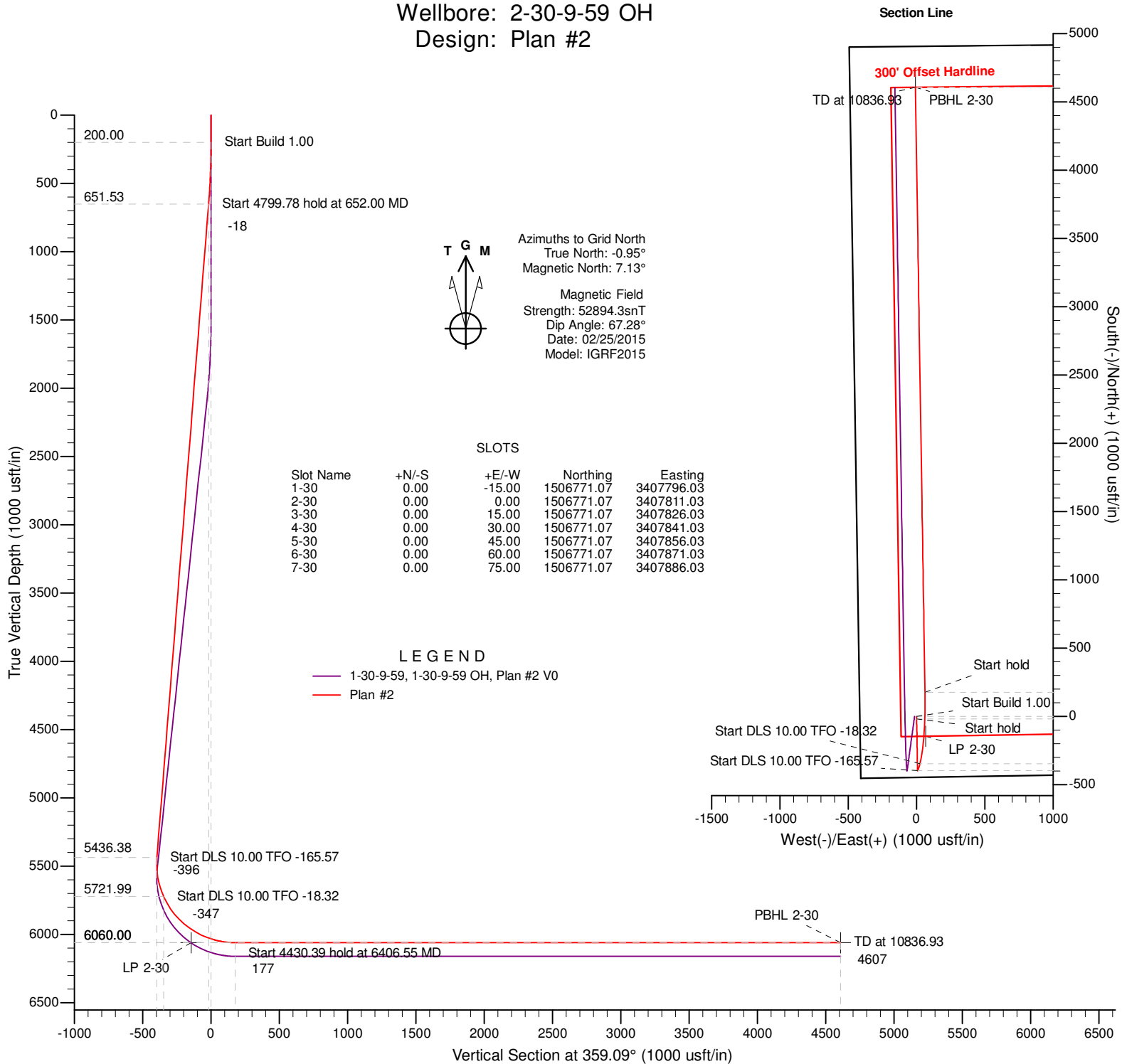




Project: Niobrara CON'83
County: Weld County, CO
Site: Ptasnik 1-30-9-59 Pad
Well: 2-30-9-59
Wellbore: 2-30-9-59 OH
Design: Plan #2



DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
LP 2-30	6060.00	-144.75	66.37	1506626.32	3407877.40	40° 42' 53.25 N	104° 1' 42.97 W	Point
PBHL 2-30	6060.00	4607.59	-8.75	1511378.61	3407802.28	40° 43' 40.21 N	104° 1' 42.93 W	Point

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	
3	652.00	4.52	179.00	651.53	-17.82	0.31	1.00	179.00	-17.82	
4	5451.78	4.52	179.00	5436.38	-396.02	6.91	0.00	0.00	-396.08	
5	5745.32	25.00	15.80	5721.99	-346.82	24.39	10.00	-165.57	-347.16	
6	6406.55	90.00	359.09	6060.00	177.76	61.40	10.00	-18.32	176.76	
7	10836.93	90.00	359.09	6060.00	4607.59	-8.75	0.00	0.00	4607.15	PBHL 2-30

Titan Directional Drilling, LLC

Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well 2-30-9-59
Company:	Carrizo Oil & Gas, Inc.	TVD Reference:	GL+KB @ 4934.00usft (Xtreme 19)
Project:	Niobrara CON'83	MD Reference:	GL+KB @ 4934.00usft (Xtreme 19)
Site:	Ptasnik 1-30-9-59 Pad	North Reference:	Grid
Well:	2-30-9-59	Survey Calculation Method:	Minimum Curvature
Wellbore:	2-30-9-59 OH		
Design:	Plan #2		

Project	Niobrara CON'83, Weld County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site	Ptasnik 1-30-9-59 Pad,		
Site Position:		Northing:	1,506,771.07 usft
From:	Map	Easting:	3,407,796.03 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in
		Latitude:	40° 42' 54.69 N
		Longitude:	104° 1' 44.00 W
		Grid Convergence:	0.95 °

Well	2-30-9-59		
Well Position	+N/-S	0.00 usft	Northing: 1,506,771.07 usft
	+E/-W	15.00 usft	Easting: 3,407,811.03 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	40° 42' 54.69 N
		Longitude:	104° 1' 43.80 W
		Ground Level:	4,917.00 usft

Wellbore	2-30-9-59 OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	02/25/15	8.08	67.28	52,894

Design	Plan #2			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	359.09

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
652.00	4.52	179.00	651.53	-17.82	0.31	1.00	1.00	0.00	179.00	
5,451.78	4.52	179.00	5,436.38	-396.02	6.91	0.00	0.00	0.00	0.00	
5,745.32	25.00	15.80	5,721.99	-346.82	24.39	10.00	6.98	-55.60	-165.57	
6,406.55	90.00	359.09	6,060.00	177.76	61.40	10.00	9.83	-2.53	-18.32	
10,836.93	90.00	359.09	6,060.00	4,607.59	-8.75	0.00	0.00	0.00	0.00	PBHL 2-30

Titan Directional Drilling, LLC

Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well 2-30-9-59
Company:	Carrizo Oil & Gas, Inc.	TVD Reference:	GL+KB @ 4934.00usft (Xtreme 19)
Project:	Niobrara CON'83	MD Reference:	GL+KB @ 4934.00usft (Xtreme 19)
Site:	Ptasnik 1-30-9-59 Pad	North Reference:	Grid
Well:	2-30-9-59	Survey Calculation Method:	Minimum Curvature
Wellbore:	2-30-9-59 OH		
Design:	Plan #2		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	1.00	179.00	299.99	-0.87	0.02	-0.87	1.00	1.00	0.00
400.00	2.00	179.00	399.96	-3.49	0.06	-3.49	1.00	1.00	0.00
500.00	3.00	179.00	499.86	-7.85	0.14	-7.85	1.00	1.00	0.00
600.00	4.00	179.00	599.68	-13.95	0.24	-13.96	1.00	1.00	0.00
652.00	4.52	179.00	651.53	-17.82	0.31	-17.82	1.00	1.00	0.00
700.00	4.52	179.00	699.38	-21.60	0.38	-21.60	0.00	0.00	0.00
800.00	4.52	179.00	799.07	-29.48	0.51	-29.48	0.00	0.00	0.00
900.00	4.52	179.00	898.76	-37.36	0.65	-37.36	0.00	0.00	0.00
1,000.00	4.52	179.00	998.45	-45.24	0.79	-45.24	0.00	0.00	0.00
1,100.00	4.52	179.00	1,098.14	-53.12	0.93	-53.13	0.00	0.00	0.00
1,200.00	4.52	179.00	1,197.83	-61.00	1.06	-61.01	0.00	0.00	0.00
1,300.00	4.52	179.00	1,297.52	-68.88	1.20	-68.89	0.00	0.00	0.00
1,400.00	4.52	179.00	1,397.20	-76.76	1.34	-76.77	0.00	0.00	0.00
1,500.00	4.52	179.00	1,496.89	-84.64	1.48	-84.65	0.00	0.00	0.00
1,600.00	4.52	179.00	1,596.58	-92.51	1.61	-92.53	0.00	0.00	0.00
1,700.00	4.52	179.00	1,696.27	-100.39	1.75	-100.41	0.00	0.00	0.00
1,800.00	4.52	179.00	1,795.96	-108.27	1.89	-108.29	0.00	0.00	0.00
1,900.00	4.52	179.00	1,895.65	-116.15	2.03	-116.17	0.00	0.00	0.00
2,000.00	4.52	179.00	1,995.34	-124.03	2.16	-124.05	0.00	0.00	0.00
2,100.00	4.52	179.00	2,095.03	-131.91	2.30	-131.93	0.00	0.00	0.00
2,200.00	4.52	179.00	2,194.72	-139.79	2.44	-139.81	0.00	0.00	0.00
2,300.00	4.52	179.00	2,294.41	-147.67	2.58	-147.69	0.00	0.00	0.00
2,400.00	4.52	179.00	2,394.09	-155.55	2.72	-155.57	0.00	0.00	0.00
2,500.00	4.52	179.00	2,493.78	-163.43	2.85	-163.45	0.00	0.00	0.00
2,600.00	4.52	179.00	2,593.47	-171.31	2.99	-171.34	0.00	0.00	0.00
2,700.00	4.52	179.00	2,693.16	-179.19	3.13	-179.22	0.00	0.00	0.00
2,800.00	4.52	179.00	2,792.85	-187.07	3.27	-187.10	0.00	0.00	0.00
2,900.00	4.52	179.00	2,892.54	-194.95	3.40	-194.98	0.00	0.00	0.00
3,000.00	4.52	179.00	2,992.23	-202.83	3.54	-202.86	0.00	0.00	0.00
3,100.00	4.52	179.00	3,091.92	-210.71	3.68	-210.74	0.00	0.00	0.00
3,200.00	4.52	179.00	3,191.61	-218.59	3.82	-218.62	0.00	0.00	0.00
3,300.00	4.52	179.00	3,291.30	-226.47	3.95	-226.50	0.00	0.00	0.00
3,400.00	4.52	179.00	3,390.98	-234.35	4.09	-234.38	0.00	0.00	0.00
3,500.00	4.52	179.00	3,490.67	-242.23	4.23	-242.26	0.00	0.00	0.00
3,600.00	4.52	179.00	3,590.36	-250.10	4.37	-250.14	0.00	0.00	0.00
3,700.00	4.52	179.00	3,690.05	-257.98	4.50	-258.02	0.00	0.00	0.00
3,800.00	4.52	179.00	3,789.74	-265.86	4.64	-265.90	0.00	0.00	0.00
3,900.00	4.52	179.00	3,889.43	-273.74	4.78	-273.78	0.00	0.00	0.00
4,000.00	4.52	179.00	3,989.12	-281.62	4.92	-281.67	0.00	0.00	0.00
4,100.00	4.52	179.00	4,088.81	-289.50	5.05	-289.55	0.00	0.00	0.00
4,200.00	4.52	179.00	4,188.50	-297.38	5.19	-297.43	0.00	0.00	0.00
4,300.00	4.52	179.00	4,288.19	-305.26	5.33	-305.31	0.00	0.00	0.00
4,400.00	4.52	179.00	4,387.87	-313.14	5.47	-313.19	0.00	0.00	0.00
4,500.00	4.52	179.00	4,487.56	-321.02	5.60	-321.07	0.00	0.00	0.00
4,600.00	4.52	179.00	4,587.25	-328.90	5.74	-328.95	0.00	0.00	0.00
4,700.00	4.52	179.00	4,686.94	-336.78	5.88	-336.83	0.00	0.00	0.00
4,800.00	4.52	179.00	4,786.63	-344.66	6.02	-344.71	0.00	0.00	0.00
4,900.00	4.52	179.00	4,886.32	-352.54	6.15	-352.59	0.00	0.00	0.00
5,000.00	4.52	179.00	4,986.01	-360.42	6.29	-360.47	0.00	0.00	0.00
5,100.00	4.52	179.00	5,085.70	-368.30	6.43	-368.35	0.00	0.00	0.00
5,200.00	4.52	179.00	5,185.39	-376.18	6.57	-376.23	0.00	0.00	0.00

Titan Directional Drilling, LLC

Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well 2-30-9-59
Company:	Carrizo Oil & Gas, Inc.	TVD Reference:	GL+KB @ 4934.00usft (Xtreme 19)
Project:	Niobrara CON'83	MD Reference:	GL+KB @ 4934.00usft (Xtreme 19)
Site:	Ptasnik 1-30-9-59 Pad	North Reference:	Grid
Well:	2-30-9-59	Survey Calculation Method:	Minimum Curvature
Wellbore:	2-30-9-59 OH		
Design:	Plan #2		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
5,300.00	4.52	179.00	5,285.08	-384.06	6.70	-384.11	0.00	0.00	0.00
5,400.00	4.52	179.00	5,384.76	-391.94	6.84	-392.00	0.00	0.00	0.00
5,451.78	4.52	179.00	5,436.38	-396.02	6.91	-396.08	0.00	0.00	0.00
5,500.00	1.21	81.83	5,484.55	-397.84	7.45	-397.91	10.00	-6.86	-201.49
5,600.00	10.50	19.47	5,583.96	-389.08	11.54	-389.21	10.00	9.29	-62.37
5,700.00	20.47	16.40	5,680.20	-363.64	19.54	-363.91	10.00	9.97	-3.07
5,745.32	25.00	15.80	5,721.99	-346.82	24.39	-347.16	10.00	9.99	-1.33
5,800.00	30.24	12.39	5,770.43	-322.23	30.49	-322.67	10.00	9.58	-6.24
5,900.00	39.96	8.30	5,852.16	-265.72	40.55	-266.33	10.00	9.72	-4.09
6,000.00	49.78	5.60	5,922.95	-195.77	48.94	-196.52	10.00	9.82	-2.70
6,100.00	59.65	3.60	5,980.65	-114.50	55.39	-115.37	10.00	9.87	-2.01
6,200.00	69.54	1.96	6,023.50	-24.40	59.71	-25.34	10.00	9.89	-1.64
6,300.00	79.44	0.52	6,050.21	71.82	61.76	70.83	10.00	9.90	-1.44
6,400.00	89.35	359.18	6,059.97	171.21	61.50	170.21	10.00	9.91	-1.34
6,406.55	90.00	359.09	6,060.00	177.76	61.40	176.76	10.00	9.91	-1.33
6,500.00	90.00	359.09	6,060.00	271.20	59.92	270.21	0.00	0.00	0.00
6,600.00	90.00	359.09	6,060.00	371.19	58.34	370.21	0.00	0.00	0.00
6,700.00	90.00	359.09	6,060.00	471.17	56.75	470.21	0.00	0.00	0.00
6,800.00	90.00	359.09	6,060.00	571.16	55.17	570.21	0.00	0.00	0.00
6,900.00	90.00	359.09	6,060.00	671.15	53.59	670.21	0.00	0.00	0.00
7,000.00	90.00	359.09	6,060.00	771.14	52.00	770.21	0.00	0.00	0.00
7,100.00	90.00	359.09	6,060.00	871.12	50.42	870.21	0.00	0.00	0.00
7,200.00	90.00	359.09	6,060.00	971.11	48.84	970.21	0.00	0.00	0.00
7,300.00	90.00	359.09	6,060.00	1,071.10	47.25	1,070.21	0.00	0.00	0.00
7,400.00	90.00	359.09	6,060.00	1,171.09	45.67	1,170.21	0.00	0.00	0.00
7,500.00	90.00	359.09	6,060.00	1,271.07	44.09	1,270.21	0.00	0.00	0.00
7,600.00	90.00	359.09	6,060.00	1,371.06	42.50	1,370.21	0.00	0.00	0.00
7,700.00	90.00	359.09	6,060.00	1,471.05	40.92	1,470.21	0.00	0.00	0.00
7,800.00	90.00	359.09	6,060.00	1,571.04	39.34	1,570.21	0.00	0.00	0.00
7,900.00	90.00	359.09	6,060.00	1,671.02	37.75	1,670.21	0.00	0.00	0.00
8,000.00	90.00	359.09	6,060.00	1,771.01	36.17	1,770.21	0.00	0.00	0.00
8,100.00	90.00	359.09	6,060.00	1,871.00	34.59	1,870.21	0.00	0.00	0.00
8,200.00	90.00	359.09	6,060.00	1,970.99	33.00	1,970.21	0.00	0.00	0.00
8,300.00	90.00	359.09	6,060.00	2,070.97	31.42	2,070.21	0.00	0.00	0.00
8,400.00	90.00	359.09	6,060.00	2,170.96	29.84	2,170.21	0.00	0.00	0.00
8,500.00	90.00	359.09	6,060.00	2,270.95	28.25	2,270.21	0.00	0.00	0.00
8,600.00	90.00	359.09	6,060.00	2,370.94	26.67	2,370.21	0.00	0.00	0.00
8,700.00	90.00	359.09	6,060.00	2,470.92	25.08	2,470.21	0.00	0.00	0.00
8,800.00	90.00	359.09	6,060.00	2,570.91	23.50	2,570.21	0.00	0.00	0.00
8,900.00	90.00	359.09	6,060.00	2,670.90	21.92	2,670.21	0.00	0.00	0.00
9,000.00	90.00	359.09	6,060.00	2,770.89	20.33	2,770.21	0.00	0.00	0.00
9,100.00	90.00	359.09	6,060.00	2,870.87	18.75	2,870.21	0.00	0.00	0.00
9,200.00	90.00	359.09	6,060.00	2,970.86	17.17	2,970.21	0.00	0.00	0.00
9,300.00	90.00	359.09	6,060.00	3,070.85	15.58	3,070.21	0.00	0.00	0.00
9,400.00	90.00	359.09	6,060.00	3,170.84	14.00	3,170.21	0.00	0.00	0.00
9,500.00	90.00	359.09	6,060.00	3,270.82	12.42	3,270.21	0.00	0.00	0.00
9,600.00	90.00	359.09	6,060.00	3,370.81	10.83	3,370.21	0.00	0.00	0.00
9,700.00	90.00	359.09	6,060.00	3,470.80	9.25	3,470.21	0.00	0.00	0.00
9,800.00	90.00	359.09	6,060.00	3,570.79	7.67	3,570.21	0.00	0.00	0.00
9,900.00	90.00	359.09	6,060.00	3,670.77	6.08	3,670.21	0.00	0.00	0.00
10,000.00	90.00	359.09	6,060.00	3,770.76	4.50	3,770.21	0.00	0.00	0.00
10,100.00	90.00	359.09	6,060.00	3,870.75	2.92	3,870.21	0.00	0.00	0.00
10,200.00	90.00	359.09	6,060.00	3,970.74	1.33	3,970.21	0.00	0.00	0.00
10,300.00	90.00	359.09	6,060.00	4,070.72	-0.25	4,070.21	0.00	0.00	0.00

Titan Directional Drilling, LLC

Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well 2-30-9-59
Company:	Carrizo Oil & Gas, Inc.	TVD Reference:	GL+KB @ 4934.00usft (Xtreme 19)
Project:	Niobrara CON'83	MD Reference:	GL+KB @ 4934.00usft (Xtreme 19)
Site:	Ptasnik 1-30-9-59 Pad	North Reference:	Grid
Well:	2-30-9-59	Survey Calculation Method:	Minimum Curvature
Wellbore:	2-30-9-59 OH		
Design:	Plan #2		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
10,400.00	90.00	359.09	6,060.00	4,170.71	-1.83	4,170.21	0.00	0.00	0.00	
10,500.00	90.00	359.09	6,060.00	4,270.70	-3.42	4,270.21	0.00	0.00	0.00	
10,600.00	90.00	359.09	6,060.00	4,370.69	-5.00	4,370.21	0.00	0.00	0.00	
10,700.00	90.00	359.09	6,060.00	4,470.67	-6.58	4,470.21	0.00	0.00	0.00	
10,800.00	90.00	359.09	6,060.00	4,570.66	-8.17	4,570.21	0.00	0.00	0.00	
10,836.93	90.00	359.09	6,060.00	4,607.59	-8.75	4,607.15	0.00	0.00	0.00	

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
- hit/miss target										
- Shape										
PBHL 2-30	0.00	0.00	6,060.00	4,607.59	-8.75	1,511,378.61	3,407,802.28	40° 43' 40.21 N	104° 1' 42.93 W	
- plan hits target center										
- Point										
LP 2-30	0.00	0.00	6,060.00	-144.75	66.37	1,506,626.32	3,407,877.40	40° 42' 53.25 N	104° 1' 42.97 W	
- plan misses target center by 84.74usft at 6107.25usft MD (5984.27 TVD, -108.24 N, 55.77 E)										
- Point										