



Directional Survey

Well Name TALCO 25-25-35 FED 001H		Lease Talco 25-25-35 Fed		Field Name Bone Spring		Business Unit Mid-Continent	
Ground Elevation (ft) 3,100.00	Original RKB (ft) 3,124.50	Current RKB Elevation 3,124.50, 7/21/2015				Mud Line Elevation (ft)	Water Depth (ft)

Wellbore Name Original Hole		Parent Wellbore Original Hole		Kick Off Depth (ftKB)		Vertical Section Direction (°) 0.00	
UTM Northing (Y) (ft)			UTM Easting (X) (ft)			UTM Grid Zone	
Date 9/20/2015		Definitive? Y		Description MWD		Planned? N	
MD Tie In (ftKB)	TVD Tie In (ftKB)	Inclination Tie In (°)		Azimuth Tie In (°)		NSTie In (ft)	EW Tie In (ft)

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
140	0.10	90.00	140.00	0.00	0.12	0.00	0.07	Magn MWD		0.07	0.12	64.29	N
311	0.30	1.00	311.00	0.45	0.28	0.45	0.18	Magn MWD		0.12	0.53	-52.05	N
472	1.60	31.90	471.97	2.78	1.47	2.78	0.84	Magn MWD		0.81	3.14	19.19	N
629	1.40	37.90	628.92	6.15	3.81	6.15	0.16	Magn MWD		-0.13	7.24	3.82	N
777	1.20	47.90	776.88	8.62	6.07	8.62	0.20	Magn MWD		-0.14	10.54	6.76	N
855	1.10	22.00	854.87	9.86	6.96	9.86	0.67	Magn MWD		-0.13	12.07	-33.21	N
1,015	0.47	62.07	1,014.85	11.59	8.11	11.59	0.50	Magn MWD		-0.39	14.15	25.04	N
1,194	0.46	66.97	1,193.85	12.22	9.42	12.22	0.02	Magn MWD		-0.01	15.43	2.74	N
1,372	0.51	82.70	1,371.84	12.60	10.87	12.60	0.08	Magn MWD		0.03	16.63	8.84	N
1,552	0.45	84.64	1,551.83	12.76	12.36	12.76	0.03	Magn MWD		-0.03	17.77	1.08	N
1,731	0.68	63.18	1,730.83	13.31	14.01	13.31	0.17	Magn MWD		0.13	19.33	-11.99	N
1,910	0.83	54.55	1,909.81	14.54	16.02	14.54	0.10	Magn MWD		0.08	21.63	-4.82	N
2,088	1.01	51.14	2,087.79	16.27	18.29	16.27	0.11	Magn MWD		0.10	24.48	-1.92	N
2,268	0.84	50.62	2,267.76	18.10	20.54	18.10	0.09	Magn MWD		-0.09	27.38	-0.29	N
2,447	0.79	38.33	2,446.75	19.90	22.32	19.90	0.10	Magn MWD		-0.03	29.91	-6.87	N
2,626	1.09	30.80	2,625.72	22.33	23.96	22.33	0.18	Magn MWD		0.17	32.76	-4.21	N
2,805	0.51	326.35	2,804.71	24.46	24.39	24.46	0.55	Magn MWD		-0.32	34.54	165.11	N
2,984	0.84	310.80	2,983.69	25.98	22.96	25.98	0.21	Magn MWD		0.18	34.67	-8.69	N
3,164	1.10	309.74	3,163.67	27.95	20.63	27.95	0.14	Magn MWD		0.14	34.74	-0.59	N
3,343	0.43	227.59	3,342.65	28.59	18.81	28.59	0.63	Magn MWD		-0.37	34.23	-45.89	N
3,522	0.33	147.76	3,521.65	27.70	18.59	27.70	0.28	Magn MWD		-0.06	33.36	-44.60	N
3,700	0.32	183.21	3,699.65	26.77	18.84	26.77	0.11	Magn MWD		-0.01	32.74	19.92	N
3,877	0.63	240.02	3,876.64	25.79	17.97	25.79	0.30	Magn MWD		0.18	31.43	32.10	N
4,056	1.11	257.26	4,055.62	24.92	15.42	24.92	0.30	Magn MWD		0.27	29.31	9.63	N
4,235	0.83	327.33	4,234.60	25.63	13.03	25.63	0.64	Magn MWD		-0.16	28.75	39.15	N
4,414	1.89	355.95	4,413.55	29.67	12.12	29.67	0.69	Magn MWD		0.59	32.05	15.99	N



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Survey Data													
MD (ft)	Inc (°)	Azm (°)	TVD (ft)	NS (ft)	EW (ft)	VS (ft)	DLS (°/100ft)	Method	Survey Company	Build (°/100ft)	Depart (ft)	Turn (°/100ft)	Unuse d data
4,593	2.26	2.88	4,592.43	36.13	12.09	36.13	0.25	Magn MWD		0.21	38.10	197.25	N
4,765	1.62	347.88	4,764.33	41.90	11.75	41.90	0.47	Magn MWD		-0.37	43.52	200.58	N
4,945	1.04	350.50	4,944.29	46.00	10.95	46.00	0.32	Magn MWD		0.00	47.28	0.00	N
4,945	1.04	350.50	4,944.29	46.00	10.95	46.00	0.32	Magn MWD		-0.32	47.28	1.46	N
5,123	0.57	339.73	5,122.27	48.42	10.37	48.42	0.28	Magn MWD		-0.26	49.52	-6.05	N
5,302	0.14	343.27	5,301.26	49.47	10.00	49.47	0.24	Magn MWD		-0.24	50.47	1.98	N
5,481	0.06	205.00	5,480.26	49.59	9.90	49.59	0.11	Magn MWD		-0.04	50.57	-77.25	N
5,660	0.03	221.64	5,659.26	49.47	9.83	49.47	0.02	Magn MWD		-0.02	50.44	9.30	N
5,838	0.18	163.42	5,837.26	49.17	9.88	49.17	0.09	Magn MWD		0.08	50.15	-32.71	N
6,017	0.10	85.54	6,016.26	48.91	10.11	48.91	0.10	Magn MWD		-0.04	49.95	-43.51	N
6,196	0.13	85.51	6,195.26	48.94	10.47	48.94	0.02	Magn MWD		0.02	50.05	-0.02	N
6,374	0.13	62.24	6,373.26	49.05	10.85	49.05	0.03	Magn MWD		0.00	50.23	-13.07	N
6,553	0.23	23.63	6,552.26	49.47	11.18	49.47	0.08	Magn MWD		0.06	50.72	-21.57	N
6,732	0.25	344.65	6,731.26	50.18	11.22	50.18	0.09	Magn MWD		0.01	51.42	179.34	N
6,911	0.20	299.85	6,910.26	50.71	10.84	50.71	0.10	Magn MWD		-0.03	51.86	-25.03	N
7,089	0.20	240.29	7,088.26	50.71	10.30	50.71	0.11	Magn MWD		0.00	51.75	-33.46	N
7,268	0.25	173.46	7,267.26	50.17	10.08	50.17	0.14	Magn MWD		0.03	51.17	-37.34	N
7,447	0.22	127.96	7,446.25	49.57	10.39	49.57	0.10	Magn MWD		-0.02	50.65	-25.42	N
7,626	0.17	58.52	7,625.25	49.50	10.89	49.50	0.13	Magn MWD		-0.03	50.68	-38.79	N
7,805	0.11	43.06	7,804.25	49.76	11.23	49.76	0.04	Magn MWD		-0.03	51.01	-8.64	N
7,984	0.11	10.84	7,983.25	50.05	11.38	50.05	0.03	Magn MWD		0.00	51.33	-18.00	N
8,163	0.20	55.73	8,162.25	50.40	11.67	50.40	0.08	Magn MWD		0.05	51.73	25.08	N
8,342	0.24	35.73	8,341.25	50.88	12.15	50.88	0.05	Magn MWD		0.02	52.31	-11.17	N
8,520	0.52	83.64	8,519.25	51.27	13.17	51.27	0.23	Magn MWD		0.16	52.94	26.92	N
8,699	0.61	79.07	8,698.24	51.54	14.91	51.54	0.06	Magn MWD		0.05	53.66	-2.55	N
8,877	0.64	118.16	8,876.23	51.25	16.72	51.25	0.24	Magn MWD		0.02	53.91	21.96	N
9,009	0.92	117.76	9,008.22	50.41	18.31	50.41	0.21	Magn MWD		0.21	53.63	-0.30	N
9,173	1.31	169.79	9,172.19	47.95	19.81	47.95	0.63	Magn MWD		0.24	51.88	31.73	N
9,352	1.19	172.11	9,351.15	44.10	20.42	44.10	0.07	Magn MWD		-0.07	48.60	1.30	N



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Survey Data													
MD (ft)	Incl (°)	Azm (°)	TVD (ft)	NS (ft)	EW (ft)	LVS (ft)	DLS (°/100ft)	Method	Survey Company	Build (°/100ft)	Depart (ft)	Turn (°/100ft)	Unuse d data
9,536	1.76	200.08	9,535.09	39.55	19.72	39.55	0.49	Magn MWD		0.31	44.19	15.20	N
9,715	2.06	198.06	9,713.99	33.91	17.77	33.91	0.17	Magn MWD		0.17	38.29	-1.13	N
9,894	1.77	192.74	9,892.89	28.16	16.17	28.16	0.19	Magn MWD		-0.16	32.47	-2.97	N
10,073	2.02	219.34	10,071.79	23.02	13.56	23.02	0.51	Magn MWD		0.14	26.72	14.86	N
10,252	2.65	217.90	10,250.64	17.31	9.02	17.31	0.35	Magn MWD		0.35	19.52	-0.80	N
10,431	1.96	229.68	10,429.50	12.07	4.14	12.07	0.47	Magn MWD		-0.39	12.76	6.58	N
10,610	1.75	242.90	10,608.41	8.84	-0.63	8.84	0.27	Magn MWD		-0.12	8.86	7.39	N
10,789	1.21	267.06	10,787.35	7.50	-4.95	7.50	0.45	Magn MWD		-0.30	8.99	13.50	N
10,968	1.01	245.20	10,966.31	6.74	-8.27	6.74	0.26	Magn MWD		-0.11	10.67	-12.21	N
11,147	1.17	234.52	11,145.28	5.02	-11.19	5.02	0.14	Magn MWD		0.09	12.26	-5.97	N
11,227	1.91	226.25	11,225.25	3.62	-12.82	3.62	0.96	Magn MWD		0.93	13.32	-10.34	N
11,361	11.40	184.90	11,358.23	-11.15	-15.57	-11.15	7.50	Magn MWD		7.08	19.15	-30.86	N
11,406	13.80	172.96	11,402.15	-20.91	-15.29	-20.91	7.84	Magn MWD		5.33	25.91	-26.53	N
11,496	31.06	182.84	11,485.06	-55.02	-15.12	-55.02	19.57	Magn MWD		19.18	57.06	10.98	N
11,540	38.31	182.89	11,521.21	-80.02	-16.37	-80.02	16.48	Magn MWD		16.48	81.67	0.11	N
11,585	45.27	181.29	11,554.75	-109.96	-17.44	-109.96	15.65	Magn MWD		15.47	111.34	-3.56	N
11,630	52.23	181.97	11,584.40	-143.76	-18.41	-143.76	15.51	Magn MWD		15.47	144.94	1.51	N
11,675	56.60	180.91	11,610.58	-180.34	-19.32	-180.34	9.90	Magn MWD		9.71	181.37	-2.36	N
11,719	58.77	180.91	11,634.10	-217.52	-19.91	-217.52	4.93	Magn MWD		4.93	218.42	0.00	N
11,764	59.41	180.90	11,657.21	-256.12	-20.52	-256.12	1.42	Magn MWD		1.42	256.94	-0.02	N
11,809	59.75	180.07	11,680.00	-294.92	-20.85	-294.92	1.76	Magn MWD		0.76	295.66	-1.84	N
11,854	63.40	179.07	11,701.42	-334.49	-20.55	-334.49	8.34	Magn MWD		8.11	335.12	-2.22	N
11,898	68.54	179.59	11,719.33	-374.66	-20.08	-374.66	11.73	Magn MWD		11.68	375.20	1.18	N
11,943	71.72	180.15	11,734.62	-416.97	-19.99	-416.97	7.16	Magn MWD		7.07	417.45	1.24	N
11,988	75.06	180.40	11,747.48	-460.09	-20.19	-460.09	7.44	Magn MWD		7.42	460.53	0.56	N
12,032	75.92	181.63	11,758.51	-502.68	-20.95	-502.68	3.34	Magn MWD		1.95	503.11	2.80	N
12,077	78.19	180.03	11,768.59	-546.53	-21.58	-546.53	6.12	Magn MWD		5.04	546.95	-3.56	N
12,122	81.46	182.52	11,776.54	-590.80	-22.57	-590.80	9.08	Magn MWD		7.27	591.23	5.53	N
12,166	86.11	181.70	11,781.30	-634.50	-24.18	-634.50	10.73	Magn MWD		10.57	634.96	-1.86	N



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			Water Depth (ft)

Survey Data													
MD (RKB)	Inc (°)	Azm (°)	TVD (RKB)	NS (ft)	EW (ft)	VS (ft)	DLS (°/100ft)	Method	Survey Company	Build (°/100ft)	Depart (ft)	Turn (°/100ft)	Unuse d data
12,211	88.38	180.92	11,783.46	-679.43	-25.21	-679.43	5.33	Magn MWD		5.04	679.90	-1.73	N
12,300	90.45	181.25	11,784.37	-768.40	-26.89	-768.40	2.36	Magn MWD		2.33	768.87	0.37	N
12,396	92.49	179.86	11,781.91	-864.36	-27.82	-864.36	2.57	Magn MWD		2.12	864.81	-1.45	N
12,479	93.70	179.38	11,777.43	-947.24	-27.27	-947.24	1.57	Magn MWD		1.46	947.63	-0.58	N
12,569	91.99	179.46	11,772.96	-1,037.12	-26.36	-1,037.12	1.90	Magn MWD		-1.90	1,037.45	0.09	N
12,658	92.32	180.27	11,769.61	-1,126.05	-26.15	-1,126.05	0.98	Magn MWD		0.37	1,126.36	0.91	N
12,748	92.91	181.59	11,765.51	-1,215.94	-27.61	-1,215.94	1.61	Magn MWD		0.66	1,216.26	1.47	N
12,837	91.68	181.45	11,761.94	-1,304.84	-29.97	-1,304.84	1.39	Magn MWD		-1.38	1,305.18	-0.16	N
12,927	90.09	180.33	11,760.55	-1,394.81	-31.37	-1,394.81	2.16	Magn MWD		-1.77	1,395.17	-1.24	N
13,016	90.03	179.12	11,760.46	-1,483.81	-30.94	-1,483.81	1.36	Magn MWD		-0.07	1,484.13	-1.36	N
13,106	90.53	177.47	11,760.02	-1,573.77	-28.27	-1,573.77	1.92	Magn MWD		0.56	1,574.02	-1.83	N
13,195	91.43	177.15	11,758.50	-1,662.66	-24.09	-1,662.66	1.07	Magn MWD		1.01	1,662.83	-0.36	N
13,284	89.89	176.92	11,757.47	-1,751.53	-19.49	-1,751.53	1.75	Magn MWD		-1.73	1,751.64	-0.26	N
13,374	89.11	178.01	11,758.26	-1,841.43	-15.51	-1,841.43	1.49	Magn MWD		-0.87	1,841.50	1.21	N
13,463	88.77	178.40	11,759.90	-1,930.37	-12.72	-1,930.37	0.58	Magn MWD		-0.38	1,930.42	0.44	N
13,552	87.43	177.53	11,762.86	-2,019.27	-9.56	-2,019.27	1.79	Magn MWD		-1.51	2,019.29	-0.98	N
13,641	89.64	178.41	11,765.13	-2,108.18	-6.41	-2,108.18	2.67	Magn MWD		2.48	2,108.19	0.99	N
13,731	90.76	177.87	11,764.82	-2,198.13	-3.49	-2,198.13	1.38	Magn MWD		1.24	2,198.13	-0.60	N
13,821	90.87	177.53	11,763.54	-2,288.04	0.12	-2,288.04	0.40	Magn MWD		0.12	2,288.04	-0.38	N
13,910	88.01	176.77	11,764.41	-2,376.92	4.55	-2,376.92	3.32	Magn MWD		-3.21	2,376.92	-0.85	N
13,999	84.99	177.04	11,769.84	-2,465.61	9.34	-2,465.61	3.41	Magn MWD		-3.39	2,465.63	0.30	N
14,088	85.07	177.90	11,777.55	-2,554.19	13.26	-2,554.19	0.97	Magn MWD		0.09	2,554.23	0.97	N
14,177	86.42	178.98	11,784.15	-2,642.91	15.67	-2,642.91	1.94	Magn MWD		1.52	2,642.96	1.21	N
14,266	88.12	179.36	11,788.39	-2,731.80	16.96	-2,731.80	1.96	Magn MWD		1.91	2,731.85	0.43	N
14,355	87.34	178.52	11,791.92	-2,820.71	18.61	-2,820.71	1.29	Magn MWD		-0.88	2,820.77	-0.94	N
14,445	89.13	177.35	11,794.69	-2,910.60	21.85	-2,910.60	2.38	Magn MWD		1.99	2,910.69	-1.30	N
14,534	90.22	176.89	11,795.19	-2,999.49	26.32	-2,999.49	1.33	Magn MWD		1.22	2,999.60	-0.52	N
14,624	91.65	177.02	11,793.73	-3,089.35	31.10	-3,089.35	1.60	Magn MWD		1.59	3,089.50	0.14	N
14,714	91.20	176.17	11,791.49	-3,179.16	36.44	-3,179.16	1.07	Magn MWD		-0.50	3,179.37	-0.94	N



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14,803	89.81	175.86	11,790.70	-3,267.94	42.63	-3,267.94	1.60	Magn MWD		-1.56	3,268. 22	-0.35	N
14,893	89.02	176.70	11,791.62	-3,357.74	48.47	-3,357.74	1.28	Magn MWD		-0.88	3,358. 09	0.93	N
14,981	86.75	177.09	11,794.87	-3,445.55	53.23	-3,445.55	2.62	Magn MWD		-2.58	3,445. 96	0.44	N
15,071	87.01	177.20	11,799.77	-3,535.30	57.71	-3,535.30	0.31	Magn MWD		0.29	3,535. 77	0.12	N
15,160	87.98	178.07	11,803.66	-3,624.14	61.37	-3,624.14	1.46	Magn MWD		1.09	3,624. 66	0.98	N
15,249	90.50	181.94	11,804.84	-3,713.11	61.37	-3,713.11	5.19	Magn MWD		2.83	3,713. 62	4.35	N
15,338	88.91	181.51	11,805.30	-3,802.06	58.69	-3,802.06	1.85	Magn MWD		-1.79	3,802. 52	-0.48	N
15,428	87.28	181.17	11,808.29	-3,891.99	56.58	-3,891.99	1.85	Magn MWD		-1.81	3,892. 40	-0.38	N
15,517	86.19	181.16	11,813.36	-3,980.82	54.78	-3,980.82	1.22	Magn MWD		-1.22	3,981. 20	-0.01	N
15,606	85.97	181.46	11,819.44	-4,069.59	52.75	-4,069.59	0.42	Magn MWD		-0.25	4,069. 93	0.34	N
15,696	85.27	181.65	11,826.32	-4,159.29	50.31	-4,159.29	0.81	Magn MWD		-0.78	4,159. 60	0.21	N
15,786	83.18	181.94	11,835.37	-4,248.79	47.51	-4,248.79	2.34	Magn MWD		-2.32	4,249. 05	0.32	N
15,875	82.95	181.80	11,846.12	-4,337.09	44.62	-4,337.09	0.30	Magn MWD		-0.26	4,337. 32	-0.16	N
15,965	81.60	181.15	11,858.21	-4,426.24	42.33	-4,426.24	1.66	Magn MWD		-1.50	4,426. 44	-0.72	N
16,055	82.68	179.34	11,870.52	-4,515.39	41.95	-4,515.39	2.33	Magn MWD		1.20	4,515. 58	-2.01	N
16,145	84.54	178.11	11,880.54	-4,604.80	43.94	-4,604.80	2.47	Magn MWD		2.07	4,605. 01	-1.37	N
16,235	85.15	177.52	11,888.63	-4,694.37	47.36	-4,694.37	0.94	Magn MWD		0.68	4,694. 61	-0.66	N
16,331	85.15	177.52	11,896.74	-4,789.94	51.50	-4,789.94	0.00	Magn MWD		0.00	4,790. 22	0.00	N