



**PHOENIX**  
TECHNOLOGY SERVICES

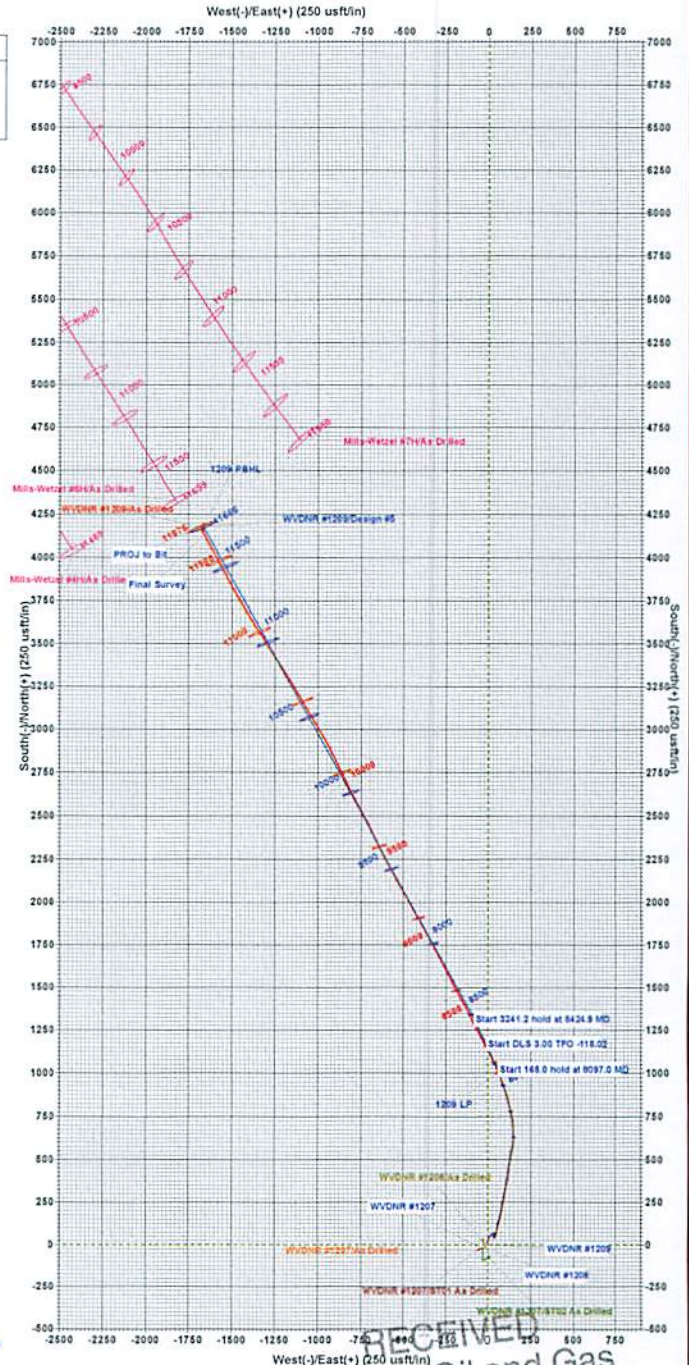
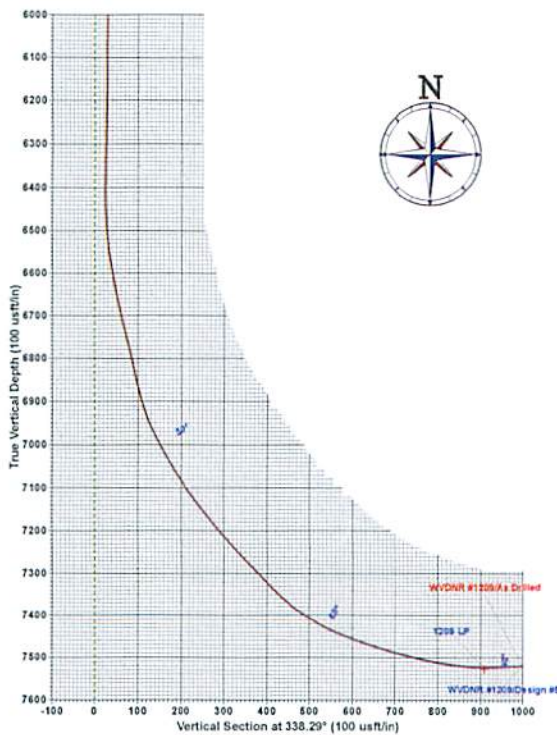
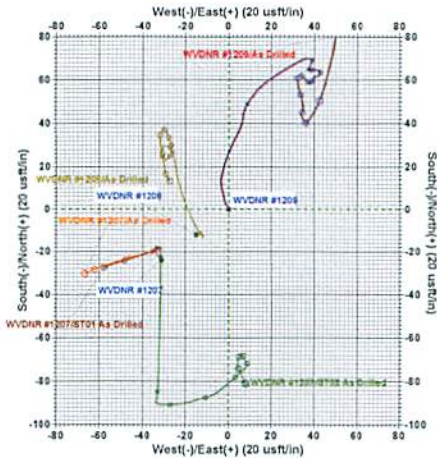
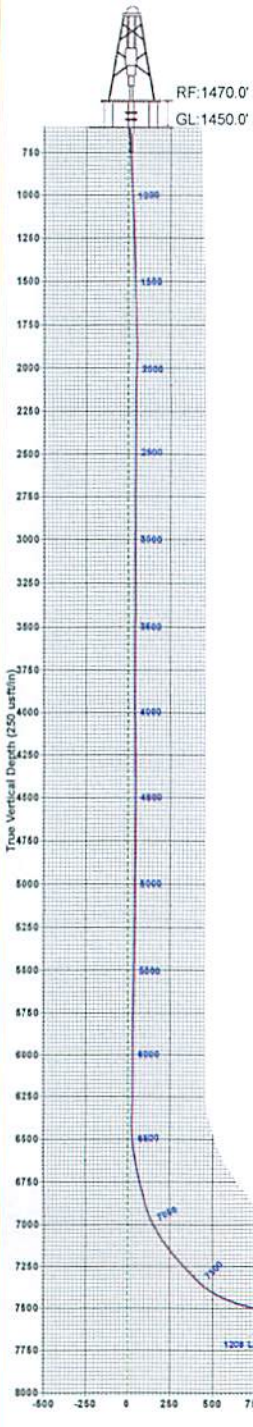


Azimuths to Grid North  
 True North: 0.74°  
 Magnetic North: -7.78°  
 Magnetic Field  
 Strength: 52669.0nT  
 Dip Angle: 67.16°  
 Date: 2/24/2012  
 Model: IGRF2010\_14

**WVDNR #1209**  
**WVDNR Pad 6**  
**20" RKB - 1450' GL @ 1470.0usft (Warren 2)**  
 Latitude: 39° 30' 18.647 N  
 Longitude: 80° 39' 27.650 W  
 Northing: 368212.00  
 Easting: 1673351.00  
 Design #5

SECTION DETAILS									
MD	Inc	Azi	TVD	+N-S	+E-W	Diag	TFace	V Sect	Target
8007.0	92.60	335.40	7522.6	1046.6	44.9	0.00	0.00	955.9	
8262.0	92.60	335.40	7515.2	1195.5	-23.7	0.00	0.00	1120.4	
5424.9	90.30	331.09	7511.0	1341.8	-97.0	3.00	-118.02	1282.5	1209 PBHL
11666.1	90.30	331.09	7494.1	4179.0	-1564.0	0.00	0.00	4498.1	1209 PBHL

DESIGN TARGET DETAILS							
Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
1209 PBHL	7494.1	4179.0	-1664.0	372391.00	1671687.0039° 30'	59.736 N 80° 39' 49.569 W	Point
1209 LP	7520.0	1003.0	64.0	369215.00	1673415.0039° 30'	28.568 N 80° 39' 26.996 W	Point
- plan miss target center by 2.1usft at 8049.4usft MD (7524.0 TVD, 1002.7 N, 63.3 E)							



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## Triad Hunter

WVDNR Pad 6  
WVDNR Pad 6 - Wetzel County, WV  
WVDNR #1209

Original Well

Design: As Drilled

## Standard Survey Report

30 September, 2013

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# Phoenix Technology Services

## Survey Report



<b>Company:</b>	Triad Hunter	<b>Local Co-ordinate Reference:</b>	Well WVDNR #1209
<b>Project:</b>	WVDNR Pad 6	<b>TVD Reference:</b>	20' RKB - 1450' GL @ 1470.0usft (Warren 12)
<b>Site:</b>	WVDNR Pad 6 - Wetzel County, WV	<b>MD Reference:</b>	20' RKB - 1450' GL @ 1470.0usft (Warren 12)
<b>Well:</b>	WVDNR #1209	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Well	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	As Drilled	<b>Database:</b>	Local database

<b>Project</b>	WVDNR Pad 6		
<b>Map System:</b>	US State Plane 1927 (Exact solution)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD 1927 (NADCON CONUS)		
<b>Map Zone:</b>	West Virginia North 4701		

<b>Site</b>	WVDNR Pad 6 - Wetzel County, WV				
<b>Site Position:</b>		<b>Northing:</b>	368,188.00 usft	<b>Latitude:</b>	39° 30' 18.406 N
<b>From:</b>	Map	<b>Easting:</b>	1,673,320.00 usft	<b>Longitude:</b>	80° 39' 28.041 W
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	-0.74 °

<b>Well</b>	WVDNR #1209					
<b>Well Position</b>	<b>+N/-S</b>	0.0 usft	<b>Northing:</b>	368,212.00 usft	<b>Latitude:</b>	39° 30' 18.647 N
	<b>+E/-W</b>	0.0 usft	<b>Easting:</b>	1,673,351.00 usft	<b>Longitude:</b>	80° 39' 27.650 W
<b>Position Uncertainty</b>		0.0 usft	<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b>	1,450.0 usft

<b>Wellbore</b>	Original Well				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010_14	2/24/2012	-8.52	67.18	52,669

<b>Design</b>	As Drilled				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0		338.29

<b>Survey Program</b>	<b>Date</b>	9/30/2013			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
111.0	6,160.0	VES Gyro (Original Well)	GyroFlex		
6,253.0	11,676.0	PHX MWD (Original Well)	MWD		

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
111.0	0.32	345.13	111.0	0.3	-0.1	0.3	0.29	0.29	0.00
211.0	0.27	329.36	211.0	0.8	-0.3	0.8	0.09	-0.05	-15.77
311.0	0.83	329.92	311.0	1.6	-0.8	1.8	0.56	0.56	0.56
411.0	0.69	325.58	411.0	2.7	-1.5	3.1	0.15	-0.14	-4.34
511.0	1.54	347.33	511.0	4.5	-2.1	5.0	0.93	0.85	21.75
611.0	1.58	356.05	610.9	7.2	-2.5	7.6	0.24	0.04	8.72
711.0	1.91	331.63	710.9	10.1	-3.4	10.6	0.81	0.33	-24.42
811.0	3.23	11.02	810.8	14.3	-3.6	14.6	2.13	1.32	39.39
911.0	4.11	14.43	910.6	20.5	-2.2	19.9	0.91	0.88	3.41

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# Phoenix Technology Services

## Survey Report



<b>Company:</b>	Triad Hunter	<b>Local Co-ordinate Reference:</b>	Well WVDNR #1209
<b>Project:</b>	WVDNR Pad 6	<b>TVD Reference:</b>	20' RKB - 1450' GL @ 1470.0usft (Warren 12)
<b>Site:</b>	WVDNR Pad 6 - Wetzel County, WV	<b>MD Reference:</b>	20' RKB - 1450' GL @ 1470.0usft (Warren 12)
<b>Well:</b>	WVDNR #1209	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Well	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	As Drilled	<b>Database:</b>	Local database

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
1,011.0	4.26	22.14	1,010.3	27.4	0.1	25.5	0.58	0.15	7.71	
1,111.0	3.92	28.22	1,110.1	33.9	3.1	30.3	0.55	-0.34	6.08	
1,211.0	2.22	21.02	1,209.9	38.7	5.4	34.0	1.74	-1.70	-7.20	
1,311.0	1.72	8.79	1,309.9	42.0	6.4	36.7	0.65	-0.50	-12.23	
1,411.0	1.56	5.81	1,409.8	44.8	6.7	39.2	0.18	-0.16	-2.98	
1,511.0	3.52	27.56	1,509.7	48.9	8.3	42.4	2.15	1.96	21.75	
1,611.0	5.38	43.27	1,609.4	55.1	12.9	46.4	2.21	1.86	15.71	
1,711.0	6.15	57.09	1,708.9	61.4	20.6	49.4	1.58	0.77	13.82	
1,811.0	5.54	59.85	1,808.4	66.7	29.3	51.1	0.67	-0.61	2.76	
1,911.0	3.59	70.31	1,908.1	70.2	36.4	51.7	2.11	-1.95	10.46	
2,011.0	2.07	190.25	2,008.0	69.5	39.0	50.1	4.96	-1.52	119.94	
2,111.0	2.07	215.56	2,107.9	66.2	37.7	47.6	0.91	0.00	25.31	
2,211.0	0.10	162.05	2,207.9	64.7	38.6	46.5	2.01	-1.97	-53.51	
2,311.0	0.31	99.48	2,307.9	64.5	36.9	46.3	0.28	0.21	-62.57	
2,411.0	0.58	81.71	2,407.9	64.6	37.7	46.0	0.30	0.27	-17.77	
2,511.0	0.44	83.75	2,507.9	64.7	38.6	45.8	0.14	-0.14	2.04	
2,611.0	0.74	87.36	2,607.9	64.8	39.6	45.5	0.30	0.30	3.61	
2,711.0	0.43	97.35	2,707.9	64.7	40.6	45.1	0.33	-0.31	9.99	
2,811.0	0.75	93.43	2,807.9	64.7	41.7	44.7	0.32	0.32	-3.92	
2,911.0	0.40	109.07	2,907.9	64.5	42.6	44.1	0.38	-0.35	15.64	
3,011.0	0.99	193.67	3,007.9	63.5	42.8	43.2	1.03	0.59	84.60	
3,111.0	0.86	221.45	3,107.9	62.1	42.1	42.2	0.46	-0.13	27.78	
3,211.0	0.84	281.45	3,207.9	61.7	40.9	42.2	0.85	-0.02	60.00	
3,311.0	0.40	219.58	3,307.9	61.6	39.9	42.5	0.74	-0.44	-61.87	
3,411.0	0.89	207.22	3,407.8	60.6	39.3	41.8	0.51	0.49	-12.36	
3,511.0	0.68	214.85	3,507.8	59.5	38.6	41.0	0.23	-0.21	7.63	
3,611.0	0.29	186.76	3,607.8	58.7	38.3	40.4	0.45	-0.39	-28.09	
3,711.0	0.13	242.11	3,707.8	58.4	38.1	40.2	0.24	-0.16	55.35	
3,811.0	0.50	293.85	3,807.8	58.5	37.6	40.5	0.43	0.37	51.74	
3,911.0	0.13	316.70	3,907.8	58.8	37.2	40.9	0.38	-0.37	22.85	
4,011.0	0.52	330.92	4,007.8	59.3	36.9	41.4	0.40	0.39	14.22	
4,111.0	0.57	303.07	4,107.8	60.0	36.2	42.3	0.27	0.05	-27.85	
4,211.0	0.42	313.97	4,207.8	60.5	35.6	43.0	0.18	-0.15	19.90	
4,311.0	0.55	315.07	4,307.8	61.1	34.9	43.8	0.13	0.13	11.10	
4,411.0	0.28	311.03	4,407.8	61.6	34.4	44.5	0.27	-0.27	17.04	
4,511.0	0.45	316.47	4,507.8	62.0	34.0	45.1	0.17	0.17	15.44	
4,611.0	0.22	280.66	4,607.8	62.3	33.5	45.5	0.30	-0.23	35.84	
4,711.0	0.34	247.88	4,707.8	62.3	33.0	45.6	0.20	0.12	22.78	
4,811.0	0.43	241.83	4,807.8	62.0	32.4	45.6	0.10	0.09	6.05	
4,911.0	0.27	201.71	4,907.8	61.6	32.0	45.4	0.28	-0.16	40.12	
5,011.0	0.60	169.53	5,007.8	60.8	32.0	44.7	0.40	0.33	-32.18	
5,111.0	0.91	178.34	5,107.8	59.5	32.2	43.4	0.33	0.31	8.81	
5,211.0	0.95	172.77	5,207.8	57.9	32.3	41.9	0.10	0.04	-5.57	

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Phoenix Technology Services  
Survey Report



<b>Company:</b>	Triad Hunter	<b>Local Co-ordinate Reference:</b>	Well WVDNR #1209
<b>Project:</b>	WVDNR Pad 6	<b>TVD Reference:</b>	20' RKB - 1450' GL @ 1470.0usft (Warren 12)
<b>Site:</b>	WVDNR Pad 6 - Wetzel County, WV	<b>MD Reference:</b>	20' RKB - 1450' GL @ 1470.0usft (Warren 12)
<b>Well:</b>	WVDNR #1209	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Well	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	As Drilled	<b>Database:</b>	Local database

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
5,311.0	0.92	162.04	5,307.8	56.3	32.6	40.3	0.18	-0.03	-10.73	
5,411.0	0.82	168.27	5,407.8	54.9	33.0	38.8	0.14	-0.10	6.23	
5,511.0	1.04	160.90	5,507.7	53.3	33.5	37.1	0.25	0.22	-7.37	
5,611.0	1.12	163.89	5,607.7	51.5	34.0	35.3	0.10	0.08	2.99	
5,711.0	1.03	169.39	5,707.7	49.7	34.5	33.4	0.14	-0.09	5.50	
5,811.0	0.93	176.64	5,807.7	48.0	34.7	31.8	0.16	-0.10	7.25	
5,911.0	0.94	185.12	5,907.7	46.4	34.7	30.3	0.14	0.01	8.48	
6,011.0	0.60	230.69	6,007.7	45.2	34.2	29.4	0.67	-0.34	45.57	
6,111.0	0.59	192.11	6,107.7	44.4	33.7	28.8	0.39	-0.01	-38.58	
6,160.0	0.60	174.16	6,156.7	43.9	33.6	28.3	0.38	0.02	-36.64	
6,253.0	1.10	145.70	6,249.7	42.7	34.2	27.0	0.69	0.54	-30.60	
6,348.0	1.40	136.70	6,344.6	41.1	35.5	25.0	0.38	0.32	-9.47	
6,380.0	1.10	134.40	6,376.6	40.6	36.0	24.4	0.95	-0.94	-7.19	
6,412.0	1.40	46.80	6,408.6	40.6	36.5	24.2	5.45	0.94	-273.75	
6,444.0	3.70	36.30	6,440.6	41.7	37.4	24.9	7.30	7.19	-32.81	
6,475.0	5.60	34.30	6,471.5	43.8	38.8	26.3	6.15	6.13	-6.45	
6,507.0	6.80	28.20	6,503.3	46.7	40.6	28.4	4.27	3.75	-19.06	
6,539.0	8.60	23.70	6,535.0	50.6	42.5	31.3	5.93	5.63	-14.06	
6,570.0	10.50	16.90	6,565.6	55.4	44.2	35.1	7.12	6.13	-21.94	
6,602.0	12.10	15.10	6,597.0	61.4	45.9	40.1	5.12	5.00	-5.63	
6,634.0	13.00	13.70	6,628.2	68.2	47.7	45.7	2.97	2.81	-4.38	
6,665.0	14.10	10.00	6,658.3	75.3	49.1	51.8	4.52	3.55	-11.94	
6,697.0	14.50	6.60	6,689.3	83.1	50.3	58.6	2.91	1.25	-10.63	
6,729.0	15.50	6.90	6,720.2	91.3	51.3	65.9	3.13	3.13	0.94	
6,761.0	16.60	9.50	6,751.0	100.1	52.5	73.6	4.11	3.44	8.13	
6,792.0	16.00	10.90	6,780.7	108.6	54.1	80.9	2.31	-1.94	4.52	
6,824.0	15.60	13.50	6,811.5	117.2	55.9	88.2	2.54	-1.25	8.13	
6,856.0	16.30	15.80	6,842.3	125.7	58.1	95.2	2.95	2.19	7.19	
6,888.0	17.60	17.70	6,872.9	134.6	60.8	102.5	4.42	4.06	5.94	
6,920.0	20.70	16.70	6,903.1	144.6	63.9	110.7	9.74	9.69	-3.13	
6,951.0	24.90	15.20	6,931.7	156.2	67.2	120.2	13.68	13.55	-4.84	
6,983.0	29.00	12.10	6,960.2	170.3	70.6	132.1	13.54	12.81	-9.69	
7,015.0	31.70	11.30	6,987.8	186.1	73.9	145.6	8.53	8.44	-5.50	
7,047.0	32.80	11.00	7,014.9	202.9	77.2	159.9	3.47	3.44	-0.94	
7,079.0	34.40	11.10	7,041.6	220.2	80.6	174.8	5.00	5.00	0.31	
7,111.0	37.10	11.00	7,067.5	238.6	84.2	190.5	8.44	8.44	0.31	
7,143.0	39.10	11.50	7,092.7	257.9	88.0	207.1	6.32	6.25	1.56	
7,174.0	40.00	11.20	7,116.6	277.3	91.9	223.6	2.97	2.90	-0.97	
7,206.0	41.60	10.50	7,140.8	297.8	95.8	241.3	5.20	5.00	-2.19	
7,238.0	43.10	10.60	7,164.5	319.0	99.8	259.5	4.69	4.69	0.31	
7,270.0	44.20	10.40	7,187.6	340.7	103.8	278.2	3.46	3.44	-0.63	
7,302.0	45.30	10.70	7,210.4	362.9	107.9	297.2	3.50	3.44	0.94	
7,333.0	46.30	9.20	7,232.0	384.8	111.8	316.1	4.74	3.23	-4.84	

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## Survey Report



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<b>Project:</b>	WVDNR Pad 6	<b>TVD Reference:</b>	20' RKB - 1450' GL @ 1470.0usft (Warren 12)
<b>Site:</b>	WVDNR Pad 6 - Wetzel County, WV	<b>MD Reference:</b>	20' RKB - 1450' GL @ 1470.0usft (Warren 12)
<b>Well:</b>	WVDNR #1209	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Well	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	As Drilled	<b>Database:</b>	Local database

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
7,365.0	46.60	7.50	7,254.0	407.7	115.1	336.2	3.96	0.94	-5.31	
7,397.0	47.30	6.70	7,275.9	430.9	118.0	356.7	2.85	2.19	-2.50	
7,429.0	46.90	7.50	7,297.7	454.2	120.9	377.2	2.22	-1.25	2.50	
7,461.0	47.20	10.70	7,319.5	477.3	124.6	397.4	7.38	0.94	10.00	
7,492.0	49.40	11.10	7,340.1	500.0	129.0	416.8	7.16	7.10	1.29	
7,524.0	53.50	11.10	7,360.0	524.6	133.8	437.9	12.81	12.81	0.00	
7,556.0	56.20	11.70	7,378.4	550.2	139.0	459.8	8.58	8.44	1.88	
7,588.0	58.80	9.00	7,395.6	576.8	143.8	482.7	10.60	8.13	-8.44	
7,620.0	60.80	5.40	7,411.7	604.2	147.3	506.9	11.56	6.25	-11.25	
7,651.0	63.90	1.50	7,426.1	631.6	148.9	531.7	14.97	10.00	-12.58	
7,683.0	67.00	358.50	7,439.4	660.7	148.9	558.8	12.90	9.69	-9.38	
7,715.0	69.10	356.20	7,451.4	690.4	147.5	586.8	9.35	6.56	-7.19	
7,747.0	70.60	353.20	7,462.4	720.3	144.8	615.6	9.97	4.69	-9.38	
7,779.0	72.10	350.60	7,472.6	750.3	140.5	645.1	9.01	4.69	-8.13	
7,811.0	73.80	348.00	7,482.0	780.3	134.8	675.1	9.41	5.31	-8.13	
7,843.0	75.00	346.30	7,490.6	810.4	127.9	705.6	6.34	3.75	-5.31	
7,874.0	76.10	344.60	7,498.4	839.4	120.4	735.3	6.39	3.55	-5.48	
7,906.0	77.20	342.30	7,505.8	869.3	111.5	766.4	7.79	3.44	-7.19	
7,938.0	79.30	341.00	7,512.3	899.0	101.7	797.6	7.67	6.56	-4.06	
7,970.0	81.90	340.00	7,517.5	928.8	91.1	829.2	8.69	8.13	-3.13	
8,002.0	83.60	339.60	7,521.5	958.6	80.2	860.9	5.46	5.31	-1.25	
8,033.0	88.20	338.90	7,523.8	987.5	69.2	891.8	15.01	14.84	-2.26	
8,049.4	89.94	338.49	7,524.0	1,002.7	63.3	908.2	10.92	10.62	-2.50	
<b>1209 LP</b>										
8,065.0	91.60	338.10	7,523.8	1,017.2	57.5	923.8	10.92	10.63	-2.50	
8,097.0	92.60	335.40	7,522.6	1,046.6	44.9	955.8	8.99	3.13	-8.44	
8,119.0	93.30	333.00	7,521.5	1,066.4	35.3	977.7	11.35	3.18	-10.91	
8,215.0	93.10	330.90	7,516.1	1,151.0	-9.8	1,072.9	2.19	-0.21	-2.19	
8,310.0	92.10	331.80	7,511.8	1,234.3	-55.3	1,167.1	1.42	-1.05	0.95	
8,405.0	92.70	331.00	7,507.9	1,317.6	-100.7	1,261.4	1.05	0.63	-0.84	
8,501.0	92.00	332.30	7,503.9	1,402.0	-146.2	1,356.6	1.54	-0.73	1.35	
8,596.0	91.60	332.50	7,500.9	1,486.2	-190.2	1,451.1	0.47	-0.42	0.21	
8,692.0	92.10	332.40	7,497.8	1,571.2	-234.6	1,546.6	0.53	0.52	-0.10	
8,788.0	92.40	333.10	7,494.1	1,656.5	-278.5	1,642.0	0.79	0.31	0.73	
8,883.0	91.20	332.00	7,491.1	1,740.8	-322.3	1,736.5	1.71	-1.26	-1.16	
8,978.0	90.30	332.60	7,489.8	1,824.9	-366.5	1,831.0	1.14	-0.95	0.63	
9,074.0	88.80	331.20	7,490.6	1,909.5	-411.7	1,926.4	2.14	-1.56	-1.46	
9,169.0	89.10	330.80	7,492.3	1,992.6	-457.7	2,020.6	0.53	0.32	-0.42	
9,264.0	90.80	329.70	7,492.4	2,075.1	-504.9	2,114.6	2.13	1.79	-1.16	
9,359.0	90.80	332.30	7,491.1	2,158.2	-550.9	2,208.9	2.74	0.00	2.74	
9,455.0	91.20	331.20	7,489.4	2,242.7	-596.3	2,304.2	1.22	0.42	-1.15	
9,550.0	90.20	333.40	7,488.3	2,326.8	-640.5	2,398.7	2.54	-1.05	-2.32	
9,646.0	90.80	332.00	7,487.4	2,412.1	-684.5	2,494.2	1.59	0.63	-1.46	
9,741.0	89.80	330.40	7,486.9	2,495.4	-730.3	2,588.5	1.99	-1.05	-1.68	

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## Survey Report



<b>Company:</b>	Triad Hunter	<b>Local Co-ordinate Reference:</b>	Well WVDNR #1209
<b>Project:</b>	WVDNR Pad 6	<b>TVD Reference:</b>	20' RKB - 1450' GL @ 1470.0usft (Warren 12)
<b>Site:</b>	WVDNR Pad 6 - Wetzel County, WV	<b>MD Reference:</b>	20' RKB - 1450' GL @ 1470.0usft (Warren 12)
<b>Well:</b>	WVDNR #1209	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Well	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	As Drilled	<b>Database:</b>	Local database

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
9,836.0	91.30	332.90	7,486.0	2,579.0	-775.4	2,682.8	3.07	1.58	2.63	
9,932.0	90.10	333.30	7,484.8	2,664.6	-818.8	2,778.4	1.32	-1.25	0.42	
10,027.0	90.90	334.60	7,484.0	2,749.9	-860.5	2,873.2	1.61	0.84	1.37	
10,122.0	92.00	333.50	7,481.6	2,835.3	-902.1	2,967.9	1.64	1.16	-1.16	
10,218.0	89.60	332.30	7,480.3	2,920.7	-945.8	3,063.4	2.79	-2.50	-1.25	
10,311.0	90.20	330.00	7,480.4	3,002.2	-990.7	3,155.7	2.56	0.65	-2.47	
10,407.0	90.70	329.50	7,479.7	3,085.1	-1,039.0	3,250.6	0.74	0.52	-0.52	
10,501.0	89.90	329.30	7,479.2	3,166.0	-1,086.9	3,343.5	0.88	-0.85	-0.21	
10,596.0	89.80	329.00	7,479.4	3,247.6	-1,135.6	3,437.3	0.33	-0.11	-0.32	
10,692.0	89.60	326.80	7,479.9	3,328.9	-1,186.6	3,531.7	2.30	-0.21	-2.29	
10,787.0	91.20	327.60	7,479.3	3,408.8	-1,238.1	3,624.9	1.88	1.68	0.84	
10,883.0	90.50	328.40	7,477.8	3,490.2	-1,288.9	3,719.4	1.11	-0.73	0.83	
10,978.0	92.00	325.20	7,475.8	3,569.6	-1,340.9	3,812.4	3.72	1.58	-3.37	
11,074.0	92.70	329.60	7,471.8	3,650.4	-1,392.6	3,906.6	4.64	0.73	4.58	
11,169.0	92.30	330.50	7,467.7	3,732.6	-1,440.0	4,000.5	1.04	-0.42	0.95	
11,264.0	89.60	330.60	7,466.1	3,815.3	-1,486.7	4,094.6	2.84	-2.84	0.11	
11,359.0	89.00	332.80	7,467.3	3,899.0	-1,531.7	4,189.0	2.40	-0.63	2.32	
11,455.0	89.20	331.70	7,468.8	3,983.9	-1,576.4	4,284.5	1.16	0.21	-1.15	
11,550.0	89.20	331.20	7,470.1	4,067.4	-1,621.8	4,378.8	0.53	0.00	-0.53	
11,624.0	89.50	331.30	7,470.9	4,132.2	-1,657.4	4,452.2	0.43	0.41	0.14	
<b>Final Survey</b>										
11,668.4	89.50	331.30	7,471.3	4,171.2	-1,678.7	4,496.3	0.00	0.00	0.00	
<b>1209 PBHL</b>										
11,676.0	89.50	331.30	7,471.4	4,177.8	-1,682.4	4,503.8	0.00	0.00	0.00	
<b>PROJ to Bit</b>										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
11,624.0	7,470.9	4,132.2	-1,657.4	Final Survey	
11,676.0	7,471.4	4,177.8	-1,682.4	PROJ to Bit	

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

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