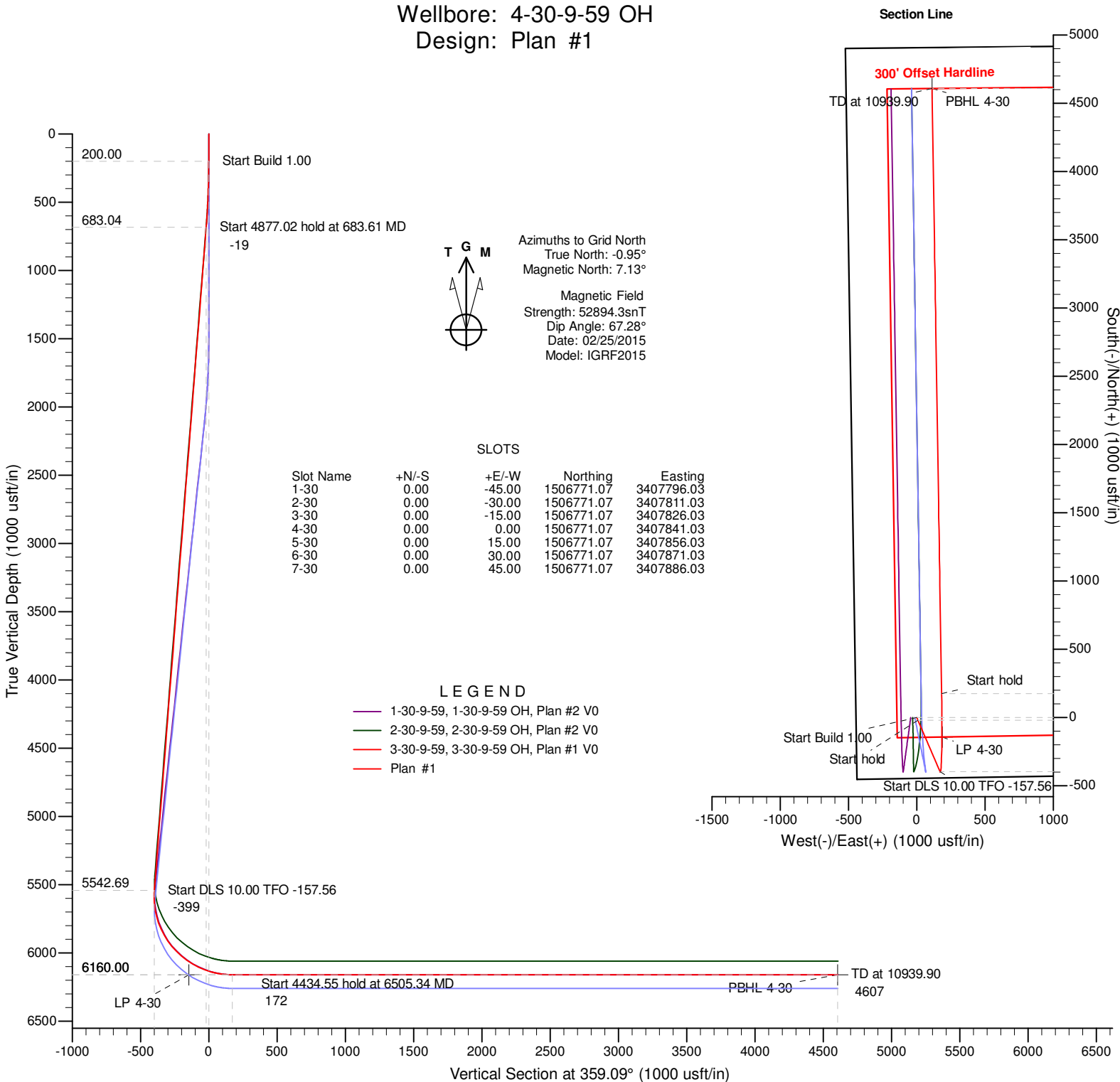




Project: Niobrara CON'83
County: Weld County, CO
Site: Ptasnik 1-30-9-59 Pad
Well: 4-30-9-59
Wellbore: 4-30-9-59 OH
Design: Plan #1



DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
LP 4-30	6160.00	-142.43	186.36	1506628.64	3408027.39	40° 42' 53.25 N	104° 1' 41.03 W	Point
PBHL 4-30	6160.00	4609.00	111.25	1511380.02	3407952.28	40° 43' 40.20 N	104° 1' 40.98 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	683.61	4.84	156.73	683.04	-18.74	8.06	1.00	156.73	-18.86	
4	5560.63	4.84	156.73	5542.69	-396.46	170.50	0.00	0.00	-399.11	
5	6505.34	90.00	359.09	6160.00	175.00	181.34	10.00	-157.56	172.10	
6	10939.90	90.00	359.09	6160.00	4609.00	111.25	0.00	0.00	4606.65	PBHL 4-30

Titan Directional Drilling, LLC

Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well 4-30-9-59
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:	4-30-9-59	Survey Calculation Method:	Minimum Curvature
Wellbore:	4-30-9-59 OH		
Design:	Plan #1		

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	4-30-9-59		
Well Position	+N/-S	0.00 usft	Northing: 1,506,771.07 usft
	+E/-W	45.00 usft	Easting: 3,407,841.03 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	40° 42' 54.68 N
		Longitude:	104° 1' 43.42 W
		Ground Level:	4,917.00 usft

Wellbore	4-30-9-59 OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	02/25/15	8.08	67.28	52,894

Design	Plan #1			
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	
683.61	4.84	156.73	683.04	-18.74	8.06	1.00	1.00	0.00	156.73	
5,560.63	4.84	156.73	5,542.69	-396.46	170.50	0.00	0.00	0.00	0.00	
6,505.34	90.00	359.09	6,160.00	175.00	181.34	10.00	9.01	-16.69	-157.56	
10,939.90	90.00	359.09	6,160.00	4,609.00	111.25	0.00	0.00	0.00	0.00	PBHL 4-30

Titan Directional Drilling, LLC

Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well 4-30-9-59
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:	4-30-9-59	Survey Calculation Method:	Minimum Curvature
Wellbore:	4-30-9-59 OH		
Design:	Plan #1		

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	156.73	299.99	-0.80	0.34	-0.81	1.00	1.00	0.00
400.00	2.00	156.73	399.96	-3.21	1.38	-3.23	1.00	1.00	0.00
500.00	3.00	156.73	499.86	-7.21	3.10	-7.26	1.00	1.00	0.00
600.00	4.00	156.73	599.68	-12.82	5.51	-12.91	1.00	1.00	0.00
683.61	4.84	156.73	683.04	-18.74	8.06	-18.86	1.00	1.00	0.00
700.00	4.84	156.73	699.37	-20.01	8.60	-20.14	0.00	0.00	0.00
800.00	4.84	156.73	799.01	-27.75	11.94	-27.94	0.00	0.00	0.00
900.00	4.84	156.73	898.66	-35.50	15.27	-35.74	0.00	0.00	0.00
1,000.00	4.84	156.73	998.30	-43.24	18.60	-43.53	0.00	0.00	0.00
1,100.00	4.84	156.73	1,097.94	-50.99	21.93	-51.33	0.00	0.00	0.00
1,200.00	4.84	156.73	1,197.59	-58.73	25.26	-59.13	0.00	0.00	0.00
1,300.00	4.84	156.73	1,297.23	-66.48	28.59	-66.92	0.00	0.00	0.00
1,400.00	4.84	156.73	1,396.88	-74.22	31.92	-74.72	0.00	0.00	0.00
1,500.00	4.84	156.73	1,496.52	-81.97	35.25	-82.52	0.00	0.00	0.00
1,600.00	4.84	156.73	1,596.16	-89.71	38.58	-90.31	0.00	0.00	0.00
1,700.00	4.84	156.73	1,695.81	-97.46	41.91	-98.11	0.00	0.00	0.00
1,800.00	4.84	156.73	1,795.45	-105.20	45.24	-105.91	0.00	0.00	0.00
1,900.00	4.84	156.73	1,895.10	-112.95	48.57	-113.70	0.00	0.00	0.00
2,000.00	4.84	156.73	1,994.74	-120.69	51.90	-121.50	0.00	0.00	0.00
2,100.00	4.84	156.73	2,094.38	-128.44	55.23	-129.30	0.00	0.00	0.00
2,200.00	4.84	156.73	2,194.03	-136.18	58.57	-137.09	0.00	0.00	0.00
2,300.00	4.84	156.73	2,293.67	-143.93	61.90	-144.89	0.00	0.00	0.00
2,400.00	4.84	156.73	2,393.32	-151.67	65.23	-152.69	0.00	0.00	0.00
2,500.00	4.84	156.73	2,492.96	-159.41	68.56	-160.48	0.00	0.00	0.00
2,600.00	4.84	156.73	2,592.60	-167.16	71.89	-168.28	0.00	0.00	0.00
2,700.00	4.84	156.73	2,692.25	-174.90	75.22	-176.08	0.00	0.00	0.00
2,800.00	4.84	156.73	2,791.89	-182.65	78.55	-183.87	0.00	0.00	0.00
2,900.00	4.84	156.73	2,891.54	-190.39	81.88	-191.67	0.00	0.00	0.00
3,000.00	4.84	156.73	2,991.18	-198.14	85.21	-199.47	0.00	0.00	0.00
3,100.00	4.84	156.73	3,090.82	-205.88	88.54	-207.26	0.00	0.00	0.00
3,200.00	4.84	156.73	3,190.47	-213.63	91.87	-215.06	0.00	0.00	0.00
3,300.00	4.84	156.73	3,290.11	-221.37	95.20	-222.86	0.00	0.00	0.00
3,400.00	4.84	156.73	3,389.76	-229.12	98.53	-230.65	0.00	0.00	0.00
3,500.00	4.84	156.73	3,489.40	-236.86	101.86	-238.45	0.00	0.00	0.00
3,600.00	4.84	156.73	3,589.04	-244.61	105.20	-246.25	0.00	0.00	0.00
3,700.00	4.84	156.73	3,688.69	-252.35	108.53	-254.04	0.00	0.00	0.00
3,800.00	4.84	156.73	3,788.33	-260.10	111.86	-261.84	0.00	0.00	0.00
3,900.00	4.84	156.73	3,887.98	-267.84	115.19	-269.64	0.00	0.00	0.00
4,000.00	4.84	156.73	3,987.62	-275.59	118.52	-277.43	0.00	0.00	0.00
4,100.00	4.84	156.73	4,087.26	-283.33	121.85	-285.23	0.00	0.00	0.00
4,200.00	4.84	156.73	4,186.91	-291.08	125.18	-293.03	0.00	0.00	0.00
4,300.00	4.84	156.73	4,286.55	-298.82	128.51	-300.83	0.00	0.00	0.00
4,400.00	4.84	156.73	4,386.20	-306.57	131.84	-308.62	0.00	0.00	0.00
4,500.00	4.84	156.73	4,485.84	-314.31	135.17	-316.42	0.00	0.00	0.00
4,600.00	4.84	156.73	4,585.48	-322.06	138.50	-324.22	0.00	0.00	0.00
4,700.00	4.84	156.73	4,685.13	-329.80	141.83	-332.01	0.00	0.00	0.00
4,800.00	4.84	156.73	4,784.77	-337.55	145.16	-339.81	0.00	0.00	0.00
4,900.00	4.84	156.73	4,884.42	-345.29	148.49	-347.61	0.00	0.00	0.00
5,000.00	4.84	156.73	4,984.06	-353.04	151.82	-355.40	0.00	0.00	0.00
5,100.00	4.84	156.73	5,083.70	-360.78	155.16	-363.20	0.00	0.00	0.00
5,200.00	4.84	156.73	5,183.35	-368.53	158.49	-371.00	0.00	0.00	0.00

Titan Directional Drilling, LLC

Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well 4-30-9-59
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:	4-30-9-59	Survey Calculation Method:	Minimum Curvature
Wellbore:	4-30-9-59 OH		
Design:	Plan #1		

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	4.84	156.73	5,282.99	-376.27	161.82	-378.79	0.00	0.00	0.00
5,400.00	4.84	156.73	5,382.64	-384.01	165.15	-386.59	0.00	0.00	0.00
5,500.00	4.84	156.73	5,482.28	-391.76	168.48	-394.39	0.00	0.00	0.00
5,560.63	4.84	156.73	5,542.69	-396.46	170.50	-399.11	0.00	0.00	0.00
5,600.00	1.92	105.26	5,582.00	-398.15	171.79	-400.83	10.00	-7.41	-130.72
5,700.00	9.64	10.02	5,681.52	-390.33	174.87	-393.06	10.00	7.72	-95.25
5,800.00	19.55	4.30	5,778.17	-365.33	177.59	-368.11	10.00	9.91	-5.72
5,900.00	29.52	2.35	5,869.03	-323.93	179.86	-326.75	10.00	9.97	-1.94
6,000.00	39.50	1.33	5,951.33	-267.38	181.61	-270.23	10.00	9.98	-1.02
6,100.00	49.49	0.67	6,022.57	-197.39	182.80	-200.27	10.00	9.99	-0.66
6,200.00	59.48	0.18	6,080.59	-116.10	183.38	-119.00	10.00	9.99	-0.49
6,300.00	69.48	359.78	6,123.61	-25.97	183.35	-28.88	10.00	9.99	-0.40
6,400.00	79.47	359.44	6,150.35	70.26	182.69	67.35	10.00	9.99	-0.35
6,500.00	89.47	359.11	6,159.98	169.66	181.42	166.75	10.00	9.99	-0.33
6,505.34	90.00	359.09	6,160.00	175.00	181.34	172.10	10.00	9.99	-0.32
6,600.00	90.00	359.09	6,160.00	269.64	179.84	266.75	0.00	0.00	0.00
6,700.00	90.00	359.09	6,160.00	369.63	178.26	366.75	0.00	0.00	0.00
6,800.00	90.00	359.09	6,160.00	469.62	176.68	466.75	0.00	0.00	0.00
6,900.00	90.00	359.09	6,160.00	569.61	175.10	566.75	0.00	0.00	0.00
7,000.00	90.00	359.09	6,160.00	669.59	173.52	666.75	0.00	0.00	0.00
7,100.00	90.00	359.09	6,160.00	769.58	171.94	766.75	0.00	0.00	0.00
7,200.00	90.00	359.09	6,160.00	869.57	170.36	866.75	0.00	0.00	0.00
7,300.00	90.00	359.09	6,160.00	969.56	168.78	966.75	0.00	0.00	0.00
7,400.00	90.00	359.09	6,160.00	1,069.54	167.20	1,066.75	0.00	0.00	0.00
7,500.00	90.00	359.09	6,160.00	1,169.53	165.62	1,166.75	0.00	0.00	0.00
7,600.00	90.00	359.09	6,160.00	1,269.52	164.04	1,266.75	0.00	0.00	0.00
7,700.00	90.00	359.09	6,160.00	1,369.51	162.46	1,366.75	0.00	0.00	0.00
7,800.00	90.00	359.09	6,160.00	1,469.49	160.88	1,466.75	0.00	0.00	0.00
7,900.00	90.00	359.09	6,160.00	1,569.48	159.30	1,566.75	0.00	0.00	0.00
8,000.00	90.00	359.09	6,160.00	1,669.47	157.72	1,666.75	0.00	0.00	0.00
8,100.00	90.00	359.09	6,160.00	1,769.46	156.13	1,766.75	0.00	0.00	0.00
8,200.00	90.00	359.09	6,160.00	1,869.44	154.55	1,866.75	0.00	0.00	0.00
8,300.00	90.00	359.09	6,160.00	1,969.43	152.97	1,966.75	0.00	0.00	0.00
8,400.00	90.00	359.09	6,160.00	2,069.42	151.39	2,066.75	0.00	0.00	0.00
8,500.00	90.00	359.09	6,160.00	2,169.41	149.81	2,166.75	0.00	0.00	0.00
8,600.00	90.00	359.09	6,160.00	2,269.39	148.23	2,266.75	0.00	0.00	0.00
8,700.00	90.00	359.09	6,160.00	2,369.38	146.65	2,366.75	0.00	0.00	0.00
8,800.00	90.00	359.09	6,160.00	2,469.37	145.07	2,466.75	0.00	0.00	0.00
8,900.00	90.00	359.09	6,160.00	2,569.36	143.49	2,566.75	0.00	0.00	0.00
9,000.00	90.00	359.09	6,160.00	2,669.34	141.91	2,666.75	0.00	0.00	0.00
9,100.00	90.00	359.09	6,160.00	2,769.33	140.33	2,766.75	0.00	0.00	0.00
9,200.00	90.00	359.09	6,160.00	2,869.32	138.75	2,866.75	0.00	0.00	0.00
9,300.00	90.00	359.09	6,160.00	2,969.31	137.17	2,966.75	0.00	0.00	0.00
9,400.00	90.00	359.09	6,160.00	3,069.29	135.59	3,066.75	0.00	0.00	0.00
9,500.00	90.00	359.09	6,160.00	3,169.28	134.01	3,166.75	0.00	0.00	0.00
9,600.00	90.00	359.09	6,160.00	3,269.27	132.43	3,266.75	0.00	0.00	0.00
9,700.00	90.00	359.09	6,160.00	3,369.26	130.85	3,366.75	0.00	0.00	0.00
9,800.00	90.00	359.09	6,160.00	3,469.24	129.26	3,466.75	0.00	0.00	0.00
9,900.00	90.00	359.09	6,160.00	3,569.23	127.68	3,566.75	0.00	0.00	0.00
10,000.00	90.00	359.09	6,160.00	3,669.22	126.10	3,666.75	0.00	0.00	0.00
10,100.00	90.00	359.09	6,160.00	3,769.21	124.52	3,766.75	0.00	0.00	0.00
10,200.00	90.00	359.09	6,160.00	3,869.19	122.94	3,866.75	0.00	0.00	0.00
10,300.00	90.00	359.09	6,160.00	3,969.18	121.36	3,966.75	0.00	0.00	0.00
10,400.00	90.00	359.09	6,160.00	4,069.17	119.78	4,066.75	0.00	0.00	0.00

Titan Directional Drilling, LLC

Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well 4-30-9-59
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:	4-30-9-59	Survey Calculation Method:	Minimum Curvature
Wellbore:	4-30-9-59 OH		
Design:	Plan #1		

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)	
10,500.00	90.00	359.09	6,160.00	4,169.16	118.20	4,166.75	0.00	0.00	0.00	
10,600.00	90.00	359.09	6,160.00	4,269.14	116.62	4,266.75	0.00	0.00	0.00	
10,700.00	90.00	359.09	6,160.00	4,369.13	115.04	4,366.75	0.00	0.00	0.00	
10,800.00	90.00	359.09	6,160.00	4,469.12	113.46	4,466.75	0.00	0.00	0.00	
10,900.00	90.00	359.09	6,160.00	4,569.11	111.88	4,566.75	0.00	0.00	0.00	
10,939.90	90.00	359.09	6,160.00	4,609.00	111.25	4,606.65	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 4-30	0.00	0.00	6,160.00	4,609.00	111.25	1,511,380.02	3,407,952.28	40° 43' 40.20 N	104° 1' 40.98 W	
- plan hits target center										
- Point										