

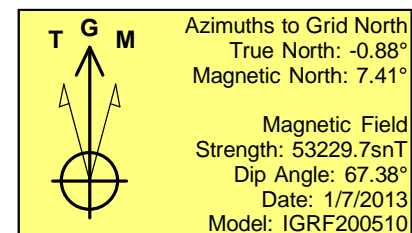
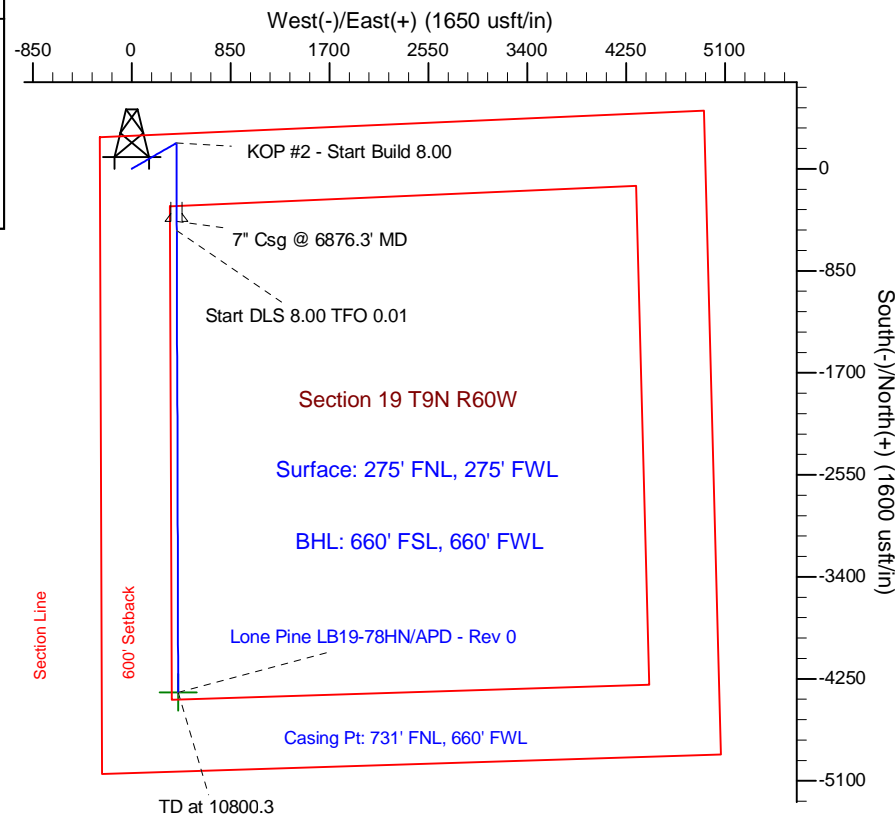
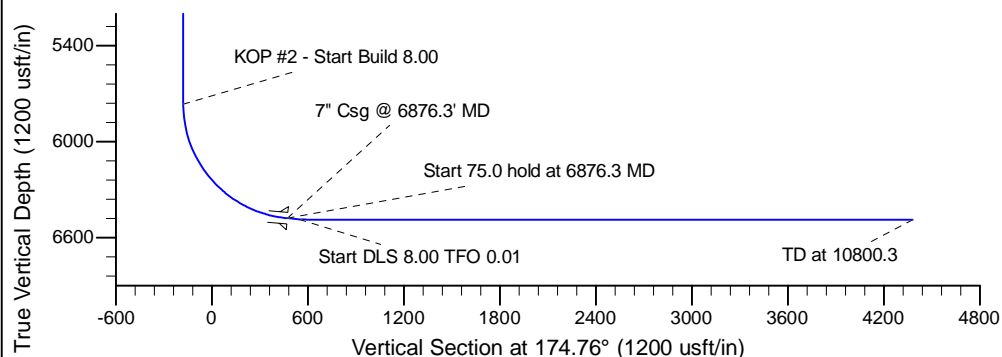
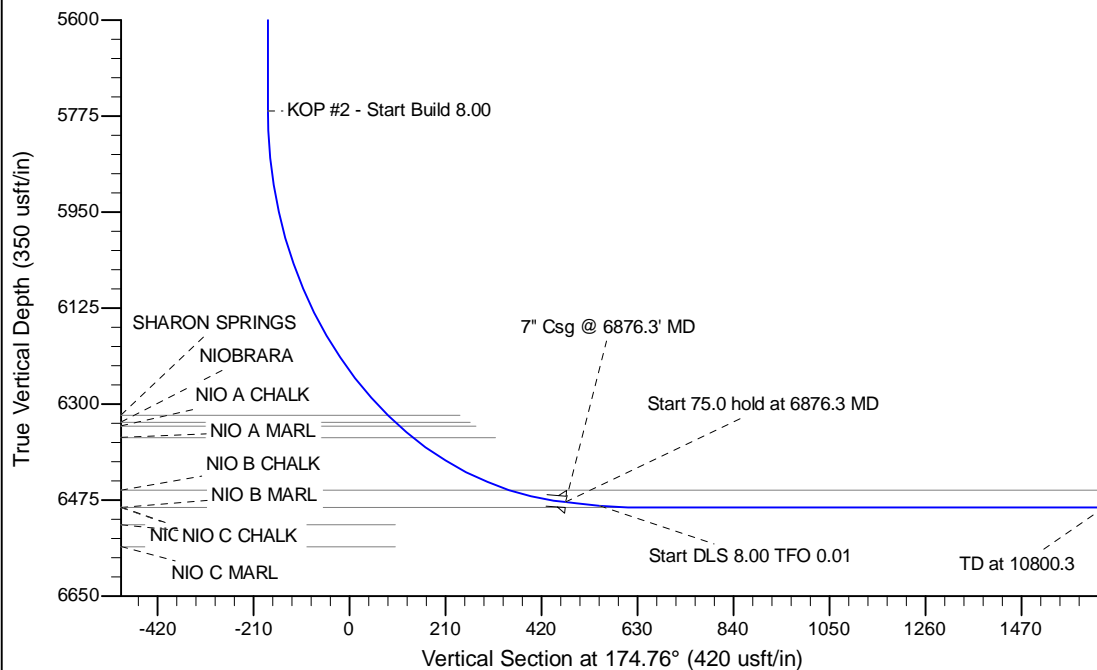
Project: Wattenberg Field
 Site: LB (Sec.19-T09N-R60W) Weld County, CO
 Well: Lone Pine LB19-78HN
 Wellbore: Original Drilling
 Design: APD - Rev 0

Northern Region Drilling

Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Colorado Northern Zone
 System Datum: Mean Sea Level

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N-/S	+E-/W	Dleg	TFace	Vsect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	2000.0	0.00	0.00	2000.0	0.0	0.0	0.00	0.00	0.0	
3	2560.6	14.02	60.82	2555.0	33.3	59.6	2.50	60.82	-27.7	
4	3818.0	14.02	60.82	3775.0	181.7	325.4	0.00	0.00	-151.2	
5	4378.6	0.00	0.00	4330.0	215.0	385.0	2.50	180.00	-178.9	
6	5813.8	0.00	0.00	5765.2	215.0	385.0	0.00	0.00	-178.9	
7	6876.3	85.00	179.81	6478.7	-438.8	387.2	8.00	179.81	472.3	
8	6951.3	85.00	179.81	6485.2	-513.5	387.4	0.00	0.00	546.7	
9	7013.8	90.00	179.81	6488.0	-575.9	387.6	8.00	0.01	608.9	
10	10800.3	90.00	179.81	6488.0	-4362.4	400.1	0.00	0.00	4380.7	Lone Pine LB19-78HN BHL 660'FSL, 660'FWL



WELL DETAILS: Lone Pine LB19-78HN			
Ground Level:	4970.0	Latitude	40.741064
Northing	1515683.88	Easting	3375522.84
		Longitude	-104.144803
Plan: APD - Rev 0 (Lone Pine LB19-78HN/Original Drilling)			
Created By: Carrie Willers	Date: 12:22, January 07 2013		
Checked: _____	Date: _____		
Reviewed: _____	Date: _____		
Approved: _____	Date: _____		



Northern Region Drilling

Wattenberg Field

LB (09N-60W)

Lone Pine LB19-78HN

Original Drilling

Plan: APD - Rev 0

Standard Planning Report

07 January, 2013

Database:	EDM Production	Local Co-ordinate Reference:	Well Lone Pine LB19-78HN
Company:	Northern Region Drilling	TVD Reference:	WELL @ 5000.0usft (Original Well Elev)
Project:	Wattenberg Field	MD Reference:	WELL @ 5000.0usft (Original Well Elev)
Site:	LB (09N-60W)	North Reference:	Grid
Well:	Lone Pine LB19-78HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 0		

Project	Wattenberg Field, 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		LB (09N-60W)			
Site Position:		Northing:	1,511,528.97 usft	Latitude:	40.729003
From:	Lat/Long	Easting:	3,390,898.92 usft	Longitude:	-104.089561
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.91

Well	Lone Pine LB19-78HN					
Well Position	+N/-S	4,154.9 usft	Northing:	1,515,683.89 usft	Latitude:	40.741064
	+E/-W	-15,376.2 usft	Easting:	3,375,522.83 usft	Longitude:	-104.144803
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	4,970.0 usft

Wellbore	Original Drilling				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	1/7/2013	8.29	67.38	53,230

Design	APD - Rev 0			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	174.76

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,560.6	14.02	60.82	2,555.0	33.3	59.6	2.50	2.50	0.00	60.82	
3,818.0	14.02	60.82	3,775.0	181.7	325.4	0.00	0.00	0.00	0.00	
4,378.6	0.00	0.00	4,330.0	215.0	385.0	2.50	-2.50	0.00	180.00	
5,813.8	0.00	0.00	5,765.2	215.0	385.0	0.00	0.00	0.00	0.00	
6,876.3	85.00	179.81	6,478.7	-438.8	387.2	8.00	8.00	0.00	179.81	
6,951.3	85.00	179.81	6,485.2	-513.5	387.4	0.00	0.00	0.00	0.00	
7,013.8	90.00	179.81	6,488.0	-575.9	387.6	8.00	8.00	0.00	0.01	
10,800.3	90.00	179.81	6,488.0	-4,362.4	400.1	0.00	0.00	0.00	0.00	Lone Pine LB19-78HN

Database:	EDM Production	Local Co-ordinate Reference:	Well Lone Pine LB19-78HN
Company:	Northern Region Drilling	TVD Reference:	WELL @ 5000.0usft (Original Well Elev)
Project:	Wattenberg Field	MD Reference:	WELL @ 5000.0usft (Original Well Elev)
Site:	LB (09N-60W)	North Reference:	Grid
Well:	Lone Pine LB19-78HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 0		

Planned 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
50.0	0.00	0.00	50.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
150.0	0.00	0.00	150.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
250.0	0.00	0.00	250.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
350.0	0.00	0.00	350.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
450.0	0.00	0.00	450.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
550.0	0.00	0.00	550.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
650.0	0.00	0.00	650.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
750.0	0.00	0.00	750.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
850.0	0.00	0.00	850.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
950.0	0.00	0.00	950.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,050.0	0.00	0.00	1,050.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,150.0	0.00	0.00	1,150.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,250.0	0.00	0.00	1,250.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,350.0	0.00	0.00	1,350.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,450.0	0.00	0.00	1,450.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,550.0	0.00	0.00	1,550.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,650.0	0.00	0.00	1,650.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,750.0	0.00	0.00	1,750.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,850.0	0.00	0.00	1,850.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,950.0	0.00	0.00	1,950.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP - Start Build 2.50									
2,050.0	1.25	60.82	2,050.0	0.3	0.5	-0.2	2.50	2.50	0.00
2,100.0	2.50	60.82	2,100.0	1.1	1.9	-0.9	2.50	2.50	0.00
2,150.0	3.75	60.82	2,149.9	2.4	4.3	-2.0	2.50	2.50	0.00
2,200.0	5.00	60.82	2,199.7	4.3	7.6	-3.5	2.50	2.50	0.00
2,250.0	6.25	60.82	2,249.5	6.6	11.9	-5.5	2.50	2.50	0.00
2,300.0	7.50	60.82	2,299.1	9.6	17.1	-8.0	2.50	2.50	0.00
2,350.0	8.75	60.82	2,348.6	13.0	23.3	-10.8	2.50	2.50	0.00
2,400.0	10.00	60.82	2,398.0	17.0	30.4	-14.1	2.50	2.50	0.00
2,450.0	11.25	60.82	2,447.1	21.5	38.4	-17.9	2.50	2.50	0.00
2,500.0	12.50	60.82	2,496.0	26.5	47.4	-22.0	2.50	2.50	0.00
2,550.0	13.75	60.82	2,544.7	32.0	57.3	-26.7	2.50	2.50	0.00
2,560.6	14.02	60.82	2,555.0	33.3	59.6	-27.7	2.50	2.50	0.00

Database:	EDM Production	Local Co-ordinate Reference:	Well Lone Pine LB19-78HN
Company:	Northern Region Drilling	TVD Reference:	WELL @ 5000.0usft (Original Well Elev)
Project:	Wattenberg Field	MD Reference:	WELL @ 5000.0usft (Original Well Elev)
Site:	LB (09N-60W)	North Reference:	Grid
Well:	Lone Pine LB19-78HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 0		

Planned 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)
2,600.0	14.02	60.82	2,593.3	37.9	67.9	-31.6	0.00	0.00	0.00
2,650.0	14.02	60.82	2,641.8	43.8	78.5	-36.5	0.00	0.00	0.00
2,700.0	14.02	60.82	2,690.3	49.7	89.0	-41.4	0.00	0.00	0.00
2,750.0	14.02	60.82	2,738.8	55.6	99.6	-46.3	0.00	0.00	0.00
2,800.0	14.02	60.82	2,787.3	61.5	110.2	-51.2	0.00	0.00	0.00
2,850.0	14.02	60.82	2,835.8	67.4	120.8	-56.1	0.00	0.00	0.00
2,900.0	14.02	60.82	2,884.3	73.3	131.3	-61.0	0.00	0.00	0.00
2,950.0	14.02	60.82	2,932.8	79.2	141.9	-66.0	0.00	0.00	0.00
3,000.0	14.02	60.82	2,981.3	85.1	152.5	-70.9	0.00	0.00	0.00
3,050.0	14.02	60.82	3,029.9	91.1	163.0	-75.8	0.00	0.00	0.00
3,100.0	14.02	60.82	3,078.4	97.0	173.6	-80.7	0.00	0.00	0.00
3,150.0	14.02	60.82	3,126.9	102.9	184.2	-85.6	0.00	0.00	0.00
3,200.0	14.02	60.82	3,175.4	108.8	194.8	-90.5	0.00	0.00	0.00
3,250.0	14.02	60.82	3,223.9	114.7	205.3	-95.4	0.00	0.00	0.00
3,300.0	14.02	60.82	3,272.4	120.6	215.9	-100.3	0.00	0.00	0.00
3,350.0	14.02	60.82	3,320.9	126.5	226.5	-105.3	0.00	0.00	0.00
3,400.0	14.02	60.82	3,369.4	132.4	237.1	-110.2	0.00	0.00	0.00
3,450.0	14.02	60.82	3,417.9	138.3	247.6	-115.1	0.00	0.00	0.00
3,500.0	14.02	60.82	3,466.5	144.2	258.2	-120.0	0.00	0.00	0.00
3,550.0	14.02	60.82	3,515.0	150.1	268.8	-124.9	0.00	0.00	0.00
3,600.0	14.02	60.82	3,563.5	156.0	279.3	-129.8	0.00	0.00	0.00
3,650.0	14.02	60.82	3,612.0	161.9	289.9	-134.7	0.00	0.00	0.00
3,700.0	14.02	60.82	3,660.5	167.8	300.5	-139.7	0.00	0.00	0.00
3,750.0	14.02	60.82	3,709.0	173.7	311.1	-144.6	0.00	0.00	0.00
3,800.0	14.02	60.82	3,757.5	179.6	321.6	-149.5	0.00	0.00	0.00
3,818.0	14.02	60.82	3,775.0	181.7	325.4	-151.3	0.00	0.00	0.00
Start Drop -2.50									
3,850.0	13.21	60.82	3,806.1	185.4	332.0	-154.3	2.50	-2.50	0.00
3,900.0	11.96	60.82	3,854.9	190.7	341.5	-158.7	2.50	-2.50	0.00
3,950.0	10.71	60.82	3,903.9	195.5	350.1	-162.7	2.50	-2.50	0.00
4,000.0	9.46	60.82	3,953.1	199.8	357.8	-166.3	2.50	-2.50	0.00
4,050.0	8.21	60.82	4,002.5	203.5	364.5	-169.4	2.50	-2.50	0.00
4,100.0	6.96	60.82	4,052.1	206.8	370.2	-172.1	2.50	-2.50	0.00
4,150.0	5.71	60.82	4,101.8	209.4	375.1	-174.3	2.50	-2.50	0.00
4,200.0	4.46	60.82	4,151.6	211.6	378.9	-176.1	2.50	-2.50	0.00
4,250.0	3.21	60.82	4,201.5	213.2	381.9	-177.5	2.50	-2.50	0.00
4,300.0	1.96	60.82	4,251.4	214.3	383.8	-178.4	2.50	-2.50	0.00
4,350.0	0.71	60.82	4,301.4	214.9	384.8	-178.9	2.50	-2.50	0.00
4,378.6	0.00	0.00	4,330.0	215.0	385.0	-178.9	2.50	-2.50	0.00
4,400.0	0.00	0.00	4,351.4	215.0	385.0	-178.9	0.00	0.00	0.00
4,450.0	0.00	0.00	4,401.4	215.0	385.0	-178.9	0.00	0.00	0.00
4,500.0	0.00	0.00	4,451.4	215.0	385.0	-178.9	0.00	0.00	0.00
4,550.0	0.00	0.00	4,501.4	215.0	385.0	-178.9	0.00	0.00	0.00
4,600.0	0.00	0.00	4,551.4	215.0	385.0	-178.9	0.00	0.00	0.00
4,650.0	0.00	0.00	4,601.4	215.0	385.0	-178.9	0.00	0.00	0.00
4,700.0	0.00	0.00	4,651.4	215.0	385.0	-178.9	0.00	0.00	0.00
4,750.0	0.00	0.00	4,701.4	215.0	385.0	-178.9	0.00	0.00	0.00
4,800.0	0.00	0.00	4,751.4	215.0	385.0	-178.9	0.00	0.00	0.00
4,850.0	0.00	0.00	4,801.4	215.0	385.0	-178.9	0.00	0.00	0.00
4,900.0	0.00	0.00	4,851.4	215.0	385.0	-178.9	0.00	0.00	0.00
4,950.0	0.00	0.00	4,901.4	215.0	385.0	-178.9	0.00	0.00	0.00
5,000.0	0.00	0.00	4,951.4	215.0	385.0	-178.9	0.00	0.00	0.00
5,050.0	0.00	0.00	5,001.4	215.0	385.0	-178.9	0.00	0.00	0.00

Database:	EDM Production	Local Co-ordinate Reference:	Well Lone Pine LB19-78HN
Company:	Northern Region Drilling	TVD Reference:	WELL @ 5000.0usft (Original Well Elev)
Project:	Wattenberg Field	MD Reference:	WELL @ 5000.0usft (Original Well Elev)
Site:	LB (09N-60W)	North Reference:	Grid
Well:	Lone Pine LB19-78HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 0		

Planned 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)
5,100.0	0.00	0.00	5,051.4	215.0	385.0	-178.9	0.00	0.00	0.00
5,150.0	0.00	0.00	5,101.4	215.0	385.0	-178.9	0.00	0.00	0.00
5,200.0	0.00	0.00	5,151.4	215.0	385.0	-178.9	0.00	0.00	0.00
5,250.0	0.00	0.00	5,201.4	215.0	385.0	-178.9	0.00	0.00	0.00
5,300.0	0.00	0.00	5,251.4	215.0	385.0	-178.9	0.00	0.00	0.00
5,350.0	0.00	0.00	5,301.4	215.0	385.0	-178.9	0.00	0.00	0.00
5,400.0	0.00	0.00	5,351.4	215.0	385.0	-178.9	0.00	0.00	0.00
5,450.0	0.00	0.00	5,401.4	215.0	385.0	-178.9	0.00	0.00	0.00
5,500.0	0.00	0.00	5,451.4	215.0	385.0	-178.9	0.00	0.00	0.00
5,550.0	0.00	0.00	5,501.4	215.0	385.0	-178.9	0.00	0.00	0.00
5,600.0	0.00	0.00	5,551.4	215.0	385.0	-178.9	0.00	0.00	0.00
5,650.0	0.00	0.00	5,601.4	215.0	385.0	-178.9	0.00	0.00	0.00
5,700.0	0.00	0.00	5,651.4	215.0	385.0	-178.9	0.00	0.00	0.00
5,750.0	0.00	0.00	5,701.4	215.0	385.0	-178.9	0.00	0.00	0.00
5,800.0	0.00	0.00	5,751.4	215.0	385.0	-178.9	0.00	0.00	0.00
5,813.8	0.00	0.00	5,765.2	215.0	385.0	-178.9	0.00	0.00	0.00
KOP #2 - Start Build 8.00									
5,850.0	2.90	179.81	5,801.4	214.1	385.0	-178.0	8.00	8.00	0.00
5,900.0	6.90	179.81	5,851.2	209.8	385.0	-173.8	8.00	8.00	0.00
5,950.0	10.90	179.81	5,900.6	202.1	385.0	-166.1	8.00	8.00	0.00
6,000.0	14.90	179.81	5,949.3	190.9	385.1	-155.0	8.00	8.00	0.00
6,050.0	18.90	179.81	5,997.2	176.4	385.1	-140.5	8.00	8.00	0.00
6,100.0	22.90	179.81	6,043.9	158.6	385.2	-122.7	8.00	8.00	0.00
6,150.0	26.90	179.81	6,089.2	137.5	385.3	-101.8	8.00	8.00	0.00
6,200.0	30.90	179.81	6,133.0	113.4	385.3	-77.7	8.00	8.00	0.00
6,250.0	34.90	179.81	6,174.9	86.2	385.4	-50.7	8.00	8.00	0.00
6,300.0	38.90	179.81	6,214.9	56.2	385.5	-20.8	8.00	8.00	0.00
6,350.0	42.90	179.81	6,252.7	23.5	385.6	11.8	8.00	8.00	0.00
6,400.0	46.90	179.81	6,288.1	-11.8	385.8	47.0	8.00	8.00	0.00
6,448.4	50.77	179.81	6,320.0	-48.3	385.9	83.3	8.00	8.00	0.00
SHARON SPRINGS									
6,450.0	50.90	179.81	6,321.0	-49.5	385.9	84.5	8.00	8.00	0.00
6,469.4	52.45	179.81	6,333.0	-64.7	385.9	99.6	8.00	8.00	0.00
NIOBRARA									
6,481.0	53.37	179.81	6,340.0	-73.9	386.0	108.9	8.00	8.00	0.00
NIO A CHALK									
6,500.0	54.90	179.81	6,351.1	-89.3	386.0	124.2	8.00	8.00	0.00
6,517.4	56.29	179.81	6,361.0	-103.7	386.1	138.6	8.00	8.00	0.00
NIO A MARL									
6,550.0	58.90	179.81	6,378.5	-131.2	386.1	165.9	8.00	8.00	0.00
6,600.0	62.90	179.81	6,402.8	-174.9	386.3	209.4	8.00	8.00	0.00
6,650.0	66.90	179.81	6,424.0	-220.2	386.4	254.5	8.00	8.00	0.00
6,700.0	70.90	179.81	6,442.0	-266.8	386.6	301.0	8.00	8.00	0.00
6,750.0	74.90	179.81	6,456.7	-314.6	386.8	348.6	8.00	8.00	0.00
6,751.2	75.00	179.81	6,457.0	-315.8	386.8	349.8	8.00	8.00	0.00
NIO B CHALK									
6,800.0	78.90	179.81	6,468.0	-363.3	386.9	397.1	8.00	8.00	0.00
6,850.0	82.90	179.81	6,475.9	-412.6	387.1	446.3	8.00	8.00	0.00
6,876.3	85.00	179.81	6,478.7	-438.8	387.2	472.3	8.00	8.00	0.00
Start 75.0 hold at 6876.3 MD - 7" Csg @ 6876.3' MD									
6,900.0	85.00	179.81	6,480.8	-462.4	387.2	495.8	0.00	0.00	0.00
6,950.0	85.00	179.81	6,485.1	-512.2	387.4	545.4	0.00	0.00	0.00
6,951.3	85.00	179.81	6,485.2	-513.5	387.4	546.7	0.00	0.00	0.00

Database:	EDM Production	Local Co-ordinate Reference:	Well Lone Pine LB19-78HN
Company:	Northern Region Drilling	TVD Reference:	WELL @ 5000.0usft (Original Well Elev)
Project:	Wattenberg Field	MD Reference:	WELL @ 5000.0usft (Original Well Elev)
Site:	LB (09N-60W)	North Reference:	Grid
Well:	Lone Pine LB19-78HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 0		

Planned 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)
Start DLS 8.00 TFO 0.01									
7,000.0	88.90	179.81	6,487.8	-562.1	387.6	595.2	8.00	8.00	0.00
7,013.8	90.00	179.81	6,488.0	-575.9	387.6	608.9	8.00	8.00	0.00
7,050.0	90.00	179.81	6,488.0	-612.1	387.7	645.0	0.00	0.00	0.00
7,100.0	90.00	179.81	6,488.0	-662.1	387.9	694.8	0.00	0.00	0.00
7,150.0	90.00	179.81	6,488.0	-712.1	388.1	744.6	0.00	0.00	0.00
7,200.0	90.00	179.81	6,488.0	-762.1	388.2	794.4	0.00	0.00	0.00
7,250.0	90.00	179.81	6,488.0	-812.1	388.4	844.2	0.00	0.00	0.00
7,300.0	90.00	179.81	6,488.0	-862.1	388.6	894.0	0.00	0.00	0.00
7,350.0	90.00	179.81	6,488.0	-912.1	388.7	943.8	0.00	0.00	0.00
7,400.0	90.00	179.81	6,488.0	-962.1	388.9	993.6	0.00	0.00	0.00
7,450.0	90.00	179.81	6,488.0	-1,012.1	389.1	1,043.4	0.00	0.00	0.00
7,500.0	90.00	179.81	6,488.0	-1,062.1	389.2	1,093.2	0.00	0.00	0.00
7,550.0	90.00	179.81	6,488.0	-1,112.1	389.4	1,143.0	0.00	0.00	0.00
7,600.0	90.00	179.81	6,488.0	-1,162.1	389.6	1,192.8	0.00	0.00	0.00
7,650.0	90.00	179.81	6,488.0	-1,212.1	389.7	1,242.6	0.00	0.00	0.00
7,700.0	90.00	179.81	6,488.0	-1,262.1	389.9	1,292.4	0.00	0.00	0.00
7,750.0	90.00	179.81	6,488.0	-1,312.1	390.1	1,342.2	0.00	0.00	0.00
7,800.0	90.00	179.81	6,488.0	-1,362.1	390.2	1,392.1	0.00	0.00	0.00
7,850.0	90.00	179.81	6,488.0	-1,412.1	390.4	1,441.9	0.00	0.00	0.00
7,900.0	90.00	179.81	6,488.0	-1,462.1	390.6	1,491.7	0.00	0.00	0.00
7,950.0	90.00	179.81	6,488.0	-1,512.1	390.7	1,541.5	0.00	0.00	0.00
8,000.0	90.00	179.81	6,488.0	-1,562.1	390.9	1,591.3	0.00	0.00	0.00
8,050.0	90.00	179.81	6,488.0	-1,612.1	391.0	1,641.1	0.00	0.00	0.00
8,100.0	90.00	179.81	6,488.0	-1,662.1	391.2	1,690.9	0.00	0.00	0.00
8,150.0	90.00	179.81	6,488.0	-1,712.1	391.4	1,740.7	0.00	0.00	0.00
8,200.0	90.00	179.81	6,488.0	-1,762.1	391.5	1,790.5	0.00	0.00	0.00
8,250.0	90.00	179.81	6,488.0	-1,812.1	391.7	1,840.3	0.00	0.00	0.00
8,300.0	90.00	179.81	6,488.0	-1,862.1	391.9	1,890.1	0.00	0.00	0.00
8,350.0	90.00	179.81	6,488.0	-1,912.1	392.0	1,939.9	0.00	0.00	0.00
8,400.0	90.00	179.81	6,488.0	-1,962.1	392.2	1,989.7	0.00	0.00	0.00
8,450.0	90.00	179.81	6,488.0	-2,012.1	392.4	2,039.5	0.00	0.00	0.00
8,500.0	90.00	179.81	6,488.0	-2,062.1	392.5	2,089.3	0.00	0.00	0.00
8,550.0	90.00	179.81	6,488.0	-2,112.1	392.7	2,139.1	0.00	0.00	0.00
8,600.0	90.00	179.81	6,488.0	-2,162.1	392.9	2,188.9	0.00	0.00	0.00
8,650.0	90.00	179.81	6,488.0	-2,212.1	393.0	2,238.8	0.00	0.00	0.00
8,700.0	90.00	179.81	6,488.0	-2,262.1	393.2	2,288.6	0.00	0.00	0.00
8,750.0	90.00	179.81	6,488.0	-2,312.1	393.4	2,338.4	0.00	0.00	0.00
8,800.0	90.00	179.81	6,488.0	-2,362.1	393.5	2,388.2	0.00	0.00	0.00
8,850.0	90.00	179.81	6,488.0	-2,412.1	393.7	2,438.0	0.00	0.00	0.00
8,900.0	90.00	179.81	6,488.0	-2,462.1	393.9	2,487.8	0.00	0.00	0.00
8,950.0	90.00	179.81	6,488.0	-2,512.1	394.0	2,537.6	0.00	0.00	0.00
9,000.0	90.00	179.81	6,488.0	-2,562.1	394.2	2,587.4	0.00	0.00	0.00
9,050.0	90.00	179.81	6,488.0	-2,612.1	394.4	2,637.2	0.00	0.00	0.00
9,100.0	90.00	179.81	6,488.0	-2,662.1	394.5	2,687.0	0.00	0.00	0.00
9,150.0	90.00	179.81	6,488.0	-2,712.1	394.7	2,736.8	0.00	0.00	0.00
9,200.0	90.00	179.81	6,488.0	-2,762.1	394.8	2,786.6	0.00	0.00	0.00
9,250.0	90.00	179.81	6,488.0	-2,812.1	395.0	2,836.4	0.00	0.00	0.00
9,300.0	90.00	179.81	6,488.0	-2,862.1	395.2	2,886.2	0.00	0.00	0.00
9,350.0	90.00	179.81	6,488.0	-2,912.1	395.3	2,936.0	0.00	0.00	0.00
9,400.0	90.00	179.81	6,488.0	-2,962.1	395.5	2,985.8	0.00	0.00	0.00
9,450.0	90.00	179.81	6,488.0	-3,012.1	395.7	3,035.6	0.00	0.00	0.00
9,500.0	90.00	179.81	6,488.0	-3,062.1	395.8	3,085.4	0.00	0.00	0.00
9,550.0	90.00	179.81	6,488.0	-3,112.1	396.0	3,135.3	0.00	0.00	0.00

Database:	EDM Production	Local Co-ordinate Reference:	Well Lone Pine LB19-78HN
Company:	Northern Region Drilling	TVD Reference:	WELL @ 5000.0usft (Original Well Elev)
Project:	Wattenberg Field	MD Reference:	WELL @ 5000.0usft (Original Well Elev)
Site:	LB (09N-60W)	North Reference:	Grid
Well:	Lone Pine LB19-78HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 0		

Planned 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)	
9,600.0	90.00	179.81	6,488.0	-3,162.1	396.2	3,185.1	0.00	0.00	0.00	
9,650.0	90.00	179.81	6,488.0	-3,212.1	396.3	3,234.9	0.00	0.00	0.00	
9,700.0	90.00	179.81	6,488.0	-3,262.1	396.5	3,284.7	0.00	0.00	0.00	
9,750.0	90.00	179.81	6,488.0	-3,312.1	396.7	3,334.5	0.00	0.00	0.00	
9,800.0	90.00	179.81	6,488.0	-3,362.1	396.8	3,384.3	0.00	0.00	0.00	
9,850.0	90.00	179.81	6,488.0	-3,412.1	397.0	3,434.1	0.00	0.00	0.00	
9,900.0	90.00	179.81	6,488.0	-3,462.1	397.2	3,483.9	0.00	0.00	0.00	
9,950.0	90.00	179.81	6,488.0	-3,512.1	397.3	3,533.7	0.00	0.00	0.00	
10,000.0	90.00	179.81	6,488.0	-3,562.1	397.5	3,583.5	0.00	0.00	0.00	
10,050.0	90.00	179.81	6,488.0	-3,612.1	397.7	3,633.3	0.00	0.00	0.00	
10,100.0	90.00	179.81	6,488.0	-3,662.1	397.8	3,683.1	0.00	0.00	0.00	
10,150.0	90.00	179.81	6,488.0	-3,712.1	398.0	3,732.9	0.00	0.00	0.00	
10,200.0	90.00	179.81	6,488.0	-3,762.1	398.2	3,782.7	0.00	0.00	0.00	
10,250.0	90.00	179.81	6,488.0	-3,812.1	398.3	3,832.5	0.00	0.00	0.00	
10,300.0	90.00	179.81	6,488.0	-3,862.1	398.5	3,882.3	0.00	0.00	0.00	
10,350.0	90.00	179.81	6,488.0	-3,912.1	398.6	3,932.1	0.00	0.00	0.00	
10,400.0	90.00	179.81	6,488.0	-3,962.1	398.8	3,982.0	0.00	0.00	0.00	
10,450.0	90.00	179.81	6,488.0	-4,012.1	399.0	4,031.8	0.00	0.00	0.00	
10,500.0	90.00	179.81	6,488.0	-4,062.1	399.1	4,081.6	0.00	0.00	0.00	
10,550.0	90.00	179.81	6,488.0	-4,112.1	399.3	4,131.4	0.00	0.00	0.00	
10,600.0	90.00	179.81	6,488.0	-4,162.1	399.5	4,181.2	0.00	0.00	0.00	
10,650.0	90.00	179.81	6,488.0	-4,212.1	399.6	4,231.0	0.00	0.00	0.00	
10,700.0	90.00	179.81	6,488.0	-4,262.1	399.8	4,280.8	0.00	0.00	0.00	
10,750.0	90.00	179.81	6,488.0	-4,312.1	400.0	4,330.6	0.00	0.00	0.00	
10,800.0	90.00	179.81	6,488.0	-4,362.1	400.1	4,380.4	0.00	0.00	0.00	
10,800.3	90.00	179.81	6,488.0	-4,362.4	400.1	4,380.7	0.00	0.00	0.00	
TD at 10800.3 - NIO B MARL - Lone Pine LB19-78HN BHL 660'FSL, 660'FWL										

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									
Lone Pine LB19-78HN E	0.00	0.00	6,488.0	-4,362.4	400.1	1,511,321.55	3,375,922.97	40.729075	-104.143600
- plan hits target center									
- Point									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
6,876.3	6,478.7	7" Csg @ 6876.3' MD	7	8-3/4	

Database:	EDM Production	Local Co-ordinate Reference:	Well Lone Pine LB19-78HN
Company:	Northern Region Drilling	TVD Reference:	WELL @ 5000.0usft (Original Well Elev)
Project:	Wattenberg Field	MD Reference:	WELL @ 5000.0usft (Original Well Elev)
Site:	LB (09N-60W)	North Reference:	Grid
Well:	Lone Pine LB19-78HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 0		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
6,448.4	6,320.0	SHARON SPRINGS		0.00		
6,469.4	6,333.0	NIOBRARA		0.00		
6,481.0	6,340.0	NIO A CHALK		0.00		
6,517.4	6,361.0	NIO A MARL		0.00		
6,751.2	6,457.0	NIO B CHALK		0.00		
10,800.3	6,488.0	NIO B MARL		0.00		

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
2,000.0	2,000.0	0.0	0.0	KOP - Start Build 2.50	
3,818.0	3,775.0	33.3	59.6	Start Drop -2.50	
5,813.8	5,765.2	181.7	325.4	KOP #2 - Start Build 8.00	
6,876.3	6,478.7	215.0	385.0	Start 75.0 hold at 6876.3 MD	
6,951.3	6,485.2	215.0	385.0	Start DLS 8.00 TFO 0.01	
10,800.3	6,488.0	-438.8	387.2	TD at 10800.3	