

Azimuths to True North  
Magnetic North: 10.34°

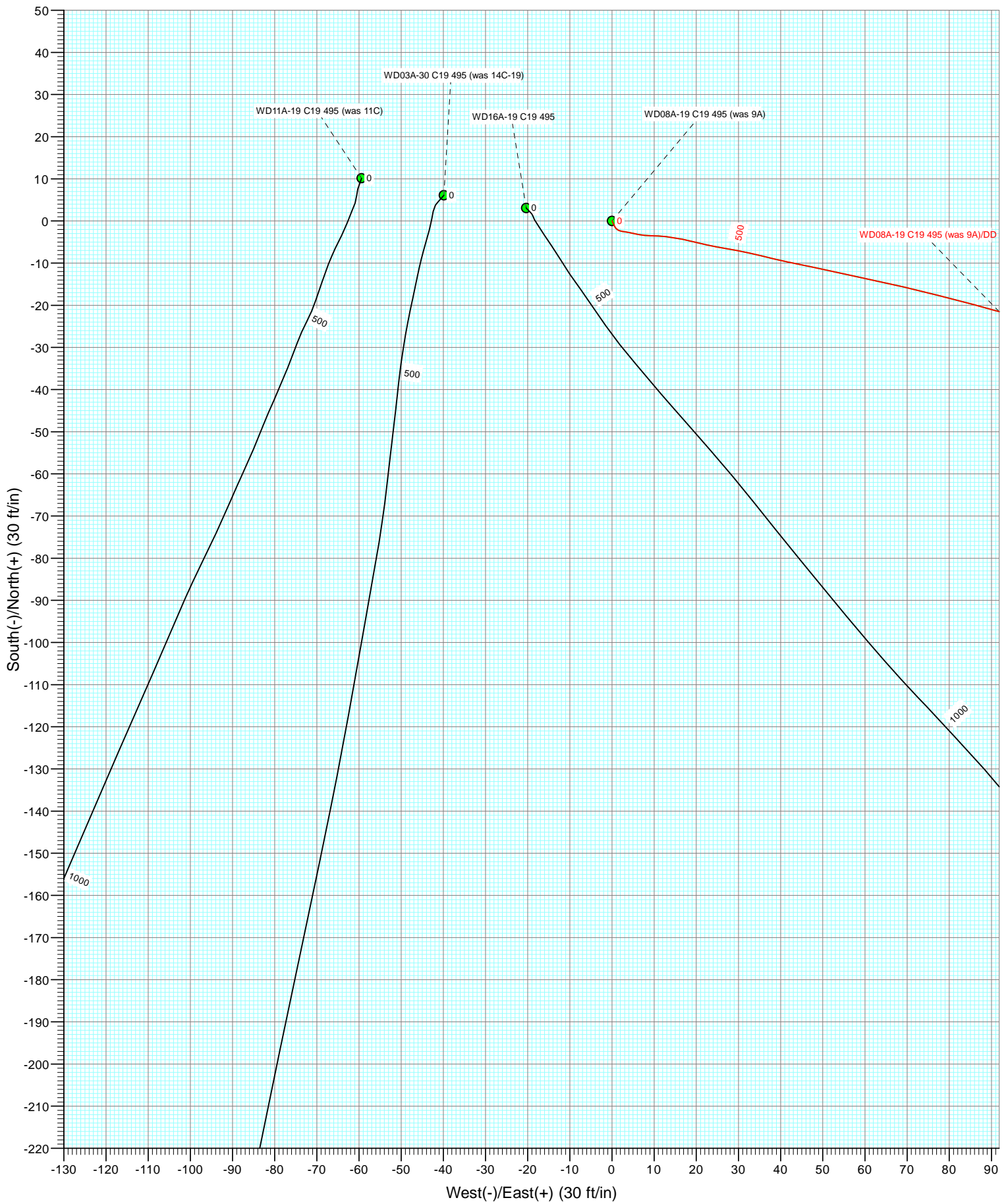
Magnetic Field  
Strength: 52258.2nT  
Dip Angle: 65.86°  
Date: 2/17/2012  
Model: IGRF2010

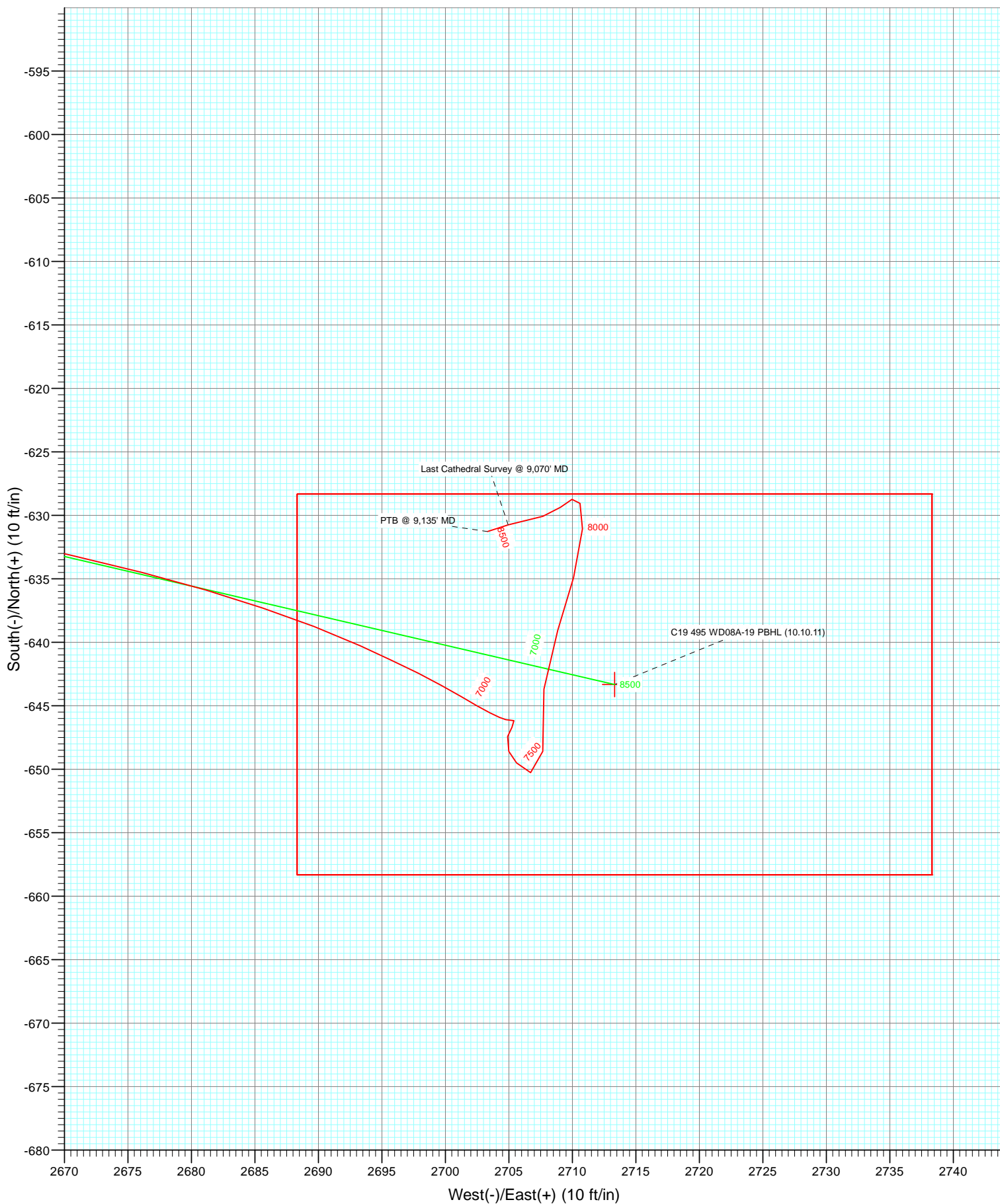
DD  
WD08A-19 C19 495 (was 9A)  
125099 140855 145055 125166; LR  
KB=32' @ 8159.0ft (Patterson 330)  
GL @ 8127.0  
North American Datum 1983  
Well WD08A-19 C19 495 (was 9A), True North

Type	Target	Azimuth	Origin Type	N/S	E/W	From TVD
Target	C19 495 WD08A-19 PBHL (10.10.11)	103.34	Slot	0.0	0.0	0.0
Name	TV	+N/-S	+E/-W	Latitude	Longitude	
C19 495 WD08A-19 PBHL (10.10.11)	8473.0	-643.3	2713.3	39° 41' 28.83 N	108° 5' 20.29 W	



Project: Story Gulch  
Site: C19 495  
Well: WD08A-19 C19 495 (was 9A)  
Wellbore: DD  
Design: Final Survey





## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well WD08A-19 C19 495 (was 9A)
<b>Project:</b>	Story Gulch	<b>TVD Reference:</b>	KB=32' @ 8159.0ft (Patterson 330)
<b>Site:</b>	C19 495	<b>MD Reference:</b>	KB=32' @ 8159.0ft (Patterson 330)
<b>Well:</b>	WD08A-19 C19 495 (was 9A)	<b>North Reference:</b>	True
<b>Wellbore:</b>	DD	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	DD	<b>Database:</b>	USA EDM 5000 Multi Users DB

<b>Project</b>	Story Gulch		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Central Zone		

Site		C19 495			
Site Position:		Northing:	1,687,624.39 ft	Latitude:	39° 41' 33.36 N
From:	Lat/Long	Easting:	2,268,676.50 ft	Longitude:	108° 5' 56.88 W
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.64 °

Well	WD08A-19 C19 495 (was 9A)					
Well Position	+N/-S	0.0 ft	Northing:	1,687,805.22 ft	Latitude:	39° 41' 35.19 N
	+E/-W	0.0 ft	Easting:	2,268,828.69 ft	Longitude:	108° 5' 55.00 W
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	8,127.0 ft

<b>Wellbore</b>	DD				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	2/17/2012	10.34	65.86	52,258

<b>Design</b>	DD				
<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)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	103.34	

<b>Survey Program</b>	<b>Date</b>	2/28/2012			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
173.0	9,135.0	Survey #1 (DD)	MWD	Geolink MWD	

<b>Survey</b>									
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Formations / Comments</b>
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
173.0	1.00	154.00	173.0	-1.4	0.7	1.0	0.58	0.58	
203.0	1.10	135.70	203.0	-1.8	1.0	1.4	1.16	0.33	
234.0	1.10	120.50	234.0	-2.2	1.4	1.9	0.94	0.00	
265.0	2.40	101.70	265.0	-2.4	2.3	2.8	4.53	4.19	
295.0	3.70	99.50	294.9	-2.7	3.9	4.4	4.35	4.33	
326.0	5.30	101.90	325.8	-3.2	6.3	6.9	5.20	5.16	
356.0	6.20	90.60	355.7	-3.5	9.3	9.8	4.81	3.00	
387.0	7.00	96.60	386.5	-3.7	12.8	13.3	3.40	2.58	
418.0	7.20	101.00	417.2	-4.3	16.6	17.1	1.87	0.65	
448.0	7.80	104.50	447.0	-5.2	20.4	21.1	2.51	2.00	
479.0	8.70	100.30	477.7	-6.1	24.8	25.5	3.49	2.90	
510.0	10.30	100.20	508.2	-7.0	29.8	30.6	5.16	5.16	

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well WD08A-19 C19 495 (was 9A)
<b>Project:</b>	Story Gulch	<b>TVD Reference:</b>	KB=32' @ 8159.0ft (Patterson 330)
<b>Site:</b>	C19 495	<b>MD Reference:</b>	KB=32' @ 8159.0ft (Patterson 330)
<b>Well:</b>	WD08A-19 C19 495 (was 9A)	<b>North Reference:</b>	True
<b>Wellbore:</b>	DD	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	DD	<b>Database:</b>	USA EDM 5000 Multi Users DB

### Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
540.0	11.00	104.30	537.7	-8.2	35.2	36.2	3.44	2.33	
573.0	12.30	102.10	570.0	-9.7	41.7	42.8	4.16	3.94	
603.0	12.50	101.20	599.3	-11.0	48.0	49.3	0.93	0.67	
634.0	13.00	103.20	629.6	-12.5	54.7	56.1	2.15	1.61	
665.0	14.20	101.40	659.7	-14.0	61.8	63.4	4.10	3.87	
695.0	15.10	103.20	688.7	-15.7	69.2	71.0	3.36	3.00	
726.0	16.00	104.30	718.6	-17.6	77.3	79.3	3.05	2.90	
756.0	16.80	104.80	747.4	-19.8	85.5	87.7	2.71	2.67	
786.0	17.60	105.30	776.0	-22.1	94.1	96.6	2.71	2.67	
816.0	18.30	107.60	804.6	-24.7	102.9	105.8	3.32	2.33	
847.0	18.50	108.95	834.0	-27.8	112.2	115.6	1.52	0.65	
878.0	19.60	108.20	863.3	-31.0	121.8	125.7	3.64	3.55	
909.0	20.50	106.80	892.4	-34.2	131.9	136.3	3.29	2.90	
940.0	21.30	103.30	921.4	-37.0	142.6	147.3	4.78	2.58	
971.0	22.60	104.30	950.1	-39.8	153.9	158.9	4.36	4.19	
1,001.0	23.20	104.70	977.8	-42.7	165.2	170.6	2.07	2.00	
1,031.0	24.10	106.20	1,005.2	-45.9	176.8	182.6	3.61	3.00	
1,122.0	25.70	104.90	1,087.8	-56.2	213.7	220.9	1.86	1.76	
1,212.0	26.60	102.80	1,168.6	-65.7	252.2	260.5	1.43	1.00	
1,305.0	28.00	102.20	1,251.2	-74.9	293.8	303.2	1.53	1.51	
1,394.0	27.80	102.10	1,329.9	-83.7	334.5	344.8	0.23	-0.22	
1,487.0	27.10	102.50	1,412.4	-92.8	376.4	387.7	0.78	-0.75	
1,579.0	26.50	100.40	1,494.5	-101.0	417.1	429.1	1.22	-0.65	
1,670.0	25.50	100.80	1,576.3	-108.4	456.3	469.0	1.12	-1.10	
1,762.0	24.50	100.30	1,659.7	-115.5	494.5	507.8	1.11	-1.09	
1,853.0	24.00	105.50	1,742.7	-123.8	530.9	545.2	2.41	-0.55	
1,945.0	24.70	106.20	1,826.5	-134.2	567.4	583.1	0.82	0.76	
2,037.0	24.90	102.70	1,910.0	-143.8	604.8	621.6	1.61	0.22	
2,128.0	25.10	103.60	1,992.5	-152.5	642.2	660.1	0.47	0.22	
2,220.0	25.70	101.40	2,075.6	-161.1	680.7	699.5	1.22	0.65	
2,312.0	25.40	103.60	2,158.6	-169.7	719.5	739.2	1.08	-0.33	
2,403.0	25.90	103.90	2,240.6	-179.0	757.7	778.6	0.57	0.55	
2,495.0	27.20	104.38	2,322.9	-189.1	797.6	819.7	1.43	1.41	
2,586.0	27.20	104.10	2,403.8	-199.3	837.9	861.3	0.14	0.00	
2,678.0	28.00	103.40	2,485.4	-209.4	879.3	903.9	0.94	0.87	
2,770.0	27.30	105.40	2,566.9	-220.0	920.7	946.6	1.26	-0.76	
2,861.0	25.60	106.50	2,648.3	-231.2	959.6	987.1	1.94	-1.87	
2,953.0	24.50	104.30	2,731.7	-241.5	997.2	1,026.0	1.57	-1.20	
2,985.0	23.60	105.50	2,760.9	-244.9	1,009.8	1,039.0	3.20	-2.81	
3,084.0	22.10	105.80	2,852.1	-255.2	1,046.8	1,077.5	1.52	-1.52	
3,175.0	20.10	103.50	2,937.0	-263.6	1,078.5	1,110.2	2.38	-2.20	
3,267.0	18.00	104.30	3,024.0	-270.8	1,107.6	1,140.2	2.30	-2.28	
3,359.0	18.60	100.50	3,111.3	-276.9	1,135.8	1,169.1	1.45	0.65	
3,450.0	18.70	103.10	3,197.6	-282.9	1,164.3	1,198.2	0.92	0.11	
3,541.0	21.40	105.30	3,283.0	-290.6	1,194.5	1,229.4	3.08	2.97	
3,633.0	23.20	104.60	3,368.2	-299.6	1,228.3	1,264.3	1.98	1.96	
3,725.0	25.10	101.20	3,452.1	-307.9	1,265.0	1,301.9	2.56	2.07	
3,817.0	26.00	99.90	3,535.1	-315.2	1,304.0	1,341.5	1.15	0.98	
3,909.0	25.60	103.30	3,617.9	-323.2	1,343.2	1,381.5	1.67	-0.43	
4,000.0	24.70	103.10	3,700.3	-332.1	1,380.8	1,420.2	0.99	-0.99	
4,092.0	23.70	102.70	3,784.2	-340.5	1,417.6	1,457.9	1.10	-1.09	
4,183.0	22.90	105.30	3,867.8	-349.2	1,452.5	1,493.9	1.43	-0.88	
4,275.0	23.30	106.00	3,952.4	-358.9	1,487.3	1,529.9	0.53	0.43	

# Survey Report

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<b>Project:</b>	Story Gulch	<b>TVD Reference:</b>	KB=32' @ 8159.0ft (Patterson 330)
<b>Site:</b>	C19 495	<b>MD Reference:</b>	KB=32' @ 8159.0ft (Patterson 330)
<b>Well:</b>	WD08A-19 C19 495 (was 9A)	<b>North Reference:</b>	True
<b>Wellbore:</b>	DD	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	DD	<b>Database:</b>	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
4,366.0	23.60	104.80	4,035.9	-368.5	1,522.2	1,566.1	0.62	0.33	
4,458.0	23.10	102.00	4,120.4	-377.0	1,557.6	1,602.6	1.32	-0.54	
4,550.0	24.50	104.50	4,204.6	-385.5	1,593.8	1,639.7	1.88	1.52	
4,641.0	26.60	101.70	4,286.7	-394.4	1,632.0	1,678.9	2.66	2.31	
4,733.0	25.70	103.60	4,369.2	-403.2	1,671.5	1,719.5	1.34	-0.98	
4,825.0	26.30	103.10	4,451.9	-412.6	1,710.8	1,759.8	0.69	0.65	
4,916.0	26.90	103.80	4,533.3	-422.0	1,750.4	1,800.6	0.74	0.66	
5,007.0	27.40	102.80	4,614.3	-431.6	1,790.8	1,842.1	0.74	0.55	
5,099.0	25.70	101.90	4,696.6	-440.4	1,831.0	1,883.2	1.90	-1.85	
5,191.0	24.60	102.20	4,779.8	-448.6	1,869.2	1,922.3	1.20	-1.20	
5,282.0	26.00	100.30	4,862.1	-456.1	1,907.4	1,961.1	1.78	1.54	
5,374.0	26.20	101.40	4,944.7	-463.7	1,947.1	2,001.6	0.57	0.22	
5,465.0	25.40	101.10	5,026.7	-471.5	1,986.0	2,041.2	0.89	-0.88	
5,557.0	25.50	103.20	5,109.7	-479.8	2,024.6	2,080.7	0.99	0.11	
5,648.0	24.60	105.00	5,192.2	-489.2	2,062.0	2,119.2	1.30	-0.99	
5,740.0	23.90	106.80	5,276.1	-499.5	2,098.3	2,156.9	1.11	-0.76	
5,831.0	24.00	102.10	5,359.2	-508.7	2,134.0	2,193.8	2.10	0.11	
5,923.0	25.30	100.40	5,442.8	-516.2	2,171.7	2,232.2	1.61	1.41	
6,014.0	24.80	100.90	5,525.3	-523.3	2,209.5	2,270.7	0.60	-0.55	
6,105.0	24.40	104.40	5,608.0	-531.6	2,246.5	2,308.5	1.66	-0.44	
6,197.0	23.70	106.50	5,692.0	-541.6	2,282.6	2,346.0	1.20	-0.76	
6,288.0	24.20	102.80	5,775.2	-550.9	2,318.4	2,382.9	1.74	0.55	
6,380.0	23.90	105.20	5,859.2	-560.0	2,354.7	2,420.4	1.11	-0.33	
6,472.0	23.80	104.10	5,943.4	-569.4	2,390.7	2,457.6	0.50	-0.11	
6,563.0	24.40	99.10	6,026.5	-576.8	2,427.1	2,494.7	2.34	0.66	
6,654.0	25.60	103.60	6,108.9	-584.4	2,464.8	2,533.1	2.47	1.32	
6,746.0	23.70	101.00	6,192.5	-592.6	2,502.2	2,571.5	2.38	-2.07	
6,838.0	19.60	104.50	6,278.0	-600.0	2,535.3	2,605.4	4.67	-4.46	
6,929.0	18.90	105.40	6,364.0	-607.7	2,564.3	2,635.4	0.84	-0.77	
7,021.0	18.60	105.20	6,451.1	-615.5	2,592.9	2,664.9	0.33	-0.33	
7,112.0	16.30	103.30	6,537.9	-622.3	2,619.3	2,692.2	2.60	-2.53	
7,203.0	15.20	101.50	6,625.5	-627.6	2,643.4	2,716.9	1.32	-1.21	
7,295.0	12.00	101.30	6,714.9	-631.9	2,664.6	2,738.5	3.48	-3.48	
7,387.0	9.30	106.50	6,805.3	-635.9	2,681.1	2,755.5	3.11	-2.93	
7,478.0	7.10	114.30	6,895.3	-640.3	2,693.3	2,768.4	2.70	-2.42	
7,569.0	4.10	120.80	6,985.9	-644.3	2,701.2	2,777.0	3.36	-3.30	
7,661.0	0.90	101.21	7,077.8	-646.1	2,704.8	2,780.8	3.55	-3.48	
7,753.0	0.10	305.60	7,169.8	-646.2	2,705.4	2,781.5	1.08	-0.87	
7,845.0	0.70	188.60	7,261.8	-646.7	2,705.2	2,781.5	0.82	0.65	
7,937.0	0.40	234.40	7,353.8	-647.4	2,704.9	2,781.3	0.55	-0.33	
8,028.0	1.30	160.00	7,444.8	-648.6	2,705.0	2,781.7	1.38	0.99	
8,120.0	1.90	117.20	7,536.8	-650.3	2,706.7	2,783.7	1.41	0.65	
8,212.0	3.00	350.60	7,628.7	-648.6	2,707.7	2,784.3	4.79	1.20	
8,304.0	3.20	10.90	7,720.6	-643.7	2,707.8	2,783.2	1.21	0.22	
8,396.0	2.70	15.80	7,812.5	-639.1	2,708.8	2,783.2	0.61	-0.54	
8,487.0	2.80	17.50	7,903.4	-634.9	2,710.1	2,783.5	0.14	0.11	
8,579.0	2.10	1.00	7,995.3	-631.1	2,710.8	2,783.3	1.07	-0.76	
8,671.0	0.50	325.50	8,087.2	-629.1	2,710.6	2,782.6	1.87	-1.74	
8,762.0	0.50	268.30	8,178.2	-628.7	2,710.0	2,781.9	0.53	0.00	
8,854.0	1.00	220.00	8,270.2	-629.4	2,709.1	2,781.2	0.83	0.54	
8,945.0	1.10	262.90	8,361.2	-630.1	2,707.7	2,780.0	0.85	0.11	
9,036.7	1.46	252.60	8,472.9	-630.6	2,705.3	2,777.8	0.38	0.32	C19 495 WD08A-19 PBHL (10.10.11)
9,070.0	1.50	251.70	8,486.2	-630.7	2,704.9	2,777.5	0.38	0.34	Last Cathedral Survey @ 9,070' MD

## Survey Report

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<b>Project:</b>	Story Gulch	<b>TVD Reference:</b>	KB=32' @ 8159.0ft (Patterson 330)
<b>Site:</b>	C19 495	<b>MD Reference:</b>	KB=32' @ 8159.0ft (Patterson 330)
<b>Well:</b>	WD08A-19 C19 495 (was 9A)	<b>North Reference:</b>	True
<b>Wellbore:</b>	DD	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	DD	<b>Database:</b>	USA EDM 5000 Multi Users DB

### Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
9,135.0	1.50	251.70	8,551.2	-631.3	2,703.3	2,776.0	0.00	0.00	PTB @ 9,135' MD

### Targets

#### Target Name

- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- Shape									
C19 495 WD08A-19 PBI	0.00	0.00	8,473.0	-643.3	2,713.3	1,687,084.55	2,271,522.52	39° 41' 28.83 N	108° 5' 20.29 W
- actual wellpath misses target center by 15.0ft at 9056.7ft MD (8472.9 TVD, -630.6 N, 2705.3 E)									
- Rectangle (sides W30.0 H50.0 D0.0)									

### Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
9,070.0	8,486.2	-630.7	2,704.9	Last Cathedral Survey @ 9,070' MD
9,135.0	8,551.2	-631.3	2,703.3	PTB @ 9,135' MD

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