

# Well Name: Andrews 26-23

Surface Location: Andrews 26-23 Pad Sec.26-T7N-R65W  
 North American Datum 1983 US State Plane 1983 Colorado Northern Zone  
 Ground Elevation: 4871.0  
 Easting 1441120.20 Northing 3240533.12 Latitude 40.541053 Longitude -104.634544 Slot  
 Original Well Elev WELL @ 4885.0ft (Original Well Elev)

+N/-S +E/-W  
 0.0 0.0

Northing  
 1441120.20

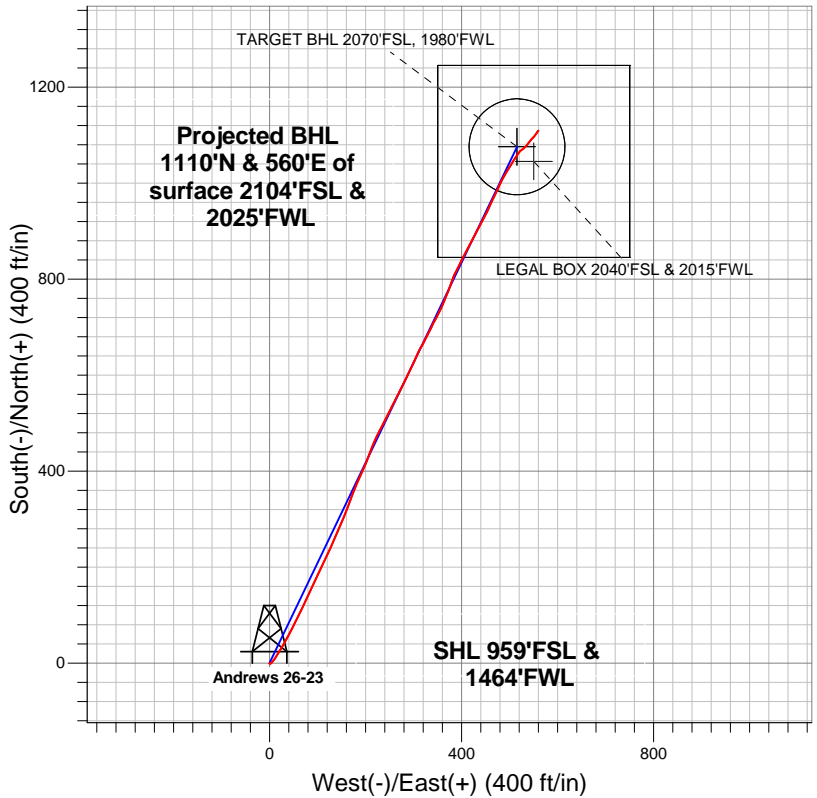
Easting  
 3240533.12

Latitude  
 40.541053

Longitude  
 -104.634544

Slot

## Great Western



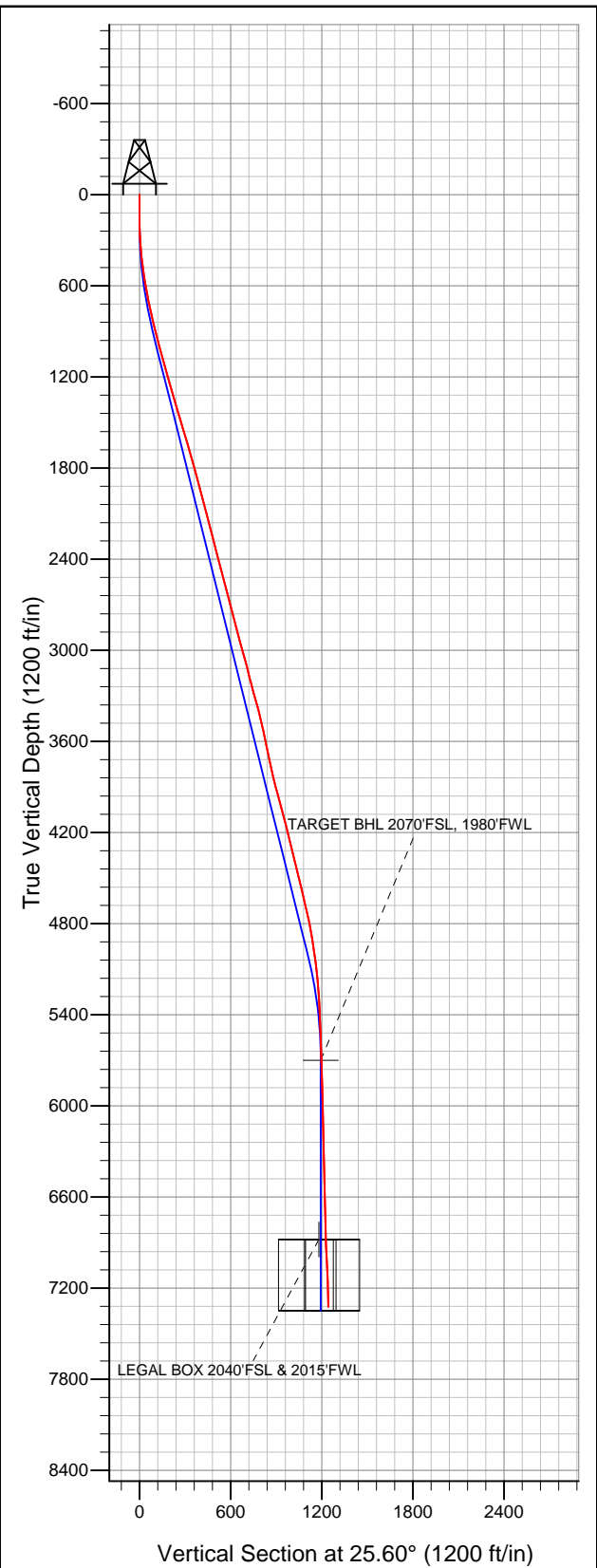
### LEGEND

- Andrews 26-23, Wellbore #1, Plan #2 (9-06-12) V0
- Wellbore #1
- Survey #1

## Final Survey Plot

Projected Final Survey -  
 7468'MD & 7322'TVD @ 1243'VS  
 1.40 deg Inc 40.00 deg AZ

Project: SEC.26-T7N-R65W  
 Site: Andrews 26-23 Pad Sec.26-T7N-R65W  
 Well: Andrews 26-23  
 Plan: Wellbore #1





## **Directional**

### **Great Western**

**SEC.26-T7N-R65W**

**Andrews 26-23 Pad Sec.26-T7N-R65W**

**Andrews 26-23**

**Wellbore #1**

**Survey: Survey #1**

### **Standard Survey Report**

**27 September, 2012**

<b>Company:</b>	Great Western	<b>Local Co-ordinate Reference:</b>	Well Andrews 26-23
<b>Project:</b>	SEC.26-T7N-R65W	<b>TVD Reference:</b>	WELL @ 4885.0ft (Original Well Elev)
<b>Site:</b>	Andrews 26-23 Pad Sec.26-T7N-R65W	<b>MD Reference:</b>	WELL @ 4885.0ft (Original Well Elev)
<b>Well:</b>	Andrews 26-23	<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

<b>Project</b>	SEC.26-T7N-R65W, Weld County, CO		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		Using Well Reference Point
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

<b>Site</b>	Andrews 26-23 Pad Sec.26-T7N-R65W		
<b>Site Position:</b>		<b>Northing:</b>	1,441,120.20 ft
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,240,533.12 ft
<b>Position Uncertainty:</b>	0.0 ft	<b>Slot Radius:</b>	"
		<b>Latitude:</b>	40.541053
		<b>Longitude:</b>	-104.634544
		<b>Grid Convergence:</b>	0.56 °

<b>Well</b>	Andrews 26-23		
<b>Well Position</b>	<b>+N/-S</b>	0.0 ft	<b>Northing:</b> 1,441,120.20 ft
	<b>+E/-W</b>	0.0 ft	<b>Easting:</b> 3,240,533.12 ft
<b>Position Uncertainty</b>	0.0 ft	<b>Wellhead Elevation:</b>	ft
		<b>Latitude:</b>	40.541053
		<b>Longitude:</b>	-104.634544
		<b>Ground Level:</b>	4,871.0 ft

<b>Wellbore</b>	Wellbore #1		
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>
	IGRF2010	9/19/2012	8.64
			<b>Dip Angle (°)</b> 67.14
			<b>Field Strength (nT)</b> 53,085

<b>Design</b>	Wellbore #1		
<b>Audit Notes:</b>			
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL
		<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>
	0.0	0.0	0.0
			<b>Direction (°)</b> 25.60

<b>Survey Program</b>	<b>Date</b> 9/27/2012		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>
87.0	7,468.0	Survey #1 (Wellbore #1)	MWD
			<b>Description</b> MWD - Standard

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
87.0	1.10	163.90	87.0	-0.8	0.2	-0.6	1.26	1.26	0.00	
179.0	1.00	70.00	179.0	-1.4	1.2	-0.7	1.67	-0.11	-102.07	
270.0	2.90	50.30	269.9	0.4	3.7	1.9	2.18	2.09	-21.65	
361.0	5.10	35.00	360.7	5.2	7.8	8.0	2.67	2.42	-16.81	
452.0	7.00	33.80	451.2	13.1	13.2	17.5	2.09	2.09	-1.32	
542.0	8.80	31.70	540.3	23.5	19.9	29.8	2.03	2.00	-2.33	
634.0	10.60	29.60	631.0	36.8	27.8	45.2	1.99	1.96	-2.28	
693.0	11.50	28.30	688.9	46.7	33.3	56.5	1.58	1.53	-2.20	
819.0	12.40	28.70	812.2	69.7	45.7	82.6	0.72	0.71	0.32	
914.0	14.20	25.30	904.6	89.1	55.6	104.4	2.07	1.89	-3.58	
1,009.0	15.70	25.50	996.4	111.3	66.1	128.9	1.58	1.58	0.21	
1,103.0	15.80	25.50	1,086.9	134.3	77.1	154.4	0.11	0.11	0.00	

<b>Company:</b>	Great Western	<b>Local Co-ordinate Reference:</b>	Well Andrews 26-23
<b>Project:</b>	SEC.26-T7N-R65W	<b>TVD Reference:</b>	WELL @ 4885.0ft (Original Well Elev)
<b>Site:</b>	Andrews 26-23 Pad Sec.26-T7N-R65W	<b>MD Reference:</b>	WELL @ 4885.0ft (Original Well Elev)
<b>Well:</b>	Andrews 26-23	<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)	
1,198.0	15.80	25.30	1,178.3	157.7	88.2	180.3	0.06	0.00	-0.21	
1,293.0	15.40	25.20	1,269.8	180.8	99.1	205.8	0.42	-0.42	-0.11	
1,387.0	16.70	25.50	1,360.1	204.3	110.2	231.8	1.39	1.38	0.32	
1,482.0	15.80	25.00	1,451.3	228.3	121.6	258.4	0.96	-0.95	-0.53	
1,577.0	17.10	23.40	1,542.5	252.8	132.6	285.3	1.45	1.37	-1.68	
1,671.0	16.90	23.40	1,632.3	278.1	143.5	312.8	0.21	-0.21	0.00	
1,766.0	15.80	23.20	1,723.5	302.6	154.1	339.5	1.16	-1.16	-0.21	
1,861.0	15.40	20.40	1,815.0	326.3	163.6	365.0	0.90	-0.42	-2.95	
1,960.0	15.10	20.20	1,910.5	350.8	172.6	390.9	0.31	-0.30	-0.20	
2,054.0	14.60	22.90	2,001.4	373.2	181.4	414.9	0.91	-0.53	2.87	
2,149.0	15.20	24.80	2,093.2	395.5	191.3	439.3	0.81	0.63	2.00	
2,243.0	14.70	21.50	2,184.0	417.8	200.8	463.6	1.05	-0.53	-3.51	
2,338.0	13.70	21.30	2,276.1	439.5	209.4	486.8	1.05	-1.05	-0.21	
2,433.0	14.70	22.40	2,368.2	461.1	218.0	510.1	1.09	1.05	1.16	
2,527.0	15.30	29.00	2,459.0	483.0	228.6	534.3	1.92	0.64	7.02	
2,622.0	14.20	26.40	2,550.9	504.4	239.9	558.5	1.35	-1.16	-2.74	
2,717.0	14.00	25.00	2,643.0	525.2	249.9	581.6	0.42	-0.21	-1.47	
2,811.0	15.40	29.40	2,733.9	546.4	260.8	605.5	1.90	1.49	4.68	
2,906.0	14.80	26.40	2,825.7	568.3	272.4	630.2	1.04	-0.63	-3.16	
3,001.0	15.10	25.90	2,917.4	590.3	283.2	654.7	0.34	0.32	-0.53	
3,095.0	15.40	23.20	3,008.1	612.8	293.5	679.4	0.82	0.32	-2.87	
3,190.0	14.70	25.50	3,099.9	635.2	303.6	704.1	0.97	-0.74	2.42	
3,285.0	13.80	29.40	3,191.9	656.0	314.4	727.4	1.38	-0.95	4.11	
3,377.0	15.70	26.90	3,280.9	676.6	325.4	750.8	2.18	2.07	-2.72	
3,472.0	15.70	26.20	3,372.4	699.6	336.9	776.5	0.20	0.00	-0.74	
3,566.0	13.00	27.30	3,463.4	720.5	347.4	799.8	2.89	-2.87	1.17	
3,661.0	11.40	29.00	3,556.3	738.2	356.8	819.9	1.73	-1.68	1.79	
3,756.0	12.00	19.90	3,649.3	755.7	364.7	839.1	2.04	0.63	-9.58	
3,850.0	12.80	20.10	3,741.1	774.6	371.6	859.2	0.85	0.85	0.21	
3,945.0	13.10	20.40	3,833.7	794.6	379.0	880.4	0.32	0.32	0.32	
4,040.0	14.50	27.30	3,926.0	815.3	388.2	903.0	2.27	1.47	7.26	
4,134.0	15.00	27.10	4,016.9	836.6	399.1	926.9	0.53	0.53	-0.21	
4,229.0	15.00	26.60	4,108.6	858.5	410.3	951.5	0.14	0.00	-0.53	
4,324.0	14.60	26.90	4,200.5	880.2	421.2	975.7	0.43	-0.42	0.32	
4,418.0	12.80	30.60	4,291.8	899.7	431.8	998.0	2.13	-1.91	3.94	
4,513.0	14.20	27.30	4,384.2	919.1	442.5	1,020.1	1.68	1.47	-3.47	
4,608.0	14.20	25.00	4,476.3	940.0	452.8	1,043.4	0.59	0.00	-2.42	
4,702.0	13.20	25.50	4,567.6	960.2	462.3	1,065.7	1.07	-1.06	0.53	
4,797.0	13.50	25.30	4,660.0	980.0	471.7	1,087.6	0.32	0.32	-0.21	
4,892.0	11.90	25.00	4,752.7	998.9	480.6	1,108.5	1.69	-1.68	-0.32	
4,986.0	10.20	29.40	4,845.0	1,014.9	488.8	1,126.5	2.02	-1.81	4.68	
5,081.0	9.10	32.50	4,938.6	1,028.6	496.9	1,142.3	1.28	-1.16	3.26	
5,176.0	7.40	30.60	5,032.6	1,040.2	504.1	1,155.9	1.81	-1.79	-2.00	
5,270.0	6.20	32.40	5,126.0	1,049.7	509.9	1,166.9	1.30	-1.28	1.91	
5,365.0	4.90	32.90	5,220.5	1,057.4	514.8	1,176.1	1.37	-1.37	0.53	
5,460.0	3.60	38.20	5,315.3	1,063.2	518.9	1,183.0	1.43	-1.37	5.58	
5,554.0	2.70	41.90	5,409.1	1,067.1	522.2	1,188.0	0.98	-0.96	3.94	
5,649.0	2.00	60.10	5,504.0	1,069.6	525.1	1,191.5	1.07	-0.74	19.16	
5,838.0	1.80	49.10	5,692.9	1,073.2	530.2	1,197.0	0.22	-0.11	-5.82	
5,844.8	1.80	48.86	5,699.7	1,073.3	530.4	1,197.2	0.13	-0.06	-3.58	
TARGET BHL 2070'FSL, 1980'FWL										
6,028.0	1.70	41.90	5,882.8	1,077.3	534.4	1,202.4	0.13	-0.05	-3.80	
6,218.0	1.40	41.30	6,072.8	1,081.1	537.8	1,207.3	0.16	-0.16	-0.32	
6,408.0	1.50	33.20	6,262.7	1,084.9	540.7	1,212.0	0.12	0.05	-4.26	

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<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)
6,597.0	1.40	33.20	6,451.6	1,088.9	543.3	1,216.8	0.05	-0.05	0.00
6,786.0	1.30	48.90	6,640.6	1,092.3	546.2	1,221.0	0.20	-0.05	8.31
6,975.0	1.30	45.70	6,829.5	1,095.2	549.3	1,225.0	0.04	0.00	-1.69
7,024.1	1.73	40.71	6,878.6	1,096.1	550.2	1,226.3	0.92	0.88	-10.16
TARGET CIRCLE 2070'FSL & 1980'FWL - LEGAL BOX 2040'FSL & 2015'FWL									
7,165.0	3.00	34.50	7,019.4	1,100.8	553.7	1,232.0	0.92	0.90	-4.41
7,418.0	1.40	38.90	7,272.2	1,108.6	559.4	1,241.5	0.64	-0.63	1.74
7,468.0	1.40	40.00	7,322.2	1,109.6	560.1	1,242.7	0.05	0.00	2.20

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 2070'F:	0.00	0.00	5,700.0	1,075.8	515.6	1,442,200.99	3,241,038.13	40.544006	-104.632689
- survey misses target center by 15.0ft at 5844.8ft MD (5699.7 TVD, 1073.3 N, 530.4 E)									
- Point									
TARGET CIRCLE 207	0.00	0.00	6,880.0	1,075.8	515.6	1,442,200.99	3,241,038.13	40.544006	-104.632689
- survey misses target center by 40.2ft at 7024.1ft MD (6878.6 TVD, 1096.1 N, 550.2 E)									
- Circle (radius 100.0)									
LEGAL BOX 2040'FS	0.00	0.00	6,880.0	1,045.8	550.6	1,442,171.29	3,241,073.47	40.543924	-104.632563
- survey misses target center by 50.3ft at 7024.1ft MD (6878.6 TVD, 1096.1 N, 550.2 E)									
- Rectangle (sides W400.0 H400.0 D469.0)									

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_