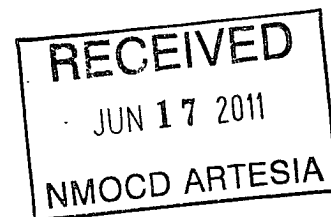


30-D15-3831R



Ryan Energy Directional Drilling Report

Field: Eddy Co, NM NAD 83
Site: PLU Big Sinks 27 Federal 1H
Well: PLU Big Sinks 27 Federal 1H
Wellpath: 27 Fed 1H ST1

Prepared For:

Chesapeake Operating, Inc.



Ryan Energy Technology

19510 Oil Center Blvd
Houston, TX 77073
Ph: 281-443-1414
Fx: 281-443-1676

www.ryanenergy.com



Chesapeake Operating, Inc.

Field: Eddy Co, NM NAD 83
 Site: PLU Big Sinks 27 Federal 1H
 Well: PLU Big Sinks 27 Federal 1H
 Wellpath: 27 Fed 1H ST1



Azimuths to Grid North
 True North: -0.25°
 Magnetic North: 7.51°
 Magnetic Field
 Strength: 48624nT
 Dip Angle: 60.11°
 Date: 12/1/2011
 Model: IGRF2010

TARGET DETAILS

Name	TVD	N/S	E/W	Northing	Easting	Latitude	Longitude	Shape
PBHL	9079.39	4724.38	-28.88	435073.10	687260.49	32°11'42.760N	103°51'41.762W	Point

FIELD DETAILS

Eddy Co, NM NAD 83
 USA

Geodetic System: US State Plane Coordinate System 1983
 Ellipsoid: GRS 1980
 Zone: New Mexico, Eastern Zone
 Magnetic Model: IGRF2010
 System Datum: Mean Sea Level
 Local North: Grid North

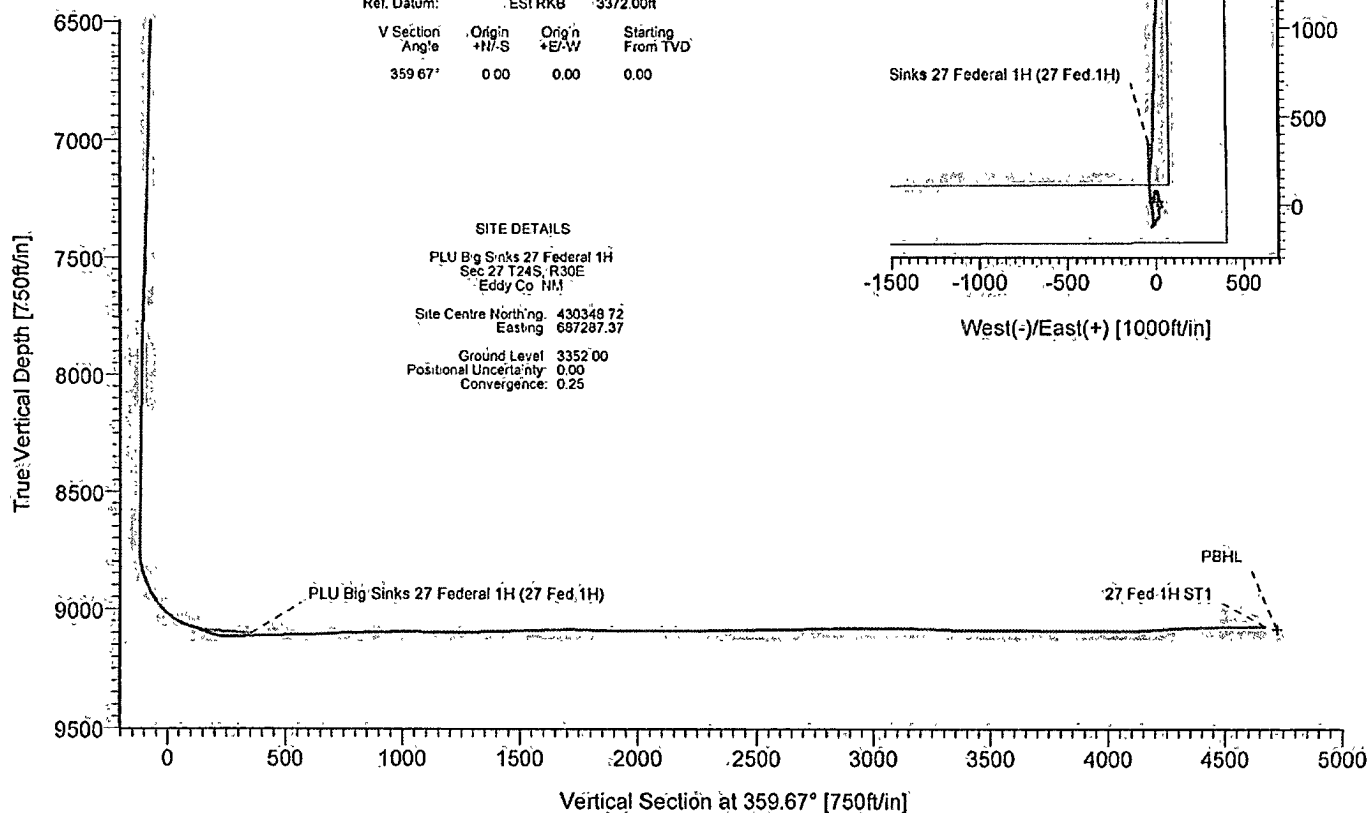
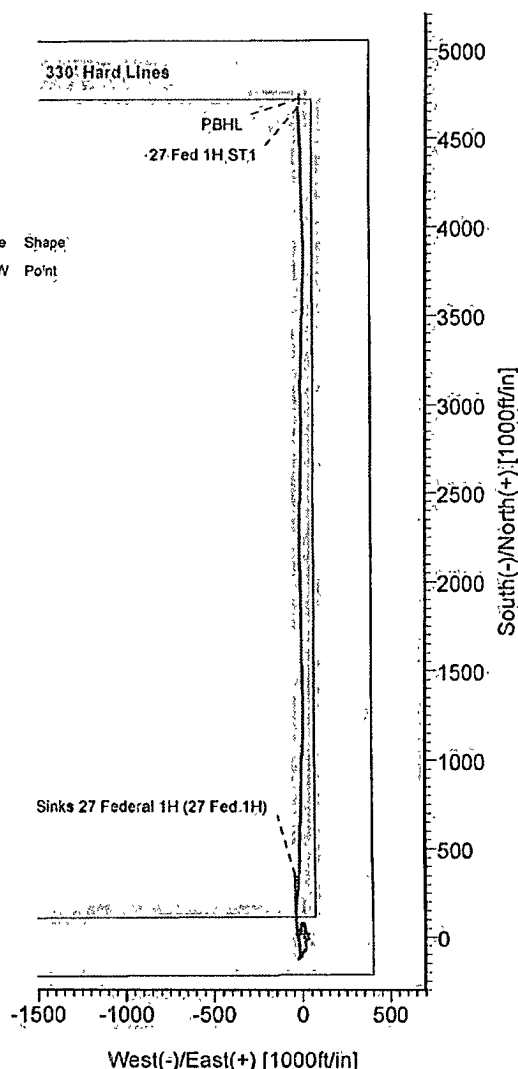
WELLPATH DETAILS

27 Fed 1H ST1

Rig:	ESRKB	3372.00ft
Ref. Datum:		
V Section	Origin	Origin
Angle	N/S	E/W
359.67°	0.00	0.00
	Starting	From TVD

SITE DETAILS

PLU Big Sinks 27 Federal 1H
 Sec 27 T24S, R30E
 Eddy Co, NM
 Site Centre Northing: 430348.72
 Easting: 687287.37
 Ground Level: 3352.00
 Positional Uncertainty: 0.00
 Convergence: 0.25





Ryan Energy Technologies Survey Report



Company: Chesapeake Operating, Inc.	Date: 2/15/2011	Time: 15:12:54	Page: 1
Field: Eddy Co, NM NAD 83	Co-ordinate(NE) Reference:	Site: PLU Big Sinks 27 Federal 1H	
Site: PLU Big Sinks 27 Federal 1H	Vertical (TYD) Reference:	ESI RKB 3372.0	
Well: PLU Big Sinks 27 Federal 1H	Section (VS) Reference:	Well (0.00N, 0.00E, 359.67Az)	
Wellpath: 27 Fed 1H	Survey Calculation Method:	Minimum Curvature	Db: Sybase

Field: Eddy Co, NM NAD 83	
USA	
Map System: US State Plane, Coordinate System 1983	Map Zone: New Mexico, Eastern Zone
Geo Datum: GRS 1980	Coordinate System: Site Centre
Sys Datum: Mean Sea Level	Geomagnetic Model: IGRF2010

Site: PLU Big Sinks 27 Federal 1H Sec 27 T24S, R30E Eddy Co, NM		
Site Position:	Northing: 430348.72 ft	Latitude: 32 10 56.007 N
From: Map	Easting: 687287.37 ft	Longitude: 103 51 41.690 W
Position Uncertainty: 0.00 ft		North Reference: Grid
Ground Level: 3352.00 ft		Grid Convergence: 0.25 deg

Well: PLU Big Sinks 27 Federal 1H	Slot Name:	
Well Position: +N/-S 0.00 ft	Northing: 430348.72 ft	Latitude: 32 10 56.007 N
+E/-W 0.00 ft	Easting: 687287.37 ft	Longitude: 103 51 41.690 W
Position Uncertainty: 0.00 ft		

Wellpath: 27 Fed 1H	Drilled From: Surface		
Current Datum: ESI RKB	Tie-on Depth: 0.00 ft		
Magnetic Data: 1/11/2011	Above System Datum: Mean Sea Level		
Field Strength: 48627 nT	Declination: 7.77 deg		
Vertical Section: Depth From (TYD)	Mag Dip Angle: 60.11 deg		
ft	+N/-S ft	+E/-W ft	Direction deg
0.00	0.00	0.00	359.67

Survey Program for Definitive Wellpath			
Date: 2/15/2011	Validated: No	Version: 6	
Actual From	To	Survey	Toolcode
ft	ft		Tool Name
100.00	8635.00	Survey #1 (100.00-8635.00)	Gyro
8692.00	9366.00	Survey #2 (8692.00-9366.00)	Ryan MWD
9424.00	9424.00	Survey #3 (9424.00-9424.00)	Projection

Survey										
MD	Incl	Azlm	TYD	+N/-S	+E/-W	VS	DLS	Build	Turn	Tool/Comment
ft	deg	deg	ft	ft	ft	ft	deg/100ft	deg/100ft	deg/100ft	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	TIE LINE
100.00	0.12	181.55	100.00	-0.10	0.00	-0.10	0.12	0.12	0.00	Gyro
200.00	0.22	186.66	200.00	-0.40	-0.03	-0.40	0.10	0.10	5.11	Gyro
300.00	0.15	125.43	300.00	-0.67	0.06	-0.67	0.20	-0.07	-61.23	Gyro
400.00	0.75	93.49	400.00	-0.78	0.82	-0.79	0.63	0.60	-31.94	Gyro
500.00	1.03	87.76	499.98	-0.79	2.37	-0.80	0.29	0.28	-5.73	Gyro
600.00	1.34	90.72	599.96	-0.77	4.44	-0.79	0.32	0.31	2.96	Gyro
700.00	2.13	91.73	699.92	-0.84	7.46	-0.88	0.79	0.79	1.01	Gyro
800.00	2.66	95.54	799.83	-1.12	11.63	-1.18	0.55	0.53	3.81	Gyro
900.00	2.08	117.17	899.74	-2.17	15.55	-2.26	1.06	-0.58	21.63	Gyro
1000.00	2.23	137.57	999.67	-4.43	18.48	-4.54	0.78	0.15	20.40	Gyro
1100.00	1.95	153.84	1099.61	-7.40	20.54	-7.52	0.65	-0.28	16.27	Gyro
1200.00	1.32	147.18	1199.57	-9.89	21.92	-10.02	0.66	-0.63	-6.66	Gyro
1270.60	1.12	122.73	1270.15	-10.95	22.94	-11.08	0.78	-0.28	-34.63	Gyro
1365.80	0.92	101.46	1365.34	-11.60	24.47	-11.75	0.45	-0.21	-22.34	Gyro
1461.10	0.56	104.91	1460.63	-11.88	25.67	-12.02	0.38	-0.38	3.62	Gyro
1556.30	0.42	120.75	1555.83	-12.17	26.42	-12.33	0.20	-0.15	16.64	Gyro
1651.50	0.14	99.24	1651.02	-12.37	26.83	-12.53	0.31	-0.29	-22.59	Gyro
1746.70	0.38	29.89	1746.22	-12.12	27.11	-12.27	0.37	0.25	-72.85	Gyro
1842.00	0.45	33.41	1841.52	-11.53	27.47	-11.69	0.08	0.07	3.69	Gyro
1937.20	0.56	35.10	1936.72	-10.84	27.94	-11.00	0.12	0.12	1.78	Gyro



Ryan Energy Technologies Survey Report



Company: Chesapeake Operating, Inc. Date: 2/15/2011 Time: 15:12:54 Page: 2
Field: Eddy Co, NM NAD 83 Co-ordinate(NE) Reference: Site: PLU Big Sinks 27 Federal 1H
Site: PLU Big Sinks 27 Federal 1H Vertical (TVD) Reference: EST RKB 3372.0
Well: PLU Big Sinks 27 Federal 1H Section (VS) Reference: Well (0.00N,0.00E,359.67Azi)
Wellpath: 27 Fed 1H Survey Calculation Method: Minimum Curvature Db: Sybase

Survey

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Bulld deg/100ft	Turn deg/100ft	Tool/Comment
2032.40	0.89	16.88	2031.91	-9.75	28.43	-9.91	0.42	0.35	-19.14	Gyro
2127.70	1.33	350.61	2127.19	-7.95	28.46	-8.11	0.69	0.46	-27.57	Gyro
2222.90	1.76	342.89	2222.36	-5.46	27.85	-5.62	0.50	0.45	-8.11	Gyro
2318.10	2.07	343.16	2317.50	-2.42	26.92	-2.57	0.33	0.33	0.28	Gyro
2413.30	2.11	339.16	2412.64	0.86	25.80	0.72	0.16	0.04	-4.20	Gyro
2508.60	1.55	326.10	2507.89	3.57	24.46	3.43	0.73	-0.59	-13.70	Gyro
2603.80	1.24	303.35	2603.06	5.21	22.88	5.08	0.66	-0.33	-23.90	Gyro
2699.00	0.95	295.47	2698.25	6.11	21.31	5.99	0.34	-0.30	-8.28	Gyro
2794.30	0.80	295.02	2793.54	6.73	19.99	6.62	0.16	-0.16	-0.47	Gyro
2889.50	0.70	236.72	2888.73	6.70	18.90	6.59	0.77	-0.11	-61.24	Gyro
2984.70	1.53	199.97	2983.91	5.18	17.98	5.08	1.11	0.87	-38.60	Gyro
3080.00	2.46	194.60	3079.15	2.01	17.03	1.91	0.99	0.98	-5.63	Gyro
3175.20	2.74	198.89	3174.25	-2.12	15.78	-2.21	0.36	0.29	4.51	Gyro
3270.40	2.03	193.75	3269.34	-6.64	14.46	-6.72	0.33	0.20	-5.40	Gyro
3365.70	3.10	188.43	3364.51	-11.55	13.51	-11.63	0.34	0.18	-5.58	Gyro
3460.90	3.29	190.62	3459.56	-16.78	12.63	-16.86	0.24	0.20	2.30	Gyro
3556.10	3.18	185.18	3554.61	-22.10	11.88	-22.17	0.34	-0.12	-5.71	Gyro
3651.30	3.10	185.46	3649.66	-27.29	11.40	-27.36	0.09	-0.08	0.29	Gyro
3746.60	2.61	177.59	3744.85	-32.02	11.25	-32.09	0.66	-0.51	-8.26	Gyro
3841.80	2.07	168.73	3839.97	-35.88	11.67	-35.94	0.68	-0.57	-9.31	Gyro
3937.00	1.44	177.67	3935.12	-38.76	12.06	-38.83	0.72	-0.66	9.39	Gyro
4032.30	1.27	176.28	4030.39	-41.01	12.18	-41.08	0.18	-0.18	-1.46	Gyro
4127.50	1.19	174.84	4125.57	-43.05	12.33	-43.12	0.09	-0.08	-1.51	Gyro
4222.70	1.12	178.41	4220.75	-44.96	12.45	-45.03	0.11	-0.07	3.75	Gyro
4317.90	1.00	167.38	4315.94	-46.70	12.66	-46.77	0.25	-0.13	-11.59	Gyro
4413.20	0.93	152.98	4411.22	-48.20	13.19	-48.28	0.26	-0.07	-15.11	Gyro
4603.60	0.68	156.46	4601.60	-50.61	14.34	-50.70	0.13	-0.13	1.83	Gyro
4698.90	0.61	147.05	4696.90	-51.56	14.84	-51.64	0.13	-0.07	-9.87	Gyro
4794.10	0.49	135.98	4792.09	-52.28	15.40	-52.36	0.17	-0.13	-11.63	Gyro
4889.30	0.48	158.32	4887.29	-52.94	15.83	-53.03	0.20	-0.01	23.47	Gyro
4984.60	0.44	170.18	4982.59	-53.67	16.04	-53.76	0.11	-0.04	12.44	Gyro
5079.80	0.38	180.75	5077.79	-54.35	16.10	-54.44	0.10	-0.06	11.10	Gyro
5175.00	0.37	188.26	5172.98	-54.97	16.05	-55.06	0.05	-0.01	7.89	Gyro
5270.30	0.45	193.57	5268.28	-55.63	15.92	-55.73	0.09	0.08	5.57	Gyro
5365.50	0.43	199.62	5363.48	-56.33	15.71	-56.42	0.05	-0.02	6.36	Gyro
5460.70	0.42	193.01	5458.68	-57.01	15.51	-57.10	0.05	-0.01	-6.94	Gyro
5555.90	0.48	188.52	5553.87	-57.75	15.38	-57.83	0.07	0.06	-4.72	Gyro
5651.20	0.52	191.10	5649.17	-58.56	15.23	-58.65	0.05	0.04	2.71	Gyro
5746.40	0.58	181.93	5744.36	-59.47	15.13	-59.56	0.11	0.06	-9.63	Gyro
5841.60	0.75	184.99	5839.56	-60.57	15.06	-60.66	0.18	0.18	3.21	Gyro
5936.90	0.85	186.08	5934.85	-61.90	14.93	-61.98	0.11	0.10	1.14	Gyro
6032.10	0.89	194.84	6030.04	-63.31	14.67	-63.40	0.15	0.04	9.20	Gyro
6127.30	1.18	198.04	6125.22	-64.96	14.18	-65.04	0.31	0.30	3.36	Gyro
6222.60	1.41	198.58	6220.50	-67.00	13.50	-67.08	0.24	0.24	0.57	Gyro
6317.80	1.27	212.24	6315.67	-69.01	12.56	-69.08	0.37	-0.15	14.35	Gyro
6413.00	1.17	224.89	6410.85	-70.59	11.32	-70.65	0.30	-0.11	13.29	Gyro
6508.20	1.24	226.32	6506.03	-71.99	9.88	-72.04	0.08	0.07	1.50	Gyro
6603.50	1.55	230.50	6601.30	-73.52	8.14	-73.57	0.34	0.33	4.39	Gyro
6698.70	1.60	224.41	6696.47	-75.29	6.22	-75.32	0.18	0.05	-6.40	Gyro
6793.90	1.58	226.18	6791.63	-77.15	4.34	-77.17	0.06	-0.02	1.86	Gyro
6889.20	1.62	225.06	6886.89	-79.01	2.44	-79.02	0.05	0.04	-1.18	Gyro
6984.40	1.62	216.78	6982.05	-81.04	0.68	-81.04	0.25	0.00	-8.70	Gyro
7079.60	1.68	206.12	7077.21	-83.37	-0.74	-83.36	0.33	0.06	-11.20	Gyro
7174.90	1.71	202.37	7172.47	-85.94	-1.89	-85.92	0.12	0.03	-3.93	Gyro



Ryan Energy Technologies Survey Report



Company: Chesapeake Operating, Inc. Date: 2/15/2011 Time: 15:12:54 Page: 3
Field: Eddy Co. NM NAD 83 Co-ordinate(NE) Reference: Site: PLU Big Sinks 27 Federal 1H
Site: PLU Big Sinks 27 Federal 1H Vertical (TVD) Reference: ESI RKB 3372.0
Well: PLU Big Sinks 27 Federal 1H Section (VS) Reference: Well (0.00N,0.00E,359.67Azi)
Wellpath: 27 Fed 1H Survey Calculation Method: Minimum Curvature Db: Sybase

Survey

NID ft	Incl deg	Azim deg	TVD ft	+N-S ft	+E-W ft	VS ft	DLS deg/100ft	Bulld deg/100ft	Turn deg/100ft	Tool/Comment
7270.10	1.98	201.89	7267.62	-88.78	-3.05	-88.76	0.28	0.28	-0.50	Gyro
7365.30	1.77	200.06	7362.77	-91.68	-4.16	-91.66	0.23	-0.22	-1.92	Gyro
7460.50	1.83	200.07	7457.93	-94.49	-5.19	-94.46	0.06	0.06	0.01	Gyro
7555.80	1.96	200.36	7553.17	-97.45	-6.28	-97.41	0.14	0.14	-0.30	Gyro
7651.00	1.98	198.63	7648.32	-100.53	-7.37	-100.49	0.07	0.02	-1.82	Gyro
7746.20	2.24	199.55	7743.45	-103.84	-8.52	-103.79	0.28	0.27	0.97	Gyro
7841.50	1.91	205.09	7838.69	-107.04	-9.81	-106.98	0.40	-0.35	5.81	Gyro
7936.70	1.50	231.51	7933.85	-109.25	-11.46	-109.18	0.92	-0.43	27.75	Gyro
8031.90	2.06	230.27	8029.00	-111.12	-13.75	-111.04	0.59	0.59	-1.30	Gyro
8127.10	1.02	249.92	8124.17	-112.50	-15.87	-112.41	1.21	-1.09	20.64	Gyro
8222.40	1.58	246.31	8219.44	-113.32	-17.87	-113.22	0.59	0.59	-3.79	Gyro
8254.10	1.69	242.63	8251.13	-113.71	-18.68	-113.60	0.48	0.35	-11.61	Gyro
8349.30	1.58	234.01	8346.29	-115.13	-20.99	-115.01	0.28	-0.12	-9.05	Gyro
8444.50	1.46	258.09	8441.46	-116.15	-23.24	-116.02	0.68	-0.13	25.29	Gyro
8539.80	1.01	208.02	8536.74	-117.14	-24.82	-117.00	1.18	-0.47	-52.54	Gyro
8635.00	1.05	174.65	8631.92	-118.75	-25.13	-118.61	0.62	0.04	-35.05	Gyro
8692.00	1.40	114.30	8688.91	-119.56	-24.45	-119.42	2.22	0.61	-105.88	Ryan MWD
8729.00	1.50	120.60	8725.90	-119.99	-23.62	-119.85	0.51	0.27	17.03	Ryan MWD
8761.00	3.70	52.90	8757.87	-119.58	-22.44	-119.45	10.70	6.87	-211.56	Ryan MWD
8793.00	8.80	21.70	8789.68	-116.68	-20.71	-116.56	18.59	15.94	-97.50	Ryan MWD
8825.00	13.60	7.90	8821.07	-110.68	-19.28	-110.56	17.08	15.00	-43.12	Ryan MWD
8857.00	18.10	3.20	8851.84	-101.98	-18.49	-101.88	14.61	14.06	-14.69	Ryan MWD
8889.00	22.00	359.50	8881.90	-91.02	-18.26	-90.92	12.81	12.19	-11.56	Ryan MWD
8920.00	25.60	355.50	8910.26	-78.53	-18.84	-78.42	12.72	11.61	-12.90	Ryan MWD
8953.00	29.40	353.80	8939.53	-63.37	-20.27	-63.25	11.76	11.52	-5.15	Ryan MWD
8984.00	34.90	352.50	8965.76	-47.00	-22.26	-46.87	17.88	17.74	-4.19	Ryan MWD
9016.00	42.00	353.10	8990.81	-27.27	-24.74	-27.13	22.22	22.19	1.87	Ryan MWD
9048.00	48.40	352.70	9013.34	-4.75	-27.55	-4.59	20.02	20.00	-1.25	Ryan MWD
9080.00	55.00	352.90	9033.17	20.15	-30.69	20.33	20.63	20.62	0.62	Ryan MWD
9111.00	61.60	353.30	9049.45	46.32	-33.86	46.52	21.32	21.29	1.29	Ryan MWD
9143.00	68.50	353.60	9062.94	75.13	-37.16	75.34	21.58	21.56	-0.94	Ryan MWD
9175.00	74.30	355.40	9073.14	105.30	-40.06	105.53	18.89	18.12	5.62	Ryan MWD
9201.00	77.55	357.68	9079.46	130.47	-41.58	130.71	15.12	12.50	8.77	Ryan MWD
9207.00	78.30	358.20	9080.72	136.34	-41.79	136.57	15.10	12.50	8.67	Ryan MWD
9238.00	82.50	359.90	9085.89	166.89	-42.29	167.13	14.59	13.55	-5.48	Ryan MWD
9270.00	84.90	0.10	9089.40	198.69	-42.29	198.93	7.53	7.50	0.63	Ryan MWD
9302.00	86.80	0.60	9091.71	230.61	-42.10	230.85	6.14	5.94	1.56	Ryan MWD
9334.00	87.20	0.10	9093.39	262.56	-41.90	262.80	2.00	1.25	-1.56	Ryan MWD
9340.00	87.01	0.06	9093.69	268.56	-41.89	268.79	3.24	-3.17	-0.67	Ryan MWD
9366.00	86.20	359.90	9095.23	294.51	-41.90	294.75	3.18	-3.12	-0.62	Ryan MWD
9424.00	86.20	359.90	9099.08	352.38	-42.00	352.62	0.00	0.00	0.00	PROJECTED to TD



Ryan Energy Technologies Survey Report



Company: Chesapeake Operating, Inc.	Date: 2/15/2011	Time: 15:27:29	Page: 1
Field: Eddy Co, NM NAD 83	Co-ordinate(N/E) Reference:	Site: PLU Big Sinks 27 Federal 1H	
Site: PLU Big Sinks 27 Federal 1H	Vertical (TVD) Reference:	ESI RKB 3372.0	
Well: PLU Big Sinks 27 Federal 1H	Section (VS) Reference:	Well (0.00N, 0.00E, 359.67Azi)	
Wellpath: 27 Fed 1H ST1	Survey Calculation Method:	Minimum Curvature	Db: Sybase

Field: Eddy Co, NM NAD 83	
USA	
Map System: US State Plane Coordinate System 1983	Map Zone: New Mexico, Eastern Zone
Geo Datum: GRS 1980	Coordinate System: Site Centre
Sys Datum: Mean Sea Level	Geomagnetic Model: IGRF2010

Site: PLU Big Sinks 27 Federal 1H Sec 27 T24S, R30E Eddy Co, NM		
Site Position:	Northing: 430348.72 ft	Latitude: 32 10 56.007 N
From: Map	Easting: 687287.37 ft	Longitude: 103 51 41.690 W
Position Uncertainty: 0.00 ft		North Reference: Grid
Ground Level: 3352.00 ft		Grid Convergence: 0.25 deg

Well: PLU Big Sinks 27 Federal 1H	Slot Name:	
Well Position: +N/-S 0.00 ft	Northing: 430348.72 ft	Latitude: 32 10 56.007 N
+E/-W 0.00 ft	Easting: 687287.37 ft	Longitude: 103 51 41.690 W
Position Uncertainty: 0.00 ft		

Wellpath: 27 Fed 1H ST1	Drilled From: Surface		
Current Datum: ESI RKB	Tie-on Depth: 0.00 ft		
Magnetic Data: 1/21/2011	Above System Datum: Mean Sea Level		
Field Strength: 48624 nT	Declination: 7.77 deg		
Vertical Section: Depth From (TVD)	Mag Dip Angle: 60.11 deg		
ft	+N/-S ft	+E/-W ft	Direction deg
0.00	0.00	0.00	359.67

Survey Program for Definitive Wellpath			
Date: 2/15/2011	Validated: No	Version: .0	
Actual From ft	To ft	Survey	Tool Name
100.00	8635.00	Survey #1 (100.00-8635.00)	Gyro
8692.00	13596.00	Survey #2 (8692.00-13596.00)	Ryan MWD
13753.00	13753.00	Survey #541 (13753.00-13753.00)	Projection

Survey										
MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
9175.00	74.30	355.40	9073.14	105.30	-40.06	105.53	0.00	0.00	0.00	Tie In
9215.00	67.00	2.20	9086.40	142.98	-40.90	143.22	24.29	-18.25	17.00	Ryan MWD
9246.00	70.80	6.10	9097.56	171.82	-38.79	172.04	16.97	12.26	12.58	Ryan MWD
9278.00	77.10	7.00	9106.40	202.35	-35.28	202.55	19.87	19.69	2.81	Ryan MWD
9310.00	83.50	6.00	9111.79	233.67	-31.72	233.85	20.24	20.00	-3.12	Ryan MWD
9342.00	90.30	4.30	9113.52	265.48	-28.85	265.64	21.90	21.25	-5.31	Ryan MWD
9391.00	93.60	2.80	9111.85	314.35	-25.82	314.49	7.40	6.73	-3.08	Ryan MWD
9408.00	94.10	2.70	9110.85	329.30	-25.10	329.44	3.40	3.33	-0.67	Ryan MWD
9437.00	93.10	2.30	9108.90	360.21	-23.75	360.34	3.47	-3.23	-1.29	Ryan MWD
9469.00	91.30	2.20	9107.67	392.16	-22.50	392.28	5.63	-5.62	-0.31	Ryan MWD
9501.00	90.90	1.90	9107.06	424.13	-21.35	424.25	1.56	-1.25	-0.94	Ryan MWD
9533.00	90.60	1.70	9106.64	456.11	-20.35	456.22	1.13	-0.94	-0.62	Ryan MWD
9564.00	90.70	1.80	9106.29	487.10	-19.40	487.20	0.46	0.32	0.32	Ryan MWD
9596.00	90.10	1.50	9106.06	519.08	-18.48	519.18	2.10	-1.87	-0.94	Ryan MWD
9628.00	89.80	1.50	9106.09	551.07	-17.64	551.16	0.94	-0.94	0.00	Ryan MWD
9660.00	91.90	1.80	9105.62	583.05	-16.72	583.14	6.63	6.56	0.94	Ryan MWD
9691.00	92.60	2.40	9104.40	614.01	-15.59	614.09	2.97	2.26	1.94	Ryan MWD
9723.00	92.80	2.20	9102.89	645.95	-14.30	646.02	0.88	0.62	-0.62	Ryan MWD
9755.00	92.80	2.10	9101.33	677.88	-13.10	677.95	0.31	0.00	-0.31	Ryan MWD
9787.00	93.00	2.20	9099.71	709.82	-11.91	709.88	0.70	0.62	0.31	Ryan MWD
9819.00	93.00	2.20	9098.04	741.75	-10.68	741.80	0.00	0.00	0.00	Ryan MWD



Ryan Energy Technologies Survey Report



Company:	Chesapeake Operating, Inc.	Date:	2/15/2011	Time:	15:27:29	Page:	2
Field:	Eddy Co, NM NAD 83	Co-ordinate(NL) Reference:	Site: PLU Big Sinks 27 Federal 1H				
Site:	PLU Big Sinks 27 Federal 1H	Vertical (TVD) Reference:	EST RKB 3372.0				
Well:	PLU Big Sinks 27 Federal 1H	Section (VS) Reference:	Well (0.00N, 0.00E, 359.67Azi)				
Wellpath:	27 Fed 1H ST1	Survey Calculation Method:	Minimum Curvature	Db:	Sybase		

Survey

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
9850.00	91.20	1.40	9096.90	772.72	-9.71	772.76	6.35	-5.81	-2.58	Ryan MWD
9882.00	90.20	0.80	9096.51	804.71	-9.09	804.75	3.64	-3.12	-1.87	Ryan MWD
9914.00	90.80	0.80	9096.23	836.70	-8.64	836.74	1.87	1.87	0.00	Ryan MWD
9946.00	91.00	0.80	9095.73	868.70	-8.20	868.73	0.62	0.62	0.00	Ryan MWD
9977.00	91.30	0.70	9095.11	899.69	-7.79	899.72	1.02	0.97	-0.32	Ryan MWD
10009.00	91.90	0.70	9094.21	931.67	-7.40	931.70	1.87	1.87	0.00	Ryan MWD
10041.00	90.50	1.80	9093.54	963.66	-6.70	963.68	5.56	-4.37	3.44	Ryan MWD
10073.00	89.90	2.20	9093.43	995.64	-5.59	995.65	2.25	-1.87	1.25	Ryan MWD
10105.00	90.00	1.90	9093.46	1027.62	-4.44	1027.62	0.99	0.31	-0.94	Ryan MWD
10136.00	89.60	1.90	9093.57	1058.60	-3.41	1058.60	1.29	-1.29	0.00	Ryan MWD
10168.00	89.50	1.80	9093.82	1090.58	-2.38	1090.58	0.44	-0.31	-0.31	Ryan MWD
10200.00	89.50	1.90	9094.10	1122.56	-1.35	1122.55	0.31	0.00	0.31	Ryan MWD
10232.00	89.10	1.50	9094.49	1154.55	-0.40	1154.53	1.77	-1.25	-1.25	Ryan MWD
10263.00	88.60	1.40	9095.11	1185.53	0.39	1185.51	1.64	-1.61	-0.32	Ryan MWD
10295.00	90.10	0.10	9095.47	1217.52	0.80	1217.50	6.20	4.69	-4.06	Ryan MWD
10327.00	90.80	359.30	9095.22	1249.52	0.64	1249.50	3.32	2.19	-2.50	Ryan MWD
10358.00	91.20	359.10	9094.68	1280.51	0.20	1280.49	1.44	1.29	-0.65	Ryan MWD
10390.00	91.10	359.00	9094.04	1312.50	-0.33	1312.48	0.44	-0.31	-0.31	Ryan MWD
10422.00	90.90	358.80	9093.48	1344.49	-0.94	1344.47	0.88	-0.62	-0.62	Ryan MWD
10454.00	91.00	358.70	9092.95	1376.48	-1.64	1376.47	0.44	0.31	-0.31	Ryan MWD
10486.00	90.80	358.90	9092.45	1408.47	-2.31	1408.46	0.88	-0.62	0.62	Ryan MWD
10517.00	91.80	358.70	9091.72	1439.45	-2.96	1439.45	3.61	3.55	-0.65	Ryan MWD
10549.00	92.50	358.70	9090.49	1471.42	-3.68	1471.42	1.87	1.87	0.00	Ryan MWD
10581.00	92.90	358.80	9088.98	1503.38	-4.38	1503.38	1.29	1.25	0.31	Ryan MWD
10612.00	91.50	359.10	9087.79	1534.35	-4.95	1534.35	4.62	-4.52	0.97	Ryan MWD
10644.00	91.60	359.00	9086.92	1566.33	-5.48	1566.34	0.44	0.31	-0.31	Ryan MWD
10676.00	91.60	359.00	9086.03	1598.32	-6.04	1598.32	0.00	0.00	0.00	Ryan MWD
10708.00	91.70	359.40	9085.11	1630.30	-6.48	1630.31	1.29	0.31	1.25	Ryan MWD
10740.00	91.70	359.20	9084.16	1662.28	-6.87	1662.29	0.62	0.00	-0.62	Ryan MWD
10771.00	91.30	358.90	9083.35	1693.27	-7.39	1693.28	1.61	-1.29	-0.97	Ryan MWD
10803.00	88.60	358.60	9083.38	1725.26	-8.09	1725.27	8.49	-8.44	-0.94	Ryan MWD
10835.00	88.30	358.40	9084.24	1757.23	-8.92	1757.26	1.13	-0.94	-0.62	Ryan MWD
10867.00	87.80	358.40	9085.33	1789.20	-9.82	1789.23	1.56	-1.56	0.00	Ryan MWD
10898.00	87.60	358.50	9086.58	1820.17	-10.65	1820.20	0.72	-0.65	0.32	Ryan MWD
10930.00	87.40	358.50	9087.97	1852.13	-11.49	1852.16	0.62	-0.62	0.00	Ryan MWD
10962.00	87.20	358.50	9089.48	1884.08	-12.33	1884.12	0.62	-0.62	0.00	Ryan MWD
10993.00	89.40	358.30	9090.40	1915.05	-13.19	1915.10	7.13	7.10	-0.65	Ryan MWD
11025.00	89.80	358.20	9090.62	1947.04	-14.17	1947.08	1.29	1.25	-0.31	Ryan MWD
11057.00	89.70	358.20	9090.76	1979.02	-15.18	1979.07	0.31	-0.31	0.00	Ryan MWD
11088.00	89.70	358.00	9090.92	2010.00	-16.20	2010.06	0.65	0.00	-0.65	Ryan MWD
11120.00	89.80	357.90	9091.06	2041.98	-17.35	2042.05	0.44	0.31	-0.31	Ryan MWD
11152.00	90.30	358.80	9091.04	2073.97	-18.27	2074.04	3.22	1.56	2.81	Ryan MWD
11184.00	90.20	359.20	9090.90	2105.96	-18.83	2106.04	1.29	-0.31	1.25	Ryan MWD
11215.00	89.90	359.10	9090.87	2136.96	-19.29	2137.03	1.02	-0.97	-0.32	Ryan MWD
11247.00	89.70	359.00	9090.98	2168.95	-19.82	2169.03	0.70	-0.62	-0.31	Ryan MWD
11279.00	90.90	359.60	9090.81	2200.95	-20.21	2201.03	4.19	3.75	1.87	Ryan MWD
11311.00	91.60	0.40	9090.11	2232.94	-20.21	2233.02	3.32	2.19	2.50	Ryan MWD
11343.00	91.60	0.20	9089.22	2264.93	-20.04	2265.01	0.62	0.00	-0.62	Ryan MWD
11374.00	91.90	0.10	9088.27	2295.91	-19.96	2295.99	1.02	0.97	-0.32	Ryan MWD
11406.00	91.90	359.80	9087.21	2327.90	-19.99	2327.97	0.94	0.00	-0.94	Ryan MWD
11438.00	91.40	1.20	9086.29	2359.88	-19.71	2359.96	4.64	-1.56	4.38	Ryan MWD
11470.00	91.10	1.20	9085.59	2391.87	-19.04	2391.94	0.94	-0.94	0.00	Ryan MWD
11502.00	91.00	1.20	9085.01	2423.85	-18.37	2423.92	0.31	-0.31	0.00	Ryan MWD
11533.00	91.00	1.00	9084.47	2454.84	-17.77	2454.91	0.65	0.00	-0.65	Ryan MWD



Ryan Energy Technologies Survey Report



Company: Chesapeake Operating, Inc.	Date: 2/15/2011	Time: 15:27:29	Page: 3
Field: Eddy Co. NM NAD 83	Co-ordinate(N/E) Reference:	Site: PLU Big Sinks 27 Federal 1H	
Site: PLU Big Sinks 27 Federal 1H	Vertical (TVD) Reference:	ESI RKB 3372.0	
Well: PLU Big Sinks 27 Federal 1H	Section (VS) Reference:	Well (0.00N,0.00E,359.67Azi)	
Wellpath: 27 Fed 1H ST1	Survey Calculation Method:	Minimum Curvature	Db: Sybase

Survey

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
11565.00	91.10	1.20	9083.88	2486.83	-17.16	2486.89	0.70	0.31	0.62	Ryan MWD
11596.00	91.00	1.00	9083.31	2517.82	-16.57	2517.88	0.72	-0.32	-0.65	Ryan MWD
11628.00	90.60	0.80	9082.87	2549.81	-16.06	2549.87	1.40	-1.25	-0.62	Ryan MWD
11660.00	90.20	0.80	9082.64	2581.81	-15.62	2581.86	1.25	-1.25	0.00	Ryan MWD
11692.00	89.90	0.40	9082.61	2613.81	-15.28	2613.85	1.56	-0.94	-1.25	Ryan MWD
11723.00	91.10	0.90	9082.34	2644.81	-14.93	2644.85	4.19	3.87	1.61	Ryan MWD
11755.00	91.30	1.00	9081.67	2676.79	-14.40	2676.83	0.70	0.62	0.31	Ryan MWD
11787.00	91.30	0.80	9080.95	2708.78	-13.90	2708.82	0.62	0.00	-0.62	Ryan MWD
11819.00	91.10	0.60	9080.28	2740.77	-13.51	2740.80	0.88	-0.62	-0.62	Ryan MWD
11851.00	90.90	0.30	9079.72	2772.77	-13.25	2772.80	1.13	-0.62	-0.94	Ryan MWD
11882.00	91.30	0.10	9079.12	2803.76	-13.15	2803.79	-1.44	1.29	-0.65	Ryan MWD
11914.00	91.10	359.80	9078.45	2835.75	-13.17	2835.78	1.13	-0.62	-0.94	Ryan MWD
11946.00	90.60	359.40	9077.98	2867.75	-13.40	2867.78	2.00	-1.56	-1.25	Ryan MWD
11977.00	90.60	359.10	9077.65	2898.74	-13.80	2898.78	0.97	0.00	-0.97	Ryan MWD
12009.00	90.70	358.60	9077.29	2930.74	-14.45	2930.77	1.59	0.31	-1.56	Ryan MWD
12041.00	90.60	358.30	9076.93	2962.72	-15.31	2962.76	0.99	-0.31	-0.94	Ryan MWD
12073.00	89.80	357.90	9076.82	2994.70	-16.37	2994.75	2.80	-2.50	-1.25	Ryan MWD
12105.00	90.30	358.40	9076.79	3026.69	-17.40	3026.74	2.21	1.56	1.56	Ryan MWD
12137.00	89.70	359.10	9076.79	3058.68	-18.10	3058.73	2.88	-1.87	-2.19	Ryan MWD
12168.00	89.90	359.20	9076.80	3089.68	-18.56	3089.73	0.72	0.65	0.32	Ryan MWD
12200.00	88.80	1.30	9077.26	3121.67	-18.42	3121.72	7.41	-3.44	6.56	Ryan MWD
12232.00	88.30	1.50	9078.07	3153.65	-17.64	3153.70	1.68	-1.56	0.62	Ryan MWD
12264.00	88.10	1.40	9079.07	3185.62	-16.83	3185.67	0.70	-0.62	-0.31	Ryan MWD
12295.00	88.30	1.50	9080.05	3216.60	-16.05	3216.64	0.72	0.65	0.32	Ryan MWD
12359.00	88.00	1.10	9082.11	3280.55	-14.60	3280.58	0.78	-0.47	-0.62	Ryan MWD
12454.00	88.40	1.80	9085.10	3375.47	-12.19	3375.49	0.85	0.42	-0.74	Ryan MWD
12549.00	90.40	1.90	9086.09	3470.41	-9.13	3470.41	2.11	2.11	0.11	Ryan MWD
12644.00	90.00	1.00	9085.76	3565.38	-6.72	3565.36	1.04	-0.42	-0.95	Ryan MWD
12740.00	89.80	0.60	9085.93	3661.37	-5.38	3661.34	0.47	-0.21	-0.42	Ryan MWD
12835.00	89.80	0.40	9086.26	3756.37	-4.55	3756.33	0.21	0.00	-0.21	Ryan MWD
12930.00	88.80	0.10	9087.42	3851.36	-4.14	3851.32	1.10	-1.05	-0.32	Ryan MWD
13025.00	89.90	358.40	9088.50	3946.34	-5.38	3946.30	2.13	1.16	-1.79	Ryan MWD
13120.00	89.80	357.90	9088.75	4041.29	-8.45	4041.27	0.54	-0.11	-0.53	Ryan MWD
13215.00	93.40	358.40	9086.10	4136.18	-11.52	4136.18	3.83	3.79	0.53	Ryan MWD
13310.00	93.60	357.90	9080.30	4230.96	-14.58	4230.97	0.57	0.21	-0.53	Ryan MWD
13405.00	92.00	358.70	9075.66	4325.80	-17.39	4325.83	1.88	-1.68	0.84	Ryan MWD
13501.00	91.80	358.00	9072.47	4421.71	-20.15	4421.75	0.76	-0.21	-0.73	Ryan MWD
13596.00	91.20	357.10	9069.99	4516.58	-24.21	4516.65	1.14	-0.63	-0.95	Ryan MWD
13753.00	91.20	357.10	9066.70	4673.35	-32.15	4673.46	0.00	0.00	0.00	Projection