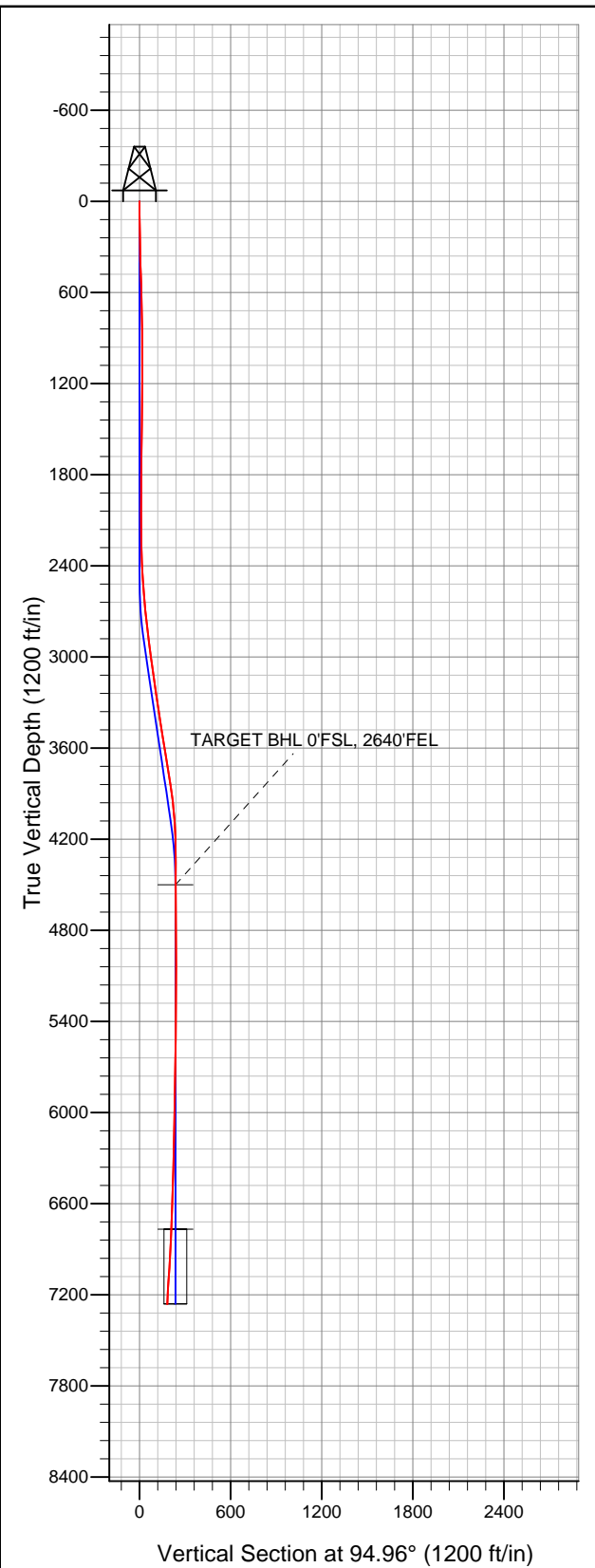
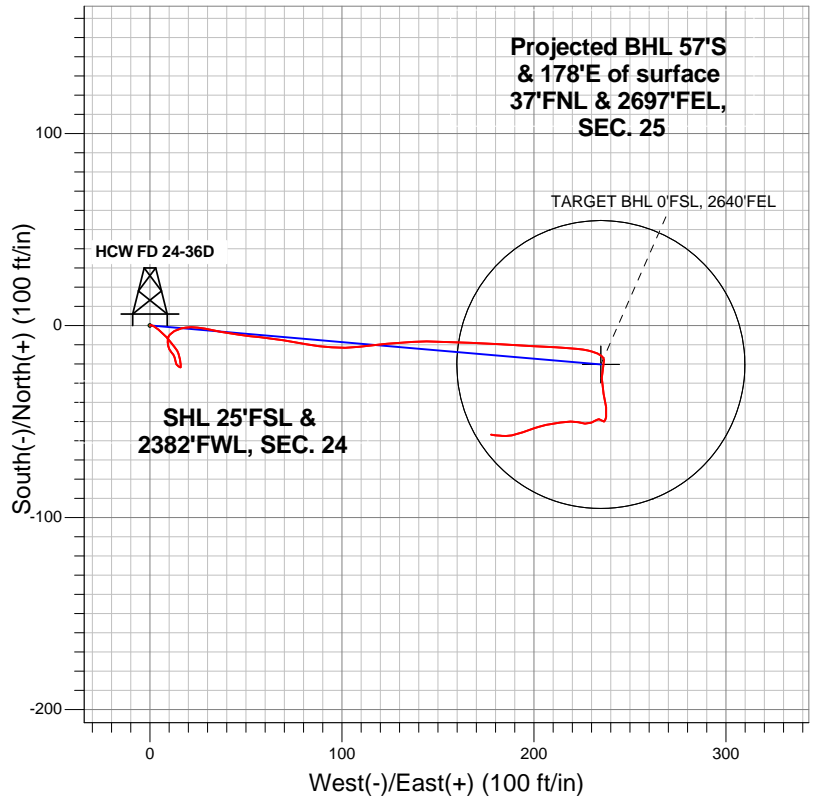


**Well Name: HCW FD 24-36D**

Surface Location: HCW FD 24-20D Pad Sec.24-T6N-R67W  
North American Datum 1983 US State Plane 1983 Colorado Northern Zone  
Ground Elevation: 4744.0  
+N/-S +E/-W Northing Easting Latitude Longitude Slot  
0.0 0.0 1413047.07 3182845.80 40.465356 -104.842847  
Original Well Elev WELL @ 4758.0ft (Original Well Elev)



**Great Western**



**LEGEND**

- △ HCW FD 24-36D, Wellbore #1, Plan #1 (8-21-12) V0
- Wellbore #1
- Survey #1

**Final Survey Plot**

**Projected Final Survey -**  
**7281'MD & 7264'TVD @ 182'VS**  
**2.60 deg Inc 277.00 deg AZ**

Project: SEC.24-T6N-R67W  
Site: HCW FD 24-20D Pad Sec.24-T6N-R67W  
Well: HCW FD 24-36D  
Plan: Wellbore #1



## **Great Western**

**SEC.24-T6N-R67W**

**HCW FD 24-20D Pad Sec.24-T6N-R67W**

**HCW FD 24-36D**

**Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**22 October, 2012**



<b>Company:</b>	Great Western	<b>Local Co-ordinate Reference:</b>	Well HCW FD 24-36D
<b>Project:</b>	SEC.24-T6N-R67W	<b>TVD Reference:</b>	WELL @ 4758.0ft (Original Well Elev)
<b>Site:</b>	HCW FD 24-20D Pad Sec.24-T6N-R67W	<b>MD Reference:</b>	WELL @ 4758.0ft (Original Well Elev)
<b>Well:</b>	HCW FD 24-36D	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Landmark

#### Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,354.0	1.10	337.50	1,353.5	-20.2	13.8	15.5	0.80	0.21	45.32
1,449.0	1.10	348.50	1,448.5	-18.5	13.3	14.8	0.22	0.00	11.58
1,544.0	1.10	344.70	1,543.5	-16.7	12.9	14.3	0.08	0.00	-4.00
1,638.0	0.90	320.90	1,637.4	-15.2	12.2	13.4	0.49	-0.21	-25.32
1,733.0	1.10	320.10	1,732.4	-14.0	11.1	12.3	0.21	0.21	-0.84
1,828.0	1.10	330.40	1,827.4	-12.5	10.1	11.1	0.21	0.00	10.84
1,922.0	1.20	351.30	1,921.4	-10.7	9.5	10.4	0.46	0.11	22.23
2,020.0	1.00	357.30	2,019.4	-8.8	9.3	10.0	0.24	-0.20	6.12
2,115.0	1.30	5.90	2,114.4	-6.9	9.4	9.9	0.36	0.32	9.05
2,210.0	1.70	42.70	2,209.3	-4.8	10.4	10.8	1.07	0.42	38.74
2,304.0	2.00	57.30	2,303.3	-2.9	12.7	12.9	0.59	0.32	15.53
2,399.0	2.60	77.10	2,398.2	-1.6	16.2	16.3	1.04	0.63	20.84
2,494.0	3.90	88.20	2,493.0	-1.0	21.6	21.6	1.51	1.37	11.68
2,588.0	4.70	101.90	2,586.8	-1.7	28.5	28.6	1.38	0.85	14.57
2,683.0	5.40	100.70	2,681.4	-3.3	36.7	36.9	0.75	0.74	-1.26
2,778.0	6.30	97.90	2,775.9	-4.8	46.3	46.5	0.99	0.95	-2.95
2,872.0	7.60	95.90	2,869.2	-6.2	57.6	57.9	1.41	1.38	-2.13
2,967.0	6.90	99.10	2,963.5	-7.7	69.5	69.9	0.85	-0.74	3.37
3,062.0	7.90	100.70	3,057.7	-9.9	81.5	82.1	1.07	1.05	1.68
3,156.0	8.40	93.50	3,150.7	-11.5	94.7	95.4	1.21	0.53	-7.66
3,251.0	8.70	83.80	3,244.7	-11.1	108.8	109.3	1.55	0.32	-10.21
3,349.0	8.40	83.80	3,341.6	-9.5	123.3	123.6	0.31	-0.31	0.00
3,444.0	8.40	87.70	3,435.6	-8.5	137.1	137.3	0.60	0.00	4.11
3,539.0	9.30	92.10	3,529.4	-8.5	151.7	151.9	1.18	0.95	4.63
3,633.0	9.60	91.90	3,622.2	-9.1	167.1	167.3	0.32	0.32	-0.21
3,728.0	9.50	93.80	3,715.8	-9.8	182.9	183.0	0.35	-0.11	2.00
3,822.0	9.10	92.60	3,808.6	-10.7	198.0	198.2	0.47	-0.43	-1.28
3,917.0	7.40	93.50	3,902.6	-11.4	211.6	211.8	1.79	-1.79	0.95
4,012.0	5.80	95.20	3,997.0	-12.2	222.5	222.8	1.70	-1.68	1.79
4,106.0	4.00	106.80	4,090.6	-13.6	230.4	230.7	2.18	-1.91	12.34
4,201.0	2.60	130.70	4,185.5	-16.0	235.2	235.7	2.04	-1.47	25.16
4,296.0	2.40	194.70	4,280.4	-19.3	236.3	237.1	2.79	-0.21	67.37
4,485.0	2.60	179.30	4,469.2	-27.4	235.4	236.9	0.37	0.11	-8.15
4,515.4	2.56	177.56	4,499.6	-28.8	235.4	237.0	0.29	-0.13	-5.71
<b>TARGET BHL 0'FSL, 2640'FEL</b>									
4,674.0	2.40	167.70	4,658.1	-35.6	236.3	238.5	0.29	-0.10	-6.22
4,864.0	1.90	171.90	4,847.9	-42.6	237.6	240.4	0.28	-0.26	2.21
5,053.0	1.30	192.40	5,036.8	-47.8	237.6	240.8	0.43	-0.32	10.85
5,242.0	0.40	250.10	5,225.8	-50.1	236.5	239.9	0.60	-0.48	30.53
5,432.0	0.80	314.30	5,415.8	-49.4	234.9	238.3	0.38	0.21	33.79
5,621.0	0.90	239.40	5,604.8	-49.2	232.7	236.1	0.55	0.05	-39.63
5,810.0	1.00	245.40	5,793.8	-50.7	229.9	233.4	0.07	0.05	3.17
5,999.0	1.10	276.60	5,982.7	-51.1	226.6	230.2	0.30	0.05	16.51
6,189.0	1.10	283.80	6,172.7	-50.5	223.0	226.6	0.07	0.00	3.79
6,378.0	1.30	270.50	6,361.7	-50.0	219.1	222.6	0.18	0.11	-7.04
6,567.0	1.90	259.80	6,550.6	-50.6	213.9	217.5	0.35	0.32	-5.66
6,662.0	2.50	262.60	6,645.5	-51.1	210.3	213.9	0.64	0.63	2.95
6,756.0	2.50	257.00	6,739.4	-51.8	206.3	210.0	0.26	0.00	-5.96
6,783.1	2.41	256.25	6,766.5	-52.1	205.1	208.9	0.34	-0.32	-2.78
<b>TARGET CIRCLE 0'FSL &amp; 2640'FEL</b>									
6,851.0	2.20	254.10	6,834.4	-52.8	202.5	206.3	0.34	-0.31	-3.16
6,946.0	3.30	249.00	6,929.2	-54.3	198.2	202.1	1.19	1.16	-5.37
7,040.0	4.60	252.70	7,023.0	-56.4	192.0	196.2	1.41	1.38	3.94
7,135.0	3.80	270.10	7,117.8	-57.5	185.3	189.5	1.57	-0.84	18.32

<b>Company:</b>	Great Western	<b>Local Co-ordinate Reference:</b>	Well HCW FD 24-36D
<b>Project:</b>	SEC.24-T6N-R67W	<b>TVD Reference:</b>	WELL @ 4758.0ft (Original Well Elev)
<b>Site:</b>	HCW FD 24-20D Pad Sec.24-T6N-R67W	<b>MD Reference:</b>	WELL @ 4758.0ft (Original Well Elev)
<b>Well:</b>	HCW FD 24-36D	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Landmark

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
7,231.0	2.60	277.00	7,213.6	-57.2	179.9	184.2	1.31	-1.25	7.19	
7,281.0	2.60	277.00	7,263.6	-57.0	177.7	181.9	0.00	0.00	0.00	

Wellbore Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude	
- hit/miss target										
- Shape										
TARGET BHL 0'FSL,	0.00	0.00	4,500.0	-20.4	234.8	1,413,028.42	3,183,080.78	40.465300	-104.842003	
- survey misses target center by 8.4ft at 4515.4ft MD (4499.6 TVD, -28.8 N, 235.4 E)										
- Point										
TARGET CIRCLE 0'F	0.00	0.00	6,768.0	-20.4	234.8	1,413,028.42	3,183,080.78	40.465300	-104.842003	
- survey misses target center by 43.5ft at 6783.0ft MD (6766.4 TVD, -52.1 N, 205.1 E)										
- Circle (radius 75.0)										

Checked By: _____	Approved By: _____	Date: _____
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