0072	11.50							90	
73	0073	11.25							270	
74	0074	11.25							90	
75	0075	11.00							270	
76	0076	11.00							90	
77	0077	10.75							270	
78	0078	10.75							90	
79	0079	10.50							270	
80	0080	10.50							90	

WLC10080



# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 166 m above G.L.  
 Azimuth x-axis: 90°  
 Azimuth y-axis: 0°

Reference Phone: Offset:        m  
 Azimuth         
 Elev. 06 m below G.L.  
 X = 0 m  
 Y = -2.10 m

Well Coord: X = (10003.66) m Y = (10006.34) m Z = (850.32) m  
 Channel Configuration: Borehole Phone  
 V=Channel 1  
 R=Channel 2  
 T=Channel 3

Ref. Polarization: Az  
 V 0  
 R 0  
 T 270  
 Vert. 0  
90  
90

Date: 14 Nov 97 Location: URISP C1 well  
 High-Cut 1000 Hz Low-Cut 4 Hz Sample Int. .0002 Number Samples 2500

Shot		Borehole Phone			Source			Source Polarization		
Rec.	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
81	0081	10.25					0	-1.05 m	270	138°
82	0082	10.25							90	
83	0083	10.00							270	
84	0084	10.00							90	
85	0085	9.75							270	
86	0086	9.75							90	
87	0087	9.50							270	
88	0088	9.50							90	
89	0089	9.25							270	
90	0090	9.25							90	

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole

Casing Elevation: 66 m above G.L.

Azimuth x-axis: 90°

Azimuth y-axis: 0°

Well Coord: X = (10003.66)m Y = (10006.34)m Z = (850.32)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 Phone: Offset:          m

Azimuth         

Elev. .06 m below G.L.

X = 0 m

Y = -2.10 m

Ref. Polarization: Az

V 0

R 0

T 270

Vert. 0

90

90

Date: 14 Nov 97

High-Cut 1000 Hz

Location: URISP C1 well

Low-Cut 4 Hz Sample Int. .0002

Number Samples 2500

Shot		Borehole Phone			Source			Source Polarization		
Rec.	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
91	0091	9.00					0	-1.05m	270	135°
92	0092	9.00							90	
93	0093	8.75							270	
94	0094	8.75							90	
95	0095	8.50							270	
96	0096	8.50							90	
97	0097	8.25							270	
98	0098	8.25							90	
99	0099	8.00							270	
100	0100	8.00						✓	90	✓

WLC10100

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 66 m above G.L.  
 Azimuth x-axis: 90°  
 Azimuth y-axis: 0°

Reference Phone: Offset:        m  
 Azimuth         
 Elev. -06 m below G.L.  
 X = 0  
 Y = -2.10 m

Above £7 CE

Well Coord: X = (10003.66) m Y = (10006.34) m Z = (850.32) 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

Ref. Polarization: Az Vert.  
 V 0 0  
 R 0 90  
 T 270 90

Date: 14 NOV 97  
 High-Cut 1000 HZ

Location: URISP C1 well  
 Low-Cut 4 HZ

Number Samples 2500

Shot		Borehole Phone			Source			Source Polarization		
Rec.	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
101	010101	7.75					0	-1.05	270	135°
102	0102	7.75					1		90	
103	0103	7.50							270	
104	0104	7.50							90	
105	0105	7.25							270	
106	0106	7.25							90	
107	0107	7.00							270	
108	0108	7.00							90	
109	0109	6.75							270	
110	0110	6.75							90	

WLC 10110

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# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: .66 m above G.L.  
 Azimuth x-axis: 90°  
 Azimuth y-axis: 0°

Reference Phone: \_\_\_\_\_  
 Offset: \_\_\_\_\_ m  
 Azimuth: \_\_\_\_\_  
 Elev.: .06 m below G.L.  
 X = 0 m  
 Y = -2.10 m

Well Coord: X = (10003.66)m Y = (10006.34)m Z = (850.32)m  
 Channel  
 Configuration: Borehole Phone  
 V=Channel 1 Reference Phone  
 R=Channel 2 V=Channel 4  
 T=Channel 3 R=Channel 5  
 T=Channel 6

Ref. Polarization: Az Vert.  
 V 0 0  
 R 0 90  
 T 270 90

Date: 14 Nov 97 Location: URISP C1 well Number Samples 2500  
 High-Cut 1000 Hz Low-Cut 4 Hz Sample Int. .002

Shot		Borehole Phone			Source			Source Polarization		
Rec.	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
111	0111	6.50					0	-1.05m	270	1350
112	0112	6.50							90	
113	0113	6.25							270	
114	0114	6.25							90	
115	0115	6.00							270	
116	0116	6.00							90	
117	0117	5.75							270	
118	0118	5.75							90	
119	0119	5.50							270	
120	0120	5.50					0		90	

w2c10120

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# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
Casing Elevation: 166 m above G.L.  
Azimuth x-axis: 90°  
Azimuth y-axis: 0°

Reference Phone: Offset:        m

Azimuth        m below G.L.  
Elev. 0.06 m  
X = 0 m  
Y = -2.10 m

Well Coord: X = (1000.3.66) m Y = (1000.6.34) m Z = (850.32) 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

Ref. Polarization: Az 0  
V 0  
R 90  
T 90

Date: 14 Nov 97

Location: URISP C1 well  
High-Cut 1000 Hz Low-Cut 4 Hz Sample Int. .0002

Number Samples 2500

Shot		Borehole Phone			Source			Source Polarization		
Rec.	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
121	0121	5.25					0	-1.05m	270	135°
122	0122	5.25					1		90	
123	0123	5.40							270	
124	0124	5.60							90	
125	0125	4.75							270	
126	0126	4.75							90	
127	0127	4.50							270	
128	0128	4.50							90	
129	0129	4.25							270	
130	0130	4.25					α	✓	90	✓

WRC10130

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole

Casing Elevation: 66 m above G.L.

Azimuth x-axis: 90°

Azimuth y-axis: 0°

Well Coord: X = (10003.66)m Y = (10006.34)m Z = (850.32)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 Phone: Offset:        m

Azimuth       

Elev.        m below G.L.

X = 0 m

Y = -2.10 m

Ref. Polarization: Az 0

V 0

R 90

T 90

Vert. 0

90

90

Date: 14 Nov 97

High-Cut 1000 Hz

Location: URISP C1 well

Low-Cut 4 Hz

Sample Int. .0002

Number Samples 2500

Shot		Borehole Phone			Source			Source Polarization		
Rec.	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
131	0131	4.00					0	-1.05	270	1350
132	0132	4.00					1	1	90	
133	0133	3.75							270	
134	0134	3.75							90	
135	0135	3.50							270	
136	0136	3.50							90	
137	0137	3.25							270	
138	0138	3.25							90	
139	0139	3.00							270	
140	0140	3.00					2	2	90	✓

WLC10140

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# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole

Casing Elevation: 166 m above G.L.

Azimuth x-axis: 90°

Azimuth y-axis: 0°

Well Coord: X = (10003.66)m Y = (10006.34)m Z = (850.32)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 Phone: Offset:        m

Azimuth       

Elev. -06 m below G.L.

X = 0 m

Y = -2.10 m

Ref. Polarization:

V

R

T

Vert.

0

90

90

Date: 14 Nov 97

High-Cut 1000 Hz

Location: URISP C1 well

Low-Cut 4 Hz Sample Int. .0002

Number Samples 2500

Shot		Borehole Phone			Source			Source Polarization			
Rec.	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical	
141	0141	2.75					0	-1.05m	270	1350	
142	0142	2.75							90		
143	0143	2.50							270		
144	0144	2.50							90		
145	0145	2.25							270		
146	0146	2.25							90		
147	0147	2.00							270		
148	0148	2.00							90		
149	0149	1.75							270		
150	0150	1.75					N	W	90	✓	

WLC10150

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# VSP Preliminary Data Sheet

Date: 14 Nov 97 Type of Phones 0/0

1. Well Name C1

2. Location of Well

x= 10003.66 y= 10006.34 z= 850.32

Casing Elevation: 850.32 m

3. Depth to top of water table (measured from CE) [10.29 feet]

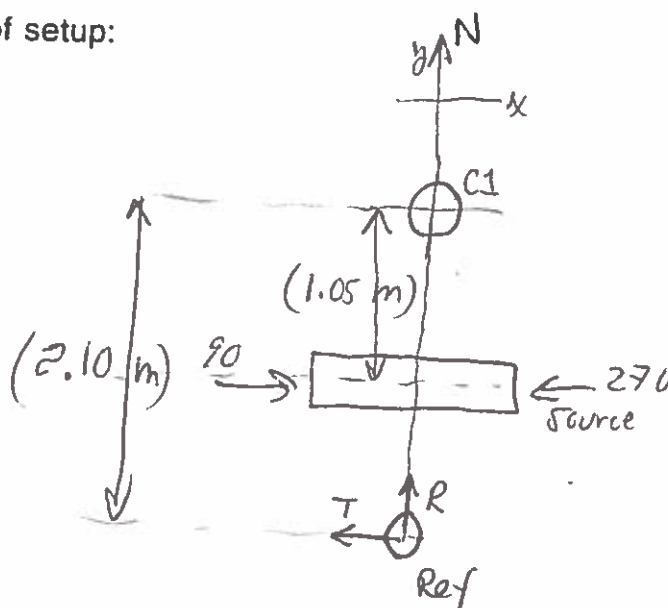
4. Casing Elevation, distance above ground level= (.66 m)

5. Reference phone offset from borehole= 2.18 m due south (1.05 m S of source)

6. Reference phone depth below ground level= 6 cm

7. Source Offset from borehole= 1.05 m due south

8. Sketch of setup:



(T/D 19.75m  
+ 1.12)

9. Blue Box switch settings:

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

# VSP Check List

Project: URISP

20.8mi

Date: 14 NOV 97

Odometer Start: 13228.8 Finish: 13248.0  
Time Out: 11:00 Time In: 16:00

Item	Out	In	Comment
BHG-2 Borehole Geophone	✓	✓	
BHGC-1 Control Box (Blue)	✓	✓	
Cable: Spool to BHGC-1	✓	✓	
Cable: BHGC-1 to Bison	✓	✓	
Ban/Alligator Power Cables BHGC-1	✓	✓	
OYO 3-c Reference Phone (Blue)	✓	✓	
Dummy tool	✓	✓	
Snatch Block and Come-a-long	✓	✓	
Bison Seismograph	✓	✓	
90° Hammer Source	NO	X	
Vertical Hammer Source	NO	X	
135° Hammer Source	✓	✓	
WD-40 and Black Tape	✓	✓	
Observer's Sheets/Note Book	✓	✓	
Rope	✓	✓	
Claw Hammer and Large Nails	✓	✓	
Tape measure (50m)	✓	✓	
Gloves	✓	✓	
Compass and Maps	✓	✓	
24Volt Clamp Battery	✓	✓	
Gas Card & Keys	✓	✓	
Water Table Logging Probe	✓	✓	

Tripod

✓ ✓