



Directional Survey

30 015 40953

Well Name *CHK*WEST SHUGART 2-19-30 STATE 002H	Lease Wolffbone	Field Name Benson	Business Unit Mid-Continent
Ground Elevation (ft)	Original RKB (ft)	Current RKB Elevation	Mud Line Elevation (ft) Water Depth (ft)

Wellbore Name Original Hole	Parent Wellbore Original Hole	Kick Off Depth (ftKB) 8,221	Vertical Section Direction (°) 269.89
UTM Northing (Y) (ft)	UTM Easting (X) (ft)	UTM Grid Zone	
Date 6/4/2013	Definitive? N	Description Actual Survey	Planned? N
MD Tie In (ftKB)	TVD Tie In (ftKB)	Inclination Tie In (°)	Azimuth Tie In (°) NSTie In (ft) EWTie 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
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	TieIn	Multi-Shot Directional	0.00	0.00	0.00	N
100	0.25	287.45	100.00	0.07	-0.21	0.21	0.25	Gyro MS	Multi-Shot Directional	0.25	0.22	287.45	N
200	0.35	245.82	200.00	0.01	-0.69	0.69	0.23	Gyro MS	Multi-Shot Directional	0.10	0.69	-41.63	N
300	0.39	229.82	300.00	-0.34	-1.23	1.23	0.11	Gyro MS	Multi-Shot Directional	0.04	1.28	-16.00	N
400	0.38	222.82	399.99	-0.80	-1.72	1.72	0.05	Gyro MS	Multi-Shot Directional	-0.01	1.90	-7.00	N
500	0.38	234.08	499.99	-1.24	-2.21	2.22	0.07	Gyro MS	Multi-Shot Directional	0.00	2.54	11.26	N
600	0.33	222.87	599.99	-1.65	-2.68	2.68	0.09	Gyro MS	Multi-Shot Directional	-0.05	3.14	-11.21	N
743	0.20	44.00	742.99	-1.77	-2.78	2.79	0.37	MWD	Phoenix	-0.09	3.30	-	N
922	0.40	57.30	921.99	-1.21	-2.04	2.04	0.12	MWD	Phoenix	0.11	2.37	7.43	N
1,101	0.70	69.60	1,100.98	-0.49	-0.49	0.49	0.18	MWD	Phoenix	0.17	0.69	6.87	N
1,280	1.10	62.90	1,279.96	0.68	2.06	-2.06	0.23	MWD	Phoenix	0.22	2.17	-3.74	N
1,459	1.70	62.60	1,458.90	2.68	5.95	-5.96	0.34	MWD	Phoenix	0.34	6.53	-0.17	N
1,638	2.20	58.90	1,637.80	5.68	11.25	-11.26	0.29	MWD	Phoenix	0.28	12.60	-2.07	N
1,817	3.00	71.90	1,816.61	8.91	18.64	-18.66	0.55	MWD	Phoenix	0.45	20.66	7.26	N
1,996	2.80	73.40	1,995.38	11.61	27.29	-27.31	0.12	MWD	Phoenix	-0.11	29.65	0.84	N
2,175	1.50	59.30	2,174.26	14.06	33.49	-33.52	0.78	MWD	Phoenix	-0.73	36.32	-7.88	N
2,354	0.30	88.40	2,353.23	15.27	35.97	-36.00	0.70	MWD	Phoenix	-0.67	39.08	16.26	N
2,533	0.30	167.70	2,532.23	14.82	36.54	-36.57	0.21	MWD	Phoenix	0.00	39.43	44.30	N
2,712	0.90	189.50	2,711.22	12.98	36.41	-36.43	0.35	MWD	Phoenix	0.34	38.65	12.18	N
2,891	1.10	196.30	2,890.19	9.94	35.70	-35.71	0.13	MWD	Phoenix	0.11	37.05	3.80	N
3,070	1.00	209.90	3,069.16	6.94	34.43	-34.45	0.15	MWD	Phoenix	-0.06	35.13	7.60	N
3,249	1.10	208.30	3,248.13	4.07	32.84	-32.85	0.06	MWD	Phoenix	0.06	33.09	-0.89	N
3,428	0.80	216.30	3,427.11	1.55	31.29	-31.29	0.18	MWD	Phoenix	-0.17	31.33	4.47	N
3,470	0.80	225.80	3,469.10	1.11	30.90	-30.91	0.32	MWD	Phoenix	0.00	30.92	22.62	N
3,630	0.90	215.40	3,629.08	-0.69	29.37	-29.37	0.11	MWD	Phoenix	0.06	29.38	-6.50	N
3,719	0.80	211.90	3,718.08	-1.79	28.64	-28.64	0.13	MWD	Phoenix	-0.11	28.70	-3.93	N
3,809	0.60	215.80	3,808.07	-2.70	28.03	-28.03	0.23	MWD	Phoenix	-0.22	28.16	4.33	N
3,898	0.60	216.70	3,897.06	-3.46	27.48	-27.48	0.01	MWD	Phoenix	0.00	27.70	1.01	N
4,077	0.60	225.90	4,076.05	-4.86	26.25	-26.24	0.05	MWD	Phoenix	0.00	26.70	5.14	N
4,255	0.90	239.70	4,254.04	-6.21	24.37	-24.36	0.20	MWD	Phoenix	0.17	25.15	7.75	N
4,434	1.00	246.10	4,433.01	-7.56	21.73	-21.72	0.08	MWD	Phoenix	0.06	23.01	3.58	N
4,613	1.00	235.50	4,611.99	-9.07	19.02	-19.00	0.10	MWD	Phoenix	0.00	21.07	-5.92	N
4,792	0.90	229.40	4,790.96	-10.87	16.66	-16.64	0.08	MWD	Phoenix	-0.06	19.90	-3.41	N
4,971	1.10	206.30	4,969.94	-13.33	14.83	-14.81	0.25	MWD	Phoenix	0.11	19.94	-12.91	N
5,150	1.00	195.10	5,148.91	-16.38	13.66	-13.63	0.13	MWD	Phoenix	-0.06	21.33	-6.26	N
5,329	1.20	213.10	5,327.87	-19.45	12.23	-12.20	0.22	MWD	Phoenix	0.11	22.98	10.06	N
5,507	1.40	213.80	5,505.83	-22.82	10.01	-9.96	0.11	MWD	Phoenix	0.11	24.92	0.39	N
5,686	1.40	244.20	5,684.78	-25.59	6.82	-6.77	0.41	MWD	Phoenix	0.00	26.48	16.98	N
5,865	1.10	334.80	5,863.75	-24.99	4.12	-4.07	1.00	MWD	Phoenix	-0.17	25.33	50.61	N
6,043	1.60	332.40	6,041.70	-21.24	2.24	-2.20	0.28	MWD	Phoenix	0.28	21.36	-1.35	N
6,222	1.60	331.00	6,220.63	-16.84	-0.13	0.16	0.02	MWD	Phoenix	0.00	16.84	-0.78	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
6,401	2.10	332.40	6,399.53	-11.75	-2.86	2.88	0.28	MWD	Phoenix	0.28	12.09	0.78	N
6,580	2.50	316.30	6,578.39	-6.02	-7.07	7.09	0.42	MWD	Phoenix	0.22	9.29	-8.99	N
6,758	2.10	319.80	6,756.25	-0.72	-11.86	11.86	0.24	MWD	Phoenix	-0.22	11.88	1.97	N
6,937	2.30	307.00	6,935.12	3.95	-16.85	16.84	0.30	MWD	Phoenix	0.11	17.30	-7.15	N
7,116	1.30	302.00	7,114.03	7.18	-21.44	21.42	0.56	MWD	Phoenix	-0.56	22.61	-2.79	N
7,294	0.70	5.70	7,292.00	9.34	-23.04	23.02	0.66	MWD	Phoenix	-0.34	24.86	-	N
											166.46		
7,473	0.70	42.20	7,470.99	11.23	-22.20	22.18	0.24	MWD	Phoenix	0.00	24.88	20.39	N
7,652	0.80	274.60	7,649.98	12.14	-22.71	22.69	0.75	MWD	Phoenix	0.06	25.75	129.83	N
7,830	1.10	269.90	7,827.96	12.24	-25.66	25.63	0.17	MWD	Phoenix	0.17	28.43	-2.64	N
8,009	2.00	284.10	8,006.89	13.00	-30.41	30.38	0.54	MWD	Phoenix	0.50	33.07	7.93	N
8,059	2.20	298.50	8,056.86	13.67	-32.09	32.07	1.12	MWD	Phoenix	0.40	34.88	28.80	N
8,128	3.20	294.00	8,125.78	15.08	-35.02	34.99	1.48	MWD	Phoenix	1.45	38.13	-6.52	N
8,173	8.00	276.50	8,170.56	15.95	-39.28	39.25	11.20	MWD	Phoenix	10.67	42.39	-38.89	N
8,218	13.70	269.30	8,214.74	16.24	-47.73	47.70	13.00	MWD	Phoenix	12.67	50.41	-16.00	N
8,262	19.10	267.70	8,256.93	15.89	-60.14	60.11	12.31	MWD	Phoenix	12.27	62.20	-3.64	N
8,307	25.30	267.30	8,298.57	15.14	-77.12	77.09	13.78	MWD	Phoenix	13.78	78.59	-0.89	N
8,352	30.50	265.00	8,338.33	13.69	-98.11	98.09	11.80	MWD	Phoenix	11.56	99.06	-5.11	N
8,397	35.10	265.10	8,376.15	11.59	-122.39	122.37	10.22	MWD	Phoenix	10.22	122.94	0.22	N
8,441	38.30	267.70	8,411.42	9.96	-148.63	148.61	8.08	MWD	Phoenix	7.27	148.96	5.91	N
8,486	40.80	269.30	8,446.12	9.22	-177.27	177.25	6.00	MWD	Phoenix	5.56	177.51	3.56	N
8,531	43.10	270.40	8,479.58	9.15	-207.35	207.33	5.37	MWD	Phoenix	5.11	207.55	2.44	N
8,575	45.00	270.10	8,511.21	9.28	-237.94	237.92	4.34	MWD	Phoenix	4.32	238.12	-0.68	N
8,620	48.70	269.00	8,541.98	9.01	-270.76	270.74	8.41	MWD	Phoenix	8.22	270.91	-2.44	N
8,665	52.50	268.90	8,570.54	8.37	-305.52	305.51	8.45	MWD	Phoenix	8.44	305.64	-0.22	N
8,710	55.80	270.10	8,596.89	8.06	-341.99	341.97	7.65	MWD	Phoenix	7.33	342.08	2.67	N
8,754	60.50	268.70	8,620.10	7.66	-379.35	379.33	11.02	MWD	Phoenix	10.68	379.43	-3.18	N
8,799	65.30	268.30	8,640.59	6.61	-419.38	419.37	10.70	MWD	Phoenix	10.67	419.44	-0.89	N
8,844	72.00	268.00	8,656.97	5.25	-461.25	461.24	14.90	MWD	Phoenix	14.89	461.28	-0.67	N
8,889	77.20	268.10	8,668.91	3.78	-504.59	504.59	11.56	MWD	Phoenix	11.56	504.61	0.22	N
8,933	78.20	268.30	8,678.29	2.43	-547.56	547.56	2.32	MWD	Phoenix	2.27	547.57	0.45	N
8,978	80.60	268.10	8,686.56	1.04	-591.77	591.77	5.35	MWD	Phoenix	5.33	591.77	-0.44	N
9,067	87.00	269.10	8,696.17	-1.12	-680.18	680.18	7.28	MWD	Phoenix	7.19	680.18	1.12	N
9,157	89.50	269.50	8,698.92	-2.22	-770.12	770.12	2.81	MWD	Phoenix	2.78	770.12	0.44	N
9,246	89.90	268.60	8,699.39	-3.69	-859.11	859.11	1.11	MWD	Phoenix	0.45	859.11	-1.01	N
9,336	90.20	268.20	8,699.31	-6.20	-949.07	949.08	0.56	MWD	Phoenix	0.33	949.09	-0.44	N
9,425	91.30	268.60	8,698.14	-8.69	-1,038.03	1,038.04	1.32	MWD	Phoenix	1.24	1,038.06	0.45	N
9,515	92.30	270.20	8,695.31	-9.63	-1,127.97	1,127.99	2.10	MWD	Phoenix	1.11	1,128.01	1.78	N
9,604	93.60	270.00	8,690.73	-9.48	-1,216.85	1,216.87	1.48	MWD	Phoenix	1.46	1,216.89	-0.22	N
9,693	93.20	272.30	8,685.46	-7.69	-1,305.67	1,305.68	2.62	MWD	Phoenix	-0.45	1,305.69	2.58	N
9,783	93.30	271.80	8,680.35	-4.48	-1,395.47	1,395.48	0.57	MWD	Phoenix	0.11	1,395.48	-0.56	N
9,872	91.30	271.90	8,676.78	-1.61	-1,484.35	1,484.35	2.25	MWD	Phoenix	-2.25	1,484.35	0.11	N
9,962	90.10	271.70	8,675.68	1.22	-1,574.29	1,574.29	1.35	MWD	Phoenix	-1.33	1,574.29	-0.22	N
10,051	89.20	271.50	8,676.23	3.70	-1,663.26	1,663.25	1.04	MWD	Phoenix	-1.01	1,663.26	-0.22	N
10,140	89.50	270.70	8,677.24	5.41	-1,752.23	1,752.22	0.96	MWD	Phoenix	0.34	1,752.24	-0.90	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
10,230	90.70	270.70	8,677.08	6.51	-1,842.22	1,842.21	1.33	MWD	Phoenix	1.33	1,842.24	0.00	N
10,319	88.30	271.20	8,677.85	7.99	-1,931.20	1,931.18	2.75	MWD	Phoenix	-2.70	1,931.22	0.56	N
10,408	87.30	270.70	8,681.27	9.46	-2,020.12	2,020.10	1.26	MWD	Phoenix	-1.12	2,020.15	-0.56	N
10,498	87.90	270.10	8,685.04	10.09	-2,110.04	2,110.02	0.94	MWD	Phoenix	0.67	2,110.07	-0.67	N
10,587	88.80	269.60	8,687.60	9.86	-2,199.00	2,198.98	1.16	MWD	Phoenix	1.01	2,199.02	-0.56	N
10,677	89.50	268.90	8,688.94	8.68	-2,288.98	2,288.96	1.10	MWD	Phoenix	0.78	2,289.00	-0.78	N
10,766	89.90	268.70	8,689.40	6.81	-2,377.96	2,377.95	0.50	MWD	Phoenix	0.45	2,377.97	-0.22	N
10,855	90.20	268.60	8,689.33	4.72	-2,466.94	2,466.92	0.36	MWD	Phoenix	0.34	2,466.94	-0.11	N
10,945	90.50	268.80	8,688.78	2.68	-2,556.91	2,556.90	0.40	MWD	Phoenix	0.33	2,556.91	0.22	N
11,034	91.50	270.10	8,687.22	1.82	-2,645.89	2,645.88	1.84	MWD	Phoenix	1.12	2,645.89	1.46	N
11,124	89.90	270.60	8,686.12	2.37	-2,735.88	2,735.87	1.86	MWD	Phoenix	-1.78	2,735.88	0.56	N
11,213	90.10	271.70	8,686.12	4.16	-2,824.86	2,824.85	1.26	MWD	Phoenix	0.22	2,824.86	1.24	N
11,303	91.30	273.00	8,685.02	7.85	-2,914.78	2,914.76	1.97	MWD	Phoenix	1.33	2,914.79	1.44	N
11,392	90.50	272.70	8,683.63	12.27	-3,003.65	3,003.62	0.96	MWD	Phoenix	-0.90	3,003.68	-0.34	N
11,482	89.30	271.50	8,683.78	15.57	-3,093.59	3,093.55	1.89	MWD	Phoenix	-1.33	3,093.63	-1.33	N
11,571	89.60	270.80	8,684.64	17.36	-3,182.57	3,182.53	0.86	MWD	Phoenix	0.34	3,182.61	-0.79	N
11,661	89.10	269.20	8,685.66	17.36	-3,272.56	3,272.52	1.86	MWD	Phoenix	-0.56	3,272.60	-1.78	N
11,750	89.30	268.60	8,686.90	15.65	-3,361.53	3,361.50	0.71	MWD	Phoenix	0.22	3,361.57	-0.67	N
11,840	90.20	268.00	8,687.29	12.98	-3,451.49	3,451.46	1.20	MWD	Phoenix	1.00	3,451.52	-0.67	N
11,930	90.90	267.20	8,686.43	9.21	-3,541.41	3,541.38	1.18	MWD	Phoenix	0.78	3,541.42	-0.89	N
12,020	92.00	267.20	8,684.15	4.81	-3,631.27	3,631.25	1.22	MWD	Phoenix	1.22	3,631.27	0.00	N
12,109	92.70	267.00	8,680.50	0.32	-3,720.08	3,720.07	0.82	MWD	Phoenix	0.79	3,720.08	-0.22	N
12,199	91.60	268.80	8,677.13	-2.98	-3,809.95	3,809.95	2.34	MWD	Phoenix	-1.22	3,809.95	2.00	N
12,288	91.60	269.00	8,674.64	-4.69	-3,898.90	3,898.90	0.22	MWD	Phoenix	0.00	3,898.90	0.22	N
12,378	89.10	269.40	8,674.09	-5.94	-3,988.88	3,988.89	2.81	MWD	Phoenix	-2.78	3,988.89	0.44	N
12,467	89.10	268.90	8,675.49	-7.26	-4,077.86	4,077.87	0.56	MWD	Phoenix	0.00	4,077.87	-0.56	N
12,557	90.20	268.50	8,676.04	-9.31	-4,167.83	4,167.84	1.30	MWD	Phoenix	1.22	4,167.84	-0.44	N
12,646	91.00	268.30	8,675.11	-11.79	-4,256.79	4,256.81	0.93	MWD	Phoenix	0.90	4,256.81	-0.22	N
12,735	91.80	267.60	8,672.93	-14.97	-4,345.71	4,345.73	1.19	MWD	Phoenix	0.90	4,345.74	-0.79	N



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Survey Data

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12,825	92.90	267.40	8,669.24	-18.90	-4,435.55	4,435.57	1.24	MWD	Phoenix	1.22	4,435.59	-0.22	N
12,867	93.60	267.10	8,666.86	-20.91	-4,477.43	4,477.46	1.81	MWD	Phoenix	1.67	4,477.48	-0.71	N
12,935	93.60	267.10	8,662.59	-24.34	-4,545.21	4,545.25	0.00	Projection	Phoenix	0.00	4,545.27	0.00	N

Phoenix Technology Services SURVEY DATA CERTIFICATION



PHOENIX JOB NUMBER 1310588

OPERATOR Chesapeake Energy

WELL NAME West Shugart 2-19-30 #2H

COUNTY & STATE Eddy Co. NM

API WELL NUMBER 30-015-40953

PROPOSED DIRECTION 269.89

TIE-IN DATA						
MEASURED	VERTICAL			N-S	E-W	DATA
DEPTH	DEPTH	INCLIN	AZIMUTH	COORD	COORD	SOURCE
600 ft	599.99 ft	.03 ft	222.9 ft	-1.65 ft	-2.68 ft	Gyro

FIRST	FIRST		
SURVEY	SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
8-Jun-13	743 ft	0.2	44.0

SURVEY INSTRUMENT
TYPE
Phoenix MWD

LAST	LAST		
SURVEY	SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
22-Jun-13	12,867 ft	93.6	267.1

TO THE BEST OF MY KNOWLEDGE I
CERTIFY THIS SURVEY DATA TO BE
TRUE AND CORRECT.

PROJECTED	PROJECTED		
TD SURVEY	TD SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
22-Jun-13	12,935 ft	93.6	267.1

Derek Webster

PRINT YOUR NAME ABOVE

Derek Webster

SIGN YOUR NAME ABOVE

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED	7.34
DECLINATION OR GRID	GRID

6/23/13

TODAY'S DATE

MWD SUPERVISOR 1

Derek Webster

DIRECTIONAL DRILLER 1

Kieth Scheppler

MWD SUPERVISOR 2

Zak Dawson

DIRECTIONAL DRILLER 2

Craig Cannon

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