



## Chief Oil & Gas - AP

Marshall County, WV (NAD 27)

Witzgall

Witzgall #1H

Wellbore #1

Survey: MWD

## Survey Report - Geographic

08 June, 2010





DDC  
Survey Report - Geographic



Company:	Chief Oil & Gas - AP	Local Co-ordinate Reference:	Well Witzgall #1H
Project:	Marshall County, WV (NAD 27)	TVD Reference:	WELL @ 1188.2usft (UDI #43)
Site:	Witzgall	MD Reference:	WELL @ 1188.2usft (UDI #43)
Well:	Witzgall #1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Project:	Marshall County, WV (NAD 27)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	West Virginia North 4701		

Site:	Witzgall		
Site Position:	From:	Map	0.0 usft
Northing:	521,911.14 usft	Latitude:	39° 55' 36.821 N
Easting:	1,667,215.38 usft	Longitude:	80° 41' 11.825 W
Slot Radius:	13-3/16 "	Grid Convergence:	-0.76 °

Well:	Witzgall #1H		
Well Position:	+N/-S	0.0 usft	Northing: 521,911.14 usft
	+E/-W	0.0 usft	Easting: 1,667,215.38 usft
Position Uncertainty:	0.0 usft	Wellhead Elevation:	usft
			Ground Level: 1,170.2 usft

Wellbore:	Wellbore #1				
Magnetics:	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/11/2010	-8.53	67.68	53,105

Design:	Wellbore #1					
Audit Notes:	Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	0.0	+N/-S (usft)	0.0	+E/-W (usft)	0.0
	Direction (°)	320.00				

Survey Program:	Date: 6/8/2010				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
200.0	5,910.0	Gyro (Wellbore #1)	Good_gyro	Good Gyro	
5,936.0	10,799.0	MWD (Wellbore #1)	MWD default	MWD - Standard	

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,910.0	0.75	135.04	5,909.7	1.0	34.3	521,912.13	1,667,249.63	39° 55' 36.835 N	80° 41' 11.385 W
5,910.1	0.75	135.04	5,909.8	1.0	34.3	521,912.13	1,667,249.64	39° 55' 36.835 N	80° 41' 11.385 W
<b>Tie-In</b>									
5,936.0	0.30	125.20	5,935.7	0.8	34.4	521,911.97	1,667,249.81	39° 55' 36.834 N	80° 41' 11.383 W
5,968.0	4.40	322.20	5,967.6	1.7	33.7	521,912.89	1,667,249.13	39° 55' 36.843 N	80° 41' 11.392 W
6,000.0	9.80	322.70	5,999.4	4.9	31.3	521,916.03	1,667,246.72	39° 55' 36.873 N	80° 41' 11.423 W
6,031.0	14.40	327.60	6,029.7	10.2	27.7	521,921.38	1,667,243.06	39° 55' 36.926 N	80° 41' 11.471 W
6,063.0	18.40	325.50	6,060.4	17.8	22.7	521,928.91	1,667,238.06	39° 55' 36.999 N	80° 41' 11.536 W
6,095.0	22.10	322.40	6,090.4	26.7	16.1	521,937.84	1,667,231.53	39° 55' 37.087 N	80° 41' 11.622 W
6,126.0	25.90	320.10	6,118.7	36.5	8.2	521,947.66	1,667,223.62	39° 55' 37.183 N	80° 41' 11.725 W
6,158.0	30.10	320.80	6,147.0	48.1	-1.3	521,959.25	1,667,214.06	39° 55' 37.296 N	80° 41' 11.850 W



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Site:	Witzgall	MD Reference:	WELL @ 1188.2usft (UDI #43)
Well:	Witzgall #1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM-5000.1 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
6,189.0	34.40	321.50	6,173.2	61.0	-11.7	521,972.13	1,667,203.69	39° 55' 37.422 N	80° 41' 11.985 W
6,221.0	39.60	321.40	6,198.7	76.0	-23.7	521,987.19	1,667,191.69	39° 55' 37.569 N	80° 41' 12.141 W
6,253.0	45.10	320.60	6,222.4	92.8	-37.3	522,003.93	1,667,178.13	39° 55' 37.733 N	80° 41' 12.318 W
6,285.0	50.80	319.50	6,243.8	111.0	-52.5	522,022.13	1,667,162.87	39° 55' 37.911 N	80° 41' 12.517 W
6,316.0	56.80	318.60	6,262.1	129.9	-68.9	522,041.01	1,667,146.48	39° 55' 38.095 N	80° 41' 12.731 W
6,348.0	62.60	318.40	6,278.2	150.6	-87.2	522,061.69	1,667,128.17	39° 55' 38.297 N	80° 41' 12.969 W
6,380.0	68.20	319.50	6,291.5	172.5	-106.3	522,083.63	1,667,109.08	39° 55' 38.512 N	80° 41' 13.218 W
6,411.0	73.90	320.70	6,301.6	195.0	-125.1	522,106.12	1,667,090.29	39° 55' 38.731 N	80° 41' 13.463 W
6,442.0	78.10	321.50	6,309.1	218.4	-144.0	522,129.52	1,667,071.40	39° 55' 38.960 N	80° 41' 13.710 W
6,474.0	82.30	321.90	6,314.6	243.1	-163.5	522,154.26	1,667,051.86	39° 55' 39.202 N	80° 41' 13.965 W
6,506.0	84.70	322.20	6,318.2	268.2	-183.1	522,179.33	1,667,032.31	39° 55' 39.447 N	80° 41' 14.220 W
6,535.0	86.40	322.10	6,320.4	291.0	-200.8	522,202.16	1,667,014.57	39° 55' 39.671 N	80° 41' 14.451 W
6,567.0	88.80	320.80	6,321.8	316.0	-220.7	522,227.16	1,666,994.65	39° 55' 39.915 N	80° 41' 14.711 W
6,631.0	91.70	320.30	6,321.5	365.4	-261.4	522,276.57	1,666,953.99	39° 55' 40.398 N	80° 41' 15.242 W
6,693.0	91.10	319.20	6,320.0	412.7	-301.4	522,323.88	1,666,913.94	39° 55' 40.860 N	80° 41' 15.764 W
6,756.0	91.00	318.60	6,318.8	460.2	-342.8	522,371.35	1,666,872.53	39° 55' 41.324 N	80° 41' 16.303 W
6,820.0	91.10	318.70	6,317.6	508.2	-385.1	522,419.38	1,666,830.26	39° 55' 41.793 N	80° 41' 16.854 W
6,883.0	91.20	318.20	6,316.4	555.4	-426.9	522,466.52	1,666,788.48	39° 55' 42.254 N	80° 41' 17.398 W
6,947.0	91.20	317.30	6,315.0	602.7	-469.9	522,513.88	1,666,745.46	39° 55' 42.716 N	80° 41' 17.958 W
7,010.0	90.40	318.40	6,314.2	649.4	-512.2	522,560.59	1,666,703.19	39° 55' 43.172 N	80° 41' 18.509 W
7,074.0	90.30	318.10	6,313.8	697.2	-554.8	522,608.33	1,666,660.57	39° 55' 43.638 N	80° 41' 19.064 W
7,137.0	90.40	317.50	6,313.4	743.9	-597.1	522,655.00	1,666,618.25	39° 55' 44.094 N	80° 41' 19.615 W
7,201.0	89.80	317.70	6,313.3	791.1	-640.3	522,702.26	1,666,575.10	39° 55' 44.555 N	80° 41' 20.177 W
7,264.0	89.90	317.70	6,313.4	837.7	-682.7	522,748.86	1,666,532.70	39° 55' 45.010 N	80° 41' 20.729 W
7,328.0	90.30	317.50	6,313.3	885.0	-725.8	522,796.12	1,666,489.54	39° 55' 45.472 N	80° 41' 21.291 W
7,391.0	90.50	315.60	6,312.9	930.7	-769.2	522,841.85	1,666,446.22	39° 55' 45.918 N	80° 41' 21.855 W
7,455.0	90.10	315.90	6,312.6	976.6	-813.8	522,887.70	1,666,401.56	39° 55' 46.365 N	80° 41' 22.436 W
7,518.0	90.90	317.30	6,312.0	1,022.3	-857.1	522,933.47	1,666,358.28	39° 55' 46.812 N	80° 41' 22.999 W
7,581.0	91.70	319.40	6,310.6	1,069.4	-899.0	522,980.53	1,666,316.42	39° 55' 47.271 N	80° 41' 23.545 W
7,645.0	91.00	319.90	6,309.1	1,118.1	-940.4	523,029.29	1,666,275.00	39° 55' 47.748 N	80° 41' 24.085 W
7,708.0	91.00	319.10	6,308.0	1,166.0	-981.3	523,077.18	1,666,234.09	39° 55' 48.216 N	80° 41' 24.618 W
7,772.0	91.60	318.90	6,306.5	1,214.3	-1,023.3	523,125.47	1,666,192.11	39° 55' 48.687 N	80° 41' 25.165 W
7,835.0	90.90	319.30	6,305.1	1,261.9	-1,064.5	523,173.08	1,666,150.88	39° 55' 49.152 N	80° 41' 25.702 W
7,899.0	90.40	318.90	6,304.4	1,310.3	-1,106.4	523,221.45	1,666,108.98	39° 55' 49.625 N	80° 41' 26.248 W
7,963.0	90.50	318.60	6,303.9	1,358.4	-1,148.6	523,269.57	1,666,066.78	39° 55' 50.095 N	80° 41' 26.798 W
8,026.0	90.40	319.20	6,303.4	1,405.9	-1,190.0	523,317.04	1,666,025.37	39° 55' 50.559 N	80° 41' 27.338 W
8,090.0	90.60	319.90	6,302.9	1,454.6	-1,231.5	523,365.74	1,665,983.84	39° 55' 51.035 N	80° 41' 27.879 W
8,153.0	91.20	319.50	6,301.9	1,502.6	-1,272.3	523,413.78	1,665,943.10	39° 55' 51.504 N	80° 41' 28.410 W
8,216.0	91.30	320.50	6,300.5	1,550.9	-1,312.8	523,462.03	1,665,902.62	39° 55' 51.975 N	80° 41' 28.938 W
8,279.0	89.90	319.20	6,299.8	1,599.0	-1,353.4	523,510.18	1,665,862.00	39° 55' 52.446 N	80° 41' 29.468 W
8,343.0	89.90	319.40	6,299.9	1,647.6	-1,395.1	523,558.70	1,665,820.26	39° 55' 52.920 N	80° 41' 30.012 W
8,406.0	91.00	321.00	6,299.5	1,696.0	-1,435.4	523,607.10	1,665,779.94	39° 55' 53.393 N	80° 41' 30.537 W
8,470.0	89.90	319.00	6,298.9	1,745.0	-1,476.6	523,656.12	1,665,738.81	39° 55' 53.872 N	80° 41' 31.074 W
8,533.0	90.50	319.40	6,298.7	1,792.7	-1,517.7	523,703.81	1,665,697.64	39° 55' 54.338 N	80° 41' 31.610 W
8,597.0	91.40	320.70	6,297.7	1,841.7	-1,558.8	523,752.87	1,665,656.55	39° 55' 54.817 N	80° 41' 32.146 W
8,660.0	89.80	318.50	6,297.0	1,889.7	-1,599.7	523,800.84	1,665,615.73	39° 55' 55.286 N	80° 41' 32.678 W
8,724.0	90.50	319.20	6,296.8	1,937.9	-1,641.8	523,849.03	1,665,573.61	39° 55' 55.757 N	80° 41' 33.227 W
8,787.0	91.80	320.70	6,295.6	1,986.1	-1,682.3	523,897.24	1,665,533.09	39° 55' 56.228 N	80° 41' 33.755 W
8,851.0	92.20	320.50	6,293.3	2,035.5	-1,722.9	523,946.66	1,665,492.49	39° 55' 56.711 N	80° 41' 34.285 W
8,914.0	91.90	320.40	6,291.1	2,084.1	-1,763.0	523,995.21	1,665,452.40	39° 55' 57.185 N	80° 41' 34.808 W
8,978.0	91.80	319.60	6,289.0	2,133.1	-1,804.1	524,044.21	1,665,411.28	39° 55' 57.664 N	80° 41' 35.344 W
9,041.0	91.80	320.10	6,287.0	2,181.2	-1,844.7	524,092.34	1,665,370.68	39° 55' 58.135 N	80° 41' 35.873 W
9,105.0	91.30	319.30	6,285.3	2,230.0	-1,886.1	524,141.13	1,665,329.30	39° 55' 58.611 N	80° 41' 36.413 W
9,168.0	90.00	317.90	6,284.6	2,277.2	-1,927.7	524,188.39	1,665,287.64	39° 55' 59.073 N	80° 41' 36.956 W
9,231.0	90.00	317.00	6,284.6	2,323.7	-1,970.3	524,234.80	1,665,245.04	39° 55' 59.526 N	80° 41' 37.510 W



**DDC**  
Survey Report - Geographic



<b>Company:</b> Chief Oil & Gas - AP	<b>Local Co-ordinate Reference:</b> Well Witzgall #1H
<b>Project:</b> Marshall County, WV (NAD 27)	<b>TVD Reference:</b> WELL @ 1188.2usft (UDI #43)
<b>Site:</b> Witzgall	<b>MD Reference:</b> WELL @ 1188.2usft (UDI #43)
<b>Well:</b> Witzgall #1H	<b>North Reference:</b> Grid
<b>Wellbore:</b> Wellbore #1	<b>Survey Calculation Method:</b> Minimum Curvature
<b>Design:</b> Wellbore #1	<b>Database:</b> EDM 5000.1 Single User Db

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,295.0	89.90	315.30	6,284.7	2,369.8	-2,014.7	524,280.94	1,665,200.72	39° 55' 59.976 N	80° 41' 38.087 W
9,359.0	89.00	314.30	6,285.3	2,414.9	-2,060.1	524,326.03	1,665,155.31	39° 56' 0.416 N	80° 41' 38.678 W
9,422.0	89.30	315.00	6,286.2	2,459.2	-2,104.9	524,370.30	1,665,110.50	39° 56' 0.847 N	80° 41' 39.261 W
9,486.0	89.50	317.20	6,286.9	2,505.3	-2,149.3	524,416.41	1,665,066.12	39° 56' 1.297 N	80° 41' 39.838 W
9,549.0	90.00	317.90	6,287.1	2,551.8	-2,191.8	524,462.89	1,665,023.60	39° 56' 1.751 N	80° 41' 40.392 W
9,613.0	89.90	319.20	6,287.2	2,599.7	-2,234.1	524,510.86	1,664,981.24	39° 56' 2.219 N	80° 41' 40.944 W
9,676.0	90.40	320.70	6,287.0	2,647.9	-2,274.7	524,559.09	1,664,940.70	39° 56' 2.691 N	80° 41' 41.472 W
9,740.0	91.00	322.90	6,286.3	2,698.2	-2,314.3	524,609.37	1,664,901.13	39° 56' 3.182 N	80° 41' 41.989 W
9,803.0	91.90	323.70	6,284.7	2,748.7	-2,351.9	524,659.87	1,664,863.49	39° 56' 3.678 N	80° 41' 42.481 W
9,867.0	91.90	323.50	6,282.5	2,800.2	-2,389.8	524,711.35	1,664,825.53	39° 56' 4.180 N	80° 41' 42.977 W
9,930.0	91.90	323.70	6,280.5	2,850.9	-2,427.2	524,762.03	1,664,788.17	39° 56' 4.678 N	80° 41' 43.465 W
9,993.0	91.30	322.80	6,278.7	2,901.4	-2,464.9	524,812.49	1,664,750.49	39° 56' 5.170 N	80° 41' 43.957 W
10,057.0	90.10	319.80	6,277.9	2,951.3	-2,504.9	524,862.43	1,664,710.48	39° 56' 5.658 N	80° 41' 44.479 W
10,120.0	89.70	319.90	6,278.0	2,999.4	-2,545.5	524,910.58	1,664,669.86	39° 56' 6.128 N	80° 41' 45.009 W
10,182.0	90.10	321.50	6,278.1	3,047.4	-2,584.8	524,958.56	1,664,630.59	39° 56' 6.597 N	80° 41' 45.521 W
10,246.0	90.20	320.60	6,278.0	3,097.2	-2,625.0	525,008.33	1,664,590.36	39° 56' 7.084 N	80° 41' 46.046 W
10,309.0	90.50	320.90	6,277.6	3,146.0	-2,664.9	525,057.12	1,664,550.50	39° 56' 7.561 N	80° 41' 46.566 W
10,372.0	90.20	321.50	6,277.2	3,195.1	-2,704.4	525,106.21	1,664,511.02	39° 56' 8.041 N	80° 41' 47.081 W
10,435.0	90.00	321.50	6,277.1	3,244.4	-2,743.6	525,155.52	1,664,471.81	39° 56' 8.523 N	80° 41' 47.593 W
10,499.0	90.10	322.20	6,277.0	3,294.7	-2,783.1	525,205.85	1,664,432.27	39° 56' 9.015 N	80° 41' 48.109 W
10,562.0	90.50	323.30	6,276.7	3,344.9	-2,821.2	525,255.99	1,664,394.14	39° 56' 9.506 N	80° 41' 48.607 W
10,625.0	90.60	323.50	6,276.1	3,395.4	-2,858.8	525,306.57	1,664,358.58	39° 56' 10.000 N	80° 41' 49.098 W
10,689.0	90.60	323.00	6,275.4	3,446.7	-2,897.1	525,357.85	1,664,318.29	39° 56' 10.502 N	80° 41' 49.599 W
10,752.0	90.50	323.00	6,274.8	3,497.0	-2,935.0	525,408.16	1,664,280.38	39° 56' 10.994 N	80° 41' 50.094 W
10,799.0	90.50	323.00	6,274.4	3,534.6	-2,963.3	525,445.69	1,664,252.09	39° 56' 11.362 N	80° 41' 50.463 W

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5,910.1	5,909.8	1.0	34.3	Tie-In
10,799.0	6,274.4	3,534.6	-2,963.3	TD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

MAY 27 2011