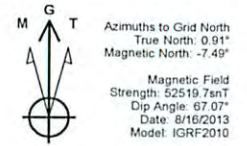




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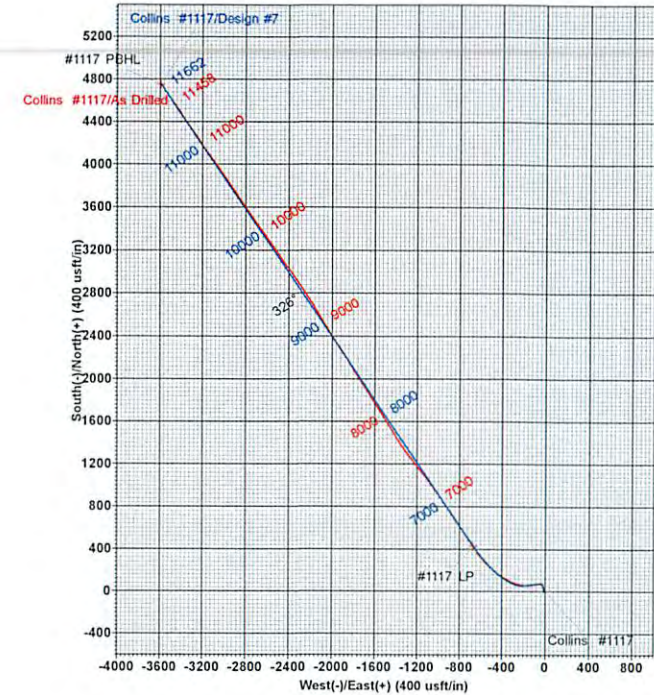
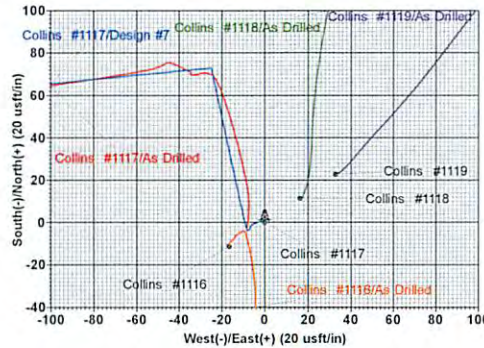
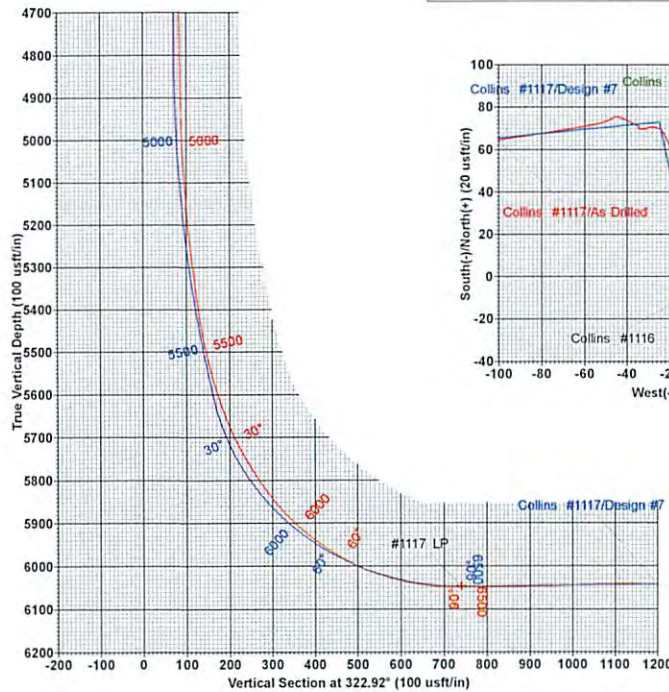
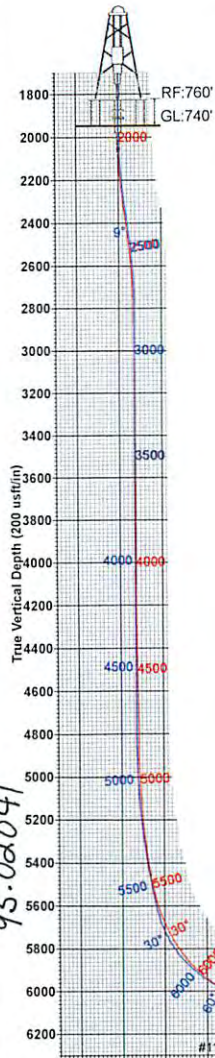
Collins #1117
Collins Unit - Tyler County, WV
20' RKB - 740' GL @ 760.0usft (Warren Drilling #12)
Latitude: 39° 29' 42.777 N
Longitude: 80° 55' 5.697 W
Northing: 365644.43
Easting: 1568288.10
Design #7

Map System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone Name: West Virginia Northern Zone
Local Origin: Well Collins #1117 - Slot #1117, Grid North

Grid East: 1568288.10
Grid North: 365644.43
Scale Factor: 1.000

Geomagnetic Model: IGRF2010
Sample Date: 16-Aug-13
Magnetic Declination: -8.39°
Dip Angle from Horizontal: 67.07°
Magnetic Field Strength: 52520

To convert a Magnetic Direction to a Grid Direction, Subtract 7.49°
To convert a Magnetic Direction to a True Direction, Subtract 8.39°
To convert a True Direction to a Grid Direction, Add 0.90°



MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VSect	Target
1921.0	0.23	309.56	1921.0	-3.8	-8.0	0.00	0.00	1.7	
1988.0	0.23	309.56	1988.0	-3.7	-8.2	0.00	0.00	2.0	
2282.0	9.00	348.00	2280.8	19.3	-13.4	3.00	39.36	23.5	
2482.0	9.00	348.00	2478.3	49.9	-19.9	0.00	0.00	51.8	
2782.0	0.00	0.00	2777.1	72.9	-24.8	3.00	180.00	73.1	
4819.0	0.00	0.00	4814.1	72.9	-24.8	0.00	0.00	73.1	
5655.9	25.10	264.32	5624.5	55.0	-204.3	3.00	264.32	167.1	
6444.6	90.50	325.95	6047.0	425.5	-666.9	10.00	63.74	741.6	#1117 LP
11661.9	90.50	325.95	6001.5	4748.0	-3588.3	0.00	0.00	5951.5	#1117 PBHL

DESIGN TARGET DETAILS								
Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude	Shape
#1117 PBHL 6001.5	4748.0	-3588.3	370392.46	1564699.77	39° 30' 29.137 N	80° 55' 52.432 W		Point
#1117 LP 6047.0	425.5	-666.9	366069.98	1567621.16	39° 29' 46.878 N	80° 55' 14.289 W		Point

95.02041

95.02041

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Triad Hunter

Collins Unit
Collins Unit - Tyler County, WV
Collins #1117 - Slot #1117

Original Well

Design: As Drilled

Standard Survey Report

04 September, 2013

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Triad Hunter

02/06/2015



Company:	Triad Hunter	Local Co-ordinate Reference:	Well Collins #1117 - Slot #1117
Project:	Collins Unit	TVD Reference:	20' RKB - 740' GL @ 760.0usft (Warren Drilling #12)
Site:	Collins Unit - Tyler County, WV	MD Reference:	20' RKB - 740' GL @ 760.0usft (Warren Drilling #12)
Well:	Collins #1117	North Reference:	Grid
Wellbore:	Original Well	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Local database

Project	Collins Unit		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	West Virginia Northern Zone		

Site	Collins Unit - Tyler County, WV				
Site Position:		Northing:	365,633.03 usft	Latitude:	39° 29' 42.662 N
From:	Map	Easting:	1,568,271.67 usft	Longitude:	80° 55' 5.904 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.90 °

Well	Collins #1117 - Slot #1117					
Well Position	+N/-S	0.0 usft	Northing:	365,644.43 usft	Latitude:	39° 29' 42.777 N
	+E/-W	0.0 usft	Easting:	1,568,288.10 usft	Longitude:	80° 55' 5.697 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	740.0 usft

Wellbore	Original Well				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/16/2013	-8.39	67.07	52,520

Design	As Drilled				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	244.34	

Survey Program	Date	9/4/2013			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
108.0	1,921.0	Vaughn Gyro (Original Well)	GyroFlex		
1,974.0	11,648.0	Phoenix MWD (Original Well)	MWD		

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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00
108.0	0.39	286.27	108.0	0.1	-0.4	0.3	0.36	0.36	0.00	0.00
208.0	0.75	268.61	208.0	0.2	-1.3	1.1	0.40	0.36	-17.66	-17.66
308.0	0.44	252.79	308.0	0.1	-2.4	2.1	0.35	-0.31	-15.82	-15.82
408.0	0.38	261.07	408.0	-0.1	-3.0	2.8	0.08	-0.06	8.28	8.28
508.0	0.40	235.35	508.0	-0.4	-3.7	3.5	0.17	0.02	-25.72	-25.72
608.0	0.31	265.32	608.0	-0.6	-4.2	4.1	0.20	-0.09	29.97	29.97
708.0	0.41	231.94	708.0	-0.8	-4.8	4.7	0.23	0.10	-33.38	-33.38



Company:	Triad Hunter	Local Co-ordinate Reference:	Well Collins #1117 - Slot #1117
Project:	Collins Unit	TVD Reference:	20' RKB - 740' GL @ 760.0usft (Warren Drilling #12)
Site:	Collins Unit - Tyler County, WV	MD Reference:	20' RKB - 740' GL @ 760.0usft (Warren Drilling #12)
Well:	Collins #1117	North Reference:	Grid
Wellbore:	Original Well	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	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)	
808.0	0.32	249.46	808.0	-1.1	-5.3	5.3	0.14	-0.09	17.52	
908.0	0.18	235.57	908.0	-1.3	-5.7	5.7	0.15	-0.14	-13.89	
1,008.0	0.23	230.00	1,008.0	-1.5	-6.0	6.1	0.05	0.05	-5.57	
1,108.0	0.40	226.95	1,108.0	-1.9	-6.4	6.6	0.17	0.17	-3.05	
1,208.0	0.11	207.24	1,208.0	-2.2	-6.7	7.0	0.30	-0.29	-19.71	
1,308.0	0.16	137.88	1,308.0	-2.4	-6.6	7.0	0.16	0.05	-69.36	
1,408.0	0.31	193.69	1,408.0	-2.8	-6.6	7.2	0.26	0.15	55.81	
1,508.0	0.27	216.26	1,508.0	-3.2	-6.8	7.6	0.12	-0.04	22.57	
1,608.0	0.29	238.50	1,608.0	-3.6	-7.2	8.0	0.11	0.02	22.24	
1,708.0	0.24	236.27	1,708.0	-3.8	-7.6	8.5	0.05	-0.05	-2.23	
1,808.0	0.04	275.72	1,808.0	-3.9	-7.8	8.7	0.21	-0.20	39.45	
1,908.0	0.16	302.40	1,908.0	-3.9	-7.9	8.8	0.13	0.12	26.68	
1,921.0	0.23	309.56	1,921.0	-3.8	-8.0	8.8	0.57	0.54	55.08	
1,974.0	0.20	193.30	1,974.0	-3.8	-8.1	8.9	0.69	-0.06	-219.36	
2,040.0	0.90	359.90	2,040.0	-3.4	-8.1	8.8	1.66	1.06	252.42	
2,072.0	2.00	13.90	2,072.0	-2.6	-8.0	8.3	3.59	3.44	43.75	
2,133.0	5.10	8.00	2,132.8	1.1	-7.3	6.1	5.11	5.08	-9.67	
2,199.0	7.10	359.70	2,198.5	8.1	-6.9	2.8	3.30	3.03	-12.58	
2,231.0	7.20	353.30	2,230.2	12.0	-7.2	1.3	2.51	0.31	-20.00	
2,263.0	8.00	351.30	2,261.9	16.2	-7.8	0.0	2.63	2.50	-6.25	
2,295.0	8.30	348.20	2,293.6	20.7	-8.6	-1.2	1.66	0.94	-9.69	
2,390.0	9.00	345.50	2,387.5	34.6	-11.8	-4.3	0.85	0.74	-2.84	
2,486.0	8.50	344.30	2,482.4	48.7	-15.6	-7.0	0.55	-0.52	-1.25	
2,581.0	6.20	339.90	2,576.6	60.3	-19.3	-8.7	2.49	-2.42	-4.63	
2,676.0	3.10	328.20	2,671.3	67.3	-22.4	-8.9	3.40	-3.26	-12.32	
2,772.0	1.10	287.00	2,767.2	69.7	-24.7	-8.0	2.48	-2.08	-42.92	
2,867.0	0.60	292.30	2,862.2	70.2	-26.0	-7.0	0.53	-0.53	5.58	
2,962.0	0.50	281.40	2,957.2	70.5	-26.9	-6.3	0.15	-0.11	-11.47	
3,057.0	0.50	276.00	3,052.2	70.6	-27.7	-5.6	0.05	0.00	-5.68	
3,153.0	0.60	250.60	3,148.2	70.5	-28.6	-4.8	0.27	0.10	-26.46	
3,248.0	0.60	256.50	3,243.2	70.2	-29.5	-3.8	0.07	0.00	6.21	
3,344.0	0.50	253.50	3,339.2	70.0	-30.4	-2.9	0.11	-0.10	-3.13	
3,440.0	0.70	254.20	3,435.2	69.7	-31.4	-1.9	0.21	0.21	0.73	
3,536.0	0.80	271.70	3,531.2	69.5	-32.6	-0.7	0.26	0.10	18.23	
3,631.0	0.80	275.90	3,626.2	69.6	-33.9	0.4	0.06	0.00	4.42	
3,727.0	0.30	18.60	3,722.2	69.9	-34.5	0.8	0.95	-0.52	106.98	
3,822.0	0.20	57.20	3,817.2	70.3	-34.3	0.5	0.20	-0.11	40.63	
3,918.0	0.20	50.10	3,913.2	70.5	-34.0	0.2	0.03	0.00	-7.40	
4,013.0	0.20	342.40	4,008.2	70.7	-34.0	0.0	0.23	0.00	-71.26	
4,108.0	0.40	290.00	4,103.2	71.0	-34.3	0.2	0.34	0.21	-55.16	
4,204.0	0.50	299.30	4,199.2	71.3	-35.0	0.7	0.13	0.10	9.69	
4,299.0	0.70	291.10	4,294.2	71.7	-35.9	1.3	0.23	0.21	-8.63	



Company:	Triad Hunter	Local Co-ordinate Reference:	Well Collins #1117 - Slot #1117
Project:	Collins Unit	TVD Reference:	20' RKB - 740' GL @ 760.0usft (Warren Drilling #12)
Site:	Collins Unit - Tyler County, WV	MD Reference:	20' RKB - 740' GL @ 760.0usft (Warren Drilling #12)
Well:	Collins #1117	North Reference:	Grid
Wellbore:	Original Well	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	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)	
4,394.0	0.80	295.10	4,389.2	72.2	-37.0	2.1	0.12	0.11	4.21	
4,490.0	0.90	300.00	4,485.1	72.9	-38.3	3.0	0.13	0.10	5.10	
4,585.0	1.10	296.00	4,580.1	73.6	-39.8	3.9	0.22	0.21	-4.21	
4,681.0	1.20	293.70	4,676.1	74.5	-41.5	5.2	0.11	0.10	-2.40	
4,776.0	1.30	289.90	4,771.1	75.2	-43.4	6.6	0.14	0.11	-4.00	
4,808.0	1.30	281.40	4,803.1	75.4	-44.1	7.1	0.60	0.00	-26.56	
4,840.0	1.70	258.20	4,835.1	75.4	-45.0	7.9	2.25	1.25	-72.50	
4,871.0	2.40	239.80	4,866.0	75.0	-46.0	9.0	3.07	2.26	-59.35	
4,903.0	3.20	242.90	4,898.0	74.2	-47.3	10.5	2.54	2.50	9.69	
4,935.0	3.80	247.40	4,929.9	73.4	-49.1	12.5	2.06	1.88	14.06	
4,982.0	5.10	255.40	4,976.8	72.3	-52.6	16.1	3.06	2.77	17.02	
5,013.0	6.20	259.00	5,007.7	71.6	-55.6	19.1	3.73	3.55	11.61	
5,045.0	6.90	258.90	5,039.4	70.9	-59.1	22.6	2.19	2.19	-0.31	
5,077.0	7.80	261.00	5,071.2	70.2	-63.2	26.5	2.93	2.81	6.56	
5,109.0	8.50	260.90	5,102.9	69.5	-67.6	30.9	2.19	2.19	-0.31	
5,140.0	9.30	259.60	5,133.5	68.7	-72.4	35.5	2.66	2.58	-4.19	
5,172.0	10.20	260.50	5,165.0	67.7	-77.7	40.7	2.85	2.81	2.81	
5,204.0	11.20	261.90	5,196.5	66.8	-83.6	46.4	3.23	3.13	4.38	
5,236.0	12.20	262.10	5,227.8	65.9	-90.0	52.6	3.13	3.13	0.63	
5,268.0	13.10	261.90	5,259.0	65.0	-96.9	59.2	2.82	2.81	-0.63	
5,299.0	13.80	261.70	5,289.2	63.9	-104.1	66.1	2.26	2.26	-0.65	
5,331.0	14.20	261.50	5,320.2	62.8	-111.7	73.5	1.26	1.25	-0.63	
5,363.0	15.20	261.60	5,351.2	61.6	-119.8	81.3	3.13	3.13	0.31	
5,395.0	16.60	261.60	5,382.0	60.3	-128.4	89.6	4.38	4.38	0.00	
5,427.0	17.90	261.90	5,412.5	59.0	-137.8	98.7	4.07	4.06	0.94	
5,459.0	18.80	264.20	5,442.9	57.8	-147.8	108.2	3.61	2.81	7.19	
5,491.0	20.50	266.60	5,473.0	56.9	-158.6	118.3	5.88	5.31	7.50	
5,523.0	21.70	266.70	5,502.9	56.2	-170.1	128.9	3.75	3.75	0.31	
5,554.0	22.00	269.30	5,531.6	55.8	-181.6	139.5	3.27	0.97	8.39	
5,585.0	23.00	272.40	5,560.3	56.0	-193.4	150.1	5.00	3.23	10.00	
5,616.0	24.20	275.70	5,588.7	56.9	-205.8	160.9	5.76	3.87	10.65	
5,648.0	25.60	278.90	5,617.7	58.6	-219.2	172.2	6.07	4.38	10.00	
5,680.0	27.00	281.50	5,646.4	61.1	-233.1	183.7	5.66	4.38	8.13	
5,712.0	28.80	284.70	5,674.7	64.5	-247.7	195.3	7.32	5.63	10.00	
5,744.0	30.20	288.40	5,702.5	69.0	-262.8	207.0	7.18	4.38	11.56	
5,775.0	31.60	291.60	5,729.1	74.5	-277.7	218.1	6.96	4.52	10.32	
5,807.0	33.60	294.00	5,756.1	81.2	-293.6	229.5	7.44	6.25	7.50	
5,839.0	35.70	296.10	5,782.4	88.9	-310.1	241.0	7.55	6.56	6.56	
5,871.0	37.70	297.10	5,808.1	97.5	-327.2	252.7	6.52	6.25	3.13	
5,903.0	39.70	298.40	5,833.1	106.8	-344.9	264.6	6.75	6.25	4.06	
5,934.0	42.70	300.00	5,856.4	116.7	-362.7	276.4	10.26	9.68	5.16	
5,966.0	45.70	301.70	5,879.3	128.2	-381.9	288.7	10.08	9.38	5.31	



Company:	Triad Hunter	Local Co-ordinate Reference:	Well Collins #1117 - Slot #1117
Project:	Collins Unit	TVD Reference:	20' RKB - 740' GL @ 760.0usft (Warren Drilling #12)
Site:	Collins Unit - Tyler County, WV	MD Reference:	20' RKB - 740' GL @ 760.0usft (Warren Drilling #12)
Well:	Collins #1117	North Reference:	Grid
Wellbore:	Original Well	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	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)	
5,998.0	48.70	303.30	5,901.1	140.8	-401.7	301.1	10.07	9.38	5.00	
6,030.0	51.40	305.10	5,921.6	154.6	-421.9	313.4	9.47	8.44	5.63	
6,062.0	54.30	306.90	5,940.9	169.6	-442.6	325.5	10.11	9.06	5.63	
6,094.0	57.30	309.80	5,958.9	186.0	-463.3	337.1	12.00	9.38	9.06	
6,125.0	59.70	313.00	5,975.1	203.5	-483.1	347.3	11.72	7.74	10.32	
6,157.0	62.50	313.80	5,990.6	222.7	-503.5	357.3	9.02	8.75	2.50	
6,189.0	66.20	314.70	6,004.4	242.9	-524.1	367.2	11.84	11.56	2.81	
6,221.0	70.50	316.00	6,016.2	264.0	-545.0	376.9	13.96	13.44	4.06	
6,253.0	73.50	318.80	6,026.1	286.4	-565.6	385.8	12.53	9.38	8.75	
6,285.0	77.20	320.10	6,034.2	310.0	-585.7	393.7	12.21	11.56	4.06	
6,317.0	79.20	321.70	6,040.8	334.3	-605.5	401.0	7.94	6.25	5.00	
6,349.0	82.70	324.00	6,045.8	359.4	-624.6	407.3	13.04	10.94	7.19	
6,381.0	86.50	325.80	6,048.8	385.5	-642.9	412.5	13.13	11.88	5.63	
6,413.0	90.10	326.70	6,049.8	412.1	-660.7	417.0	11.60	11.25	2.81	
6,427.7	90.19	326.61	6,049.7	424.4	-668.7	419.0	0.88	0.63	-0.62	
#1117 LP										
6,445.0	90.30	326.50	6,049.6	438.8	-678.3	421.3	0.88	0.62	-0.63	
6,540.0	90.40	326.90	6,049.1	518.2	-730.4	433.9	0.43	0.11	0.42	
6,630.0	92.10	326.80	6,047.1	593.5	-779.6	445.7	1.89	1.89	-0.11	
6,721.0	92.10	326.00	6,043.8	669.3	-830.0	458.2	0.88	0.00	-0.88	
6,812.0	89.60	325.60	6,042.4	744.5	-881.1	471.7	2.78	-2.75	-0.44	
6,902.0	89.50	325.60	6,043.1	818.8	-931.9	485.4	0.11	-0.11	0.00	
6,993.0	90.50	325.00	6,043.1	893.6	-983.7	499.7	1.28	1.10	-0.66	
7,083.0	92.40	325.30	6,040.8	967.4	-1,035.1	514.1	2.14	2.11	0.33	
7,174.0	92.40	324.50	6,037.0	1,041.8	-1,087.4	529.0	0.88	0.00	-0.88	
7,265.0	89.60	320.40	6,035.4	1,113.9	-1,142.9	547.7	5.45	-3.08	-4.51	
7,356.0	91.50	321.70	6,034.6	1,184.7	-1,200.1	568.6	2.53	2.09	1.43	
7,451.0	92.40	322.50	6,031.3	1,259.6	-1,258.4	588.7	1.27	0.95	0.84	
7,547.0	90.90	324.80	6,028.6	1,336.9	-1,315.3	606.5	2.86	-1.56	2.40	
7,643.0	90.30	326.70	6,027.6	1,416.2	-1,369.3	620.9	2.08	-0.63	1.98	
7,738.0	91.00	329.70	6,026.5	1,497.0	-1,419.3	631.0	3.24	0.74	3.16	
7,834.0	90.70	328.00	6,025.1	1,579.1	-1,469.0	640.2	1.80	-0.31	-1.77	
7,929.0	90.50	326.70	6,024.1	1,659.1	-1,520.2	651.7	1.38	-0.21	-1.37	
8,024.0	91.20	328.50	6,022.7	1,739.3	-1,571.1	662.9	2.03	0.74	1.89	
8,119.0	90.50	327.20	6,021.3	1,819.7	-1,621.7	673.6	1.55	-0.74	-1.37	
8,214.0	90.90	328.10	6,020.1	1,900.0	-1,672.5	684.7	1.04	0.42	0.95	
8,310.0	90.60	326.60	6,018.8	1,980.8	-1,724.3	696.4	1.59	-0.31	-1.56	
8,405.0	90.90	327.30	6,017.6	2,060.4	-1,776.1	708.6	0.80	0.32	0.74	
8,501.0	90.20	328.60	6,016.7	2,141.8	-1,827.0	719.2	1.54	-0.73	1.35	
8,596.0	91.50	327.90	6,015.3	2,222.5	-1,877.0	729.3	1.55	1.37	-0.74	
8,692.0	89.80	323.80	6,014.2	2,302.0	-1,930.9	743.5	4.62	-1.77	-4.27	
8,783.0	90.70	326.80	6,013.8	2,376.8	-1,982.7	757.8	3.44	0.99	3.30	



Company:	Triad Hunter	Local Co-ordinate Reference:	Well Collins #1117 - Slot #1117
Project:	Collins Unit	TVD Reference:	20' RKB - 740' GL @ 760.0usft (Warren Drilling #12)
Site:	Collins Unit - Tyler County, WV	MD Reference:	20' RKB - 740' GL @ 760.0usft (Warren Drilling #12)
Well:	Collins #1117	North Reference:	Grid
Wellbore:	Original Well	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	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)	
8,879.0	90.60	329.10	6,012.7	2,458.1	-2,033.6	768.4	2.40	-0.10	2.40	
8,975.0	90.20	329.30	6,012.0	2,540.6	-2,082.8	777.0	0.47	-0.42	0.21	
9,070.0	91.30	329.20	6,010.8	2,622.2	-2,131.4	785.5	1.16	1.16	-0.11	
9,166.0	90.70	327.50	6,009.1	2,703.9	-2,181.7	795.5	1.88	-0.63	-1.77	
9,262.0	89.90	326.00	6,008.6	2,784.2	-2,234.3	808.1	1.77	-0.83	-1.56	
9,357.0	91.40	326.80	6,007.5	2,863.3	-2,286.9	821.3	1.79	1.58	0.84	
9,453.0	91.00	325.20	6,005.5	2,942.9	-2,340.6	835.2	1.72	-0.42	-1.67	
9,549.0	89.30	323.20	6,005.3	3,020.7	-2,396.7	852.1	2.73	-1.77	-2.08	
9,644.0	91.20	324.80	6,004.8	3,097.6	-2,452.6	869.1	2.61	2.00	1.68	
9,740.0	92.30	326.30	6,001.9	3,176.7	-2,506.8	883.8	1.94	1.15	1.56	
9,834.0	92.50	325.30	5,998.0	3,254.4	-2,559.6	897.7	1.08	0.21	-1.06	
9,930.0	90.20	324.40	5,995.7	3,332.9	-2,614.9	913.5	2.57	-2.40	-0.94	
10,025.0	89.90	325.20	5,995.6	3,410.5	-2,669.6	929.3	0.90	-0.32	0.84	
10,121.0	90.00	326.00	5,995.7	3,489.7	-2,723.9	943.9	0.84	0.10	0.83	
10,216.0	90.10	325.30	5,995.6	3,568.1	-2,777.5	958.2	0.74	0.11	-0.74	
10,312.0	90.00	325.50	5,995.5	3,647.2	-2,832.0	973.1	0.23	-0.10	0.21	
10,407.0	90.30	326.90	5,995.3	3,726.1	-2,884.8	986.6	1.51	0.32	1.47	
10,503.0	90.60	326.10	5,994.5	3,806.1	-2,937.8	999.6	0.89	0.31	-0.83	
10,598.0	90.90	325.60	5,993.3	3,884.8	-2,991.2	1,013.7	0.61	0.32	-0.53	
10,694.0	91.20	325.10	5,991.5	3,963.7	-3,045.7	1,028.7	0.61	0.31	-0.52	
10,789.0	90.40	323.30	5,990.2	4,040.8	-3,101.3	1,045.4	2.07	-0.84	-1.89	
10,885.0	90.40	325.00	5,989.5	4,118.6	-3,157.5	1,062.4	1.77	0.00	1.77	
10,980.0	90.30	326.70	5,989.0	4,197.2	-3,210.8	1,076.4	1.79	-0.11	1.79	
11,076.0	91.10	326.30	5,987.8	4,277.2	-3,263.8	1,089.5	0.93	0.83	-0.42	
11,171.0	89.40	323.90	5,987.4	4,355.1	-3,318.2	1,104.7	3.10	-1.79	-2.53	
11,267.0	91.10	327.20	5,987.0	4,434.3	-3,372.5	1,119.4	3.87	1.77	3.44	
11,362.0	90.60	325.50	5,985.5	4,513.3	-3,425.1	1,132.6	1.87	-0.53	-1.79	
11,458.0	89.50	324.00	5,985.5	4,591.7	-3,480.5	1,148.6	1.94	-1.15	-1.56	
11,553.0	89.60	323.20	5,986.2	4,668.2	-3,536.9	1,166.3	0.85	0.11	-0.84	
11,598.0	89.60	322.60	5,986.5	4,704.1	-3,564.0	1,175.2	1.33	0.00	-1.33	
Final Survey										
11,647.8	89.60	322.60	5,986.9	4,743.6	-3,594.2	1,185.3	0.00	0.00	0.00	
#1117 PBHL										
11,648.0	89.60	322.60	5,986.9	4,743.8	-3,594.4	1,185.3	0.00	0.00	0.00	
PROJ to Bit										



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Well:	Collins #1117	North Reference:	Grid
Wellbore:	Original Well	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Local database

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
11,598.0	5,986.5	4,704.1	-3,564.0	Final Survey	
11,648.0	5,986.9	4,743.8	-3,594.4	PROJ to Bit	

Checked By: _____ Approved By: _____ Date: _____

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