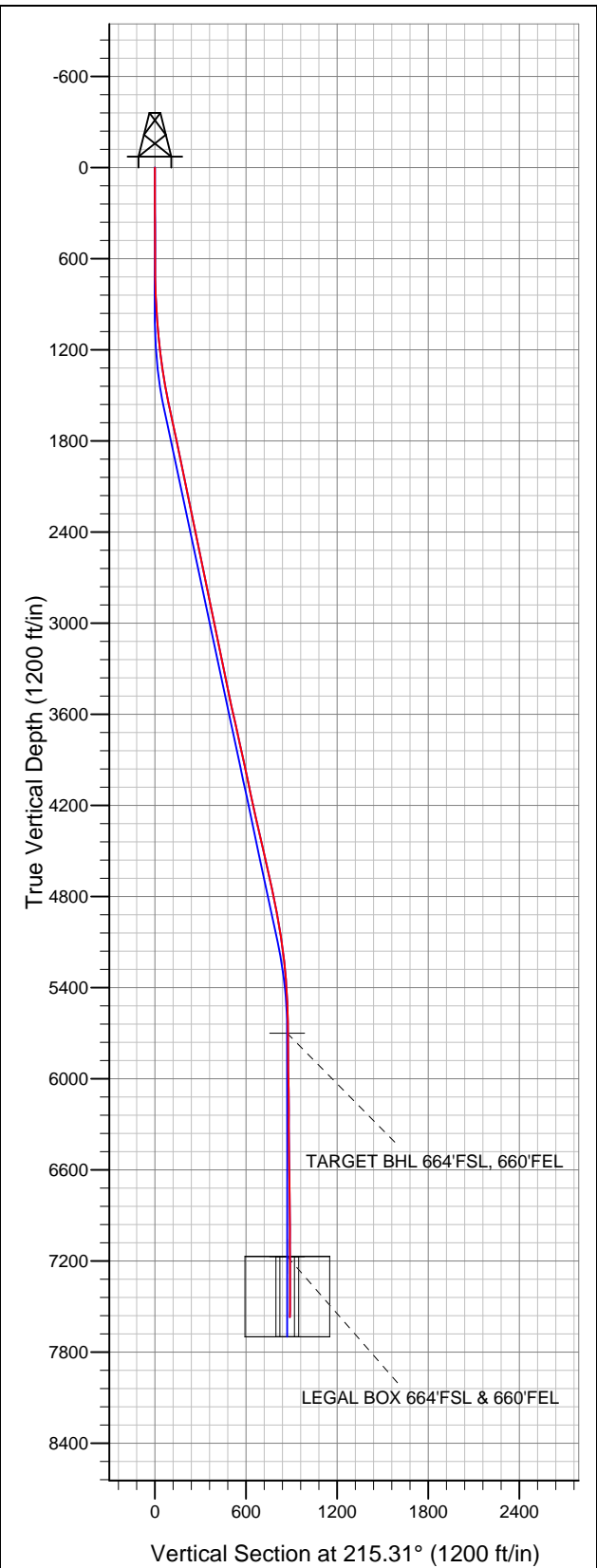


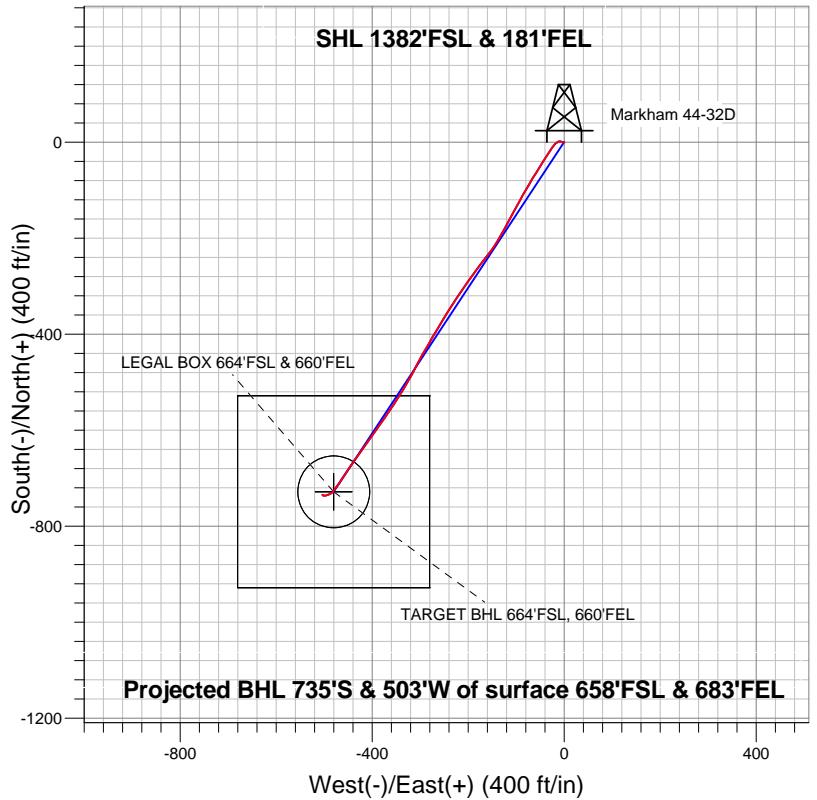


# Well Name: Markham 44-32D

Surface Location: Markham 44-32D Pad Sec.32-T4N-R68W  
North American Datum 1983 US State Plane 1983 Colorado Northern Zone  
Ground Elevation: 5061.0  
+N/-S 0.0 +E/-W 0.0 Northing 1340146.75 Easting 3134411.59 Latitude 40.266100 Longitude -105.018340 Slot  
Original Well Elev WELL @ 5074.0ft (Original Well Elev)



## Apollo Operating, LLC.



### LEGEND

- △ Markham 44-32D, Wellbore #1, Plan #4 (4-17-13) V0
- Wellbore #1
- Survey #1

## Final Survey Plot

Projected Final Survey -  
7658'MD & 7572'TVD @ 890'VS  
0.4 deg Inc 32.1 deg AZ

Project: SEC.32-T4N-R68W  
Site: Markham 44-32D Pad Sec.32-T4N-R68W  
Well: Markham 44-32D  
Plan: Wellbore #1



# **Apollo Operating, LLC.**

**SEC.32-T4N-R68W**

**Markham 44-32D Pad Sec.32-T4N-R68W**

**Markham 44-32D**

**Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**29 April, 2013**

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
	250.0	0.40	240.90	250.0	-0.4	-0.8	0.8	0.16	0.16	0.00
	500.0	1.00	286.80	500.0	-0.2	-3.6	2.3	0.31	0.24	18.36
	732.0	1.20	294.60	731.9	1.4	-7.8	3.4	0.11	0.09	3.36
	772.0	1.80	278.70	771.9	1.6	-8.8	3.7	1.81	1.50	-39.75
	900.0	3.80	236.70	899.8	-0.4	-14.3	8.6	2.14	1.56	-32.81
	1,028.0	4.20	221.00	1,027.5	-6.2	-20.9	17.2	0.91	0.31	-12.27
	1,157.0	6.20	210.70	1,155.9	-15.8	-27.6	28.8	1.70	1.55	-7.98
	1,285.0	7.80	215.50	1,283.0	-28.8	-36.1	44.4	1.33	1.25	3.75
	1,413.0	9.40	210.50	1,409.5	-44.9	-46.5	63.5	1.38	1.25	-3.91
	1,541.0	11.50	212.80	1,535.4	-64.6	-58.7	86.7	1.67	1.64	1.80
	1,670.0	12.50	209.80	1,661.6	-87.6	-72.6	113.4	0.91	0.78	-2.33
	1,798.0	12.40	210.20	1,786.6	-111.5	-86.4	140.9	0.10	-0.08	0.31

<b>Company:</b>	Apollo Operating, LLC.	<b>Local Co-ordinate Reference:</b>	Well Markham 44-32D
<b>Project:</b>	SEC.32-T4N-R68W	<b>TVD Reference:</b>	WELL @ 5074.0ft (Original Well Elev)
<b>Site:</b>	Markham 44-32D Pad Sec.32-T4N-R68W	<b>MD Reference:</b>	WELL @ 5074.0ft (Original Well Elev)
<b>Well:</b>	Markham 44-32D	<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)	
1,926.0	11.60	207.20	1,911.8	-134.8	-99.2	167.3	0.79	-0.63	-2.34	
2,054.0	12.20	210.00	2,037.0	-157.9	-111.9	193.5	0.65	0.47	2.19	
2,182.0	11.40	208.80	2,162.3	-180.7	-124.7	219.6	0.65	-0.63	-0.94	
2,310.0	10.90	208.80	2,287.9	-202.4	-136.6	244.2	0.39	-0.39	0.00	
2,439.0	12.30	217.00	2,414.3	-224.1	-150.8	270.0	1.67	1.09	6.36	
2,567.0	11.90	217.60	2,539.4	-245.4	-167.0	296.8	0.33	-0.31	0.47	
2,695.0	12.30	216.50	2,664.6	-266.8	-183.2	323.6	0.36	0.31	-0.86	
2,824.0	11.40	215.60	2,790.8	-288.3	-198.8	350.1	0.71	-0.70	-0.70	
2,952.0	10.70	212.60	2,916.5	-308.6	-212.6	374.7	0.71	-0.55	-2.34	
3,080.0	11.30	215.60	3,042.1	-328.8	-226.3	399.1	0.65	0.47	2.34	
3,208.0	12.00	211.40	3,167.5	-350.3	-240.5	424.9	0.86	0.55	-3.28	
3,336.0	11.30	210.90	3,292.8	-372.4	-253.9	450.7	0.55	-0.55	-0.39	
3,465.0	11.80	211.20	3,419.2	-394.6	-267.2	476.4	0.39	0.39	0.23	
3,593.0	13.10	209.70	3,544.2	-418.4	-281.2	503.9	1.05	1.02	-1.17	
3,722.0	12.70	209.30	3,670.0	-443.4	-295.3	532.6	0.32	-0.31	-0.31	
3,850.0	12.10	207.40	3,795.0	-467.6	-308.4	559.8	0.57	-0.47	-1.48	
3,978.0	12.60	208.40	3,920.0	-491.8	-321.2	587.0	0.42	0.39	0.78	
4,106.0	12.30	214.10	4,045.0	-515.4	-335.5	614.5	0.99	-0.23	4.45	
4,235.0	12.20	211.40	4,171.1	-538.4	-350.3	641.8	0.45	-0.08	-2.09	
4,363.0	12.00	213.00	4,296.2	-561.1	-364.6	668.6	0.31	-0.16	1.25	
4,491.0	13.10	214.40	4,421.2	-584.2	-380.0	696.4	0.89	0.86	1.09	
4,620.0	13.20	216.30	4,546.8	-608.1	-397.0	725.8	0.34	0.08	1.47	
4,748.0	12.90	216.70	4,671.5	-631.4	-414.2	754.6	0.24	-0.23	0.31	
4,877.0	11.80	214.90	4,797.5	-653.7	-430.4	782.2	0.90	-0.85	-1.40	
5,005.0	10.10	213.90	4,923.2	-673.8	-444.1	806.5	1.34	-1.33	-0.78	
5,133.0	8.70	214.20	5,049.4	-691.1	-455.8	827.4	1.09	-1.09	0.23	
5,262.0	7.40	213.00	5,177.2	-706.2	-465.8	845.5	1.02	-1.01	-0.93	
5,390.0	5.10	216.00	5,304.4	-717.7	-473.7	859.4	1.81	-1.80	2.34	
5,518.0	2.90	214.90	5,432.1	-724.9	-478.9	868.4	1.72	-1.72	-0.86	
5,646.0	2.40	229.90	5,559.9	-729.3	-482.8	874.2	0.66	-0.39	11.72	
5,775.0	0.40	223.00	5,688.9	-731.4	-485.1	877.2	1.55	-1.55	-5.35	
5,786.1	0.42	225.93	5,699.9	-731.4	-485.2	877.3	0.28	0.20	26.47	
TARGET BHL 664'FSL, 660'FEL										
5,903.0	0.70	243.90	5,816.9	-732.1	-486.1	878.4	0.28	0.24	15.37	
6,032.0	0.60	256.20	5,945.9	-732.6	-487.5	879.6	0.13	-0.08	9.53	
6,160.0	0.70	236.90	6,073.9	-733.2	-488.8	880.8	0.19	0.08	-15.08	
6,288.0	0.60	239.70	6,201.9	-733.9	-490.0	882.2	0.08	-0.08	2.19	
6,416.0	0.40	245.30	6,329.9	-734.4	-491.0	883.1	0.16	-0.16	4.38	
6,544.0	0.70	258.90	6,457.9	-734.8	-492.2	884.1	0.25	0.23	10.63	
6,672.0	0.90	246.00	6,585.8	-735.3	-493.9	885.5	0.21	0.16	-10.08	
6,801.0	0.80	251.00	6,714.8	-736.0	-495.7	887.1	0.10	-0.08	3.88	
6,929.0	0.80	262.90	6,842.8	-736.4	-497.4	888.5	0.13	0.00	9.30	
7,058.0	0.70	273.50	6,971.8	-736.5	-499.1	889.5	0.13	-0.08	8.22	
7,186.0	0.70	269.60	7,099.8	-736.5	-500.6	890.4	0.04	0.00	-3.05	
7,256.0	0.63	281.50	7,169.8	-736.4	-501.4	890.8	0.22	-0.10	16.99	
TARGET CIRCLE 664'FSL & 660'FEL - LEGAL BOX 664'FSL & 660'FEL										
7,315.0	0.60	293.20	7,228.8	-736.2	-502.1	891.0	0.22	-0.05	19.84	
7,443.0	0.40	296.00	7,356.8	-735.7	-503.1	891.2	0.16	-0.16	2.19	
7,614.0	0.40	32.10	7,527.8	-735.0	-503.3	890.7	0.35	0.00	56.20	
7,658.0	0.40	32.10	7,571.8	-734.7	-503.1	890.4	0.00	0.00	0.00	

<b>Company:</b>	Apollo Operating, LLC.	<b>Local Co-ordinate Reference:</b>	Well Markham 44-32D
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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

Checked By: _____	Approved By: _____	Date: _____
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