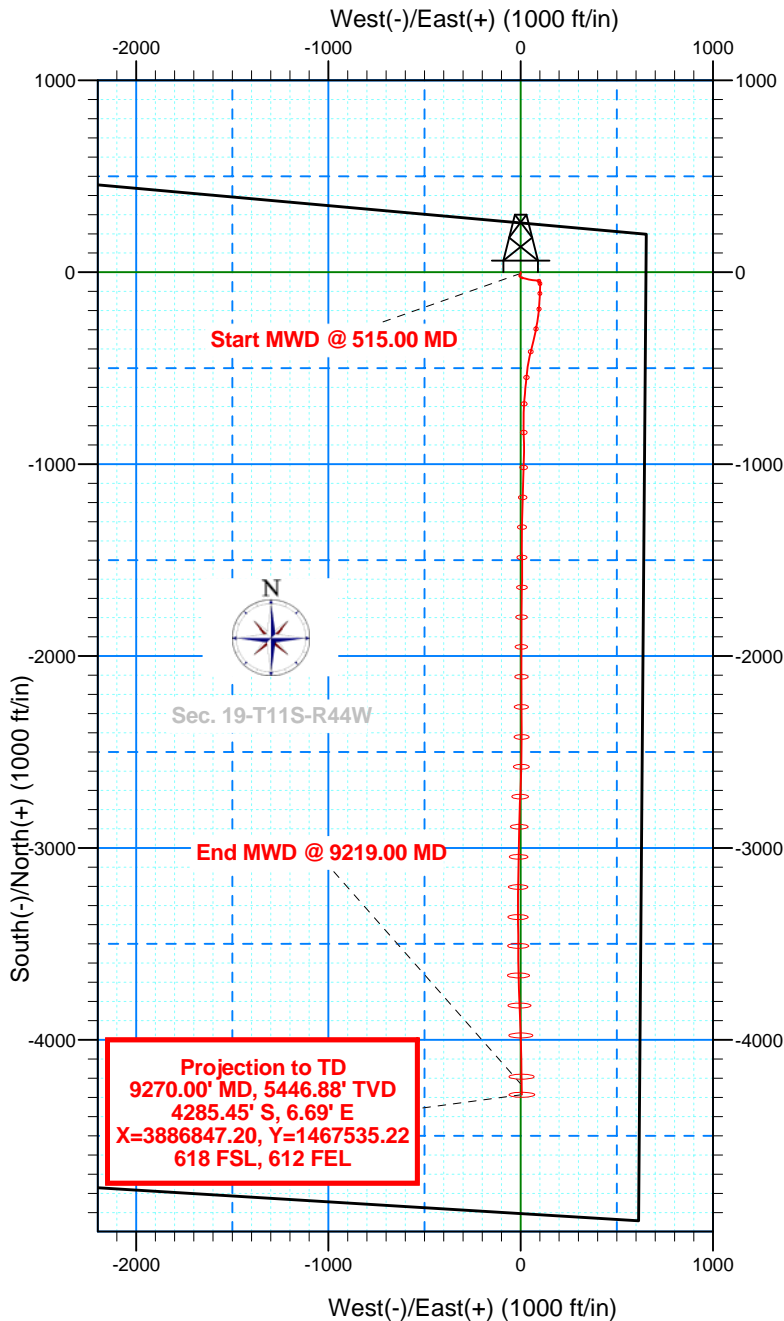
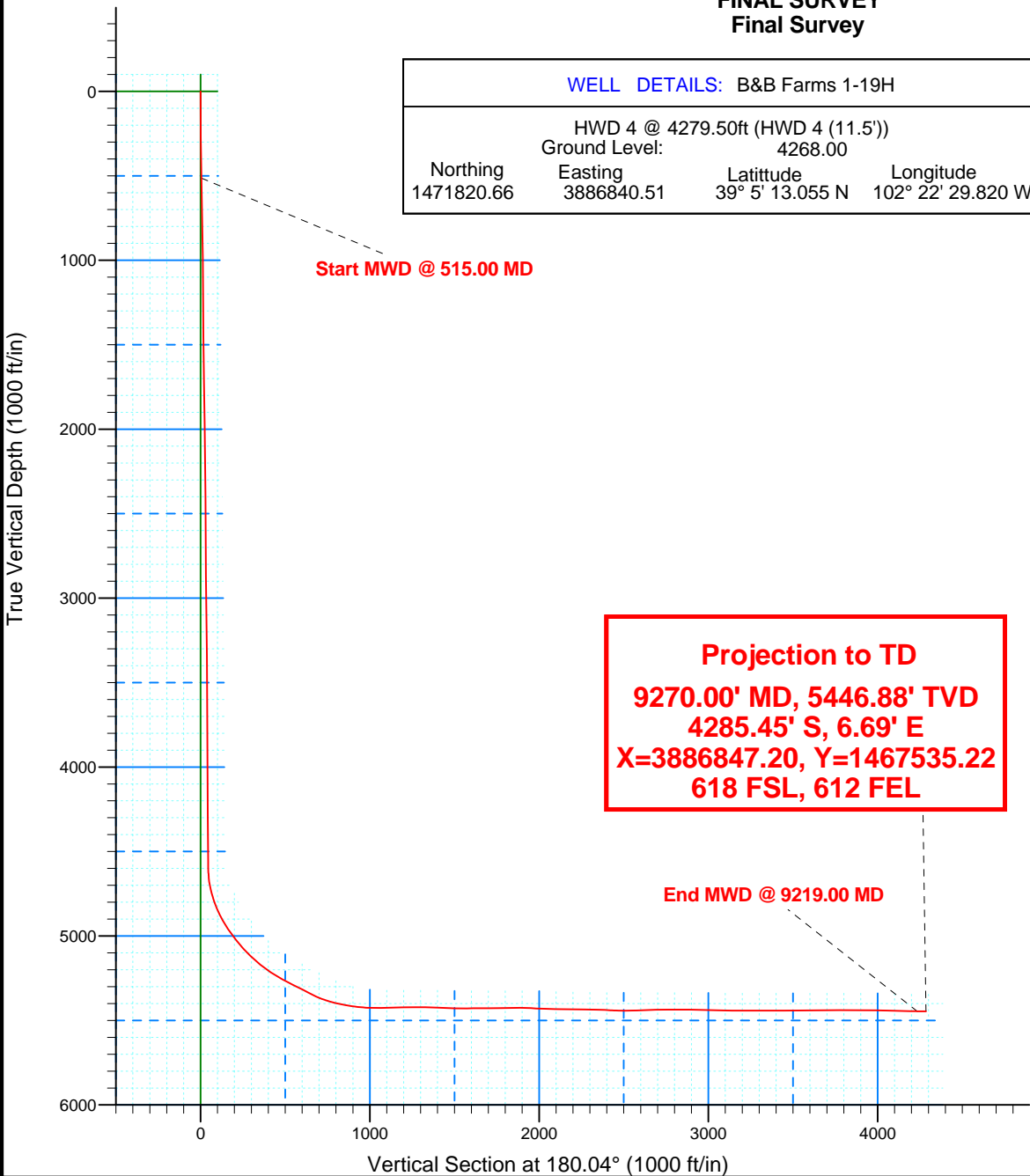


Kit Carson Co., CO (NAD-83)  
Sec 19-T11S-R44W (Grid)  
Api # 0506306346  
B&B Farms 1-19H  
260 FNL, 660 FEL  
Job# 900266611  
HWD 4 (11.5')  
FINAL SURVEY  
Final Survey



Job# 900266611  
**HWD 4 (11.5')**

# Kirkpatrick Oil Company, Inc

Kit Carson Co., CO (NAD-83) Sec 19-T11S-R44W (Grid)  
API# 0506306346

**B&B Farms 1-19H (260 FNL, 660 FEL)**

**Wellbore #1**

**Design: Final Survey**

## **Sperry Drilling Services** **Combo Report**

**30 July, 2013**

Well Coordinates: 39° 05' 13.06" N  
102° 22' 29.82" W

North American Datum 1983  
Colorado Central Zone  
1,471,820.66 N  
3,886,840.51 E

Ground Level: 4,268.00 ft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

**North Reference:**

Unit System:

Centered on Well B&B Farms 1-19H  
HWD 4 @ 4279.50ft (HWD 4 (11.5'))

N

**Grid**

API US New

Version: 2003.21 Build: 46

Report Version: Midcon Combo v1.30

**HALLIBURTON**

## Design Report for B&amp;B Farms 1-19H - Final Survey

Measured Depth (ft)	Inclination (°)	Grid Azimuth (°)	True Azimuth (°)	TVD below System (ft)	Vertical Depth (ft)	Local Coordinates (ft)		Map Coordinates (ft)		Dogleg Rate (°/100ft)	Vertical Section (ft)	Comments
North	East	North	East	North	East	North	East	North	East			
0.00	0.00	0.00	1.97	-4,279.50	0.00	0.00 N	0.00 E	1,471,820.66	3,886,840.51	0.00	0.00	
515.00	1.25	174.64	176.61	-3,764.54	514.96	5.59 S	0.52 E	1,471,815.07	3,886,841.03	0.24	5.59	Start MWD @ 515.00 MD
985.00	1.26	241.01	242.98	-3,294.63	984.87	13.20 S	3.52 W	1,471,807.46	3,886,836.99	0.29	13.20	
1,454.00	0.53	175.06	177.03	-2,825.68	1,453.82	17.86 S	7.84 W	1,471,802.80	3,886,832.66	0.25	17.87	
1,970.00	1.55	131.54	133.51	-2,309.77	1,969.73	24.87 S	2.41 W	1,471,795.79	3,886,838.09	0.24	24.87	
2,406.00	1.76	93.85	95.82	-1,873.94	2,405.56	29.23 S	8.68 E	1,471,791.43	3,886,849.19	0.25	29.22	
2,872.00	2.21	107.54	109.51	-1,408.22	2,871.28	32.42 S	24.39 E	1,471,788.25	3,886,864.90	0.14	32.40	
3,343.00	2.27	103.79	105.76	-937.58	3,341.92	37.38 S	42.11 E	1,471,783.29	3,886,882.61	0.03	37.35	
3,812.00	2.67	94.04	96.01	-469.01	3,810.49	40.36 S	62.03 E	1,471,780.30	3,886,902.53	0.12	40.32	
4,283.00	2.43	100.29	102.26	1.52	4,281.02	42.92 S	82.79 E	1,471,777.75	3,886,923.30	0.08	42.86	
4,561.00	2.95	102.13	104.10	279.22	4,558.72	45.47 S	95.59 E	1,471,775.19	3,886,936.09	0.19	45.41	
4,597.00	2.91	110.24	112.21	315.17	4,594.67	45.98 S	97.35 E	1,471,774.68	3,886,937.85	1.16	45.92	
4,628.00	3.31	128.62	130.59	346.13	4,625.63	46.81 S	98.79 E	1,471,773.85	3,886,939.29	3.45	46.75	
4,659.00	5.66	163.49	165.46	377.03	4,656.53	48.84 S	99.92 E	1,471,771.82	3,886,940.43	11.28	48.77	
4,691.00	9.23	173.50	175.47	408.76	4,688.26	52.90 S	100.66 E	1,471,767.76	3,886,941.17	11.83	52.83	
4,722.00	12.54	177.89	179.86	439.20	4,718.70	58.74 S	101.07 E	1,471,761.92	3,886,941.57	11.00	58.67	
4,753.00	15.59	181.43	183.40	469.27	4,748.77	66.27 S	101.09 E	1,471,754.39	3,886,941.59	10.22	66.20	
4,785.00	18.34	181.55	183.52	499.87	4,779.37	75.60 S	100.84 E	1,471,745.06	3,886,941.35	8.59	75.53	
4,816.00	20.71	180.74	182.71	529.09	4,808.59	85.96 S	100.64 E	1,471,734.70	3,886,941.14	7.69	85.89	
4,848.00	22.24	180.47	182.44	558.86	4,838.36	97.67 S	100.52 E	1,471,722.99	3,886,941.02	4.79	97.60	
4,879.00	24.77	181.10	183.07	587.29	4,866.79	110.03 S	100.34 E	1,471,710.63	3,886,940.85	8.20	109.96	
4,911.00	27.79	181.84	183.81	615.98	4,895.48	124.20 S	99.98 E	1,471,696.47	3,886,940.48	9.49	124.13	
4,942.00	30.63	182.75	184.72	643.03	4,922.53	139.31 S	99.36 E	1,471,681.35	3,886,939.87	9.27	139.24	
4,973.00	33.19	183.37	185.34	669.35	4,948.85	155.67 S	98.49 E	1,471,664.99	3,886,938.99	8.33	155.60	
5,005.00	35.45	184.30	186.27	695.77	4,975.27	173.67 S	97.28 E	1,471,646.99	3,886,937.78	7.25	173.60	
5,036.00	37.01	185.54	187.51	720.78	5,000.28	191.92 S	95.70 E	1,471,628.74	3,886,936.21	5.56	191.86	
5,067.00	38.43	187.67	189.64	745.30	5,024.80	210.76 S	93.51 E	1,471,609.90	3,886,934.02	6.22	210.69	
5,099.00	40.13	188.76	190.73	770.07	5,049.57	230.81 S	90.62 E	1,471,589.85	3,886,931.12	5.73	230.75	
5,130.00	42.26	188.46	190.43	793.40	5,072.90	251.00 S	87.56 E	1,471,569.67	3,886,928.07	6.90	250.93	
5,161.00	44.65	189.17	191.14	815.90	5,095.40	272.06 S	84.29 E	1,471,548.60	3,886,924.80	7.87	272.00	
5,193.00	46.91	190.37	192.34	838.21	5,117.71	294.66 S	80.39 E	1,471,526.00	3,886,920.90	7.56	294.60	
5,224.00	48.58	191.74	193.71	859.06	5,138.56	317.18 S	75.99 E	1,471,503.49	3,886,916.50	6.30	317.12	
5,255.00	50.14	193.12	195.09	879.25	5,158.75	340.15 S	70.93 E	1,471,480.52	3,886,911.43	6.06	340.10	
5,286.00	52.35	194.40	196.37	898.65	5,178.15	363.62 S	65.17 E	1,471,457.04	3,886,905.68	7.82	363.58	
5,318.00	54.78	194.26	196.23	917.66	5,197.16	388.57 S	58.80 E	1,471,432.10	3,886,899.31	7.60	388.53	
5,349.00	57.26	193.67	195.64	934.98	5,214.48	413.51 S	52.60 E	1,471,407.15	3,886,893.10	8.15	413.47	
5,380.00	59.21	192.07	194.04	951.30	5,230.80	439.20 S	46.73 E	1,471,381.46	3,886,887.24	7.67	439.17	
5,411.00	60.76	190.35	192.32	966.81	5,246.31	465.53 S	41.52 E	1,471,355.13	3,886,882.02	6.93	465.50	
5,443.00	61.55	188.33	190.30	982.25	5,261.75	493.19 S	36.97 E	1,471,327.47	3,886,877.48	6.06	493.16	
5,474.00	62.99	186.49	188.46	996.67	5,276.17	520.40 S	33.44 E	1,471,300.27	3,886,873.94	7.01	520.37	
5,505.00	63.00	186.01	187.98	1,010.75	5,290.25	547.85 S	30.43 E	1,471,272.81	3,886,870.93	1.38	547.83	

## Design Report for B&amp;B Farms 1-19H - Final Survey

Measured Depth (ft)	Inclination (°)	Grid Azimuth (°)	True Azimuth (°)	TVD below System (ft)	Vertical Depth (ft)	Local Coordinates (ft)		Map Coordinates (ft)		Dogleg Rate (°/100ft)	Vertical Section (ft)	Comments
Northings	Eastings		Northings	Eastings								
5,537.00	62.91	185.52	187.49	1,025.30	5,304.80	576.21 S	27.57 E	1,471,244.45	3,886,868.07	1.39	576.19	
5,568.00	62.85	185.25	187.22	1,039.43	5,318.93	603.68 S	24.98 E	1,471,216.98	3,886,865.48	0.80	603.66	
5,599.00	62.82	185.11	187.08	1,053.59	5,333.09	631.15 S	22.49 E	1,471,189.52	3,886,862.99	0.41	631.13	
5,631.00	63.28	184.57	186.54	1,068.09	5,347.59	659.57 S	20.08 E	1,471,161.09	3,886,860.59	2.08	659.56	
5,660.00	65.47	183.63	185.60	1,080.63	5,360.13	685.65 S	18.21 E	1,471,135.01	3,886,858.72	8.10	685.64	
5,692.00	68.87	182.60	184.57	1,093.04	5,372.54	715.09 S	16.61 E	1,471,105.57	3,886,857.12	11.03	715.08	
5,723.00	72.77	181.21	183.18	1,103.23	5,382.73	744.35 S	15.64 E	1,471,076.31	3,886,856.15	13.27	744.34	
5,754.00	74.68	179.70	181.67	1,111.92	5,391.42	774.11 S	15.41 E	1,471,046.56	3,886,855.92	7.73	774.09	
5,786.00	76.72	179.20	181.17	1,119.82	5,399.32	805.11 S	15.71 E	1,471,015.55	3,886,856.21	6.55	805.10	
5,816.00	78.56	178.93	180.90	1,126.24	5,405.74	834.41 S	16.19 E	1,470,986.25	3,886,856.69	6.20	834.40	
5,847.00	80.15	178.71	180.68	1,131.97	5,411.47	864.87 S	16.81 E	1,470,955.79	3,886,857.32	5.18	864.86	
5,878.00	82.03	178.91	180.88	1,136.77	5,416.27	895.49 S	17.45 E	1,470,925.18	3,886,857.96	6.10	895.48	
5,910.00	83.39	179.70	181.67	1,140.83	5,420.33	927.23 S	17.84 E	1,470,893.44	3,886,858.34	4.90	927.21	
5,968.00	87.31	182.13	184.10	1,145.53	5,425.03	985.01 S	16.91 E	1,470,835.65	3,886,857.41	7.94	985.00	
6,000.00	88.80	182.02	183.99	1,146.62	5,426.12	1,016.97 S	15.75 E	1,470,803.69	3,886,856.26	4.67	1,016.96	
6,031.00	90.90	182.04	184.01	1,146.70	5,426.20	1,047.95 S	14.65 E	1,470,772.71	3,886,855.16	6.77	1,047.94	
6,063.00	91.17	181.81	183.78	1,146.12	5,425.62	1,079.93 S	13.58 E	1,470,740.74	3,886,854.08	1.11	1,079.92	
6,094.00	91.23	181.68	183.65	1,145.47	5,424.97	1,110.91 S	12.63 E	1,470,709.76	3,886,853.14	0.46	1,110.90	
6,125.00	91.20	182.06	184.03	1,144.81	5,424.31	1,141.88 S	11.62 E	1,470,678.78	3,886,852.13	1.23	1,141.87	
6,156.00	90.77	181.61	183.58	1,144.28	5,423.78	1,172.86 S	10.63 E	1,470,647.80	3,886,851.14	2.01	1,172.85	
6,187.00	90.74	181.38	183.35	1,143.87	5,423.37	1,203.85 S	9.82 E	1,470,616.82	3,886,850.33	0.75	1,203.84	
6,218.00	90.62	181.62	183.59	1,143.50	5,423.00	1,234.84 S	9.01 E	1,470,585.83	3,886,849.52	0.87	1,234.83	
6,249.00	90.15	181.23	183.20	1,143.29	5,422.79	1,265.82 S	8.24 E	1,470,554.84	3,886,848.74	1.97	1,265.82	
6,280.00	89.75	180.76	182.73	1,143.32	5,422.82	1,296.82 S	7.70 E	1,470,523.85	3,886,848.21	1.99	1,296.81	
6,311.00	89.72	180.68	182.65	1,143.47	5,422.97	1,327.82 S	7.31 E	1,470,492.85	3,886,847.82	0.28	1,327.81	
6,343.00	88.49	181.00	182.97	1,143.96	5,423.46	1,359.81 S	6.84 E	1,470,460.86	3,886,847.35	3.97	1,359.80	
6,375.00	88.24	180.20	182.17	1,144.88	5,424.38	1,391.79 S	6.51 E	1,470,428.87	3,886,847.01	2.62	1,391.79	
6,406.00	87.94	180.00	181.97	1,145.91	5,425.41	1,422.78 S	6.45 E	1,470,397.89	3,886,846.96	1.16	1,422.77	
6,437.00	87.13	179.28	181.25	1,147.24	5,426.74	1,453.75 S	6.65 E	1,470,366.92	3,886,847.15	3.49	1,453.74	
6,469.00	87.72	179.42	181.39	1,148.68	5,428.18	1,485.71 S	7.01 E	1,470,334.95	3,886,847.52	1.89	1,485.71	
6,499.00	88.95	179.67	181.64	1,149.55	5,429.05	1,515.70 S	7.25 E	1,470,304.97	3,886,847.75	4.18	1,515.69	
6,530.00	90.62	180.24	182.21	1,149.67	5,429.17	1,546.70 S	7.27 E	1,470,273.97	3,886,847.78	5.69	1,546.69	
6,562.00	90.22	180.14	182.11	1,149.44	5,428.94	1,578.70 S	7.17 E	1,470,241.97	3,886,847.67	1.29	1,578.69	
6,593.00	90.62	180.41	182.38	1,149.21	5,428.71	1,609.69 S	7.02 E	1,470,210.97	3,886,847.52	1.56	1,609.69	
6,625.00	90.86	180.62	182.59	1,148.80	5,428.30	1,641.69 S	6.73 E	1,470,178.98	3,886,847.24	1.00	1,641.69	
6,656.00	89.82	180.16	182.13	1,148.61	5,428.11	1,672.69 S	6.52 E	1,470,147.98	3,886,847.02	3.67	1,672.68	
6,687.00	89.01	180.09	182.06	1,148.93	5,428.43	1,703.69 S	6.45 E	1,470,116.98	3,886,846.96	2.62	1,703.68	
6,717.00	90.43	180.68	182.65	1,149.07	5,428.57	1,733.68 S	6.25 E	1,470,086.98	3,886,846.76	5.13	1,733.68	
6,748.00	91.85	181.62	183.59	1,148.46	5,427.96	1,764.67 S	5.63 E	1,470,055.99	3,886,846.13	5.49	1,764.67	
6,780.00	91.95	180.99	182.96	1,147.40	5,426.90	1,796.65 S	4.90 E	1,470,024.02	3,886,845.41	1.99	1,796.64	
6,809.00	90.46	180.52	182.49	1,146.79	5,426.29	1,825.64 S	4.52 E	1,469,995.03	3,886,845.02	5.39	1,825.63	

## Design Report for B&amp;B Farms 1-19H - Final Survey

Measured Depth (ft)	Inclination (°)	Grid Azimuth (°)	True Azimuth (°)	TVD below System (ft)	Vertical Depth (ft)	Local Coordinates Northing (ft)	Easting (ft)	Map Coordinates Northing (ft)	Easting (ft)	Dogleg Rate (°/100ft)	Vertical Section (ft)	Comments
6,841.00	90.65	180.81	182.78	1,146.48	5,425.98	1,857.63 S	4.15 E	1,469,963.03	3,886,844.65	1.08	1,857.63	
6,872.00	89.66	180.16	182.13	1,146.39	5,425.89	1,888.63 S	3.88 E	1,469,932.04	3,886,844.39	3.82	1,888.63	
6,903.00	87.87	179.78	181.75	1,147.06	5,426.56	1,919.62 S	3.90 E	1,469,901.04	3,886,844.41	5.90	1,919.62	
6,935.00	87.62	179.96	181.93	1,148.32	5,427.82	1,951.60 S	3.97 E	1,469,869.07	3,886,844.48	0.96	1,951.59	
6,966.00	87.53	179.75	181.72	1,149.63	5,429.13	1,982.57 S	4.05 E	1,469,838.10	3,886,844.56	0.74	1,982.57	
6,997.00	87.32	179.53	181.50	1,151.02	5,430.52	2,013.54 S	4.25 E	1,469,807.13	3,886,844.75	0.98	2,013.53	
7,029.00	87.25	179.83	181.80	1,152.54	5,432.04	2,045.50 S	4.42 E	1,469,775.17	3,886,844.93	0.96	2,045.50	
7,060.00	89.11	179.86	181.83	1,153.52	5,433.02	2,076.48 S	4.51 E	1,469,744.18	3,886,845.01	6.00	2,076.48	
7,091.00	89.45	180.24	182.21	1,153.91	5,433.41	2,107.48 S	4.48 E	1,469,713.19	3,886,844.99	1.64	2,107.48	
7,123.00	89.01	179.99	181.96	1,154.34	5,433.84	2,139.48 S	4.42 E	1,469,681.19	3,886,844.92	1.58	2,139.47	
7,154.00	88.95	180.04	182.01	1,154.90	5,434.40	2,170.47 S	4.41 E	1,469,650.19	3,886,844.91	0.25	2,170.47	
7,185.00	88.92	179.96	181.93	1,155.47	5,434.97	2,201.47 S	4.41 E	1,469,619.20	3,886,844.91	0.28	2,201.46	
7,216.00	89.57	180.23	182.20	1,155.88	5,435.38	2,232.46 S	4.36 E	1,469,588.20	3,886,844.86	2.27	2,232.46	
7,248.00	89.88	180.63	182.60	1,156.03	5,435.53	2,264.46 S	4.12 E	1,469,556.20	3,886,844.62	1.58	2,264.46	
7,279.00	89.20	179.83	181.80	1,156.28	5,435.78	2,295.46 S	3.99 E	1,469,525.21	3,886,844.50	3.39	2,295.46	
7,310.00	88.61	179.55	181.52	1,156.88	5,436.38	2,326.45 S	4.16 E	1,469,494.21	3,886,844.67	2.11	2,326.45	
7,341.00	88.15	179.60	181.57	1,157.75	5,437.25	2,357.44 S	4.39 E	1,469,463.23	3,886,844.90	1.49	2,357.44	
7,373.00	87.16	179.06	181.03	1,159.06	5,438.56	2,389.41 S	4.76 E	1,469,431.26	3,886,845.27	3.52	2,389.41	
7,405.00	86.76	178.87	180.84	1,160.76	5,440.26	2,421.36 S	5.34 E	1,469,399.31	3,886,845.85	1.38	2,421.36	
7,436.00	88.18	180.59	182.56	1,162.13	5,441.63	2,452.33 S	5.49 E	1,469,368.34	3,886,845.99	7.19	2,452.32	
7,468.00	89.35	180.39	182.36	1,162.82	5,442.32	2,484.32 S	5.21 E	1,469,336.35	3,886,845.72	3.71	2,484.32	
7,499.00	89.82	180.28	182.25	1,163.04	5,442.54	2,515.32 S	5.03 E	1,469,305.35	3,886,845.54	1.56	2,515.31	
7,530.00	90.95	181.36	183.33	1,162.83	5,442.33	2,546.31 S	4.59 E	1,469,274.35	3,886,845.09	5.04	2,546.31	
7,560.00	91.54	181.60	183.57	1,162.18	5,441.68	2,576.30 S	3.81 E	1,469,244.37	3,886,844.32	2.12	2,576.29	
7,591.00	92.38	182.35	184.32	1,161.12	5,440.62	2,607.26 S	2.75 E	1,469,213.41	3,886,843.25	3.63	2,607.26	
7,623.00	92.84	182.13	184.10	1,159.66	5,439.16	2,639.20 S	1.50 E	1,469,181.47	3,886,842.00	1.59	2,639.20	
7,653.00	91.73	182.49	184.46	1,158.47	5,437.97	2,669.15 S	0.29 E	1,469,151.51	3,886,840.79	3.89	2,669.15	
7,685.00	91.11	182.55	184.52	1,157.67	5,437.17	2,701.11 S	1.12 W	1,469,119.56	3,886,839.39	1.95	2,701.11	
7,716.00	90.46	182.28	184.25	1,157.25	5,436.75	2,732.08 S	2.42 W	1,469,088.59	3,886,838.08	2.27	2,732.08	
7,747.00	90.31	182.12	184.09	1,157.04	5,436.54	2,763.06 S	3.61 W	1,469,057.61	3,886,836.89	0.71	2,763.06	
7,779.00	90.40	182.08	184.05	1,156.84	5,436.34	2,795.04 S	4.79 W	1,469,025.63	3,886,835.72	0.31	2,795.04	
7,810.00	89.20	181.57	183.54	1,156.95	5,436.45	2,826.02 S	5.77 W	1,468,994.65	3,886,834.73	4.21	2,826.02	
7,842.00	89.60	181.21	183.18	1,157.29	5,436.79	2,858.01 S	6.55 W	1,468,962.66	3,886,833.96	1.68	2,858.01	
7,873.00	89.81	181.03	183.00	1,157.45	5,436.95	2,889.00 S	7.16 W	1,468,931.67	3,886,833.35	0.89	2,889.01	
7,904.00	88.80	181.32	183.29	1,157.82	5,437.32	2,919.99 S	7.79 W	1,468,900.68	3,886,832.71	3.39	2,920.00	
7,935.00	88.77	181.28	183.25	1,158.48	5,437.98	2,950.98 S	8.49 W	1,468,869.69	3,886,832.01	0.16	2,950.98	
7,967.00	88.74	180.94	182.91	1,159.17	5,438.67	2,982.96 S	9.11 W	1,468,837.70	3,886,831.39	1.07	2,982.97	
7,999.00	88.83	181.05	183.02	1,159.85	5,439.35	3,014.95 S	9.67 W	1,468,805.72	3,886,830.84	0.44	3,014.96	
8,030.00	88.49	181.12	183.09	1,160.58	5,440.08	3,045.94 S	10.26 W	1,468,774.73	3,886,830.25	1.12	3,045.94	
8,061.00	88.86	181.22	183.19	1,161.30	5,440.80	3,076.92 S	10.89 W	1,468,743.75	3,886,829.62	1.24	3,076.93	
8,093.00	88.89	180.78	182.75	1,161.92	5,441.42	3,108.91 S	11.45 W	1,468,711.76	3,886,829.06	1.38	3,108.92	

## Design Report for B&amp;B Farms 1-19H - Final Survey

Measured Depth (ft)	Inclination (°)	Grid Azimuth (°)	True Azimuth (°)	TVD below System (ft)	Vertical Depth (ft)	Local Coordinates Northing (ft) Easting (ft)		Map Coordinates Northing (ft) Easting (ft)		Dogleg Rate (°/100ft)	Vertical Section (ft)	Comments
8,124.00	88.92	180.87	182.84	1,162.52	5,442.02	3,139.90	S 11.89 W	1,468,680.77	3,886,828.61	0.31	3,139.91	
8,156.00	89.11	180.90	182.87	1,163.07	5,442.57	3,171.89	S 12.39 W	1,468,648.77	3,886,828.12	0.60	3,171.90	
8,187.00	89.85	180.97	182.94	1,163.35	5,442.85	3,202.89	S 12.89 W	1,468,617.78	3,886,827.61	2.40	3,202.90	
8,218.00	89.88	181.38	183.35	1,163.42	5,442.92	3,233.88	S 13.53 W	1,468,586.79	3,886,826.98	1.33	3,233.89	
8,250.00	89.57	180.26	182.23	1,163.57	5,443.07	3,265.88	S 13.99 W	1,468,554.79	3,886,826.52	3.63	3,265.89	
8,281.00	89.48	179.77	181.74	1,163.83	5,443.33	3,296.88	S 14.00 W	1,468,523.79	3,886,826.51	1.61	3,296.89	
8,313.00	89.69	179.77	181.74	1,164.06	5,443.56	3,328.88	S 13.87 W	1,468,491.79	3,886,826.64	0.66	3,328.88	
8,344.00	90.25	179.12	181.09	1,164.08	5,443.58	3,359.87	S 13.57 W	1,468,460.80	3,886,826.94	2.77	3,359.88	
8,375.00	90.55	179.56	181.53	1,163.86	5,443.36	3,390.87	S 13.21 W	1,468,429.80	3,886,827.30	1.72	3,390.88	
8,407.00	90.68	179.79	181.76	1,163.52	5,443.02	3,422.87	S 13.03 W	1,468,397.80	3,886,827.48	0.83	3,422.88	
8,438.00	90.80	179.71	181.68	1,163.12	5,442.62	3,453.87	S 12.89 W	1,468,366.80	3,886,827.61	0.47	3,453.87	
8,469.00	91.08	179.50	181.47	1,162.61	5,442.11	3,484.86	S 12.68 W	1,468,335.81	3,886,827.83	1.13	3,484.87	
8,494.00	91.33	179.45	181.42	1,162.08	5,441.58	3,509.85	S 12.45 W	1,468,310.82	3,886,828.05	1.02	3,509.86	
8,526.00	91.85	179.66	181.63	1,161.20	5,440.70	3,541.84	S 12.20 W	1,468,278.83	3,886,828.30	1.75	3,541.85	
8,557.00	91.08	179.46	181.43	1,160.40	5,439.90	3,572.83	S 11.96 W	1,468,247.84	3,886,828.54	2.57	3,572.84	
8,586.00	90.80	179.36	181.33	1,159.93	5,439.43	3,601.82	S 11.67 W	1,468,218.85	3,886,828.84	1.03	3,601.83	
8,617.00	90.09	178.99	180.96	1,159.69	5,439.19	3,632.82	S 11.22 W	1,468,187.85	3,886,829.29	2.58	3,632.83	
8,648.00	89.85	178.60	180.57	1,159.70	5,439.20	3,663.81	S 10.57 W	1,468,156.86	3,886,829.94	1.48	3,663.82	
8,680.00	89.91	178.62	180.59	1,159.77	5,439.27	3,695.80	S 9.79 W	1,468,124.87	3,886,830.71	0.20	3,695.81	
8,711.00	90.22	178.53	180.50	1,159.74	5,439.24	3,726.79	S 9.02 W	1,468,093.88	3,886,831.48	1.04	3,726.80	
8,742.00	90.22	178.21	180.18	1,159.62	5,439.12	3,757.78	S 8.14 W	1,468,062.89	3,886,832.37	1.03	3,757.79	
8,774.00	89.78	177.96	179.93	1,159.62	5,439.12	3,789.76	S 7.07 W	1,468,030.91	3,886,833.44	1.58	3,789.77	
8,805.00	89.82	177.98	179.95	1,159.72	5,439.22	3,820.74	S 5.97 W	1,467,999.93	3,886,834.53	0.14	3,820.75	
8,833.00	89.88	177.73	179.70	1,159.80	5,439.30	3,848.72	S 4.92 W	1,467,971.95	3,886,835.58	0.92	3,848.73	
8,865.00	89.78	177.12	179.09	1,159.89	5,439.39	3,880.69	S 3.49 W	1,467,939.98	3,886,837.02	1.93	3,880.69	
8,897.00	89.14	177.16	179.13	1,160.19	5,439.69	3,912.65	S 1.89 W	1,467,908.02	3,886,838.62	2.00	3,912.65	
8,928.00	88.61	177.45	179.42	1,160.80	5,440.30	3,943.61	S 0.43 W	1,467,877.06	3,886,840.07	1.95	3,943.61	
8,961.00	88.86	177.73	179.70	1,161.53	5,441.03	3,976.57	S 0.96 E	1,467,844.10	3,886,841.46	1.14	3,976.57	
8,992.00	88.67	178.57	180.54	1,162.20	5,441.70	4,007.55	S 1.96 E	1,467,813.12	3,886,842.46	2.78	4,007.55	
9,022.00	88.58	179.17	181.14	1,162.92	5,442.42	4,037.53	S 2.55 E	1,467,783.14	3,886,843.05	2.02	4,037.53	
9,053.00	88.61	179.32	181.29	1,163.68	5,443.18	4,068.52	S 2.96 E	1,467,752.15	3,886,843.46	0.49	4,068.52	
9,084.00	89.54	179.42	181.39	1,164.18	5,443.68	4,099.51	S 3.30 E	1,467,721.16	3,886,843.80	3.02	4,099.51	
9,176.00	88.64	178.55	180.52	1,165.64	5,445.14	4,191.49	S 4.93 E	1,467,629.18	3,886,845.43	1.36	4,191.48	
9,207.00	88.89	179.09	181.06	1,166.31	5,445.81	4,222.47	S 5.56 E	1,467,598.20	3,886,846.07	1.92	4,222.47	
9,219.00	89.04	178.96	180.93	1,166.53	5,446.03	4,234.47	S 5.77 E	1,467,586.20	3,886,846.27	1.65	4,234.46	End MWD @ 9219.00 MD
9,270.00	89.04	178.96	180.93	1,167.38	5,446.88	4,285.45	S 6.69 E	1,467,535.22	3,886,847.20	0.00	4,285.45	Projection to TD @ 9270.00 MD

## Design Report for B&B Farms 1-19H - Final Survey

### Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
515.00	514.96	-5.59	0.52	Start MWD @ 515.00 MD
9,219.00	5,446.03	-4,234.47	5.77	End MWD @ 9219.00 MD
9,270.00	5,446.88	-4,285.45	6.69	Projection to TD @ 9270.00 MD

### Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (ft)	Origin +E/-W (ft)	Start TVD (ft)
User	No Target (Freehand)	180.04	Slot	0.00	0.00	0.00

### Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
515.00	9,270.00	MWD	MWD+SC

### Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (°)	+N/-S (°)	+E/-W (°)	Northing (°)	Easting (°)	Latitude	Longitude
- hit/miss target									
- Shape									
( )									

### Directional Difficulty Index

Average Dogleg over Survey:	1.85 °/100ft	Maximum Dogleg over Survey:	13.27 °/100ft at 5,723.00 ft
Net Tortousity applicable to Plans:	0.74 °/100ft	Directional Difficulty Index:	6.107

## North Reference Sheet for Sec 19-T11S-R44W (Grid) - B&B Farms 1-19H - Wellbore #1

All data is in Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to HWD 4 @ 4279.50ft (HWD 4 (11.5')). Northing and Easting are relative to B&B Farms 1-19H

Coordinate System is US State Plane 1983, Colorado Central Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is 105° 30' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:39° 45' 0.000 N°

False Easting: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99993594

Grid Coordinates of Well: 1,471,820.66 ft N, 3,886,840.51 ft E

Geographical Coordinates of Well: 39° 05' 13.06" N, 102° 22' 29.82" W

Grid Convergence at Surface is: 1.97°

Based upon Minimum Curvature type calculations, at a Measured Depth of 9,270.00ft  
the Bottom Hole Displacement is 4,285.46ft in the Direction of 179.91° (Grid).

Magnetic Convergence at surface is: -5.28° ( 1 July 2013, , BGGM2013)

