

# Great Western

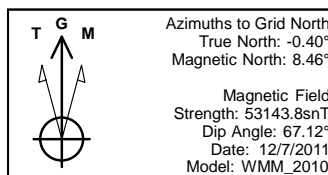
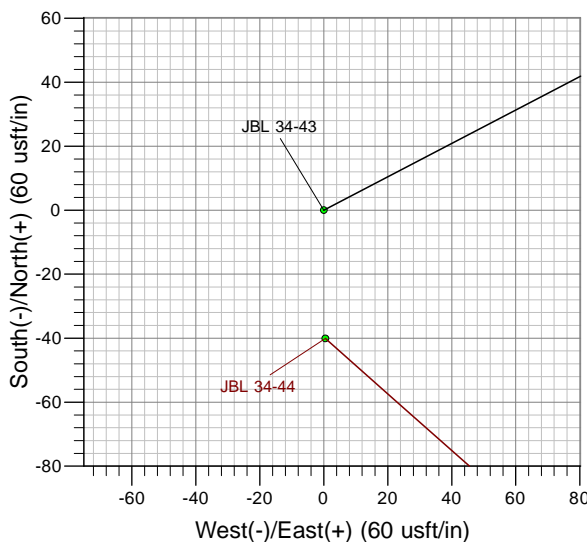
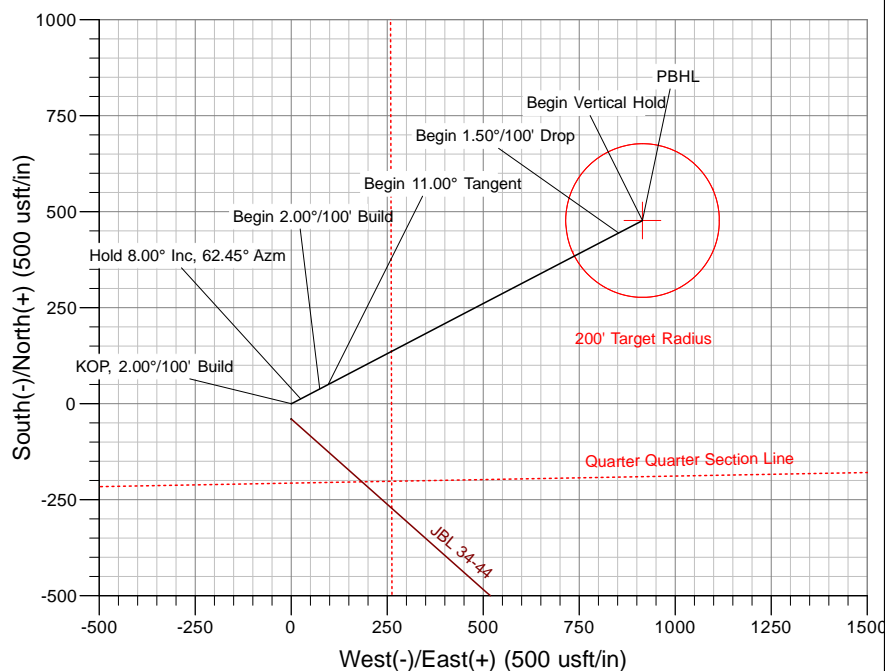
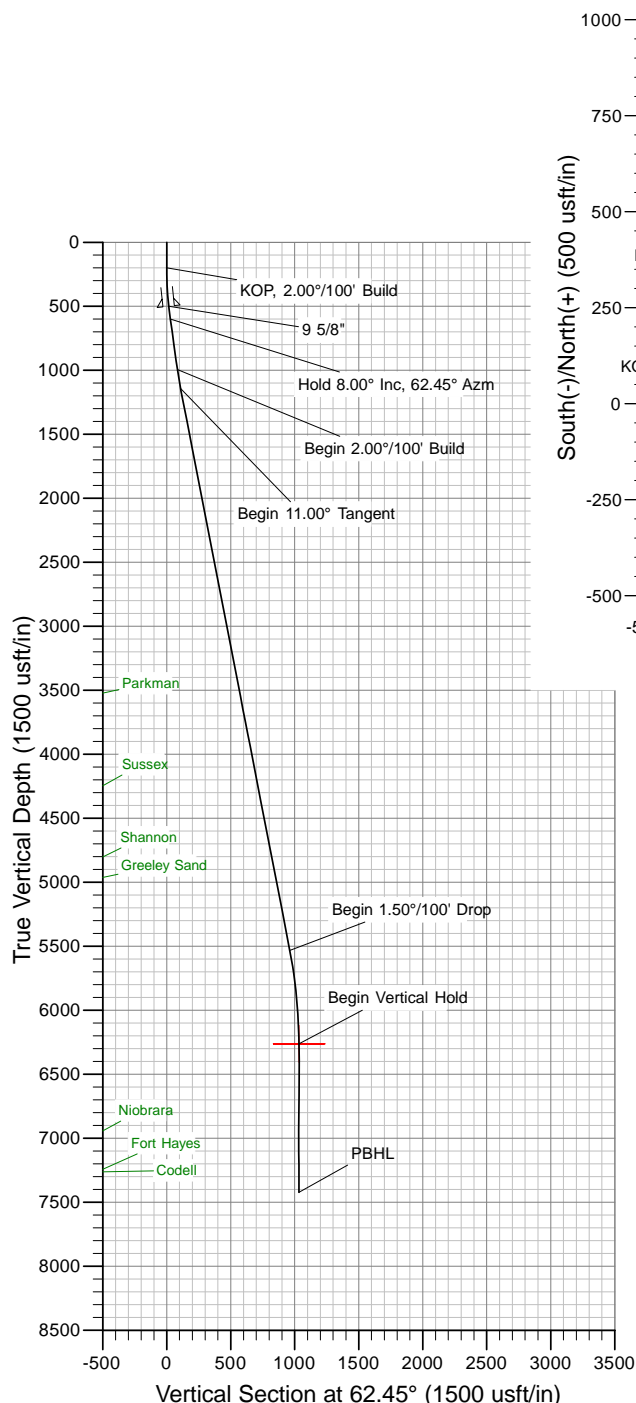
Company: Great Western  
Site: JBL  
Well: 34-43  
Project: Weld County, Colorado (NAD 83)  
Rig Name: Cade 22



Planning: 936.442.2510 Fax: 936.442.2515  
Operations: 936.442.2500 Fax: 936.442.2599

## ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure	Annotation
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	KOP, 2.00°/100' Build
600.00	8.00	62.45	598.70	12.89	24.72	27.88	27.88	Hold 8.00° Inc, 62.45° Azm
1000.00	8.00	62.45	994.81	38.64	74.08	83.55	83.55	Begin 2.00°/100' Build
1150.01	11.00	62.45	1142.74	50.09	96.03	108.31	108.31	Begin 11.00° Tangent
5622.59	11.00	62.45	5533.15	444.76	852.71	961.73	961.73	Begin 1.50°/100' Drop
6355.94	0.00	0.00	6262.00	477.21	914.94	1031.91	1031.91	Begin Vertical Hold
7515.94	0.00	0.00	7422.00	477.21	914.94	1031.91	1031.91	PBHL



US State Plane 1983  
Colorado Northern Zone

Created By: Allen Slack  
Date: 8:41, December 08 2011  
Plan: Design #1

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# **Great Western**

**Weld County, Colorado (NAD 83)**

**JBL**

**34-43**

**Wellbore #1**

**Plan: Design #1**

## **Standard Planning Report**

**07 December, 2011**

<b>Database:</b>	Southern Region	<b>Local Co-ordinate Reference:</b>	Well 34-43
<b>Company:</b>	Great Western	<b>TVD Reference:</b>	WELL @ 4962.00usft (Cade 22)
<b>Project:</b>	Weld County, Colorado (NAD 83)	<b>MD Reference:</b>	WELL @ 4962.00usft (Cade 22)
<b>Site:</b>	JBL	<b>North Reference:</b>	Grid
<b>Well:</b>	34-43	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

<b>Project</b>	Weld County, Colorado (NAD 83)		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

<b>Well</b>	34-43			
<b>Well Position</b>	<b>+N/-S</b>	1,435,594.74 usft	<b>Northing:</b>	1,435,594.74 usft
	<b>+E/-W</b>	3,173,535.78 usft	<b>Easting:</b>	3,173,535.78 usft
<b>Position Uncertainty</b>		0.00 usft	<b>Wellhead Elevation:</b>	
			<b>Latitude:</b>	40° 31' 38.7526 N
			<b>Longitude:</b>	104° 52' 32.649 W
			<b>Ground Level:</b>	4,948.00 usft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	WMM_2010	12/7/2011	8.87	67.12	53,144

<b>Design</b>	Design #1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	62.45

<b>Plan Sections</b>										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
600.00	8.00	62.45	598.70	12.89	24.72	2.00	2.00	0.00	62.45	Vert. v1 - JBL 34-43
1,000.00	8.00	62.45	994.81	38.64	74.08	0.00	0.00	0.00	0.00	
1,150.01	11.00	62.45	1,142.74	50.09	96.03	2.00	2.00	0.00	0.00	
5,622.59	11.00	62.45	5,533.15	444.76	852.71	0.00	0.00	0.00	0.00	
6,355.94	0.00	0.00	6,262.00	477.21	914.94	1.50	-1.50	0.00	180.00	Vert. v1 - JBL 34-43
7,515.94	0.00	0.00	7,422.00	477.21	914.94	0.00	0.00	0.00	0.00	

<b>Database:</b>	Southern Region	<b>Local Co-ordinate Reference:</b>	Well 34-43
<b>Company:</b>	Great Western	<b>TVD Reference:</b>	WELL @ 4962.00usft (Cade 22)
<b>Project:</b>	Weld County, Colorado (NAD 83)	<b>MD Reference:</b>	WELL @ 4962.00usft (Cade 22)
<b>Site:</b>	JBL	<b>North Reference:</b>	Grid
<b>Well:</b>	34-43	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>KOP, 2.00°/100' Build</b>									
300.00	2.00	62.45	299.98	0.81	1.55	1.75	2.00	2.00	0.00
400.00	4.00	62.45	399.84	3.23	6.19	6.98	2.00	2.00	0.00
500.00	6.00	62.45	499.45	7.26	13.91	15.69	2.00	2.00	0.00
500.55	6.01	62.45	500.00	7.28	13.97	15.75	2.00	2.00	0.00
<b>9 5/8"</b>									
600.00	8.00	62.45	598.70	12.89	24.72	27.88	2.00	2.00	0.00
<b>Hold 8.00° Inc, 62.45° Azm</b>									
700.00	8.00	62.45	697.73	19.33	37.06	41.80	0.00	0.00	0.00
800.00	8.00	62.45	796.76	25.77	49.40	55.71	0.00	0.00	0.00
900.00	8.00	62.45	895.78	32.20	61.74	69.63	0.00	0.00	0.00
1,000.00	8.00	62.45	994.81	38.64	74.08	83.55	0.00	0.00	0.00
<b>Begin 2.00°/100' Build</b>									
1,100.00	10.00	62.45	1,093.57	45.87	87.95	99.19	2.00	2.00	0.00
1,150.01	11.00	62.45	1,142.74	50.09	96.03	108.31	2.00	2.00	0.00
<b>Begin 11.00° Tangent</b>									
1,200.00	11.00	62.45	1,191.82	54.50	104.49	117.84	0.00	0.00	0.00
1,300.00	11.00	62.45	1,289.98	63.32	121.40	136.93	0.00	0.00	0.00
1,400.00	11.00	62.45	1,388.14	72.15	138.32	156.01	0.00	0.00	0.00
1,500.00	11.00	62.45	1,486.30	80.97	155.24	175.09	0.00	0.00	0.00
1,600.00	11.00	62.45	1,584.47	89.79	172.16	194.17	0.00	0.00	0.00
1,700.00	11.00	62.45	1,682.63	98.62	189.08	213.25	0.00	0.00	0.00
1,800.00	11.00	62.45	1,780.79	107.44	206.00	232.33	0.00	0.00	0.00
1,900.00	11.00	62.45	1,878.95	116.27	222.91	251.41	0.00	0.00	0.00
2,000.00	11.00	62.45	1,977.12	125.09	239.83	270.49	0.00	0.00	0.00
2,100.00	11.00	62.45	2,075.28	133.92	256.75	289.58	0.00	0.00	0.00
2,200.00	11.00	62.45	2,173.44	142.74	273.67	308.66	0.00	0.00	0.00
2,300.00	11.00	62.45	2,271.61	151.56	290.59	327.74	0.00	0.00	0.00
2,400.00	11.00	62.45	2,369.77	160.39	307.50	346.82	0.00	0.00	0.00
2,500.00	11.00	62.45	2,467.93	169.21	324.42	365.90	0.00	0.00	0.00
2,600.00	11.00	62.45	2,566.09	178.04	341.34	384.98	0.00	0.00	0.00
2,700.00	11.00	62.45	2,664.26	186.86	358.26	404.06	0.00	0.00	0.00
2,800.00	11.00	62.45	2,762.42	195.69	375.18	423.14	0.00	0.00	0.00
2,900.00	11.00	62.45	2,860.58	204.51	392.10	442.23	0.00	0.00	0.00
3,000.00	11.00	62.45	2,958.74	213.33	409.01	461.31	0.00	0.00	0.00
3,100.00	11.00	62.45	3,056.91	222.16	425.93	480.39	0.00	0.00	0.00
3,200.00	11.00	62.45	3,155.07	230.98	442.85	499.47	0.00	0.00	0.00
3,300.00	11.00	62.45	3,253.23	239.81	459.77	518.55	0.00	0.00	0.00
3,400.00	11.00	62.45	3,351.39	248.63	476.69	537.63	0.00	0.00	0.00
3,500.00	11.00	62.45	3,449.56	257.45	493.61	556.71	0.00	0.00	0.00
3,573.80	11.00	62.45	3,522.00	263.97	506.09	570.79	0.00	0.00	0.00
<b>Parkman</b>									
3,600.00	11.00	62.45	3,547.72	266.28	510.52	575.79	0.00	0.00	0.00
3,700.00	11.00	62.45	3,645.88	275.10	527.44	594.88	0.00	0.00	0.00
3,800.00	11.00	62.45	3,744.05	283.93	544.36	613.96	0.00	0.00	0.00
3,900.00	11.00	62.45	3,842.21	292.75	561.28	633.04	0.00	0.00	0.00
4,000.00	11.00	62.45	3,940.37	301.58	578.20	652.12	0.00	0.00	0.00
4,100.00	11.00	62.45	4,038.53	310.40	595.11	671.20	0.00	0.00	0.00
4,200.00	11.00	62.45	4,136.70	319.22	612.03	690.28	0.00	0.00	0.00
4,300.00	11.00	62.45	4,234.86	328.05	628.95	709.36	0.00	0.00	0.00

<b>Database:</b>	Southern Region	<b>Local Co-ordinate Reference:</b>	Well 34-43
<b>Company:</b>	Great Western	<b>TVD Reference:</b>	WELL @ 4962.00usft (Cade 22)
<b>Project:</b>	Weld County, Colorado (NAD 83)	<b>MD Reference:</b>	WELL @ 4962.00usft (Cade 22)
<b>Site:</b>	JBL	<b>North Reference:</b>	Grid
<b>Well:</b>	34-43	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,311.35	11.00	62.45	4,246.00	329.05	630.87	711.53	0.00	0.00	0.00	
<b>Sussex</b>										
4,400.00	11.00	62.45	4,333.02	336.87	645.87	728.44	0.00	0.00	0.00	
4,500.00	11.00	62.45	4,431.18	345.70	662.79	747.52	0.00	0.00	0.00	
4,600.00	11.00	62.45	4,529.35	354.52	679.71	766.61	0.00	0.00	0.00	
4,700.00	11.00	62.45	4,627.51	363.35	696.62	785.69	0.00	0.00	0.00	
4,800.00	11.00	62.45	4,725.67	372.17	713.54	804.77	0.00	0.00	0.00	
4,877.76	11.00	62.45	4,802.00	379.03	726.70	819.61	0.00	0.00	0.00	
<b>Shannon</b>										
4,900.00	11.00	62.45	4,823.83	380.99	730.46	823.85	0.00	0.00	0.00	
5,000.00	11.00	62.45	4,922.00	389.82	747.38	842.93	0.00	0.00	0.00	
5,040.75	11.00	62.45	4,962.00	393.41	754.27	850.71	0.00	0.00	0.00	
<b>Greeley Sand</b>										
5,100.00	11.00	62.45	5,020.16	398.64	764.30	862.01	0.00	0.00	0.00	
5,200.00	11.00	62.45	5,118.32	407.47	781.22	881.09	0.00	0.00	0.00	
5,300.00	11.00	62.45	5,216.48	416.29	798.13	900.17	0.00	0.00	0.00	
5,400.00	11.00	62.45	5,314.65	425.11	815.05	919.26	0.00	0.00	0.00	
5,500.00	11.00	62.45	5,412.81	433.94	831.97	938.34	0.00	0.00	0.00	
5,600.00	11.00	62.45	5,510.97	442.76	848.89	957.42	0.00	0.00	0.00	
5,622.59	11.00	62.45	5,533.15	444.76	852.71	961.73	0.00	0.00	0.00	
<b>Begin 1.50°/100' Drop</b>										
5,700.00	9.84	62.45	5,609.28	451.23	865.12	975.73	1.50	-1.50	0.00	
5,800.00	8.34	62.45	5,708.02	458.54	879.13	991.53	1.50	-1.50	0.00	
5,900.00	6.84	62.45	5,807.14	464.64	890.84	1,004.73	1.50	-1.50	0.00	
6,000.00	5.34	62.45	5,906.58	469.55	900.24	1,015.34	1.50	-1.50	0.00	
6,100.00	3.84	62.45	6,006.25	473.25	907.34	1,023.34	1.50	-1.50	0.00	
6,200.00	2.34	62.45	6,106.10	475.74	912.11	1,028.73	1.50	-1.50	0.00	
6,300.00	0.84	62.45	6,206.06	477.02	914.57	1,031.50	1.50	-1.50	0.00	
6,355.94	0.00	0.00	6,262.00	477.21	914.94	1,031.91	1.50	-1.50	0.00	
<b>Begin Vertical Hold</b>										
6,400.00	0.00	0.00	6,306.06	477.21	914.94	1,031.91	0.00	0.00	0.00	
6,500.00	0.00	0.00	6,406.06	477.21	914.94	1,031.91	0.00	0.00	0.00	
6,600.00	0.00	0.00	6,506.06	477.21	914.94	1,031.91	0.00	0.00	0.00	
6,700.00	0.00	0.00	6,606.06	477.21	914.94	1,031.91	0.00	0.00	0.00	
6,800.00	0.00	0.00	6,706.06	477.21	914.94	1,031.91	0.00	0.00	0.00	
6,900.00	0.00	0.00	6,806.06	477.21	914.94	1,031.91	0.00	0.00	0.00	
7,000.00	0.00	0.00	6,906.06	477.21	914.94	1,031.91	0.00	0.00	0.00	
7,035.94	0.00	0.00	6,942.00	477.21	914.94	1,031.91	0.00	0.00	0.00	
<b>Niobrara</b>										
7,100.00	0.00	0.00	7,006.06	477.21	914.94	1,031.91	0.00	0.00	0.00	
7,200.00	0.00	0.00	7,106.06	477.21	914.94	1,031.91	0.00	0.00	0.00	
7,300.00	0.00	0.00	7,206.06	477.21	914.94	1,031.91	0.00	0.00	0.00	
7,335.94	0.00	0.00	7,242.00	477.21	914.94	1,031.91	0.00	0.00	0.00	
<b>Fort Hayes</b>										
7,355.94	0.00	0.00	7,262.00	477.21	914.94	1,031.91	0.00	0.00	0.00	
<b>Codell</b>										
7,400.00	0.00	0.00	7,306.06	477.21	914.94	1,031.91	0.00	0.00	0.00	
7,500.00	0.00	0.00	7,406.06	477.21	914.94	1,031.91	0.00	0.00	0.00	
7,515.94	0.00	0.00	7,422.00	477.21	914.94	1,031.91	0.00	0.00	0.00	
<b>PBHL</b>										

<b>Database:</b>	Southern Region	<b>Local Co-ordinate Reference:</b>	Well 34-43
<b>Company:</b>	Great Western	<b>TVD Reference:</b>	WELL @ 4962.00usft (Cade 22)
<b>Project:</b>	Weld County, Colorado (NAD 83)	<b>MD Reference:</b>	WELL @ 4962.00usft (Cade 22)
<b>Site:</b>	JBL	<b>North Reference:</b>	Grid
<b>Well:</b>	34-43	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

#### Design Targets

##### Target Name

- hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Vert. v1 - JBL 34-43 - plan hits target center - Point	0.00	0.00	6,262.00	477.21	914.94	1,436,071.95	3,174,450.72	40° 31' 43.4044 N	104° 52' 20.757 W

#### Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
500.55	500.00	9 5/8"	9-5/8	12-1/4

#### Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,573.80	3,522.00	Parkman		0.00	
4,311.35	4,246.00	Sussex		0.00	
4,877.76	4,802.00	Shannon		0.00	
5,040.75	4,962.00	Greeley Sand		0.00	
7,035.94	6,942.00	Niobrara		0.00	
7,335.94	7,242.00	Fort Hayes		0.00	
7,355.94	7,262.00	Codell		0.00	

#### Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
200.00	200.00	0.00	0.00	KOP, 2.00°/100' Build
600.00	598.70	12.89	24.72	Hold 8.00° Inc, 62.45° Azm
1,000.00	994.81	38.64	74.08	Begin 2.00°/100' Build
1,150.01	1,142.74	50.09	96.03	Begin 11.00° Tangent
5,622.59	5,533.15	444.76	852.71	Begin 1.50°/100' Drop
6,355.94	6,262.00	477.21	914.94	Begin Vertical Hold
7,515.94	7,422.00	477.21	914.94	PBHL