



# Weatherford®

## SURVEY REPORT

Report Date: 5/22/2011  
 Customer: Chesapeake  
 Job Name: 4022635  
 Well Name: Reliance Minerals 3H

Field: Reliance Minerals  
 Rig: Nomac 241  
 Rig Loc: Monongalia

Survey Calculation Method: <b>Minimum Curvature</b>						
Magnetic Reference	Target Direction	Total Magnetic Field	Magnetic Dip Angle	Magnetic Declination	Grid Convergence	Total Correction
<b>Grid North</b>	<b>329.23 deg</b>	<b>52703 nT</b>	<b>67.19 deg</b>	<b>-8.98 deg</b>	<b>-0.30 deg</b>	<b>-8.68 deg</b>
<b>Survey Tie-On</b>	Depth	INC	AZ	TVD	NS	EW
	<b>3056.00 ft</b>	<b>0.90 deg</b>	<b>185.87 deg</b>	<b>3055.81 ft</b>	<b>-23.70 ft</b>	<b>14.12 ft</b>

Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head			Vsect (ft)	Dogleg (deg/100ft)
				NS (ft)	EW (ft)			
3124.00	0.53	223.34	3123.80	-24.46	13.85	-28.10	0.85	
3167.00	0.85	284.20	3166.80	-24.52	13.40	-27.93	1.75	
3210.00	2.39	303.82	3209.78	-23.95	12.35	-26.90	3.74	
3252.00	4.03	302.54	3251.72	-22.67	10.38	-24.79	3.91	
3295.00	4.60	305.59	3294.59	-20.85	7.71	-21.86	1.44	
3337.00	4.61	306.98	3336.46	-18.86	4.99	-18.75	0.27	
3380.00	4.37	305.10	3379.33	-16.88	2.27	-15.66	0.64	
3465.00	4.22	301.01	3464.09	-13.40	-3.07	-9.95	0.40	
3550.00	3.95	300.19	3548.87	-10.32	-8.28	-4.63	0.33	
3636.00	3.72	298.04	3634.68	-7.52	-13.30	0.34	0.32	
3721.00	4.91	307.22	3719.44	-4.02	-18.62	6.07	1.62	
3806.00	4.56	304.50	3804.15	0.09	-24.30	12.51	0.49	
3892.00	4.03	305.80	3889.91	3.79	-29.57	18.38	0.63	
3977.00	3.60	301.69	3974.72	6.94	-34.25	23.48	0.60	
4062.00	2.93	303.56	4059.58	9.54	-38.33	27.81	0.79	
4148.00	2.21	308.62	4145.49	11.79	-41.46	31.34	0.88	
4233.00	3.35	299.58	4230.39	14.04	-44.90	35.03	1.43	
4318.00	3.22	301.52	4315.25	16.51	-49.10	39.30	0.20	
4404.00	2.63	300.63	4401.14	18.78	-52.86	43.18	0.69	
4489.00	2.53	300.72	4486.05	20.73	-56.15	46.54	0.12	
4574.00	1.50	273.72	4571.00	21.76	-58.87	48.82	1.62	
4659.00	1.21	259.46	4655.98	21.67	-60.86	49.76	0.52	
4745.00	0.92	266.30	4741.96	21.46	-62.43	50.38	0.37	
4830.00	0.88	252.92	4826.95	21.23	-63.74	50.85	0.25	
4915.00	0.81	223.95	4911.95	20.60	-64.78	50.84	0.51	
5000.00	0.91	170.11	4996.94	19.50	-65.08	50.05	0.92	
5085.00	1.33	158.19	5081.92	17.92	-64.60	48.45	0.56	
5171.00	1.29	172.27	5167.90	16.04	-64.10	46.58	0.38	
5256.00	1.90	158.37	5252.87	13.78	-63.45	44.30	0.85	
5341.00	1.94	131.28	5337.82	11.52	-61.85	41.55	1.06	
5427.00	0.73	83.68	5423.80	10.63	-60.22	39.94	1.79	
5512.00	0.76	68.26	5508.79	10.89	-59.15	39.62	0.24	
5597.00	1.30	78.27	5593.78	11.30	-57.69	39.22	0.66	
5683.00	1.37	75.80	5679.75	11.75	-55.73	38.61	0.11	
5768.00	1.26	348.26	5764.74	12.92	-54.94	39.20	2.15	

Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head		VSect (ft)	Dogleg (deg/100ft)
				NS (ft)	EW (ft)		
5853.00	1.41	348.41	5849.71	14.86	-55.34	41.08	0.18
5938.00	1.63	1.95	5934.68	17.10	-55.51	43.09	0.49
6024.00	1.77	357.06	6020.65	19.65	-55.53	45.29	0.23
6109.00	1.82	7.99	6105.60	22.29	-55.41	47.50	0.41
6194.00	1.39	307.08	6190.58	24.25	-56.04	49.51	1.96
6280.00	1.91	307.79	6276.54	25.76	-58.01	51.81	0.62
6365.00	2.02	249.25	6361.50	26.10	-60.53	53.39	2.27
6450.00	2.38	250.99	6446.44	24.99	-63.60	54.01	0.43
6535.00	1.25	208.10	6531.39	23.60	-65.71	53.89	1.99
6620.00	1.53	193.48	6616.37	21.68	-66.41	52.60	0.53
6706.00	1.65	195.35	6702.34	19.37	-67.01	50.92	0.16
6791.00	1.84	205.19	6787.30	16.95	-67.91	49.31	0.42
6837.00	1.96	212.54	6833.27	15.62	-68.65	48.54	0.58
6880.00	2.52	296.44	6876.25	15.42	-69.89	49.00	7.02
6923.00	7.38	325.84	6919.08	18.13	-72.29	52.56	12.39
6965.00	11.71	335.64	6960.49	24.24	-75.56	59.49	10.98
7008.00	15.35	339.73	7002.29	33.56	-79.34	69.43	8.76
7050.00	19.27	339.47	7042.38	45.27	-83.69	81.72	9.32
7093.00	23.87	335.44	7082.36	59.84	-89.80	97.36	11.25
7136.00	27.94	333.50	7121.03	76.78	-97.92	116.06	9.67
7178.00	32.77	332.02	7157.27	95.63	-107.65	137.24	11.62
7221.00	38.24	329.78	7192.26	117.43	-119.81	162.19	13.09
7264.00	44.48	328.80	7224.52	141.84	-134.33	190.59	14.59
7306.00	50.68	328.04	7252.83	168.23	-150.57	221.58	14.82
7349.00	55.90	327.28	7278.53	197.34	-169.01	256.03	12.21
7391.00	61.21	328.82	7300.43	227.74	-187.95	291.84	13.04
7434.00	64.99	329.93	7319.88	260.74	-207.48	330.18	9.08
7476.00	68.92	330.24	7336.32	294.23	-226.75	368.81	9.38
7519.00	74.17	331.11	7349.93	329.78	-246.71	409.57	12.38
7562.00	78.92	331.31	7359.93	366.42	-266.84	451.36	11.04
7605.00	82.60	331.71	7366.83	403.72	-287.08	493.76	8.60
7647.00	86.39	331.95	7370.86	440.57	-306.82	535.51	9.06
7690.00	88.85	331.87	7372.65	478.47	-327.05	578.43	5.70
7775.00	91.36	331.22	7372.49	553.19	-367.54	663.35	3.06
7860.00	92.20	331.03	7369.84	627.59	-408.57	748.26	1.01
7945.00	91.29	329.58	7367.25	701.38	-450.66	833.20	2.01
8031.00	91.15	329.20	7365.41	775.38	-494.44	919.18	0.47
8116.00	90.94	329.18	7363.86	848.37	-537.97	1004.17	0.25
8201.00	89.97	329.08	7363.18	921.33	-581.58	1089.16	1.16
8285.00	90.17	330.52	7363.08	993.93	-623.83	1173.16	1.73
8371.00	88.85	329.42	7363.82	1068.38	-666.87	1259.14	2.00
8456.00	89.06	330.31	7365.37	1141.88	-709.54	1344.12	1.07
8541.00	88.78	329.02	7366.98	1215.22	-752.46	1429.11	1.55
8626.00	88.71	328.77	7368.85	1287.98	-796.36	1514.08	0.30
8712.00	88.57	328.41	7370.89	1361.36	-841.17	1600.05	0.45
8797.00	88.92	328.35	7372.76	1433.72	-885.72	1685.02	0.42
8882.00	89.69	328.60	7373.80	1506.17	-930.16	1770.01	0.95
8968.00	88.57	329.14	7375.11	1579.78	-974.61	1856.00	1.44
9053.00	88.85	329.49	7377.02	1652.86	-1017.98	1940.97	0.53
9138.00	88.78	329.13	7378.78	1725.94	-1061.35	2025.96	0.44

Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head		Vsect (ft)	Dogleg (deg/100ft)
				NS (ft)	EW (ft)		
9223.00	89.20	330.01	7380.29	1799.21	-1104.40	2110.94	1.15
9309.00	87.80	328.06	7382.54	1872.93	-1148.63	2196.90	2.79
9394.00	87.80	327.56	7385.81	1944.80	-1193.89	2281.81	0.59
9479.00	88.71	329.22	7388.40	2017.15	-1238.42	2366.76	2.22
9564.00	90.03	334.25	7389.34	2091.99	-1278.66	2451.65	6.12
9650.00	88.99	333.42	7390.07	2169.17	-1316.57	2537.36	1.55
9735.00	88.78	330.35	7391.73	2244.12	-1356.62	2622.25	3.63
9820.00	90.38	332.05	7392.35	2318.60	-1397.57	2707.19	2.76
9905.00	88.64	329.74	7393.08	2392.85	-1438.90	2792.14	3.41
9991.00	89.76	329.98	7394.28	2467.22	-1482.08	2878.12	1.33
10076.00	89.06	328.06	7395.16	2540.08	-1525.83	2963.11	2.41
10161.00	86.82	323.91	7398.22	2610.47	-1573.34	3047.90	5.54
10247.00	86.89	322.71	7402.94	2679.32	-1624.65	3133.31	1.39
10332.00	87.87	323.96	7406.83	2747.43	-1675.35	3217.77	1.87
10417.00	89.69	326.39	7408.65	2817.19	-1723.87	3302.53	3.57
10502.00	88.43	326.60	7410.05	2888.05	-1770.79	3387.42	1.50
10588.00	89.41	328.76	7411.67	2960.71	-1816.75	3473.36	2.76
10672.00	90.38	328.99	7411.82	3032.62	-1860.17	3557.36	1.20
10758.00	90.73	329.62	7410.99	3106.56	-1904.07	3643.36	0.84
10843.00	89.48	328.22	7410.83	3179.36	-1947.95	3728.35	2.21
10928.00	86.75	329.25	7413.63	3251.97	-1992.03	3813.29	3.43
11014.00	87.38	329.32	7418.03	3325.81	-2035.90	3899.18	0.74
11099.00	88.78	330.20	7420.89	3399.20	-2078.68	3984.12	1.94
11184.00	90.17	332.03	7421.66	3473.62	-2119.73	4069.07	2.71
11269.00	88.01	330.52	7423.01	3548.14	-2160.58	4154.00	3.11
11354.00	87.80	329.68	7426.13	3621.77	-2202.93	4238.93	1.02
11439.00	89.55	331.59	7428.10	3695.82	-2244.60	4323.87	3.04
11525.00	88.50	329.91	7429.56	3770.84	-2286.61	4409.83	2.30
11610.00	88.57	330.36	7431.74	3844.53	-2328.92	4494.79	0.54
11695.00	88.71	330.06	7433.76	3918.28	-2371.14	4579.75	0.39
11781.00	88.08	328.74	7436.18	3992.27	-2414.90	4665.71	1.70
11866.00	89.76	329.95	7437.79	4065.38	-2458.22	4750.69	2.44
11951.00	91.08	331.16	7437.16	4139.39	-2500.01	4835.67	2.11
12036.00	91.57	330.37	7435.19	4213.54	-2541.51	4920.61	1.09
12121.00	91.01	330.69	7433.27	4287.52	-2583.32	5005.57	0.76
12206.00	89.76	330.28	7432.70	4361.49	-2625.20	5090.54	1.56
12291.00	89.76	330.07	7433.07	4435.23	-2667.47	5175.53	0.25
12375.00	88.78	330.89	7434.14	4508.32	-2708.85	5259.50	1.52
12460.00	89.27	330.67	7435.59	4582.49	-2750.34	5344.46	0.63
12545.00	87.52	329.50	7437.98	4656.14	-2792.71	5429.41	2.48
12631.00	87.45	329.27	7441.76	4730.08	-2836.46	5515.33	0.28
12716.00	87.73	328.74	7445.34	4802.87	-2880.20	5600.25	0.71
12802.00	87.87	329.37	7448.64	4876.58	-2924.39	5686.19	0.76
12887.00	88.36	329.42	7451.44	4949.70	-2967.64	5771.14	0.58
12972.00	88.57	329.82	7453.72	5023.00	-3010.60	5856.11	0.53
13058.00	88.64	329.95	7455.82	5097.37	-3053.74	5942.08	0.17
13143.00	87.17	329.85	7458.93	5170.86	-3096.34	6027.01	1.74
13228.00	87.31	330.31	7463.03	5244.44	-3138.69	6111.90	0.56
13313.00	87.66	330.10	7466.76	5318.13	-3180.89	6196.81	0.48
13398.00	88.08	330.39	7469.92	5391.88	-3223.04	6281.74	0.60

Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head		VSect (ft)	Dogleg (deg/100ft)
				NS (ft)	EW (ft)		
13484.00	88.43	330.49	7472.54	5466.65	-3265.45	6367.68	0.42
13569.00	87.94	330.50	7475.23	5540.58	-3307.29	6452.61	0.57
13654.00	87.38	329.95	7478.71	5614.30	-3349.47	6537.53	0.92
13739.00	87.94	329.62	7482.18	5687.69	-3392.21	6622.45	0.77
13824.00	88.01	328.90	7485.19	5760.70	-3435.62	6707.40	0.84
13909.00	88.50	329.21	7487.78	5833.57	-3479.31	6792.36	0.67
13994.00	88.78	328.91	7489.80	5906.45	-3523.00	6877.33	0.48
14079.00	88.57	329.52	7491.77	5979.46	-3566.49	6962.31	0.76
14165.00	88.99	329.16	7493.61	6053.42	-3610.33	7048.29	0.64
14250.00	88.92	329.55	7495.16	6126.54	-3653.65	7133.28	0.46
14335.00	88.64	329.39	7496.98	6199.74	-3696.82	7218.26	0.38
14421.00	87.59	328.80	7499.81	6273.49	-3740.97	7304.21	1.40
14506.00	87.31	329.26	7503.59	6346.30	-3784.67	7389.12	0.63
14591.00	88.01	329.57	7507.07	6419.41	-3827.88	7474.05	0.90
14676.00	88.64	329.36	7509.56	6492.59	-3871.05	7559.01	0.78
14762.00	88.92	329.41	7511.39	6566.58	-3914.84	7644.99	0.33
14847.00	87.24	329.77	7514.25	6639.84	-3957.84	7729.94	2.02
14932.00	86.68	330.43	7518.75	6713.43	-4000.15	7814.81	1.01
15017.00	86.68	330.84	7523.68	6787.38	-4041.76	7899.64	0.48
15102.00	85.98	330.02	7529.12	6861.15	-4083.62	7984.45	1.27
15188.00	85.21	330.06	7535.73	6935.44	-4126.45	8070.18	0.90
15274.00	85.70	330.13	7542.55	7009.75	-4169.19	8155.90	0.58
15359.00	85.70	330.52	7548.92	7083.40	-4211.15	8240.65	0.45
15444.00	86.19	330.94	7554.93	7157.36	-4252.61	8325.41	0.76
15530.00	86.33	331.49	7560.54	7232.57	-4293.93	8411.17	0.65
15556.00	86.19	331.40	7562.24	7255.36	-4306.33	8437.10	0.62

Vertical Section is 8500.92 ft along the target direction of 329.23 deg at a measured depth of 15620.01 ft.  
Horizontal Displacement is 8500.93 ft along the well bore azimuth of 329.32 deg.  
The total correction is -8.68 deg relative to Grid North.