



Directional Survey

Well Name HAYHURST 16-25-27 STATE 002H		Lease Hayhurst 16 Federal		Field Name Wildcat		Business Unit Mid-Continent	
Ground Elevation (ft) 3,201.00	Original RKB (ft) 3,232.00	Current RKB Elevation 3,232.00, 3/17/2014		Mud Line Elevation (ft) 0.00		Water Depth (ft) 0.00	

Wellbore Name Original Hole		Parent Wellbore Original Hole		Kick Off Depth (ftKB) 6,280		Vertical Section Direction (°) 179.73	
UTM Northing (Y) (ft)			UTM Easting (X) (ft)			UTM Grid Zone	
Date 4/28/2014		Definitive? Y		Description MWD side track 1		Planned? N	
MD Tie In (ftKB) 0.00	TVD Tie In (ftKB) 0.00	Inclination Tie In (°) 0.00		Azimuth Tie In (°) 0.00		NSTie In (ft) 0.00	EW Tie In (ft) 0.00

Survey Data

MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	NS (ft)	EW (ft)	VS (ft)	DLS (°/100ft)	Method	Survey Company	Build (°/100ft)	Depart (ft)	Turn (°/100ft)	Unuse d data
462	0.10	0.00	462.00	0.40	0.00	-0.40	0.02	Magn MWD	Schlumberger	0.02	0.40	0.00	N
561	0.10	149.00	561.00	0.42	0.04	-0.42	0.19	Magn MWD	Schlumberger	0.00	0.42	150.51	N
738	0.10	183.00	738.00	0.13	0.12	-0.13	0.03	Magn MWD	Schlumberger	0.00	0.17	19.21	N
927	0.50	287.00	927.00	0.21	-0.68	-0.21	0.28	Magn MWD	Schlumberger	0.21	0.71	55.03	N
1,115	0.80	26.00	1,114.99	1.62	-0.89	-1.63	0.54	Magn MWD	Schlumberger	0.16	1.85	- 138.83	N
1,308	0.70	116.00	1,307.98	2.32	0.76	-2.32	0.55	Magn MWD	Schlumberger	-0.05	2.44	46.63	N
1,688	0.50	320.00	1,687.97	2.57	1.78	-2.56	0.31	Magn MWD	Schlumberger	-0.05	3.13	53.68	N
1,878	0.90	40.00	1,877.96	4.35	2.21	-4.34	0.50	Magn MWD	Schlumberger	0.21	4.88	- 147.37	N
2,065	0.70	169.00	2,064.95	4.35	3.37	-4.34	0.77	Magn MWD	Schlumberger	-0.11	5.50	68.98	N
2,445	0.60	53.00	2,444.94	3.27	5.40	-3.25	0.29	Magn MWD	Schlumberger	-0.03	6.31	-30.53	N
2,635	0.50	140.00	2,634.93	3.24	6.73	-3.20	0.40	Magn MWD	Schlumberger	-0.05	7.47	45.79	N
2,825	0.30	261.00	2,824.93	2.52	6.77	-2.49	0.37	Magn MWD	Schlumberger	-0.11	7.22	63.68	N
3,019	0.50	328.00	3,018.93	3.16	5.82	-3.13	0.24	Magn MWD	Schlumberger	0.10	6.62	34.54	N
3,397	0.70	211.00	3,396.91	2.58	3.76	-2.56	0.27	Magn MWD	Schlumberger	0.05	4.56	-30.95	N
3,587	0.70	316.00	3,586.91	2.42	2.35	-2.41	0.58	Magn MWD	Schlumberger	0.00	3.38	55.26	N
3,778	0.40	51.00	3,777.90	3.68	2.06	-3.67	0.44	Magn MWD	Schlumberger	-0.16	4.22	- 138.74	N
3,964	0.60	139.00	3,963.89	3.35	3.20	-3.34	0.38	Magn MWD	Schlumberger	0.11	4.64	47.31	N
4,155	0.70	232.00	4,154.89	1.88	2.94	-1.87	0.50	Magn MWD	Schlumberger	0.05	3.49	48.69	N
4,345	0.30	32.00	4,344.88	1.59	2.29	-1.58	0.52	Magn MWD	Schlumberger	-0.21	2.79	- 105.26	N
4,535	0.40	148.00	4,534.88	1.45	2.90	-1.43	0.31	Magn MWD	Schlumberger	0.05	3.24	61.05	N
4,920	0.50	113.00	4,919.87	-0.35	5.16	0.37	0.07	Magn MWD	Schlumberger	0.03	5.17	-9.09	N
5,110	0.30	285.00	5,109.87	-0.54	5.45	0.57	0.42	Magn MWD	Schlumberger	-0.11	5.47	90.53	N
5,295	0.60	60.00	5,294.86	0.07	5.82	-0.04	0.45	Magn MWD	Schlumberger	0.16	5.82	- 121.62	N
5,377	0.50	332.00	5,376.86	0.60	6.02	-0.57	0.94	Magn MWD	Schlumberger	-0.12	6.05	331.71	N
5,687	0.60	248.00	5,686.85	1.18	3.88	-1.16	0.24	Magn MWD	Schlumberger	0.03	4.06	-27.10	N
5,771	0.50	233.60	5,770.85	0.80	3.18	-0.78	0.20	Magn MWD	Schlumberger	-0.12	3.28	-17.14	N



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Survey Data

MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	NS (ft)	EW (ft)	VS (ft)	DLS (°/100ft)	Method	Survey Company	Build (°/100ft)	Depart (ft)	Turn (°/100ft)	Unuse d data
5,898	0.90	197.90	5,897.84	-0.48	2.42	0.49	0.45	Magn MWD	Schlumberger	0.31	2.47	-28.11	N
6,087	1.70	242.10	6,086.79	-3.20	-0.51	3.20	0.65	Magn MWD	Schlumberger	0.42	3.24	23.39	N
6,100	1.44	242.10	6,099.79	-3.37	-0.82	3.37	2.00	Magn MWD	Schlumberger	-2.00	3.47	0.00	N
6,201	1.56	302.23	6,200.76	-3.23	-3.11	3.22	1.49	Magn MWD	Schlumberger	0.12	4.48	59.53	N
6,360	6.05	236.09	6,359.41	-6.75	-11.90	6.70	3.52	Magn MWD	Schlumberger	2.82	13.68	-41.60	N
6,391	7.89	236.30	6,390.18	-8.84	-15.03	8.77	5.94	Magn MWD	Schlumberger	5.94	17.44	0.68	N
6,423	10.54	235.62	6,421.77	-11.72	-19.27	11.63	8.29	Magn MWD	Schlumberger	8.28	22.55	-2.13	N
6,455	12.85	234.95	6,453.10	-15.41	-24.60	15.30	7.23	Magn MWD	Schlumberger	7.22	29.03	-2.09	N
6,486	15.47	233.09	6,483.16	-19.88	-30.73	19.73	8.58	Magn MWD	Schlumberger	8.45	36.60	-6.00	N
6,550	21.14	215.90	6,543.94	-34.37	-44.34	34.16	12.15	Magn MWD	Schlumberger	8.86	56.10	-26.86	N
6,582	23.86	206.12	6,573.51	-44.86	-50.58	44.63	14.43	Magn MWD	Schlumberger	8.50	67.61	-30.56	N
6,614	28.04	198.16	6,602.28	-57.83	-55.77	57.57	16.98	Magn MWD	Schlumberger	13.06	80.35	-24.88	N
6,646	32.84	191.76	6,629.87	-73.49	-59.89	73.20	18.08	Magn MWD	Schlumberger	15.00	94.80	-20.00	N
6,677	37.38	188.02	6,655.23	-91.05	-62.92	90.75	16.20	Magn MWD	Schlumberger	14.65	110.67	-12.06	N
6,708	40.38	185.05	6,679.36	-110.37	-65.12	110.06	11.39	Magn MWD	Schlumberger	9.68	128.15	-9.58	N
6,740	43.34	181.34	6,703.19	-131.68	-66.29	131.37	12.06	Magn MWD	Schlumberger	9.25	147.43	-11.59	N
6,772	46.20	178.87	6,725.91	-154.21	-66.32	153.90	10.46	Magn MWD	Schlumberger	8.94	167.87	-7.72	N
6,834	52.89	175.48	6,766.12	-201.29	-63.92	200.99	11.56	Magn MWD	Schlumberger	10.79	211.20	-5.47	N
6,866	56.48	173.61	6,784.62	-227.28	-61.43	226.99	12.19	Magn MWD	Schlumberger	11.22	235.43	-5.84	N
6,897	59.47	172.77	6,801.06	-253.37	-58.31	253.09	9.91	Magn MWD	Schlumberger	9.65	259.99	-2.71	N
6,929	62.05	171.58	6,816.69	-281.03	-54.51	280.77	8.69	Magn MWD	Schlumberger	8.06	286.27	-3.72	N
6,961	64.96	170.99	6,830.96	-309.33	-50.17	309.09	9.24	Magn MWD	Schlumberger	9.09	313.38	-1.84	N
6,992	68.85	170.55	6,843.12	-337.48	-45.59	337.26	12.62	Magn MWD	Schlumberger	12.55	340.54	-1.42	N
7,023	72.43	171.59	6,853.40	-366.36	-41.06	366.17	11.97	Magn MWD	Schlumberger	11.55	368.66	3.35	N
7,055	75.61	172.74	6,862.20	-396.83	-36.87	396.66	10.52	Magn MWD	Schlumberger	9.94	398.54	3.59	N
7,086	78.58	173.59	6,869.13	-426.83	-33.27	426.67	9.95	Magn MWD	Schlumberger	9.58	428.13	2.74	N
7,117	81.26	174.16	6,874.55	-457.18	-30.02	457.03	8.83	Magn MWD	Schlumberger	8.65	458.16	1.84	N
7,149	83.35	174.39	6,878.84	-488.73	-26.85	488.60	6.57	Magn MWD	Schlumberger	6.53	489.47	0.72	N
7,180	84.32	174.33	6,882.17	-519.40	-23.82	519.28	3.13	Magn MWD	Schlumberger	3.13	519.95	-0.19	N



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Survey Data													
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7,241	89.48	173.88	6,885.46	-579.97	-17.57	579.88	8.49	Magn MWD	Schlumberger	8.46	580.24	-0.74	N
7,335	91.38	174.15	6,884.76	-673.45	-7.77	673.41	2.04	Magn MWD	Schlumberger	2.02	673.49	0.29	N
7,430	91.65	174.85	6,882.25	-767.98	1.33	767.98	0.79	Magn MWD	Schlumberger	0.28	767.98	0.74	N
7,525	89.62	174.51	6,881.19	-862.56	10.14	862.60	2.17	Magn MWD	Schlumberger	-2.14	862.62	-0.36	N
7,620	90.24	174.57	6,881.31	-957.13	19.18	957.21	0.66	Magn MWD	Schlumberger	0.65	957.32	0.06	N
7,713	91.82	176.76	6,879.64	-1,049.84	26.21	1,049.95	2.90	Magn MWD	Schlumberger	1.70	1,050. 16	2.35	N
7,808	89.62	179.60	6,878.44	-1,144.77	29.22	1,144.89	3.78	Magn MWD	Schlumberger	-2.32	1,145. 14	2.99	N
7,903	91.07	180.63	6,877.87	-1,239.76	29.03	1,239.88	1.87	Magn MWD	Schlumberger	1.53	1,240. 10	1.08	N
7,997	91.03	181.05	6,876.15	-1,333.73	27.66	1,333.85	0.45	Magn MWD	Schlumberger	-0.04	1,334. 02	0.45	N
8,092	88.35	180.09	6,876.66	-1,428.72	26.71	1,428.83	3.00	Magn MWD	Schlumberger	-2.82	1,428. 97	-1.01	N
8,187	88.93	182.09	6,878.92	-1,523.67	24.90	1,523.77	2.19	Magn MWD	Schlumberger	0.61	1,523. 87	2.11	N
8,282	88.00	181.66	6,881.46	-1,618.58	21.80	1,618.67	1.08	Magn MWD	Schlumberger	-0.98	1,618. 73	-0.45	N
8,378	88.97	181.90	6,884.00	-1,714.50	18.82	1,714.57	1.04	Magn MWD	Schlumberger	1.01	1,714. 61	0.25	N
8,472	90.10	182.98	6,884.76	-1,808.41	14.81	1,808.46	1.66	Magn MWD	Schlumberger	1.20	1,808. 47	1.15	N
8,567	89.62	182.66	6,885.00	-1,903.30	10.14	1,903.32	0.61	Magn MWD	Schlumberger	-0.51	1,903. 32	-0.34	N
8,662	89.38	182.28	6,885.83	-1,998.20	6.05	1,998.21	0.47	Magn MWD	Schlumberger	-0.25	1,998. 21	-0.40	N
8,757	89.52	181.48	6,886.74	-2,093.15	2.93	2,093.14	0.85	Magn MWD	Schlumberger	0.15	2,093. 15	-0.84	N
8,853	89.52	181.23	6,887.54	-2,189.12	0.66	2,189.10	0.26	Magn MWD	Schlumberger	0.00	2,189. 12	-0.26	N
8,948	89.38	180.33	6,888.45	-2,284.10	-0.63	2,284.07	0.96	Magn MWD	Schlumberger	-0.15	2,284. 10	-0.95	N
9,043	91.65	181.10	6,887.60	-2,379.08	-1.82	2,379.05	2.52	Magn MWD	Schlumberger	2.39	2,379. 08	0.81	N
9,138	89.62	180.78	6,886.55	-2,474.06	-3.38	2,474.02	2.16	Magn MWD	Schlumberger	-2.14	2,474. 06	-0.34	N
9,233	89.72	179.60	6,887.09	-2,569.06	-3.69	2,569.01	1.25	Magn MWD	Schlumberger	0.11	2,569. 06	-1.24	N
9,331	91.00	180.06	6,886.48	-2,667.05	-3.40	2,667.01	1.39	Magn MWD	Schlumberger	1.31	2,667. 05	0.47	N
9,425	89.45	178.77	6,886.11	-2,761.04	-2.44	2,761.00	2.15	Magn MWD	Schlumberger	-1.65	2,761. 04	-1.37	N
9,520	90.89	178.52	6,885.83	-2,856.01	-0.19	2,855.98	1.54	Magn MWD	Schlumberger	1.52	2,856. 01	-0.26	N
9,615	89.45	179.27	6,885.55	-2,950.99	1.64	2,950.97	1.71	Magn MWD	Schlumberger	-1.52	2,950. 99	0.79	N
9,711	89.97	179.28	6,886.03	-3,046.98	2.85	3,046.96	0.54	Magn MWD	Schlumberger	0.54	3,046. 98	0.01	N
9,806	89.97	179.29	6,886.08	-3,141.97	4.04	3,141.96	0.01	Magn MWD	Schlumberger	0.00	3,141. 98	0.01	N
9,901	91.38	179.23	6,884.96	-3,236.96	5.26	3,236.95	1.49	Magn MWD	Schlumberger	1.48	3,236. 96	-0.06	N



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9,996	89.62	179.18	6,884.13	-3,331.94	6.58	3,331.93	1.85	Magn MWD	Schlumberger	-1.85	3,331. 95	-0.05	N
10,091	90.03	180.22	6,884.42	-3,426.94	7.08	3,426.93	1.18	Magn MWD	Schlumberger	0.43	3,426. 94	1.09	N
10,185	89.38	178.71	6,884.91	-3,520.93	7.96	3,520.93	1.75	Magn MWD	Schlumberger	-0.69	3,520. 94	-1.61	N
10,281	89.83	178.94	6,885.57	-3,616.91	9.93	3,616.91	0.53	Magn MWD	Schlumberger	0.47	3,616. 92	0.24	N
10,376	91.89	179.06	6,884.14	-3,711.88	11.58	3,711.89	2.17	Magn MWD	Schlumberger	2.17	3,711. 89	0.13	N
10,472	91.20	177.03	6,881.55	-3,807.78	14.86	3,807.81	2.23	Magn MWD	Schlumberger	-0.72	3,807. 81	-2.11	N
10,567	89.83	177.16	6,880.70	-3,902.65	19.67	3,902.70	1.45	Magn MWD	Schlumberger	-1.44	3,902. 70	0.14	N
10,662	92.13	177.88	6,879.08	-3,997.54	23.78	3,997.61	2.54	Magn MWD	Schlumberger	2.42	3,997. 61	0.76	N
10,757	90.86	179.72	6,876.60	-4,092.48	25.77	4,092.56	2.35	Magn MWD	Schlumberger	-1.34	4,092. 56	1.94	N
10,852	89.24	179.62	6,876.51	-4,187.48	26.32	4,187.55	1.71	Magn MWD	Schlumberger	-1.71	4,187. 56	-0.11	N
10,947	88.80	178.70	6,878.14	-4,282.45	27.71	4,282.54	1.07	Magn MWD	Schlumberger	-0.46	4,282. 54	-0.97	N
11,042	88.90	177.82	6,880.05	-4,377.39	30.59	4,377.48	0.93	Magn MWD	Schlumberger	0.11	4,377. 50	-0.93	N
11,137	89.21	177.02	6,881.61	-4,472.28	34.87	4,472.39	0.90	Magn MWD	Schlumberger	0.33	4,472. 41	-0.84	N
11,231	89.72	176.91	6,882.49	-4,566.14	39.85	4,566.28	0.56	Magn MWD	Schlumberger	0.54	4,566. 32	-0.12	N
11,326	90.52	176.95	6,882.29	-4,661.00	44.93	4,661.16	0.84	Magn MWD	Schlumberger	0.84	4,661. 22	0.04	N
11,421	89.79	175.80	6,882.03	-4,755.81	50.94	4,756.00	1.43	Magn MWD	Schlumberger	-0.77	4,756. 08	-1.21	N
11,481	90.21	175.65	6,882.03	-4,815.64	55.41	4,815.85	0.74	Magn MWD	Schlumberger	0.70	4,815. 96	-0.25	N
11,535	30.21	175.65	6,907.65	-4,860.27	58.81	4,860.49	111.11	Magn MWD	Schlumberger	- 111.11	4,860. 62	0.00	N