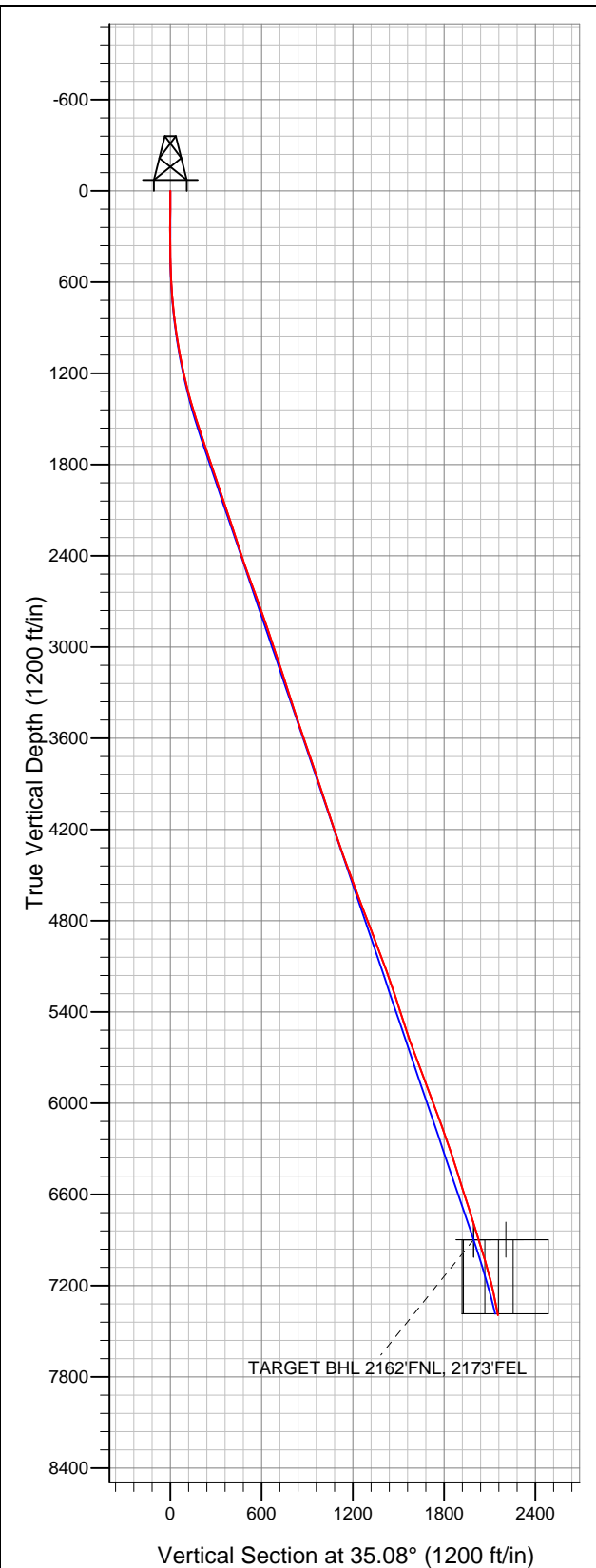


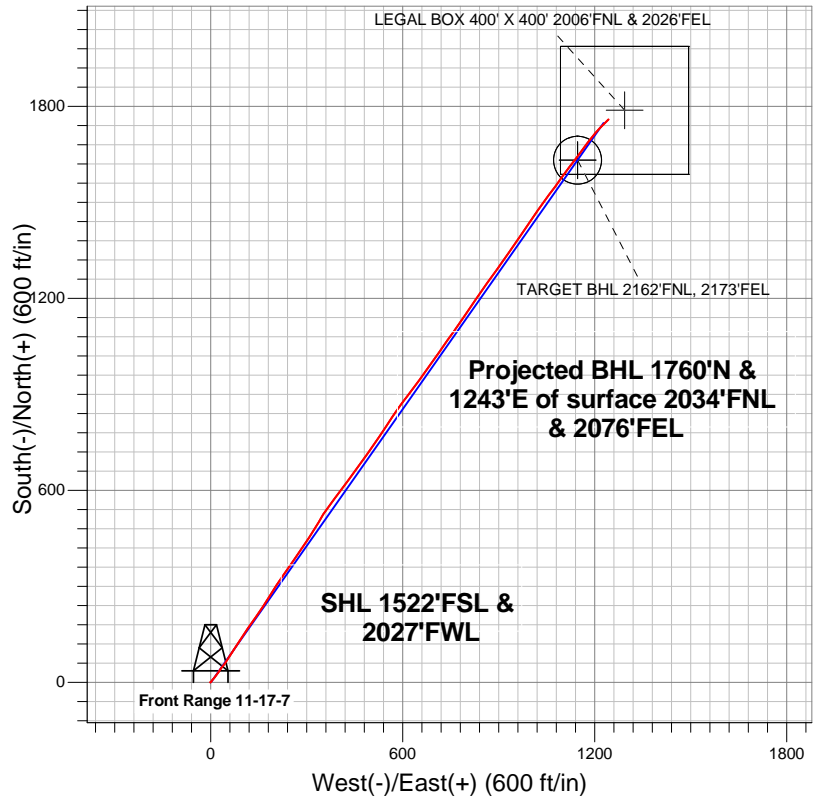
**Well Name: Front Range 11-17-7**

Surface Location: Front Range 11-17-8 Pad Sec.17-T4N-R66W  
North American Datum 1983 US State Plane 1983Colorado Northern Zone  
Ground Elevation: 4723.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1356026.10	3194152.75	40.308600	-104.803820	
Original Well Elev		WELL @ 4735.0ft (Original Well Elev)				



**KP KAUFFMAN**



**LEGEND**

- Wellbore #1
- Front Range 11-17-7, Wellbore #1, Plan #2 (7-17-12) V0
- Survey #1

**Final Survey Plot**

Projected Final Survey -  
7740'MD & 7394'TVD @ 2154'VS  
10.60 deg Inc 44.40 deg AZ

Project: SEC.17-T4N-R66W  
Site: Front Range 11-17-8 Pad Sec.17-T4N-R66W  
Well: Front Range 11-17-7  
Plan: Wellbore #1



## **KP KAUFFMAN**

**SEC.17-T4N-R66W**

**Front Range 11-17-8 Pad Sec.17-T4N-R66W**

**Front Range 11-17-7**

**Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**30 July, 2012**

<b>Company:</b>	KP KAUFFMAN	<b>Local Co-ordinate Reference:</b>	Well Front Range 11-17-7
<b>Project:</b>	SEC.17-T4N-R66W	<b>TVD Reference:</b>	WELL @ 4735.0ft (Original Well Elev)
<b>Site:</b>	Front Range 11-17-8 Pad Sec.17-T4N-R66W	<b>MD Reference:</b>	WELL @ 4735.0ft (Original Well Elev)
<b>Well:</b>	Front Range 11-17-7	<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.17-T4N-R66W, Weld County, Colorado		
<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

Site		Front Range 11-17-8 Pad Sec.17-T4N-R66W			
Position:		Northing:		1,356,026.27 ft	
From:	Lat/Long	Easting:		Longitude:	
		3,194,172.27 ft		-104.803750	
Position Uncertainty:		Slot Radius:		Grid Convergence:	
0.0 ft		"		0.45 °	

Well	Front Range 11-17-7					
Well Position	+N/-S	0.0 ft	Northing:	1,356,026.10 ft	Latitude:	40.30860
	+E/-W	0.0 ft	Easting:	3,194,152.75 ft	Longitude:	-104.80382
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,723.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/17/2012	8.73	66.93	52,965

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	6,898.0	0.0	0.0	35.08	

Survey Program		Date	7/30/2012		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
128.0	7,740.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

Survey	Wellbore Data									
	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)
Survey Data	0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
	128.0	0.60	281.00	128.0	0.1	-0.7	-0.3	0.47	0.47	0.00
	249.0	0.20	319.00	249.0	0.4	-1.4	-0.5	0.38	-0.33	31.41
	370.0	0.40	59.90	370.0	0.8	-1.2	0.0	0.40	0.17	83.39
	493.0	1.60	46.30	493.0	2.2	0.4	2.0	0.99	0.98	-11.06
	617.0	3.50	40.20	616.8	6.3	4.1	7.5	1.55	1.53	-4.92
	690.0	4.90	38.30	689.6	10.4	7.5	12.8	1.93	1.92	-2.60
	768.0	5.50	39.80	767.3	15.9	11.9	19.9	0.79	0.77	1.92
	893.0	7.60	35.30	891.5	27.3	20.6	34.1	1.73	1.68	-3.60
	1,017.0	9.40	36.00	1,014.1	42.1	31.2	52.4	1.45	1.45	0.56
	1,142.0	11.50	36.50	1,137.1	60.4	44.7	75.1	1.68	1.68	0.40
	1,267.0	13.80	31.90	1,259.0	83.1	60.0	102.5	2.01	1.84	-3.68
	1,392.0	15.40	32.30	1,380.0	109.8	76.7	133.9	1.28	1.28	0.32

<b>Company:</b>	KP KAUFFMAN	<b>Local Co-ordinate Reference:</b>	Well Front Range 11-17-7
<b>Project:</b>	SEC.17-T4N-R66W	<b>TVD Reference:</b>	WELL @ 4735.0ft (Original Well Elev)
<b>Site:</b>	Front Range 11-17-8 Pad Sec.17-T4N-R66W	<b>MD Reference:</b>	WELL @ 4735.0ft (Original Well Elev)
<b>Well:</b>	Front Range 11-17-7	<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)	
1,516.0	17.70	34.20	1,498.8	139.3	96.1	169.2	1.91	1.85	1.53	
1,641.0	18.60	34.60	1,617.6	171.4	118.1	208.2	0.73	0.72	0.32	
1,766.0	18.90	34.70	1,736.0	204.5	140.9	248.3	0.24	0.24	0.08	
1,891.0	18.40	34.00	1,854.4	237.5	163.5	288.3	0.44	-0.40	-0.56	
2,015.0	18.30	31.40	1,972.1	270.3	184.6	327.3	0.66	-0.08	-2.10	
2,140.0	18.60	33.30	2,090.7	303.7	205.8	366.8	0.54	0.24	1.52	
2,265.0	18.50	33.70	2,209.2	336.9	227.7	406.6	0.13	-0.08	0.32	
2,390.0	18.50	35.40	2,327.7	369.6	250.2	446.2	0.43	0.00	1.36	
2,514.0	18.40	34.70	2,445.4	401.7	272.7	485.5	0.20	-0.08	-0.56	
2,639.0	20.00	34.00	2,563.4	435.6	295.9	526.6	1.29	1.28	-0.56	
2,764.0	20.30	31.80	2,680.8	471.8	319.3	569.6	0.65	0.24	-1.76	
2,889.0	19.10	30.40	2,798.4	507.8	341.1	611.6	1.03	-0.96	-1.12	
3,013.0	18.70	35.10	2,915.8	541.6	362.8	651.7	1.27	-0.32	3.79	
3,138.0	18.60	36.30	3,034.2	574.1	386.1	691.7	0.32	-0.08	0.96	
3,263.0	17.80	36.70	3,152.9	605.4	409.3	730.7	0.65	-0.64	0.32	
3,388.0	18.00	36.70	3,271.9	636.3	432.3	769.1	0.16	0.16	0.00	
3,513.0	18.00	37.20	3,390.8	667.1	455.5	807.7	0.12	0.00	0.40	
3,637.0	18.70	34.00	3,508.5	698.9	478.2	846.7	0.99	0.56	-2.58	
3,762.0	18.80	35.30	3,626.8	731.9	501.0	886.9	0.34	0.08	1.04	
3,887.0	19.10	34.70	3,745.1	765.2	524.3	927.5	0.29	0.24	-0.48	
4,012.0	18.60	34.00	3,863.4	798.5	547.1	967.9	0.44	-0.40	-0.56	
4,136.0	18.30	32.80	3,981.0	831.3	568.7	1,007.1	0.39	-0.24	-0.97	
4,261.0	17.50	36.00	4,099.9	863.0	590.4	1,045.5	1.01	-0.64	2.56	
4,386.0	19.60	37.70	4,218.4	894.8	614.3	1,085.3	1.73	1.68	1.36	
4,511.0	18.50	35.40	4,336.6	927.5	638.6	1,126.0	1.07	-0.88	-1.84	
4,635.0	20.80	37.00	4,453.4	961.1	663.2	1,167.7	1.90	1.85	1.29	
4,760.0	19.80	34.90	4,570.6	996.2	688.7	1,211.1	0.99	-0.80	-1.68	
4,887.0	19.90	34.60	4,690.1	1,031.7	713.3	1,254.2	0.11	0.08	-0.24	
5,012.0	21.70	35.40	4,806.9	1,068.0	738.7	1,298.6	1.46	1.44	0.64	
5,136.0	21.50	35.40	4,922.2	1,105.2	765.2	1,344.2	0.16	-0.16	0.00	
5,261.0	20.10	33.90	5,039.0	1,141.7	790.4	1,388.6	1.20	-1.12	-1.20	
5,386.0	19.20	35.40	5,156.8	1,176.3	814.3	1,430.6	0.83	-0.72	1.20	
5,511.0	18.80	33.00	5,275.0	1,210.0	837.2	1,471.3	0.70	-0.32	-1.92	
5,635.0	18.50	35.60	5,392.4	1,242.7	859.5	1,511.0	0.71	-0.24	2.10	
5,760.0	17.70	36.20	5,511.3	1,274.2	882.3	1,549.8	0.66	-0.64	0.48	
5,885.0	20.00	34.90	5,629.5	1,307.0	905.8	1,590.2	1.87	1.84	-1.04	
6,010.0	20.80	34.90	5,746.7	1,342.8	930.7	1,633.7	0.64	0.64	0.00	
6,134.0	21.30	35.10	5,862.4	1,379.3	956.2	1,678.3	0.41	0.40	0.16	
6,259.0	20.50	33.30	5,979.2	1,416.1	981.3	1,722.9	0.82	-0.64	-1.44	
6,384.0	19.70	34.70	6,096.6	1,451.7	1,005.3	1,765.8	0.75	-0.64	1.12	
6,509.0	19.40	35.60	6,214.4	1,485.9	1,029.4	1,807.6	0.34	-0.24	0.72	
6,634.0	18.60	36.90	6,332.6	1,518.8	1,053.5	1,848.3	0.72	-0.64	1.04	
6,758.0	17.40	35.10	6,450.5	1,549.8	1,076.0	1,886.6	1.07	-0.97	-1.45	
6,883.0	17.50	36.20	6,569.8	1,580.2	1,097.8	1,924.1	0.28	0.08	0.88	
7,008.0	17.90	36.50	6,688.8	1,610.8	1,120.4	1,962.1	0.33	0.32	0.24	
7,133.0	17.40	38.40	6,808.0	1,640.9	1,143.4	2,000.0	0.61	-0.40	1.52	
7,217.6	16.85	36.52	6,888.8	1,660.7	1,158.5	2,024.8	0.92	-0.65	-2.23	
TARGET CIRCLE 2162'FNL & 2173'FEL										
7,217.7	16.85	36.52	6,888.9	1,660.7	1,158.6	2,024.9	0.00	0.00	0.00	
TARGET BHL 2162'FNL, 2173'FEL										
7,257.0	16.60	35.60	6,926.5	1,669.8	1,165.2	2,036.2	0.93	-0.64	-2.34	
7,279.2	16.67	36.11	6,947.8	1,675.0	1,169.0	2,042.6	0.72	0.31	2.28	
LEGAL BOX 400' X 400' 2006'FNL & 2026'FEL										
7,382.0	17.00	38.40	7,046.2	1,698.7	1,187.0	2,072.3	0.72	0.32	2.23	

<b>Company:</b>	KP KAUFFMAN	<b>Local Co-ordinate Reference:</b>	Well Front Range 11-17-7
<b>Project:</b>	SEC.17-T4N-R66W	<b>TVD Reference:</b>	WELL @ 4735.0ft (Original Well Elev)
<b>Site:</b>	Front Range 11-17-8 Pad Sec.17-T4N-R66W	<b>MD Reference:</b>	WELL @ 4735.0ft (Original Well Elev)
<b>Well:</b>	Front Range 11-17-7	<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)
7,507.0	14.30	42.50	7,166.6	1,724.4	1,208.8	2,105.9	2.33	-2.16	3.28
7,632.0	12.00	44.40	7,288.3	1,745.1	1,228.3	2,134.0	1.87	-1.84	1.52
7,694.0	10.60	44.40	7,349.1	1,753.7	1,236.8	2,146.0	2.26	-2.26	0.00
7,740.0	10.60	44.40	7,394.3	1,759.8	1,242.7	2,154.3	0.00	0.00	0.00

Checked By: _____	Approved By: _____	Date: _____
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