



Shell Morrow Land 3007 #28-1H DEF MWD 0ft to 8709ft MD

(Def Survey)

Report Date: December 16, 2012 - 05:19 PM	Survey / DLS Computation: Minimum Curvature / Lubinski
Client: Shell	Vertical Section Azimuth: 358.523 ° (Grid North)
Field: Kingman County (NAD 27)	Vertical Section Origin: 0.000 ft, 0.000 ft
Structure / Slot: Patterson #264 / Shell Morrow Land 3007 #28-1H	TVD Reference Datum: RKB
Well: Shell Morrow Land 3007 #28-1H	TVD Reference Elevation: 1651.600 ft above MSL
Borehole: Original Borehole	Seabed / Ground Elevation: 1628.000 ft above MSL
UWI / API#: Unknown / Unknown	Magnetic Declination: 4.636 °
Survey Name: Shell Morrow Land 3007 #28-1H DEF MWD 0ft to 8709ft MD	Total Gravity Field Strength: 999.7814 mgn (9.8 based)
Survey Date: December 16, 2012	Total Magnetic Field Strength: 51935.599 nT
Tort / AHD / DDI / ERD Ratio: 135.473 ° / 4693.080 ft / 6.097 / 1.060	Magnetic Dip Angle: 65.490 °
Coordinate Reference System: NAD27 Kansas State Plane, Southern Zone, US Feet	Declination Date: December 16, 2012
Location Lat / Long: N 37° 24' 0.19736", W 98° 5' 11.32604"	Magnetic Declination Model: BGGM 2012
Location Grid N/E Y/X: N 267303.890 ftUS, E 2120125.540 ftUS	North Reference: Grid North
CRS Grid Convergence Angle: 0.2541 °	Grid Convergence Used: 0.2541 °
Grid Scale Factor: 0.99997645	Total Corr Mag North->Grid North: 4.3815 °
	Local Coord Referenced To: Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	TVDSS (ft)	Closure (ft)	Closure Azimuth (°)	TF (°)	Northing (ftUS)	Easting (ftUS)
SHL Shell M. Land 3007 #28-1H	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	N/A	N/A	-1651.60	0.00	0.00	259.24M	267303.89	2120125.54
First SLB MWD	142.00	0.46	259.24	142.00	-0.09	-0.11	-0.56	0.32	0.32	0.00	-1509.60	0.57	259.24	325.96M	267303.78	2120124.98
	235.00	0.46	325.96	235.00	0.16	0.13	-1.14	0.54	0.00	71.74	-1416.60	1.14	276.69	344.15M	267304.02	2120124.40
	327.00	1.78	344.15	326.98	1.86	1.81	-1.73	1.47	1.43	19.77	-1324.62	2.51	316.31	353.93M	267305.70	2120123.81
	417.00	3.65	353.93	416.87	6.07	6.01	-2.42	2.13	2.08	10.87	-1234.73	6.48	338.08	352.75M	267309.90	2120123.12
	459.00	3.82	352.75	458.78	8.79	8.72	-2.74	0.44	0.40	-2.81	-1192.82	9.14	342.59	355.4M	267312.61	2120122.80
	606.00	4.37	355.40	605.41	19.26	19.16	-3.80	0.40	0.37	1.80	-1046.19	19.54	348.78	358.33M	267323.05	2120121.74
	702.00	4.55	358.33	701.12	26.72	26.62	-4.21	0.30	0.19	3.05	-950.48	26.95	351.02	359.06M	267330.51	2120121.33
	796.00	4.45	359.06	794.83	34.09	33.99	-4.38	0.12	-0.11	0.78	-856.77	34.27	352.66	359.81M	267337.88	2120121.16
	889.00	4.51	359.81	887.54	41.35	41.25	-4.45	0.09	0.06	0.81	-764.06	41.49	353.85	359.96M	267345.14	2120121.09
	983.00	4.31	359.96	981.26	48.58	48.48	-4.46	0.21	-0.21	0.16	-670.34	48.69	354.74	0.69M	267352.37	2120121.08
	1076.00	4.14	0.69	1074.01	55.43	55.33	-4.42	0.19	0.19	0.78	-577.59	55.51	355.43	359.84M	267359.22	2120121.12
	1170.00	4.15	359.84	1167.77	62.22	62.13	-4.39	0.07	0.01	-0.90	-483.83	62.28	355.96	358.29M	267366.02	2120121.15
	1263.00	3.67	358.29	1260.55	68.56	68.47	-4.49	0.53	-0.52	-1.67	-391.05	68.61	356.25	358.2M	267372.36	2120121.05
	1353.00	2.40	358.20	1350.42	73.33	73.23	-4.64	1.41	-1.41	-0.10	-301.18	73.38	356.38	354.42M	267377.12	2120120.90
	1446.00	1.99	354.42	1443.35	76.88	76.78	-4.85	0.47	-0.44	-4.06	-208.25	76.94	356.38	343.05M	267380.67	2120120.69
	1538.00	1.74	343.05	1535.30	79.82	79.71	-5.42	0.48	-0.27	-12.36	-116.30	79.89	356.11	336.30M	267383.60	2120120.12
	1659.00	1.80	336.30	1656.25	83.35	83.21	-6.72	0.18	0.05	-5.58	4.65	83.48	355.39	7.15M	267387.09	2120118.82
	1751.00	1.15	7.15	1748.22	85.60	85.45	-7.18	1.09	-0.71	33.53	96.62	85.75	355.20	9.57M	267389.33	2120118.36
	1846.00	1.05	9.57	1843.20	87.40	87.25	-6.92	0.12	-0.11	2.55	191.60	87.52	355.47	23.16M	267391.14	2120118.62
	1939.00	0.45	23.16	1936.19	88.57	88.43	-6.63	0.67	-0.65	14.61	284.59	88.67	355.71	44.4M	267392.31	2120118.91
	2000.00	0.17	44.40	1997.19	88.85	88.71	-6.48	0.49	-0.46	34.82	345.59	88.95	355.83	18.79M	267392.60	2120119.07
	2092.00	0.24	18.79	2089.19	89.12	88.99	-6.32	0.12	0.08	-27.84	437.59	89.21	355.94	26.5M	267392.88	2120119.22
	2185.00	0.28	26.50	2182.19	89.51	89.38	-6.15	0.06	0.04	8.29	530.59	89.59	356.06	352.31M	267393.27	2120119.39
	2278.00	0.23	352.31	2275.19	89.89	89.77	-6.08	0.17	-0.05	-36.76	623.59	89.97	356.13	54.89M	267393.65	2120119.46
	2372.00	0.29	54.89	2369.19	90.21	90.09	-5.91	0.29	0.06	66.57	717.59	90.28	356.25	56.05M	267393.98	2120119.63
	2465.00	0.45	56.05	2462.18	90.54	90.43	-5.41	0.17	0.17	1.25	810.58	90.59	356.57	57.17M	267394.32	2120120.13
	2557.00	0.46	57.17	2554.18	90.93	90.83	-4.80	0.01	0.01	1.22	902.58	90.96	356.97	62.76M	267394.72	2120120.74
	2651.00	0.51	62.76	2648.18	91.30	91.23	-4.11	0.07	0.05	5.95	996.58	91.32	357.42	60.86M	267395.12	2120121.43
	2744.00	0.48	60.86	2741.18	91.66	91.61	-3.40	0.04	-0.03	-2.04	1089.58	91.67	357.87	55.97M	267395.50	2120122.14
	2837.00	0.49	55.97	2834.17	92.06	92.02	-2.74	0.05	0.01	-5.26	1182.57	92.06	358.30	59.02M	267395.91	2120122.80
	2931.00	0.40	59.02	2928.17	92.44	92.41	-2.12	0.10	-0.10	3.24	1276.57	92.44	358.69	58.03M	267396.30	2120123.42
	3024.00	0.35	58.03	3021.17	92.74	92.73	-1.60	0.05	-0.05	-1.06	1369.57	92.74	359.01	64.99M	267396.62	2120123.94
	3121.00	0.47	64.99	3118.16	93.05	93.06	-0.99	0.13	0.12	7.18	1466.56	93.06	359.39	59.76M	267396.94	2120124.55
	3215.00	0.53	59.76	3212.16	93.41	93.44	-0.26	0.08	0.06	-5.56	1560.56	93.44	359.84	46.64M	267397.33	2120125.28
	3308.00	0.54	46.64	3305.16	93.91	93.96	0.43	0.13	0.01	-14.11	1653.56	93.96	0.26	29.49M	267397.84	2120125.97
	3402.00	0.24	29.49	3399.15	94.38	94.43	0.84	0.34	-0.32	-18.24	1747.55	94.43	0.51	322.82M	267398.32	2120126.38

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	TVDSS (ft)	Closure (ft)	Closure Azimuth (°)	TF (°)	Northing (ftUS)	Easting (ftUS)
	3496.00	0.08	322.82	3493.15	94.60	94.65	0.90	0.23	-0.17	-70.93	1841.55	94.66	0.55	264.59M	267398.54	2120126.44
	3590.00	0.03	264.59	3587.15	94.65	94.70	0.84	0.07	-0.05	-61.95	1935.55	94.71	0.51	121.99M	267398.59	2120126.38
	3682.00	0.17	121.99	3679.15	94.57	94.63	0.93	0.21	0.15	-155.00	2027.55	94.63	0.56	30.73M	267398.52	2120126.47
	3776.00	0.22	30.73	3773.15	94.65	94.71	1.14	0.30	0.05	-97.09	2121.55	94.72	0.69	345.49M	267398.60	2120126.68
Tie-In	3870.00	7.83	345.49	3866.86	101.05	101.07	-0.37	8.17	8.10	-48.13	2215.26	101.08	359.79	342.66M	267404.96	2120125.17
Survey 8Dec12	3964.00	17.78	342.66	3958.40	121.15	121.02	-6.27	10.60	10.59	-3.01	2306.80	121.19	357.03	0.31R	267424.91	2120119.27
	4058.00	28.32	342.78	4044.78	156.51	156.12	-17.18	11.21	11.21	0.13	2393.18	157.06	353.72	21.63R	267460.01	2120108.36
	4150.00	36.78	348.28	4122.27	204.72	204.03	-29.26	9.73	9.20	5.98	2470.67	206.12	351.84	26.4R	267507.91	2120096.28
	4245.00	45.67	354.31	4193.68	266.74	265.84	-38.43	10.24	9.36	6.35	2542.08	268.60	351.77	14.21R	267569.72	2120087.11
Survey 9Dec12	4338.00	56.06	357.45	4252.31	338.69	337.68	-43.46	11.47	11.17	3.38	2600.71	340.47	352.67	12.56R	267641.56	2120082.09
	4432.00	62.41	359.04	4300.37	419.42	418.37	-45.89	6.91	6.76	1.69	2648.77	420.88	353.74	3.19R	267722.25	2120079.65
	4523.00	69.85	359.48	4337.17	502.57	501.52	-46.96	8.19	8.18	0.48	2685.57	503.72	354.65	6.75R	267805.40	2120078.58
	4617.00	77.81	0.44	4363.32	592.74	591.73	-47.00	8.52	8.47	1.02	2711.72	593.59	355.46	3.8L	267895.60	2120078.54
Survey 10Dec12	4711.00	84.42	0.00	4377.83	685.52	684.55	-46.65	7.05	7.03	-0.47	2726.23	686.14	356.10	8.09R	267988.42	2120078.89
	4820.00	90.48	0.86	4382.68	794.30	793.39	-45.83	5.62	5.56	0.79	2731.08	794.71	356.69	58.53L	268097.26	2120079.71
	4913.00	90.89	0.19	4381.57	887.24	886.38	-44.98	0.84	0.44	-0.72	2729.97	887.52	357.09	169.02R	268190.24	2120080.56
	5009.00	89.24	0.51	4381.46	982.37	983.19	-44.39	1.75	-1.72	0.33	2729.86	983.37	357.41	133.22R	268286.23	2120081.15
	5102.00	88.93	0.84	4382.94	1076.11	1075.35	-43.30	0.49	-0.33	0.35	2731.34	1076.22	357.69	132.28L	268379.21	2120082.24
	5196.00	88.73	0.62	4384.86	1170.02	1169.32	-42.10	0.32	-0.21	-0.23	2733.26	1170.08	357.94	143.44R	268473.18	2120083.44
	5289.00	88.42	0.85	4387.18	1262.92	1262.29	-40.91	0.42	-0.25	0.25	2735.58	1262.95	358.14	36.13R	268566.15	2120084.63
	5382.00	89.42	1.58	4388.93	1355.80	1355.25	-38.94	1.33	1.08	0.78	2737.33	1355.81	358.35	87.02L	268659.10	2120086.60
	5475.00	89.48	0.43	4389.82	1448.71	1448.23	-37.31	1.24	0.06	-1.24	2738.22	1448.71	358.52	82.34L	268752.08	2120088.24
	5569.00	89.55	359.91	4390.62	1542.67	1542.22	-37.03	0.56	0.07	-0.55	2739.02	1542.67	358.62	129.61R	268846.07	2120088.51
Survey 13Dec12	5665.00	89.31	0.20	4391.57	1638.63	1638.22	-36.93	0.39	-0.25	0.30	2739.97	1638.64	358.71	4.16L	268942.07	2120088.61
	5760.00	89.86	0.16	4392.26	1733.58	1733.22	-36.64	0.58	0.58	-0.04	2740.66	1733.60	358.79	128.2L	269037.06	2120088.91
	5853.00	89.38	359.55	4392.88	1826.56	1826.21	-36.87	0.83	-0.52	-0.66	2741.28	1826.58	358.84	8.46R	269130.06	2120088.67
	5947.00	90.86	359.77	4392.68	1920.53	1920.21	-37.43	1.59	1.57	0.23	2741.08	1920.57	358.88	90L	269224.05	2120088.11
	6041.00	90.86	359.66	4391.27	2014.50	2014.20	-37.90	0.12	0.00	-0.12	2739.67	2014.55	358.92	148.02L	269318.03	2120087.64
Survey 14Dec12	6134.00	88.73	358.33	4391.60	2107.49	2107.17	-39.53	2.70	-2.29	-1.43	2740.00	2107.54	358.93	15.02R	269411.01	2120086.01
	6226.00	89.14	358.44	4393.31	2199.48	2199.12	-42.12	0.46	0.45	0.12	2741.71	2199.52	358.90	65.51R	269502.96	2120083.42
	6316.00	89.55	359.34	4394.34	2289.10	2289.47	-43.86	1.10	0.46	1.00	2742.74	2289.52	358.90	151.79L	269592.93	2120081.68
	6409.00	89.14	359.12	4395.41	2382.45	2382.08	-45.11	0.50	-0.44	-0.24	2743.81	2382.51	358.92	30.75L	269685.91	2120080.43
	6500.00	89.93	358.65	4396.14	2473.45	2473.06	-46.88	1.01	0.87	-0.52	2744.54	2473.51	358.91	49.9R	269776.89	2120078.66
	6594.00	90.41	359.22	4395.86	2567.44	2567.04	-48.63	0.79	0.51	0.61	2744.26	2567.50	358.91	61.26L	269870.87	2120076.91
	6687.00	90.58	358.91	4395.06	2660.44	2660.03	-50.15	0.38	0.18	-0.33	2743.46	2660.50	358.92	14.03L	269963.85	2120075.39
	6779.00	90.86	358.84	4393.91	2752.43	2752.00	-51.95	0.31	0.30	-0.08	2742.31	2752.49	358.92	158.2L	270055.82	2120073.59
	6871.00	90.76	358.80	4392.60	2844.42	2843.97	-53.85	0.12	-0.11	-0.04	2741.00	2844.48	358.92	143.97L	270147.79	2120071.69
	6963.00	89.55	357.92	4392.36	2936.41	2935.93	-56.48	1.63	-1.32	-0.96	2740.76	2936.48	358.90	14.04L	270239.75	2120069.06
Survey 15Dec12	7057.00	90.31	357.73	4392.47	3030.41	3029.87	-60.05	0.83	0.81	-0.20	2740.87	3030.46	358.86	156.71L	270333.68	2120065.49
	7151.00	88.80	357.08	4393.20	3124.38	3123.76	-64.30	1.75	-1.61	-0.69	2741.60	3124.42	358.82	63.85L	270427.57	2120061.24
	7243.00	89.07	356.53	4394.91	3216.32	3215.60	-69.43	0.67	0.29	-0.60	2743.31	3216.35	358.76	90R	270519.41	2120056.11
	7336.00	89.07	356.87	4396.42	3309.27	3308.44	-74.78	0.37	0.00	0.37	2744.82	3309.28	358.71	152.6R	270612.24	2120050.76
	7429.00	88.80	357.01	4398.15	3402.21	3401.29	-79.75	0.33	-0.29	0.15	2746.55	3402.22	358.66	17.88L	270705.09	2120045.79
	7522.00	89.11	356.91	4399.84	3495.16	3494.14	-84.68	0.35	0.33	-0.11	2748.24	3495.17	358.61	112.38R	270797.94	2120040.86
	7617.00	89.04	357.08	4401.38	3589.00	3589.00	-89.66	0.19	-0.07	0.18	2749.78	3589.12	358.57	70.35L	270892.80	2120035.88
	7711.00	89.14	356.80	4402.87	3684.07	3684.07	-94.68	0.32	0.11	-0.30	2751.27	3684.07	358.53	135.61L	270986.65	2120030.87
	7805.00	88.66	356.33	4404.68	3778.00	3776.67	-100.31	0.71	-0.51	-0.50	2753.08	3778.00	358.48	46.04R	271080.46	2120025.24
	7897.00	88.93	356.61	4406.61	3869.92	3868.47	-105.97	0.42	0.29	0.30	2755.01	3869.92	358.43	89.25L	271172.26	2120019.57
	7995.00	88.94	355.85	4408.43	3967.82	3966.24	-112.41	0.78	0.01	-0.78	2756.83	3967.83	358.38	112.74L	271270.03	2120013.13
	8088.00	88.63	355.11	4410.40	4060.67	4058.93	-119.74	0.86	-0.33	-0.80	2758.80	4060.70	358.31	68.72L	271362.72	2120005.80
	8182.00	88.93	354.34	4412.41	4154.44	4152.51	-128.38	0.88	0.32	-0.82	2760.81	4154.49	358.23	87.03L	271456.29	2119997.16
	8276.00	88.97	353.57	4414.13	4248.12	4245.97	-138.28	0.82	0.04	-0.82	2762.53	4248.22	358.13	110.89L	271549.75	2119987.27
	8366.00	88.52	352.39	4416.10	4337.68	4335.27	-149.27	1.40	-0.50	-1.31	2764.50	4337.84	358.03	137.74L	271639.05	2119976.27
	8461.00	88.08	351.99	4418.92	4432.06	4429.35	-162.18	0.63	-0.46	-0.42	2767.32	4432.32	357.90	122.38L	271733.13	2119963.37
	8554.00	87.70	351.39	4422.34	4524.34	4521.31	-175.61	0.76	-0.41	-0.65	2770.74	4524.72	357.78	33.38R	271825.09	2119949.94
Final Survey	8652.00	88.14	351.68	4425.90	4621.54	4618.18	-190.03	0.54	0.45	0.30	2774.30	4622.09	357.64	HS	271921.95	2119935.52
Proj to TD	8709.00	88.14	351.68	4427.75	4678.11	4674.55	-198.27	0.00	0.00	0.00	2776.15	4678.75	357.57		271978.32	2119927.28

Survey Type: Def Survey

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	TVDSS (ft)	Closure (ft)	Closure Azimuth (°)	TF (°)	Northing (ftUS)	Easting (ftUS)
Survey Error Model:	ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma															
Survey Program:																

Description	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	0.000	23.600		30.000	30.000	SLB_MWD-STD-Depth Only	Original Borehole / Shell Morrow Land 3007 #28-1H DEF MWD 0ft
	23.600	8652.000		30.000	30.000	SLB_MWD-STD	Original Borehole / Shell Morrow Land 3007 #28-1H DEF MWD 0ft
	8652.000	8709.000		30.000	30.000	SLB_BLIND+TREND	Original Borehole / Shell Morrow Land 3007 #28-1H DEF MWD 0ft