



15-40447

Chesapeake Operating Inc.

Eddy County, New Mexico (NAD 1983)

PLU Big Sinks 7-25-31 USA 1H

Job #1210774

Latshaw 14

Survey: Phoenix MWD Surveys



Chesapeake Energy, Survey Report

19 September, 2012





Chesapeake Energy, Survey Report

Chesapeake

Company:	Chesapeake Operating Inc.	Local Co-ordinate Reference:	Well Job #1210774
Project:	Eddy County, New Mexico (NAD 1983)	TVD Reference:	WELL @ 3386.00usft (Trinidad 111)
Site:	PLU Big Sinks 7-25-31 USA 1H	MD Reference:	WELL @ 3386.00usft (Trinidad 111)
Well:	Job #1210774	North Reference:	Grid
Wellbore:	Latshaw 14	Survey Calculation Method:	Minimum Curvature
Design:	Latshaw 14	Database:	Compass5000

Project	Eddy County, New Mexico (NAD 1983)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	PLU Big Sinks 7-25-31 USA 1H		
Site Position:		Northing:	419,414.49 usft
From:	Map	Easting:	700,388.59 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 9' 7.2191 N
		Longitude:	103° 49' 9.8360 W
		Grid Convergence:	0.27 °

Well		Job #1210774				
Well Position	+N-S	0.00 usft	Northing:	419,414.49 usft	Latitude:	32° 9' 7.2191 N
	+E-W	0.00 usft	Easting:	700,388.59 usft	Longitude:	103° 49' 9.8360 W
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,369.00 usft	

Wellbore	Latshaw,14				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010_14	08/17/12	7.55	60.05	48,429

Design		Latshaw 14		
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD) (usft)	+N/S (usft)	+E/W (usft)	Direction (°)
	0.00	0.00	0.00	179.98



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Survey Program		Date	09/19/12		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
200.00	8,800.00	VES Gyro (Latshaw 14)	NS-GYRO-MS	North sensing gyrocompassing m/s	
8,800.00	14,050.00	Phoenix MWD Surveys (Latshaw 14)	MWD	MWD - Standard	

Survey											
MD (usft)	Inc. (°)	Azi (azimuth) (°)	TVDSS (usft)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
8,800.00	2.54	272.59	-5,406.90	8,792.90	-238.80	105.28	238.84	0.00	419,175.69	700,493.87	
Tie on From Gyro Surveys @ 8800' MD											
8,886.00	2.50	285.60	-5,492.82	8,878.82	-238.21	101.57	238.24	0.67	419,176.28	700,490.16	
First Phoenix MWD Surveys @ 8886' MD											
8,918.00	5.40	202.80	-5,524.76	8,910.76	-239.41	100.31	239.45	17.68	419,175.08	700,488.90	
8,949.00	8.70	184.90	-5,555.53	8,941.53	-243.09	99.55	243.13	12.67	419,171.40	700,488.13	
8,981.00	11.60	177.30	-5,587.02	8,973.02	-248.72	99.49	248.75	9.96	419,165.77	700,488.08	
9,013.00	15.50	178.50	-5,618.13	9,004.13	-256.21	99.76	256.25	12.22	419,158.28	700,488.34	
9,045.00	19.60	178.50	-5,648.63	9,034.63	-265.85	100.01	265.89	12.81	419,148.64	700,488.60	
9,076.00	23.60	179.30	-5,677.45	9,063.45	-277.26	100.22	277.30	12.94	419,137.23	700,488.81	
9,108.00	27.40	182.20	-5,706.33	9,092.33	-291.03	100.02	291.06	12.50	419,123.46	700,488.60	
9,140.00	30.90	185.30	-5,734.27	9,120.27	-306.58	98.97	306.61	11.91	419,107.92	700,487.56	
9,172.00	34.20	187.80	-5,761.24	9,147.24	-323.67	96.99	323.71	11.13	419,090.82	700,485.58	
9,203.00	36.40	187.50	-5,786.54	9,172.54	-341.43	94.61	341.46	7.12	419,073.07	700,483.20	
9,235.00	39.30	186.90	-5,811.81	9,197.81	-360.90	92.15	360.94	9.14	419,053.59	700,480.74	
9,267.00	41.10	186.00	-5,836.25	9,222.25	-381.43	89.84	381.46	5.91	419,033.07	700,478.42	
9,298.00	42.40	185.20	-5,859.38	9,245.38	-401.97	87.82	402.00	4.53	419,012.52	700,476.41	
9,330.00	44.40	183.10	-5,882.63	9,268.63	-423.90	86.24	423.93	7.71	418,990.60	700,474.83	
9,362.00	48.00	183.70	-5,904.77	9,290.77	-446.95	84.87	446.98	11.33	418,967.54	700,473.45	
9,394.00	52.50	185.90	-5,925.23	9,311.23	-471.45	82.79	471.48	15.02	418,943.04	700,471.38	
9,426.00	55.60	188.40	-5,944.01	9,330.01	-497.15	79.56	497.18	11.57	418,917.34	700,468.15	
9,457.00	59.10	188.90	-5,960.74	9,346.74	-522.95	75.63	522.98	11.37	418,891.54	700,464.22	



Chesapeake Energy, Survey Report

CHESAPEAKE

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Site:	PLU Big Sinks 7-25-31 USA 1H	MD Reference:	WELL @ 3386.00usft (Trinidad 111)
Well:	Job #1210774	North Reference:	Grid
Wellbore:	Latshaw 14	Survey Calculation Method:	Minimum Curvature
Design:	Latshaw 14	Database:	Compass5000

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVDSS (usft)	TVD (usft)	N/S (usft)	EW/ (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
9,489.00	62.00	188.90	-5,976.47	9,362.47	-550.48	71.32	550.50	9.06	418,864.02	700,459.91
9,521.00	64.50	189.10	-5,990.87	9,376.87	-578.70	66.85	578.72	7.83	418,835.79	700,455.44
9,552.00	67.50	189.00	-6,003.48	9,389.48	-606.66	62.40	606.68	9.68	418,807.83	700,450.98
9,584.00	70.50	187.90	-6,014.94	9,400.94	-636.21	58.01	636.23	9.91	418,778.28	700,446.60
9,616.00	72.80	186.50	-6,025.02	9,411.02	-666.34	54.21	666.36	8.30	418,748.15	700,442.79
9,648.00	75.40	185.70	-6,033.79	9,419.79	-696.94	50.94	696.96	8.47	418,717.55	700,439.52
9,679.00	78.40	183.90	-6,040.81	9,426.81	-727.02	48.41	727.04	11.21	418,687.47	700,437.00
9,711.00	82.20	182.20	-6,046.20	9,432.20	-758.51	46.74	758.53	12.98	418,655.98	700,435.33
9,743.00	86.30	182.70	-6,049.41	9,435.41	-790.31	45.38	790.33	12.91	418,624.18	700,433.97
9,775.00	90.20	182.40	-6,050.38	9,436.38	-822.26	43.96	822.28	12.22	418,592.23	700,432.54
9,838.00	91.60	182.20	-6,049.39	9,435.39	-885.20	41.43	885.22	2.24	418,529.29	700,430.01
9,934.00	91.60	181.70	-6,046.71	9,432.71	-981.11	38.16	981.12	0.52	418,433.38	700,426.75
10,028.00	91.80	181.70	-6,043.93	9,429.93	-1,075.03	35.37	1,075.04	0.21	418,339.47	700,423.96
10,123.00	91.60	181.60	-6,041.11	9,427.11	-1,169.94	32.64	1,169.96	0.24	418,244.55	700,421.23
10,219.00	91.80	181.70	-6,038.26	9,424.26	-1,265.86	29.88	1,265.87	0.23	418,148.63	700,418.46
10,314.00	91.60	181.70	-6,035.44	9,421.44	-1,360.78	27.06	1,360.79	0.21	418,053.71	700,415.65
10,409.00	90.70	181.70	-6,033.53	9,419.53	-1,455.72	24.24	1,455.72	0.95	417,958.78	700,412.83
10,504.00	90.30	181.40	-6,032.71	9,418.71	-1,550.68	21.67	1,550.69	0.53	417,863.81	700,410.26
10,599.00	89.10	181.20	-6,033.20	9,419.20	-1,645.65	19.52	1,645.66	1.28	417,768.84	700,408.11
10,694.00	90.90	180.20	-6,033.20	9,419.20	-1,740.64	18.36	1,740.64	2.17	417,673.85	700,406.94
10,790.00	90.70	179.50	-6,031.86	9,417.86	-1,836.63	18.61	1,836.63	0.76	417,577.86	700,407.20
10,885.00	90.40	178.40	-6,030.95	9,416.95	-1,931.61	20.35	1,931.61	1.20	417,482.89	700,408.94
10,980.00	90.60	177.90	-6,030.12	9,416.12	-2,026.55	23.42	2,026.56	0.57	417,387.94	700,412.00
11,075.00	90.60	177.70	-6,029.13	9,415.13	-2,121.48	27.06	2,121.49	0.21	417,293.01	700,415.65
11,170.00	90.40	177.20	-6,028.30	9,414.30	-2,216.38	31.29	2,216.39	0.57	417,198.11	700,419.88
11,266.00	90.20	180.10	-6,027.80	9,413.80	-2,312.34	33.55	2,312.35	3.03	417,102.15	700,422.14
11,361.00	89.30	179.10	-6,028.21	9,414.21	-2,407.34	34.21	2,407.35	1.42	417,007.16	700,422.80



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Site:	PLU Big Sinks 7-25-31 USA 1H	MD Reference:	WELL @ 3386.00usft (Trinidad 111)
Well:	Job #1210774	North Reference:	Grid
Wellbore:	Latshaw 14	Survey Calculation Method:	Minimum Curvature
Design:	Latshaw 14	Database:	Compass5000

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVDSS (usft)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
11,456.00	90.40	180.60	-6,028.46	9,414.46	-2,502.33	34.46	2,502.34	1.96	416,912.16	700,423.05
11,551.00	89.60	180.70	-6,028.46	9,414.46	-2,597.32	33.39	2,597.34	0.85	416,817.17	700,421.97
11,646.00	89.10	180.50	-6,029.54	9,415.54	-2,692.31	32.39	2,692.32	0.57	416,722.18	700,420.98
11,741.00	89.30	181.70	-6,030.86	9,416.86	-2,787.28	30.57	2,787.29	1.28	416,627.21	700,419.15
11,836.00	89.60	182.20	-6,031.77	9,417.77	-2,882.22	27.33	2,882.23	0.61	416,532.27	700,415.92
11,931.00	89.10	182.00	-6,032.85	9,418.85	-2,977.15	23.85	2,977.16	0.57	416,437.34	700,412.44
12,027.00	89.80	181.90	-6,033.77	9,419.77	-3,073.09	20.59	3,073.10	0.74	416,341.40	700,409.17
12,122.00	89.40	181.50	-6,034.44	9,420.44	-3,168.05	17.77	3,168.05	0.60	416,246.44	700,406.36
12,217.00	89.70	181.30	-6,035.18	9,421.18	-3,263.02	15.45	3,263.02	0.38	416,151.48	700,404.03
12,313.00	89.20	181.00	-6,036.10	9,422.10	-3,358.99	13.52	3,359.00	0.61	416,055.50	700,402.11
12,408.00	88.00	180.60	-6,038.43	9,424.43	-3,453.95	12.19	3,453.96	1.33	415,960.54	700,400.78
12,504.00	89.00	180.90	-6,040.94	9,426.94	-3,549.91	10.94	3,549.91	1.09	415,864.58	700,399.53
12,599.00	90.40	181.20	-6,041.44	9,427.44	-3,644.89	9.20	3,644.89	1.51	415,769.60	700,397.78
12,695.00	89.80	181.00	-6,041.27	9,427.27	-3,740.87	7.35	3,740.87	0.66	415,673.62	700,395.94
12,790.00	91.10	182.00	-6,040.52	9,426.52	-3,835.83	4.87	3,835.84	1.73	415,578.66	700,393.46
12,886.00	89.30	180.90	-6,040.19	9,426.19	-3,931.80	2.44	3,931.80	2.20	415,482.69	700,391.03
12,981.00	90.00	180.80	-6,040.77	9,426.77	-4,026.78	1.03	4,026.78	0.74	415,387.71	700,389.62
13,077.00	89.40	180.60	-6,041.27	9,427.27	-4,122.78	-0.14	4,122.78	0.66	415,291.72	700,388.44
13,172.00	90.10	180.20	-6,041.68	9,427.68	-4,217.77	-0.81	4,217.77	0.85	415,196.72	700,387.78
13,267.00	89.50	181.30	-6,042.02	9,428.02	-4,312.76	-2.05	4,312.76	1.32	415,101.73	700,386.54
13,362.00	90.00	181.40	-6,042.43	9,428.43	-4,407.73	-4.29	4,407.73	0.54	415,006.76	700,384.30
13,457.00	91.10	181.20	-6,041.52	9,427.52	-4,502.70	-6.44	4,502.70	1.18	414,911.79	700,382.14
13,552.00	88.30	180.40	-6,042.02	9,428.02	-4,597.68	-7.77	4,597.68	3.07	414,816.81	700,380.82
13,647.00	89.80	179.80	-6,043.59	9,429.59	-4,692.67	-7.93	4,692.66	1.70	414,721.83	700,380.65
13,742.00	88.60	178.90	-6,044.92	9,430.92	-4,787.65	-6.86	4,787.64	1.58	414,626.84	700,381.73
13,838.00	90.00	178.60	-6,046.09	9,432.09	-4,883.62	-4.76	4,883.61	1.49	414,530.88	700,383.82
13,933.00	89.80	178.30	-6,046.26	9,432.26	-4,978.58	-2.19	4,978.58	0.38	414,435.91	700,386.39



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Site:	PLU Big Sinks 7-25-31 USA 1H	MD Reference:	WELL @ 3386.00usft (Trinidad 111)
Well:	Job #1210774	North Reference:	Grid
Wellbore:	Latshaw 14	Survey Calculation Method:	Minimum Curvature
Design:	Latshaw 14	Database:	Compass5000

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVDSS (usft)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
13,998.00	89.10	177.30	-6,046.88	9,432.88	-5,043.53	0.30	5,043.53	1.88	414,370.96	700,388.89
Last Phoenix MWD Surveys @ 13998' MD										
14,050.00	89.10	177.30	-6,047.70	9,433.70	-5,095.46	2.75	5,095.46	0.00	414,319.03	700,391.34
Projection to TD @ 14050' MD										

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
8,800.00	8,792.90	-238.80	105.28	Tie on From Gyro Surveys @ 8800' MD
8,886.00	8,878.82	-238.21	101.57	First Phoenix MWD Surveys @ 8886' MD
13,998.00	9,432.88	-5,043.53	0.30	Last Phoenix MWD Surveys @ 13998' MD
14,050.00	9,433.70	-5,095.46	2.75	Projection to TD @ 14050' MD

Checked By: _____	Approved By: _____	Date: _____
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MD	Inc	Az	TVDSS	TVD	N/S	E/W
0	0	0	-3386	0	0 N	0 E
200	0.26	243.62	-3186	200	0.2 S	0.41 W
400	0.3	244.1	-2986	400	0.63 S	1.28 W
600	0.63	196.46	-2786.01	599.99	1.92 S	2.07 W
800	0.7	179.35	-2586.02	799.98	4.19 S	2.36 W
1000	0.51	184.84	-2386.03	999.97	6.3 S	2.43 W
1200	0.28	172.63	-2186.04	1199.96	7.67 S	2.44 W
1400	0.22	155.68	-1986.04	1399.96	8.51 S	2.22 W
1600	0.12	142.16	-1786.04	1599.96	9.02 S	1.93 W
1800	0.39	140.02	-1586.04	1799.96	9.71 S	1.36 W
2000	0.42	149.84	-1386.05	1999.95	10.86 S	0.56 W
2200	0.55	148.51	-1186.06	2199.94	12.32 S	0.31 E
2400	0.63	148.19	-986.07	2399.93	14.07 S	1.39 E
2600	0.5	141.74	-786.08	2599.92	15.69 S	2.51 E
2800	0.36	146.99	-586.08	2799.92	16.9 S	3.39 E
3000	0.34	145.27	-386.09	2999.91	17.92 S	4.07 E
3200	0.71	141.19	-186.09	3199.91	19.37 S	5.19 E
3400	0.89	141.79	13.89	3399.89	21.55 S	6.93 E
3600	1.95	148.49	213.82	3599.82	25.68 S	9.67 E
3800	3.32	152.09	413.61	3799.61	33.7 S	14.16 E
4000	4.03	148.93	613.19	3999.19	44.83 S	20.49 E
4200	3.75	149.94	812.73	4198.73	56.51 S	27.4 E
4400	3.65	148.26	1012.32	4398.32	67.59 S	34.02 E
4600	3.8	149.49	1211.89	4597.89	78.71 S	40.74 E
4800	3.67	141.34	1411.47	4797.47	89.42 S	48.1 E
5000	3.73	143.12	1611.05	4997.05	99.62 S	56 E
5200	3.5	138.64	1810.66	5196.66	109.41 S	63.94 E
5400	3.49	141.52	2010.28	5396.28	118.75 S	71.76 E
5600	3.42	136.06	2209.92	5595.92	127.82 S	79.69 E
5800	3.17	139.35	2409.59	5795.59	136.31 S	87.43 E
6000	3	141.73	2609.3	5995.3	144.61 S	94.27 E
6200	2.82	146.96	2809.04	6195.04	152.84 S	100.2 E
6400	2.82	157.03	3008.8	6394.8	161.5 S	104.8 E
6600	2.8	167.58	3208.56	6594.56	170.8 S	107.77 E
6800	2.45	168.71	3408.35	6794.35	179.76 S	109.66 E
7000	2.48	169.72	3608.17	6994.17	188.21 S	111.27 E
7200	2.61	162.23	3807.97	7193.97	196.81 S	113.43 E
7400	2.63	160.64	4007.76	7393.76	205.47 S	116.34 E
7600	2.55	161.26	4207.56	7593.56	214.01 S	119.29 E
7800	2.39	169.4	4407.37	7793.37	222.33 S	121.49 E
8000	2.1	183.02	4607.22	7993.22	230.08 S	122.06 E
8200	1.05	223.82	4807.15	8193.15	235.07 S	120.6 E
8400	1.19	240.11	5007.11	8393.11	237.42 S	117.53 E
8600	1.73	264.37	5207.04	8593.04	238.75 S	112.73 E
8800	2.54	272.59	5406.9	8792.9	238.8 S	105.28 E
8886	2.5	285.6	5492.82	8878.82	238.21 S	101.57 E

8918	5.4	202.8	5524.76	8910.76	239.41 S	100.31 E
8949	8.7	184.9	5555.53	8941.53	243.09 S	99.55 E
8981	11.6	177.3	5587.02	8973.02	248.72 S	99.49 E
9013	15.5	178.5	5618.13	9004.13	256.21 S	99.76 E
9045	19.6	178.5	5648.63	9034.63	265.85 S	100.01 E
9076	23.6	179.3	5677.45	9063.45	277.26 S	100.22 E
9108	27.4	182.2	5706.33	9092.33	291.03 S	100.02 E
9140	30.9	185.3	5734.27	9120.27	306.58 S	98.97 E
9172	34.2	187.8	5761.24	9147.24	323.67 S	96.99 E
9203	36.4	187.5	5786.54	9172.54	341.43 S	94.61 E
9235	39.3	186.9	5811.81	9197.81	360.9 S	92.15 E
9267	41.1	186	5836.25	9222.25	381.43 S	89.84 E
9298	42.4	185.2	5859.38	9245.38	401.97 S	87.82 E
9330	44.4	183.1	5882.63	9268.63	423.9 S	86.24 E
9362	48	183.7	5904.77	9290.77	446.95 S	84.87 E
9394	52.5	185.9	5925.23	9311.23	471.45 S	82.79 E
9426	55.6	188.4	5944.01	9330.01	497.15 S	79.56 E
9457	59.1	188.9	5960.74	9346.74	522.95 S	75.63 E
9489	62	188.9	5976.47	9362.47	550.48 S	71.32 E
9521	64.5	189.1	5990.87	9376.87	578.7 S	66.85 E
9552	67.5	189	6003.48	9389.48	606.66 S	62.4 E
9584	70.5	187.9	6014.94	9400.94	636.21 S	58.01 E
9616	72.8	186.5	6025.02	9411.02	666.34 S	54.21 E
9648	75.4	185.7	6033.79	9419.79	696.94 S	50.94 E
9679	78.4	183.9	6040.81	9426.81	727.02 S	48.41 E
9711	82.2	182.2	6046.2	9432.2	758.51 S	46.74 E
9743	86.3	182.7	6049.41	9435.41	790.31 S	45.38 E
9775	90.2	182.4	6050.38	9436.38	822.26 S	43.96 E
9838	91.6	182.2	6049.39	9435.39	885.2 S	41.43 E
9934	91.6	181.7	6046.71	9432.71	981.11 S	38.16 E
10028	91.8	181.7	6043.93	9429.93	1075.03 S	35.37 E
10123	91.6	181.6	6041.11	9427.11	1169.94 S	32.64 E
10219	91.8	181.7	6038.26	9424.26	1265.86 S	29.88 E
10314	91.6	181.7	6035.44	9421.44	1360.78 S	27.06 E
10409	90.7	181.7	6033.53	9419.53	1455.72 S	24.24 E
10504	90.3	181.4	6032.71	9418.71	1550.68 S	21.67 E
10599	89.1	181.2	6033.2	9419.2	1645.65 S	19.52 E
10694	90.9	180.2	6033.2	9419.2	1740.64 S	18.36 E
10790	90.7	179.5	6031.86	9417.86	1836.63 S	18.61 E
10885	90.4	178.4	6030.95	9416.95	1931.61 S	20.35 E
10980	90.6	177.9	6030.12	9416.12	2026.55 S	23.42 E
11075	90.6	177.7	6029.13	9415.13	2121.48 S	27.06 E
11170	90.4	177.2	6028.3	9414.3	2216.38 S	31.29 E
11266	90.2	180.1	6027.8	9413.8	2312.34 S	33.55 E
11361	89.3	179.1	6028.21	9414.21	2407.34 S	34.21 E
11456	90.4	180.6	6028.46	9414.46	2502.33 S	34.46 E
11551	89.6	180.7	6028.46	9414.46	2597.32 S	33.39 E

11646	89.1	180.5	6029.54	9415.54	2692.31 S	32.39 E
11741	89.3	181.7	6030.86	9416.86	2787.28 S	30.57 E
11836	89.6	182.2	6031.77	9417.77	2882.22 S	27.33 E
11931	89.1	182	6032.85	9418.85	2977.15 S	23.85 E
12027	89.8	181.9	6033.77	9419.77	3073.09 S	20.59 E
12122	89.4	181.5	6034.44	9420.44	3168.05 S	17.77 E
12217	89.7	181.3	6035.18	9421.18	3263.02 S	15.45 E
12313	89.2	181	6036.1	9422.1	3358.99 S	13.52 E
12408	88	180.6	6038.43	9424.43	3453.95 S	12.19 E
12504	89	180.9	6040.94	9426.94	3549.91 S	10.94 E
12599	90.4	181.2	6041.44	9427.44	3644.89 S	9.2 E
12695	89.8	181	6041.27	9427.27	3740.87 S	7.35 E
12790	91.1	182	6040.52	9426.52	3835.83 S	4.87 E
12886	89.3	180.9	6040.19	9426.19	3931.8 S	2.44 E
12981	90	180.8	6040.77	9426.77	4026.78 S	1.03 E
13077	89.4	180.6	6041.27	9427.27	4122.78 S	0.14 W
13172	90.1	180.2	6041.68	9427.68	4217.77 S	0.81 W
13267	89.5	181.3	6042.02	9428.02	4312.76 S	2.05 W
13362	90	181.4	6042.43	9428.43	4407.73 S	4.29 W
13457	91.1	181.2	6041.52	9427.52	4502.7 S	6.44 W
13552	88.3	180.4	6042.02	9428.02	4597.68 S	7.77 W
13647	89.8	179.8	6043.59	9429.59	4692.67 S	7.93 W
13742	88.6	178.9	6044.92	9430.92	4787.65 S	6.86 W
13838	90	178.6	6046.09	9432.09	4883.62 S	4.76 W
13933	89.8	178.3	6046.26	9432.26	4978.58 S	2.19 W
13998	89.1	177.3	6046.88	9432.88	5043.53 S	0.3 E
14050	89.1	177.3	6047.7	9433.7	5095.46 S	2.75 E

Northing	Easting	V Sec	D Leg
419414.5 N	700388.6 E	0	0
419414.3 N	700388.2 E	0.2	0.13
419413.9 N	700387.3 E	0.63	0.02
419412.6 N	700386.5 E	1.91	0.24
419410.3 N	700386.2 E	4.19	0.1
419408.2 N	700386.2 E	6.3	0.1
419406.8 N	700386.1 E	7.67	0.12
419406 N	700386.4 E	8.51	0.05
419405.5 N	700386.7 E	9.02	0.05
419404.8 N	700387.2 E	9.71	0.14
419403.6 N	700388 E	10.86	0.04
419402.2 N	700388.9 E	12.32	0.07
419400.4 N	700390 E	14.07	0.04
419398.8 N	700391.1 E	15.69	0.07
419397.6 N	700392 E	16.9	0.07
419396.6 N	700392.7 E	17.92	0.01
419395.1 N	700393.8 E	19.37	0.19
419392.9 N	700395.5 E	21.56	0.09
419388.8 N	700398.3 E	25.68	0.54
419380.8 N	700402.7 E	33.7	0.69
419369.7 N	700409.1 E	44.84	0.37
419358 N	700416 E	56.52	0.14
419346.9 N	700422.6 E	67.6	0.07
419335.8 N	700429.3 E	78.73	0.08
419325.1 N	700436.7 E	89.44	0.27
419314.9 N	700444.6 E	99.64	0.06
419305.1 N	700452.5 E	109.43	0.18
419295.7 N	700460.3 E	118.78	0.09
419286.7 N	700468.3 E	127.84	0.17
419278.2 N	700476 E	136.34	0.16
419269.9 N	700482.9 E	144.64	0.11
419261.6 N	700488.8 E	152.88	0.16
419253 N	700493.4 E	161.54	0.25
419243.7 N	700496.4 E	170.84	0.26
419234.7 N	700498.2 E	179.8	0.18
419226.3 N	700499.9 E	188.25	0.03
419217.7 N	700502 E	196.85	0.18
419209 N	700504.9 E	205.51	0.04
419200.5 N	700507.9 E	214.06	0.04
419192.2 N	700510.1 E	222.37	0.19
419184.4 N	700510.6 E	230.13	0.3
419179.4 N	700509.2 E	235.11	0.74
419177.1 N	700506.1 E	237.46	0.17
419175.7 N	700501.3 E	238.79	0.4
419175.7 N	700493.9 E	238.84	0
419176.3 N	700490.2 E	238.24	0.67

419175.1 N	700488.9 E	239.45	17.68
419171.4 N	700488.1 E	243.13	12.67
419165.8 N	700488.1 E	248.75	9.96
419158.3 N	700488.3 E	256.25	12.22
419148.6 N	700488.6 E	265.89	12.81
419137.2 N	700488.8 E	277.3	12.94
419123.5 N	700488.6 E	291.06	12.5
419107.9 N	700487.6 E	306.61	11.91
419090.8 N	700485.6 E	323.71	11.13
419073.1 N	700483.2 E	341.46	7.12
419053.6 N	700480.7 E	360.94	9.14
419033.1 N	700478.4 E	381.46	5.91
419012.5 N	700476.4 E	402	4.53
418990.6 N	700474.8 E	423.93	7.71
418967.5 N	700473.5 E	446.98	11.33
418943 N	700471.4 E	471.48	15.02
418917.3 N	700468.1 E	497.18	11.57
418891.5 N	700464.2 E	522.98	11.37
418864 N	700459.9 E	550.5	9.06
418835.8 N	700455.4 E	578.72	7.83
418807.8 N	700451 E	606.68	9.68
418778.3 N	700446.6 E	636.23	9.91
418748.2 N	700442.8 E	666.36	8.3
418717.6 N	700439.5 E	696.96	8.47
418687.5 N	700437 E	727.04	11.21
418656 N	700435.3 E	758.53	12.98
418624.2 N	700434 E	790.33	12.91
418592.2 N	700432.5 E	822.28	12.22
418529.3 N	700430 E	885.22	2.24
418433.4 N	700426.7 E	981.12	0.52
418339.5 N	700424 E	1075.04	0.21
418244.5 N	700421.2 E	1169.96	0.24
418148.6 N	700418.5 E	1265.87	0.23
418053.7 N	700415.6 E	1360.79	0.21
417958.8 N	700412.8 E	1455.72	0.95
417863.8 N	700410.3 E	1550.69	0.53
417768.8 N	700408.1 E	1645.66	1.28
417673.9 N	700406.9 E	1740.64	2.17
417577.9 N	700407.2 E	1836.63	0.76
417482.9 N	700408.9 E	1931.61	1.2
417387.9 N	700412 E	2026.56	0.57
417293 N	700415.7 E	2121.49	0.21
417198.1 N	700419.9 E	2216.39	0.57
417102.2 N	700422.1 E	2312.35	3.03
417007.2 N	700422.8 E	2407.35	1.42
416912.2 N	700423.1 E	2502.34	1.96
416817.2 N	700422 E	2597.34	0.85

416722.2 N	700421 E	2692.32	0.57
416627.2 N	700419.2 E	2787.29	1.28
416532.3 N	700415.9 E	2882.23	0.61
416437.3 N	700412.4 E	2977.16	0.57
416341.4 N	700409.2 E	3073.1	0.74
416246.4 N	700406.4 E	3168.05	0.6
416151.5 N	700404 E	3263.02	0.38
416055.5 N	700402.1 E	3359	0.61
415960.5 N	700400.8 E	3453.96	1.33
415864.6 N	700399.5 E	3549.91	1.09
415769.6 N	700397.8 E	3644.89	1.51
415673.6 N	700395.9 E	3740.87	0.66
415578.7 N	700393.5 E	3835.84	1.73
415482.7 N	700391 E	3931.8	2.2
415387.7 N	700389.6 E	4026.78	0.74
415291.7 N	700388.4 E	4122.78	0.66
415196.7 N	700387.8 E	4217.77	0.85
415101.7 N	700386.5 E	4312.76	1.32
415006.8 N	700384.3 E	4407.73	0.54
414911.8 N	700382.1 E	4502.7	1.18
414816.8 N	700380.8 E	4597.68	3.07
414721.8 N	700380.7 E	4692.66	1.7
414626.8 N	700381.7 E	4787.64	1.58
414530.9 N	700383.8 E	4883.61	1.49
414435.9 N	700386.4 E	4978.58	0.38
414371 N	700388.9 E	5043.53	1.88
414319 N	700391.3 E	5095.46	0



Chesapeake Operating Inc.

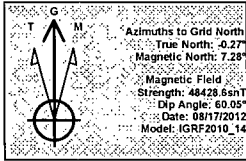
Project: Eddy County, New Mexico (NAD 1983)

Site: PLU Big Sinks 7-25-31 USA 1H

Well: Job #1210774

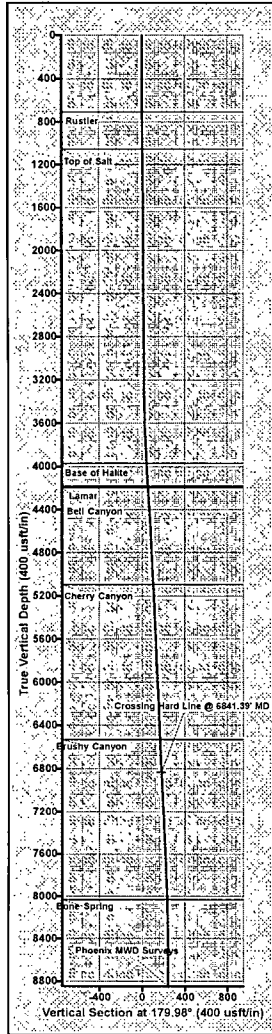
Wellbore: Latshaw 14

Plan: Plan 3 09-12-12



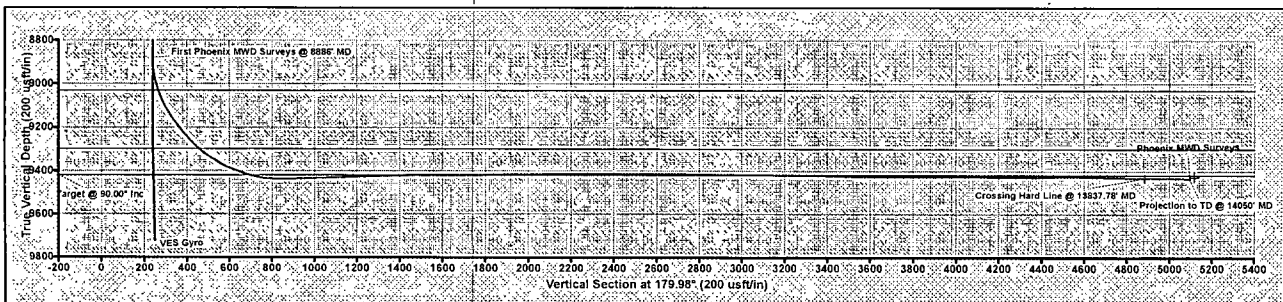
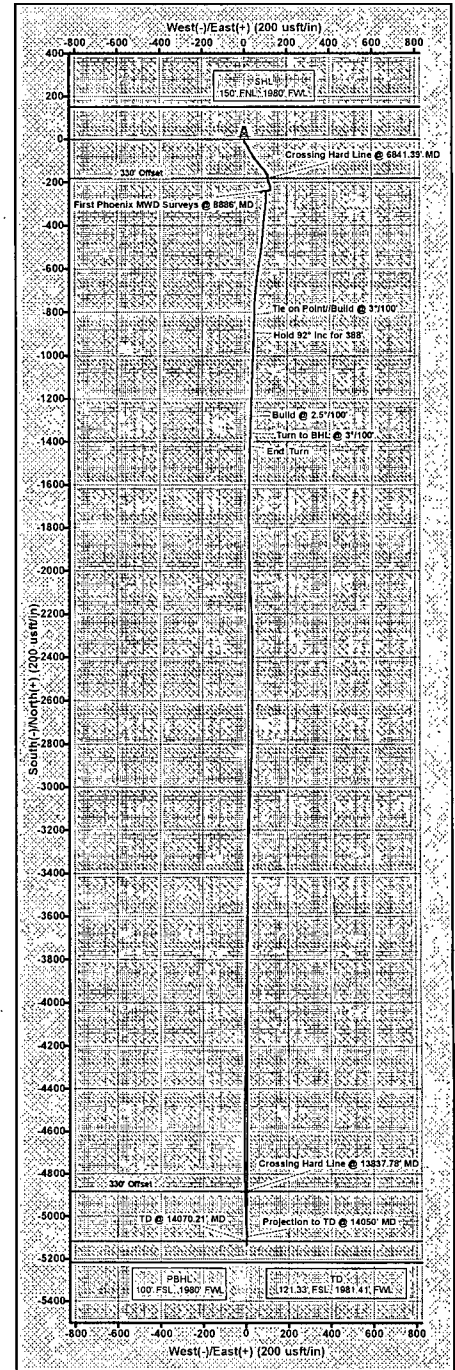
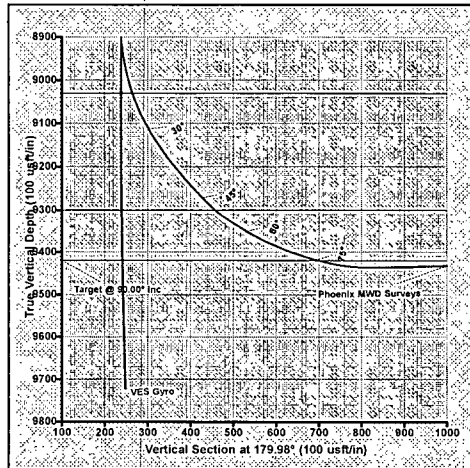
WELL DETAILS: Job #1210774			
Ground Level: 3369.00			
Northings	Easting	Latitude	Longitude
419414.49	700388.59	32° 9' 7.2191 N	103° 49' 9.8360 W

SECTION DETAILS									
MD	Inc	Alt	TVD	N-S	E-W	Deg	TFace	VSec	
9763.00	88.74	182.51	9436.27	810.27	44.47	0.00	0.00	810.29	
9872.62	92.00	182.10	9435.57	819.78	40.06	3.00	7.20	819.79	
10260.62	92.00	182.10	9422.03	1307.29	25.85	0.00	0.00	1307.29	
10376.75	90.00	182.10	9420.00	1423.32	21.60	1.72	180.00	1423.33	
10436.77	90.00	180.30	9420.00	1483.32	20.34	3.00	90.00	1483.33	
14070.28	90.00	180.30	9420.00	5116.79	1.34	0.00	0.00	5116.79	PLU Big Sinks 7-25-31 USA 1H : PBHL



FORMATION TOP DETAILS				
TVDPath	MDPath	Formation	DipAngle	DipDir
8051.00	8041.15	FBS Sand	0.00	179.98
8300.00	8276.06	FBS Shale	0.00	179.98
8420.00	8648.86	Target @ 90.00° Inc	0.00	179.98

ANNOTATIONS		
TVD	MD	Annotation
9436.27	9763.00	Tie on Point/Build @ 3°/100'
9436.31	9846.33	Hold 92° Inc for 388'
9422.94	10234.33	Build @ 2.5°/100'
9420.59	10314.28	Turn to BHL @ 3°/100'
9420.00	10372.89	End Turn
9420.00	14070.00	TD @ 14070.21' MD



MD	Inc	Az	TVDSS	TVD	N/S	E/W
0	0	0	-3386	0	0 N	0 E
200	0.26	243.62	-3186	200	0.2 S	0.41 W
400	0.3	244.1	-2986	400	0.63 S	1.28 W
600	0.63	196.46	-2786.01	599.99	1.92 S	2.07 W
800	0.7	179.35	-2586.02	799.98	4.19 S	2.36 W
1000	0.51	184.84	-2386.03	999.97	6.3 S	2.43 W
1200	0.28	172.63	-2186.04	1199.96	7.67 S	2.44 W
1400	0.22	155.68	-1986.04	1399.96	8.51 S	2.22 W
1600	0.12	142.16	-1786.04	1599.96	9.02 S	1.93 W
1800	0.39	140.02	-1586.04	1799.96	9.71 S	1.36 W
2000	0.42	149.84	-1386.05	1999.95	10.86 S	0.56 W
2200	0.55	148.51	-1186.06	2199.94	12.32 S	0.31 E
2400	0.63	148.19	-986.07	2399.93	14.07 S	1.39 E
2600	0.5	141.74	-786.08	2599.92	15.69 S	2.51 E
2800	0.36	146.99	-586.08	2799.92	16.9 S	3.39 E
3000	0.34	145.27	-386.09	2999.91	17.92 S	4.07 E
3200	0.71	141.19	-186.09	3199.91	19.37 S	5.19 E
3400	0.89	141.79	13.89	3399.89	21.55 S	6.93 E
3600	1.95	148.49	213.82	3599.82	25.68 S	9.67 E
3800	3.32	152.09	413.61	3799.61	33.7 S	14.16 E
4000	4.03	148.93	613.19	3999.19	44.83 S	20.49 E
4200	3.75	149.94	812.73	4198.73	56.51 S	27.4 E
4400	3.65	148.26	1012.32	4398.32	67.59 S	34.02 E
4600	3.8	149.49	1211.89	4597.89	78.71 S	40.74 E
4800	3.67	141.34	1411.47	4797.47	89.42 S	48.1 E
5000	3.73	143.12	1611.05	4997.05	99.62 S	56 E
5200	3.5	138.64	1810.66	5196.66	109.41 S	63.94 E
5400	3.49	141.52	2010.28	5396.28	118.75 S	71.76 E
5600	3.42	136.06	2209.92	5595.92	127.82 S	79.69 E
5800	3.17	139.35	2409.59	5795.59	136.31 S	87.43 E
6000	3	141.73	2609.3	5995.3	144.61 S	94.27 E
6200	2.82	146.96	2809.04	6195.04	152.84 S	100.2 E
6400	2.82	157.03	3008.8	6394.8	161.5 S	104.8 E
6600	2.8	167.58	3208.56	6594.56	170.8 S	107.77 E
6800	2.45	168.71	3408.35	6794.35	179.76 S	109.66 E
7000	2.48	169.72	3608.17	6994.17	188.21 S	111.27 E
7200	2.61	162.23	3807.97	7193.97	196.81 S	113.43 E
7400	2.63	160.64	4007.76	7393.76	205.47 S	116.34 E
7600	2.55	161.26	4207.56	7593.56	214.01 S	119.29 E
7800	2.39	169.4	4407.37	7793.37	222.33 S	121.49 E
8000	2.1	183.02	4607.22	7993.22	230.08 S	122.06 E
8200	1.05	223.82	4807.15	8193.15	235.07 S	120.6 E
8400	1.19	240.11	5007.11	8393.11	237.42 S	117.53 E
8600	1.73	264.37	5207.04	8593.04	238.75 S	112.73 E
8800	2.54	272.59	5406.9	8792.9	238.8 S	105.28 E
8886	2.5	285.6	5492.82	8878.82	238.21 S	101.57 E

8918	5.4	202.8	5524.76	8910.76	239.41 S	100.31 E
8949	8.7	184.9	5555.53	8941.53	243.09 S	99.55 E
8981	11.6	177.3	5587.02	8973.02	248.72 S	99.49 E
9013	15.5	178.5	5618.13	9004.13	256.21 S	99.76 E
9045	19.6	178.5	5648.63	9034.63	265.85 S	100.01 E
9076	23.6	179.3	5677.45	9063.45	277.26 S	100.22 E
9108	27.4	182.2	5706.33	9092.33	291.03 S	100.02 E
9140	30.9	185.3	5734.27	9120.27	306.58 S	98.97 E
9172	34.2	187.8	5761.24	9147.24	323.67 S	96.99 E
9203	36.4	187.5	5786.54	9172.54	341.43 S	94.61 E
9235	39.3	186.9	5811.81	9197.81	360.9 S	92.15 E
9267	41.1	186	5836.25	9222.25	381.43 S	89.84 E
9298	42.4	185.2	5859.38	9245.38	401.97 S	87.82 E
9330	44.4	183.1	5882.63	9268.63	423.9 S	86.24 E
9362	48	183.7	5904.77	9290.77	446.95 S	84.87 E
9394	52.5	185.9	5925.23	9311.23	471.45 S	82.79 E
9426	55.6	188.4	5944.01	9330.01	497.15 S	79.56 E
9457	59.1	188.9	5960.74	9346.74	522.95 S	75.63 E
9489	62	188.9	5976.47	9362.47	550.48 S	71.32 E
9521	64.5	189.1	5990.87	9376.87	578.7 S	66.85 E
9552	67.5	189	6003.48	9389.48	606.66 S	62.4 E
9584	70.5	187.9	6014.94	9400.94	636.21 S	58.01 E
9616	72.8	186.5	6025.02	9411.02	666.34 S	54.21 E
9648	75.4	185.7	6033.79	9419.79	696.94 S	50.94 E
9679	78.4	183.9	6040.81	9426.81	727.02 S	48.41 E
9711	82.2	182.2	6046.2	9432.2	758.51 S	46.74 E
9743	86.3	182.7	6049.41	9435.41	790.31 S	45.38 E
9775	90.2	182.4	6050.38	9436.38	822.26 S	43.96 E
9838	91.6	182.2	6049.39	9435.39	885.2 S	41.43 E
9934	91.6	181.7	6046.71	9432.71	981.11 S	38.16 E
10028	91.8	181.7	6043.93	9429.93	1075.03 S	35.37 E
10123	91.6	181.6	6041.11	9427.11	1169.94 S	32.64 E
10219	91.8	181.7	6038.26	9424.26	1265.86 S	29.88 E
10314	91.6	181.7	6035.44	9421.44	1360.78 S	27.06 E
10409	90.7	181.7	6033.53	9419.53	1455.72 S	24.24 E
10504	90.3	181.4	6032.71	9418.71	1550.68 S	21.67 E
10599	89.1	181.2	6033.2	9419.2	1645.65 S	19.52 E
10694	90.9	180.2	6033.2	9419.2	1740.64 S	18.36 E
10790	90.7	179.5	6031.86	9417.86	1836.63 S	18.61 E
10885	90.4	178.4	6030.95	9416.95	1931.61 S	20.35 E
10980	90.6	177.9	6030.12	9416.12	2026.55 S	23.42 E
11075	90.6	177.7	6029.13	9415.13	2121.48 S	27.06 E
11170	90.4	177.2	6028.3	9414.3	2216.38 S	31.29 E
11266	90.2	180.1	6027.8	9413.8	2312.34 S	33.55 E
11361	89.3	179.1	6028.21	9414.21	2407.34 S	34.21 E
11456	90.4	180.6	6028.46	9414.46	2502.33 S	34.46 E
11551	89.6	180.7	6028.46	9414.46	2597.32 S	33.39 E

11646	89.1	180.5	6029.54	9415.54	2692.31 S	32.39 E
11741	89.3	181.7	6030.86	9416.86	2787.28 S	30.57 E
11836	89.6	182.2	6031.77	9417.77	2882.22 S	27.33 E
11931	89.1	182	6032.85	9418.85	2977.15 S	23.85 E
12027	89.8	181.9	6033.77	9419.77	3073.09 S	20.59 E
12122	89.4	181.5	6034.44	9420.44	3168.05 S	17.77 E
12217	89.7	181.3	6035.18	9421.18	3263.02 S	15.45 E
12313	89.2	181	6036.1	9422.1	3358.99 S	13.52 E
12408	88	180.6	6038.43	9424.43	3453.95 S	12.19 E
12504	89	180.9	6040.94	9426.94	3549.91 S	10.94 E
12599	90.4	181.2	6041.44	9427.44	3644.89 S	9.2 E
12695	89.8	181	6041.27	9427.27	3740.87 S	7.35 E
12790	91.1	182	6040.52	9426.52	3835.83 S	4.87 E
12886	89.3	180.9	6040.19	9426.19	3931.8 S	2.44 E
12981	90	180.8	6040.77	9426.77	4026.78 S	1.03 E
13077	89.4	180.6	6041.27	9427.27	4122.78 S	0.14 W
13172	90.1	180.2	6041.68	9427.68	4217.77 S	0.81 W
13267	89.5	181.3	6042.02	9428.02	4312.76 S	2.05 W
13362	90	181.4	6042.43	9428.43	4407.73 S	4.29 W
13457	91.1	181.2	6041.52	9427.52	4502.7 S	6.44 W
13552	88.3	180.4	6042.02	9428.02	4597.68 S	7.77 W
13647	89.8	179.8	6043.59	9429.59	4692.67 S	7.93 W
13742	88.6	178.9	6044.92	9430.92	4787.65 S	6.86 W
13838	90	178.6	6046.09	9432.09	4883.62 S	4.76 W
13933	89.8	178.3	6046.26	9432.26	4978.58 S	2.19 W
13998	89.1	177.3	6046.88	9432.88	5043.53 S	0.3 E
14050	89.1	177.3	6047.7	9433.7	5095.46 S	2.75 E

Northing	Easting	V Sec	D Leg
419414.5 N	700388.6 E	0	0
419414.3 N	700388.2 E	0.2	0.13
419413.9 N	700387.3 E	0.63	0.02
419412.6 N	700386.5 E	1.91	0.24
419410.3 N	700386.2 E	4.19	0.1
419408.2 N	700386.2 E	6.3	0.1
419406.8 N	700386.1 E	7.67	0.12
419406 N	700386.4 E	8.51	0.05
419405.5 N	700386.7 E	9.02	0.05
419404.8 N	700387.2 E	9.71	0.14
419403.6 N	700388 E	10.86	0.04
419402.2 N	700388.9 E	12.32	0.07
419400.4 N	700390 E	14.07	0.04
419398.8 N	700391.1 E	15.69	0.07
419397.6 N	700392 E	16.9	0.07
419396.6 N	700392.7 E	17.92	0.01
419395.1 N	700393.8 E	19.37	0.19
419392.9 N	700395.5 E	21.56	0.09
419388.8 N	700398.3 E	25.68	0.54
419380.8 N	700402.7 E	33.7	0.69
419369.7 N	700409.1 E	44.84	0.37
419358 N	700416 E	56.52	0.14
419346.9 N	700422.6 E	67.6	0.07
419335.8 N	700429.3 E	78.73	0.08
419325.1 N	700436.7 E	89.44	0.27
419314.9 N	700444.6 E	99.64	0.06
419305.1 N	700452.5 E	109.43	0.18
419295.7 N	700460.3 E	118.78	0.09
419286.7 N	700468.3 E	127.84	0.17
419278.2 N	700476 E	136.34	0.16
419269.9 N	700482.9 E	144.64	0.11
419261.6 N	700488.8 E	152.88	0.16
419253 N	700493.4 E	161.54	0.25
419243.7 N	700496.4 E	170.84	0.26
419234.7 N	700498.2 E	179.8	0.18
419226.3 N	700499.9 E	188.25	0.03
419217.7 N	700502 E	196.85	0.18
419209 N	700504.9 E	205.51	0.04
419200.5 N	700507.9 E	214.06	0.04
419192.2 N	700510.1 E	222.37	0.19
419184.4 N	700510.6 E	230.13	0.3
419179.4 N	700509.2 E	235.11	0.74
419177.1 N	700506.1 E	237.46	0.17
419175.7 N	700501.3 E	238.79	0.4
419175.7 N	700493.9 E	238.84	0
419176.3 N	700490.2 E	238.24	0.67

419175.1 N	700488.9 E	239.45	17.68
419171.4 N	700488.1 E	243.13	12.67
419165.8 N	700488.1 E	248.75	9.96
419158.3 N	700488.3 E	256.25	12.22
419148.6 N	700488.6 E	265.89	12.81
419137.2 N	700488.8 E	277.3	12.94
419123.5 N	700488.6 E	291.06	12.5
419107.9 N	700487.6 E	306.61	11.91
419090.8 N	700485.6 E	323.71	11.13
419073.1 N	700483.2 E	341.46	7.12
419053.6 N	700480.7 E	360.94	9.14
419033.1 N	700478.4 E	381.46	5.91
419012.5 N	700476.4 E	402	4.53
418990.6 N	700474.8 E	423.93	7.71
418967.5 N	700473.5 E	446.98	11.33
418943 N	700471.4 E	471.48	15.02
418917.3 N	700468.1 E	497.18	11.57
418891.5 N	700464.2 E	522.98	11.37
418864 N	700459.9 E	550.5	9.06
418835.8 N	700455.4 E	578.72	7.83
418807.8 N	700451 E	606.68	9.68
418778.3 N	700446.6 E	636.23	9.91
418748.2 N	700442.8 E	666.36	8.3
418717.6 N	700439.5 E	696.96	8.47
418687.5 N	700437 E	727.04	11.21
418656 N	700435.3 E	758.53	12.98
418624.2 N	700434 E	790.33	12.91
418592.2 N	700432.5 E	822.28	12.22
418529.3 N	700430 E	885.22	2.24
418433.4 N	700426.7 E	981.12	0.52
418339.5 N	700424 E	1075.04	0.21
418244.5 N	700421.2 E	1169.96	0.24
418148.6 N	700418.5 E	1265.87	0.23
418053.7 N	700415.6 E	1360.79	0.21
417958.8 N	700412.8 E	1455.72	0.95
417863.8 N	700410.3 E	1550.69	0.53
417768.8 N	700408.1 E	1645.66	1.28
417673.9 N	700406.9 E	1740.64	2.17
417577.9 N	700407.2 E	1836.63	0.76
417482.9 N	700408.9 E	1931.61	1.2
417387.9 N	700412 E	2026.56	0.57
417293 N	700415.7 E	2121.49	0.21
417198.1 N	700419.9 E	2216.39	0.57
417102.2 N	700422.1 E	2312.35	3.03
417007.2 N	700422.8 E	2407.35	1.42
416912.2 N	700423.1 E	2502.34	1.96
416817.2 N	700422 E	2597.34	0.85

416722.2 N	700421 E	2692.32	0.57
416627.2 N	700419.2 E	2787.29	1.28
416532.3 N	700415.9 E	2882.23	0.61
416437.3 N	700412.4 E	2977.16	0.57
416341.4 N	700409.2 E	3073.1	0.74
416246.4 N	700406.4 E	3168.05	0.6
416151.5 N	700404 E	3263.02	0.38
416055.5 N	700402.1 E	3359	0.61
415960.5 N	700400.8 E	3453.96	1.33
415864.6 N	700399.5 E	3549.91	1.09
415769.6 N	700397.8 E	3644.89	1.51
415673.6 N	700395.9 E	3740.87	0.66
415578.7 N	700393.5 E	3835.84	1.73
415482.7 N	700391 E	3931.8	2.2
415387.7 N	700389.6 E	4026.78	0.74
415291.7 N	700388.4 E	4122.78	0.66
415196.7 N	700387.8 E	4217.77	0.85
415101.7 N	700386.5 E	4312.76	1.32
415006.8 N	700384.3 E	4407.73	0.54
414911.8 N	700382.1 E	4502.7	1.18
414816.8 N	700380.8 E	4597.68	3.07
414721.8 N	700380.7 E	4692.66	1.7
414626.8 N	700381.7 E	4787.64	1.58
414530.9 N	700383.8 E	4883.61	1.49
414435.9 N	700386.4 E	4978.58	0.38
414371 N	700388.9 E	5043.53	1.88
414319 N	700391.3 E	5095.46	0

PLU Big Sinks 7-25-31 USA 1H Final Surveys txt.txt

Chesapeake Operating Inc.
Job #1210774 - Phoenix MWD Surveys

Eddy County, New Mexico (NAD 1983)
PLU Big Sinks 7-25-31 USA 1H
Your Ref:

Measured UTM Coordinates			Sub-Sea Vertical	Vertical Dogleg	Local Coordinates	
Depth	Incl.	Azim.	Depth	Depth	Northings	Eastings
Northings		Eastings	Section	Rate		
(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
(ft)		(ft)	(ft)	(°/100ft)		
8800.00	2.540	272.590	5406.90	8792.90	238.80 S	105.28 E
419175.692 N	700493.867 E		238.84	0.00		
8886.00	2.500	285.600	5492.82	8878.82	238.21 S	101.57 E
419176.283 N	700490.157 E		238.24	0.67		
8918.00	5.400	202.800	5524.76	8910.76	239.41 S	100.31 E
419175.081 N	700488.900 E		239.45	17.68		
8949.00	8.700	184.900	5555.53	8941.53	243.09 S	99.55 E
419171.399 N	700488.134 E		243.13	12.67		
8981.00	11.600	177.300	5587.02	8973.02	248.72 S	99.49 E
419165.773 N	700488.079 E		248.75	9.96		
9013.00	15.500	178.500	5618.13	9004.13	256.21 S	99.76 E
419158.282 N	700488.343 E		256.25	12.22		
9045.00	19.600	178.500	5648.63	9034.63	265.85 S	100.01 E
419148.638 N	700488.595 E		265.89	12.81		
9076.00	23.600	179.300	5677.45	9063.45	277.26 S	100.22 E
419137.230 N	700488.807 E		277.30	12.94		
9108.00	27.400	182.200	5706.33	9092.33	291.03 S	100.02 E
419123.462 N	700488.603 E		291.06	12.50		
9140.00	30.900	185.300	5734.27	9120.27	306.58 S	98.97 E
419107.917 N	700487.561 E		306.61	11.91		
9172.00	34.200	187.800	5761.24	9147.24	323.67 S	96.99 E
419090.820 N	700485.580 E		323.71	11.13		
9203.00	36.400	187.500	5786.54	9172.54	341.43 S	94.61 E
419073.067 N	700483.197 E		341.46	7.12		
9235.00	39.300	186.900	5811.81	9197.81	360.90 S	92.15 E
419053.588 N	700480.740 E		360.94	9.14		
9267.00	41.100	186.000	5836.25	9222.25	381.43 S	89.84 E
419033.065 N	700478.423 E		381.46	5.91		
9298.00	42.400	185.200	5859.38	9245.38	401.97 S	87.82 E
419012.522 N	700476.410 E		402.00	4.53		
9330.00	44.400	183.100	5882.63	9268.63	423.90 S	86.24 E
418990.596 N	700474.827 E		423.93	7.71		
9362.00	48.000	183.700	5904.77	9290.77	446.95 S	84.87 E
418967.545 N	700473.454 E		446.98	11.33		
9394.00	52.500	185.900	5925.23	9311.23	471.45 S	82.79 E
418943.038 N	700471.380 E		471.48	15.02		
9426.00	55.600	188.400	5944.01	9330.01	497.15 S	79.56 E
418917.343 N	700468.146 E		497.18	11.57		
9457.00	59.100	188.900	5960.74	9346.74	522.95 S	75.63 E
418891.543 N	700464.219 E		522.98	11.37		
9489.00	62.000	188.900	5976.47	9362.47	550.48 S	71.32 E
418864.016 N	700459.908 E		550.50	9.06		
9521.00	64.500	189.100	5990.87	9376.87	578.70 S	66.85 E
418835.795 N	700455.438 E		578.72	7.83		
9552.00	67.500	189.000	6003.48	9389.48	606.66 S	62.40 E
418807.831 N	700450.984 E		606.68	9.68		
9584.00	70.500	187.900	6014.94	9400.94	636.21 S	58.01 E

PLU Big Sinks		7-25-31	USA 1H Final Surveys txt.txt		
418778.284	N 700446.597 E	636.23	9.91		
9616.00	72.800 186.500	6025.02	9411.02	666.34 S	54.21 E
418748.153	N 700442.794 E	666.36	8.30		
9648.00	75.400 185.700	6033.79	9419.79	696.94 S	50.94 E
418717.554	N 700439.525 E	696.96	8.47		
9679.00	78.400 183.900	6040.81	9426.81	727.02 S	48.41 E
418687.472	N 700437.002 E	727.04	11.21		
9711.00	82.200 182.200	6046.20	9432.20	758.51 S	46.74 E
418655.981	N 700435.326 E	758.53	12.98		
9743.00	86.300 182.700	6049.41	9435.41	790.31 S	45.38 E
418624.178	N 700433.965 E	790.33	12.91		
9775.00	90.200 182.400	6050.38	9436.38	822.26 S	43.96 E
418592.230	N 700432.542 E	822.28	12.22		
9838.00	91.600 182.200	6049.39	9435.39	885.20 S	41.43 E
418529.291	N 700430.015 E	885.22	2.24		
9934.00	91.600 181.700	6046.71	9432.71	981.11 S	38.16 E
418433.384	N 700426.749 E	981.12	0.52		
10028.00	91.800 181.700	6043.93	9429.93	1075.03 S	35.37 E
418339.467	N 700423.962 E	1075.04	0.21		
10123.00	91.600 181.600	6041.11	9427.11	1169.94 S	32.64 E
418244.548	N 700421.228 E	1169.96	0.24		
10219.00	91.800 181.700	6038.26	9424.26	1265.86 S	29.88 E
418148.630	N 700418.465 E	1265.87	0.23		
10314.00	91.600 181.700	6035.44	9421.44	1360.78 S	27.06 E
418053.714	N 700415.648 E	1360.79	0.21		
10409.00	90.700 181.700	6033.53	9419.53	1455.72 S	24.24 E
417958.776	N 700412.830 E	1455.72	0.95		
10504.00	90.300 181.400	6032.71	9418.71	1550.68 S	21.67 E
417863.814	N 700410.260 E	1550.69	0.53		
10599.00	89.100 181.200	6033.20	9419.20	1645.65 S	19.52 E
417768.842	N 700408.105 E	1645.66	1.28		
10694.00	90.900 180.200	6033.20	9419.20	1740.64 S	18.36 E
417673.854	N 700406.944 E	1740.64	2.17		
10790.00	90.700 179.500	6031.86	9417.86	1836.63 S	18.61 E
417577.864	N 700407.196 E	1836.63	0.76		
10885.00	90.400 178.400	6030.95	9416.95	1931.61 S	20.35 E
417482.886	N 700408.937 E	1931.61	1.20		
10980.00	90.600 177.900	6030.12	9416.12	2026.55 S	23.42 E
417387.940	N 700412.003 E	2026.56	0.57		
11075.00	90.600 177.700	6029.13	9415.13	2121.48 S	27.06 E
417293.015	N 700415.650 E	2121.49	0.21		
11170.00	90.400 177.200	6028.30	9414.30	2216.38 S	31.29 E
417198.113	N 700419.876 E	2216.39	0.57		
11266.00	90.200 180.100	6027.80	9413.80	2312.34 S	33.55 E
417102.151	N 700422.138 E	2312.35	3.03		
11361.00	89.300 179.100	6028.21	9414.21	2407.34 S	34.21 E
417007.157	N 700422.801 E	2407.35	1.42		
11456.00	90.400 180.600	6028.46	9414.46	2502.33 S	34.46 E
416912.161	N 700423.050 E	2502.34	1.96		
11551.00	89.600 180.700	6028.46	9414.46	2597.32 S	33.39 E
416817.168	N 700421.972 E	2597.34	0.85		
11646.00	89.100 180.500	6029.54	9415.54	2692.31 S	32.39 E
416722.180	N 700420.977 E	2692.32	0.57		
11741.00	89.300 181.700	6030.86	9416.86	2787.28 S	30.57 E
416627.209	N 700419.154 E	2787.29	1.28		
11836.00	89.600 182.200	6031.77	9417.77	2882.22 S	27.33 E
416532.268	N 700415.921 E	2882.23	0.61		
11931.00	89.100 182.000	6032.85	9418.85	2977.15 S	23.85 E
416437.339	N 700412.440 E	2977.16	0.57		
12027.00	89.800 181.900	6033.77	9419.77	3073.09 S	20.59 E
416341.399	N 700409.174 E	3073.10	0.74		
12122.00	89.400 181.500	6034.44	9420.44	3168.05 S	17.77 E
416246.444	N 700406.356 E	3168.05	0.60		

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12217.00	89.700	181.300	6035.18 9421.18 3263.02 S 15.45 E
416151.475	N	700404.035 E	3263.02 0.38
12313.00	89.200	181.000	6036.10 9422.10 3358.99 S 13.52 E
416055.499	N	700402.108 E	3359.00 0.61
12408.00	88.000	180.600	6038.43 9424.43 3453.95 S 12.19 E
415960.539	N	700400.782 E	3453.96 1.33
12504.00	89.000	180.900	6040.94 9426.94 3549.91 S 10.94 E
415864.581	N	700399.526 E	3549.91 1.09
12599.00	90.400	181.200	6041.44 9427.44 3644.89 S 9.20 E
415769.601	N	700397.785 E	3644.89 1.51
12695.00	89.800	181.000	6041.27 9427.27 3740.87 S 7.35 E
415673.619	N	700395.942 E	3740.87 0.66
12790.00	91.100	182.000	6040.52 9426.52 3835.83 S 4.87 E
415578.658	N	700393.455 E	3835.84 1.73
12886.00	89.300	180.900	6040.19 9426.19 3931.80 S 2.44 E
415482.695	N	700391.026 E	3931.80 2.20
12981.00	90.000	180.800	6040.77 9426.77 4026.78 S 1.03 E
415387.708	N	700389.617 E	4026.78 0.74
13077.00	89.400	180.600	6041.27 9427.27 4122.78 S 0.14 W
415291.717	N	700388.444 E	4122.78 0.66
13172.00	90.100	180.200	6041.68 9427.68 4217.77 S 0.81 W
415196.721	N	700387.781 E	4217.77 0.85
13267.00	89.500	181.300	6042.02 9428.02 4312.76 S 2.05 W
415101.731	N	700386.538 E	4312.76 1.32
13362.00	90.000	181.400	6042.43 9428.43 4407.73 S 4.29 W
415006.759	N	700384.299 E	4407.73 0.54
13457.00	91.100	181.200	6041.52 9427.52 4502.70 S 6.44 W
414911.789	N	700382.144 E	4502.70 1.18
13552.00	88.300	180.400	6042.02 9428.02 4597.68 S 7.77 W
414816.810	N	700380.818 E	4597.68 3.07
13647.00	89.800	179.800	6043.59 9429.59 4692.67 S 7.93 W
414721.826	N	700380.652 E	4692.66 1.70
13742.00	88.600	178.900	6044.92 9430.92 4787.65 S 6.86 W
414626.844	N	700381.730 E	4787.64 1.58
13838.00	90.000	178.600	6046.09 9432.09 4883.62 S 4.76 W
414530.877	N	700383.824 E	4883.61 1.49
13933.00	89.800	178.300	6046.26 9432.26 4978.58 S 2.19 W
414435.912	N	700386.394 E	4978.58 0.38
13998.00	89.100	177.300	6046.88 9432.88 5043.53 S 0.30 E
414370.964	N	700388.889 E	5043.53 1.88
14050.00	89.100	177.300	6047.70 9433.70 5095.46 S 2.75 E
414319.028	N	700391.338 E	5095.46 0.00

All data are in feet unless otherwise stated. Directions and coordinates are relative to Grid North.
Vertical depths are relative to WELL. Northings and Eastings are relative to well.

The Dogleg Severity is in Degrees per 100 feet.
Vertical Section is from Slot and calculated along an Azimuth of 179.980° (Grid).

Coordinate System is North American Datum 1983 US State Plane 1983, New Mexico Eastern Zone.
Grid Convergence at Surface is 0.274°.

Based upon Minimum Curvature type calculations, at a Measured Depth of 14050.00ft., the Bottom Hole Displacement is 5095.46ft., in the Direction of 179.980° (Grid).



Chesapeake Operating Inc.

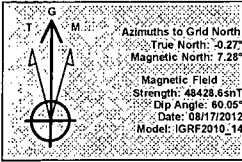
Project: Eddy County, New Mexico (NAD 1983)

Site: PLU Big Sinks 7-25-31 USA 1H

Well: Job #1210774

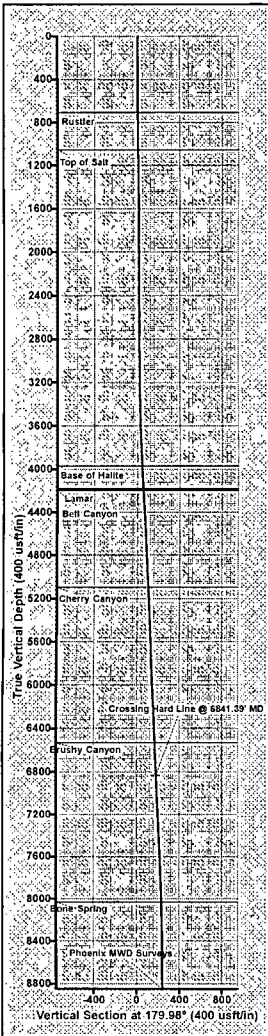
Wellbore: Latshaw 14

Plan: Plan 3 09-12-12



WELL DETAILS: Job #1210774			
Northing	Easting	Latitude	Longitude
419414.49	700388.59	32° 9' 7.2191 N	103° 49' 9.8360 W

SECTION DETAILS											
MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VFace			
9763.00	88.74	182.51	9436.27	-810.27	44.47	0.00	0.00	810.29			
9872.62	92.00	182.10	9435.57	-819.78	40.06	0.00	7.20	919.79			
10250.62	92.00	182.10	9422.03	-1307.29	25.85	0.00	0.00	1307.29			
10376.75	90.00	182.10	9420.00	-1423.32	21.60	1.72	-180.00	1423.33			
10436.77	90.00	180.30	9420.00	-1483.32	20.34	3.00	-90.00	1483.33			
14070.28	90.00	180.30	9420.00	-5116.79	1.34	0.00	0.00	5116.79	PLU Big Sinks 7-25-31 USA 1H	PBHL	



FORMATION TOP DETAILS				
TVDPath	MDPath	Formation	DipAngle	DipDir
9031.00	9041.15	FBS Sand	0.00	179.98
9300.00	9376.04	FBS	0.00	179.98
9420.00	9468.86	Target @ 90.00° Inc	0.00	179.98

ANNOTATIONS		
TVD	MD	Annotation
9436.27	9763.00	Tie on Point/Build @ 3°/100'
9436.31	9846.33	Hold 92° Inc for 388'
9422.94	10234.33	Build @ 2.5°/100'
9420.59	10314.28	Turn to BHL @ 3°/100'
9420.00	10372.89	End Turn
9420.00	14070.00	TD @ 14070.21' MD

