

Nighthawk Production, LLC

Lincoln County, CO

Snowking Pad

Snowking 5-33

Wellbore #1

Plan: Plan #1 26Apr14 kjs

Standard Planning Report - Geographic

26 April, 2014

New Tech

Planning Report - Geographic

Database:	EDM 2003.16 Single User Db	Local Co-ordinate Reference:	Well Snowking 5-33
Company:	Nighthawk Production, LLC	TVD Reference:	WELL @ 5329.0ft (Original Well Elev)
Project:	Lincoln County, CO	MD Reference:	WELL @ 5329.0ft (Original Well Elev)
Site:	Snowking Pad	North Reference:	True
Well:	Snowking 5-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 26Apr14 kjs		

Project	Lincoln County, CO, Lincoln, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site		Snowking Pad			
Site Position:		Northing:	1,607,980.90 ft	Latitude:	39° 29' 5.280 N
From:	Lat/Long	Easting:	3,577,913.39 ft	Longitude:	103° 27' 8.172 W
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	1.29 °

Well	Snowking 5-33					
Well Position	+N/-S	0.0 ft	Northing:	1,607,980.90 ft	Latitude:	39° 29' 5.280 N
	+E/-W	0.0 ft	Easting:	3,577,913.39 ft	Longitude:	103° 27' 8.172 W
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,314.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010	4/26/2014	7.69	66.42	52,476

Design	Plan #1 26Apr14 kjs			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(ft)	(ft)	(ft)	(°)
	0.0	0.0	0.0	66.20

Plan Sections										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Dogleg	Build	Turn	TFO	Target
Depth	(°)	(°)	Depth	(ft)	(ft)	Rate	Rate	Rate	(°)	
(ft)			(ft)			(°/100ft)	(°/100ft)	(°/100ft)		
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,431.0	0.00	0.00	2,431.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,831.0	6.00	66.20	2,830.3	8.4	19.1	1.50	1.50	0.00	66.20	
4,762.0	6.00	66.20	4,750.7	89.9	203.8	0.00	0.00	0.00	0.00	
5,162.0	0.00	0.00	5,150.0	98.3	223.0	1.50	-1.50	0.00	180.00	Target (50' Radius) 5-
9,012.0	0.00	0.00	9,000.0	98.3	223.0	0.00	0.00	0.00	0.00	

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Site:	Snowking Pad	North Reference:	True
Well:	Snowking 5-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 26Apr14 kjs		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	1,607,980.90	3,577,913.39	39° 29' 5.280 N	103° 27' 8.172 W
200.0	0.00	0.00	200.0	0.0	0.0	1,607,980.90	3,577,913.39	39° 29' 5.280 N	103° 27' 8.172 W
400.0	0.00	0.00	400.0	0.0	0.0	1,607,980.90	3,577,913.39	39° 29' 5.280 N	103° 27' 8.172 W
600.0	0.00	0.00	600.0	0.0	0.0	1,607,980.90	3,577,913.39	39° 29' 5.280 N	103° 27' 8.172 W
800.0	0.00	0.00	800.0	0.0	0.0	1,607,980.90	3,577,913.39	39° 29' 5.280 N	103° 27' 8.172 W
1,000.0	0.00	0.00	1,000.0	0.0	0.0	1,607,980.90	3,577,913.39	39° 29' 5.280 N	103° 27' 8.172 W
1,200.0	0.00	0.00	1,200.0	0.0	0.0	1,607,980.90	3,577,913.39	39° 29' 5.280 N	103° 27' 8.172 W
1,400.0	0.00	0.00	1,400.0	0.0	0.0	1,607,980.90	3,577,913.39	39° 29' 5.280 N	103° 27' 8.172 W
1,600.0	0.00	0.00	1,600.0	0.0	0.0	1,607,980.90	3,577,913.39	39° 29' 5.280 N	103° 27' 8.172 W
1,800.0	0.00	0.00	1,800.0	0.0	0.0	1,607,980.90	3,577,913.39	39° 29' 5.280 N	103° 27' 8.172 W
2,000.0	0.00	0.00	2,000.0	0.0	0.0	1,607,980.90	3,577,913.39	39° 29' 5.280 N	103° 27' 8.172 W
2,200.0	0.00	0.00	2,200.0	0.0	0.0	1,607,980.90	3,577,913.39	39° 29' 5.280 N	103° 27' 8.172 W
2,400.0	0.00	0.00	2,400.0	0.0	0.0	1,607,980.90	3,577,913.39	39° 29' 5.280 N	103° 27' 8.172 W
2,431.0	0.00	0.00	2,431.0	0.0	0.0	1,607,980.90	3,577,913.39	39° 29' 5.280 N	103° 27' 8.172 W
KOP 1.5°/100									
2,600.0	2.54	66.20	2,599.9	1.5	3.4	1,607,982.48	3,577,916.77	39° 29' 5.295 N	103° 27' 8.128 W
2,800.0	5.54	66.20	2,799.4	7.2	16.3	1,607,988.45	3,577,929.51	39° 29' 5.351 N	103° 27' 7.964 W
2,831.0	6.00	66.20	2,830.3	8.4	19.1	1,607,989.77	3,577,932.34	39° 29' 5.363 N	103° 27' 7.928 W
Hold 6° Inc, 66.2° Az									
3,000.0	6.00	66.20	2,998.3	15.6	35.3	1,607,997.26	3,577,948.33	39° 29' 5.434 N	103° 27' 7.722 W
3,200.0	6.00	66.20	3,197.2	24.0	54.4	1,608,006.13	3,577,967.27	39° 29' 5.517 N	103° 27' 7.478 W
3,400.0	6.00	66.20	3,396.2	32.4	73.6	1,608,014.99	3,577,986.20	39° 29' 5.601 N	103° 27' 7.234 W
3,600.0	6.00	66.20	3,595.1	40.9	92.7	1,608,023.86	3,578,005.13	39° 29' 5.684 N	103° 27' 6.990 W
3,714.6	6.00	66.20	3,709.0	45.7	103.6	1,608,028.94	3,578,015.98	39° 29' 5.732 N	103° 27' 6.850 W
Niobrara									
3,800.0	6.00	66.20	3,794.0	49.3	111.8	1,608,032.72	3,578,024.07	39° 29' 5.767 N	103° 27' 6.746 W
4,000.0	6.00	66.20	3,992.9	57.8	130.9	1,608,041.59	3,578,043.00	39° 29' 5.851 N	103° 27' 6.502 W
4,200.0	6.00	66.20	4,191.8	66.2	150.1	1,608,050.45	3,578,061.93	39° 29' 5.934 N	103° 27' 6.258 W
4,400.0	6.00	66.20	4,390.7	74.6	169.2	1,608,059.32	3,578,080.86	39° 29' 6.018 N	103° 27' 6.014 W
4,600.0	6.00	66.20	4,589.6	83.1	188.3	1,608,068.19	3,578,099.80	39° 29' 6.101 N	103° 27' 5.770 W
4,657.7	6.00	66.20	4,647.0	85.5	193.9	1,608,070.74	3,578,105.26	39° 29' 6.125 N	103° 27' 5.699 W
D Sand									
4,762.0	6.00	66.20	4,750.7	89.9	203.8	1,608,075.37	3,578,115.13	39° 29' 6.168 N	103° 27' 5.572 W
Start Drop -1.50									
4,800.0	5.43	66.20	4,788.5	91.4	207.3	1,608,076.97	3,578,118.56	39° 29' 6.184 N	103° 27' 5.528 W
5,000.0	2.43	66.20	4,988.0	97.0	219.8	1,608,082.78	3,578,130.97	39° 29' 6.238 N	103° 27' 5.368 W
5,162.0	0.00	0.00	5,150.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W
Target - Target (50' Radius) 5-33									
5,200.0	0.00	0.00	5,188.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W
5,400.0	0.00	0.00	5,388.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W
5,600.0	0.00	0.00	5,588.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W
5,800.0	0.00	0.00	5,788.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W
6,000.0	0.00	0.00	5,988.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W
6,200.0	0.00	0.00	6,188.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W
6,243.0	0.00	0.00	6,231.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W
PENNSYLVANIAN									
6,400.0	0.00	0.00	6,388.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W
6,600.0	0.00	0.00	6,588.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W
6,800.0	0.00	0.00	6,788.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W
6,971.0	0.00	0.00	6,959.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W
LKC									
7,000.0	0.00	0.00	6,988.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W
7,200.0	0.00	0.00	7,188.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W

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Project:	Lincoln County, CO	MD Reference:	WELL @ 5329.0ft (Original Well Elev)
Site:	Snowking Pad	North Reference:	True
Well:	Snowking 5-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 26Apr14 kjs		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude	
7,323.0	0.00	0.00	7,311.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W	
MARMATON										
7,400.0	0.00	0.00	7,388.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W	
7,529.0	0.00	0.00	7,517.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W	
CHEROKEE										
7,600.0	0.00	0.00	7,588.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W	
7,800.0	0.00	0.00	7,788.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W	
8,000.0	0.00	0.00	7,988.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W	
8,200.0	0.00	0.00	8,188.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W	
8,254.0	0.00	0.00	8,242.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W	
SPERGEN										
8,400.0	0.00	0.00	8,388.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W	
8,600.0	0.00	0.00	8,588.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W	
8,800.0	0.00	0.00	8,788.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W	
9,000.0	0.00	0.00	8,988.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W	
9,012.0	0.00	0.00	9,000.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W	
TD at 9012.04 - TD										

Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude	
- hit/miss target										
- Shape										
Target (50' Radius) 5-33	0.00	0.00	5,150.0	98.3	223.0	1,608,084.24	3,578,134.08	39° 29' 6.252 N	103° 27' 5.328 W	
- plan hits target										
- Circle (radius 50.0)										

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
9,012.0	9,000.0	TD				
8,254.0	8,242.0	SPERGEN				
6,971.0	6,959.0	LKC				
6,243.0	6,231.0	PENNSYLVANIAN				
3,714.6	3,709.0	Niobrara				
7,323.0	7,311.0	MARMATON				
7,529.0	7,517.0	CHEROKEE				
4,657.7	4,647.0	D Sand				

New Tech

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Company:	Nighthawk Production, LLC	TVD Reference:	WELL @ 5329.0ft (Original Well Elev)
Project:	Lincoln County, CO	MD Reference:	WELL @ 5329.0ft (Original Well Elev)
Site:	Snowking Pad	North Reference:	True
Well:	Snowking 5-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 26Apr14 kjs		

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
2,431.0	2,431.0	0.0	0.0	KOP 1.5°/100	
2,831.0	2,830.3	8.4	19.1	Hold 6° Inc, 66.2° Az	
4,762.0	4,750.7	89.9	203.8	Start Drop -1.50	
5,162.0	5,150.0	98.3	223.0	Target	
9,012.0	9,000.0	98.3	223.0	TD at 9012.04	



Well Name: Snowking 5-33
Surface Location: Snowking Pad
North American Datum 1983
US State Plane 1983 , Colorado Central Zone
Ground Elevation: 5314.0

WELL @ 5329.0ft (Original Well Elev)

+N/-S +E/-W Northing
0.0 0.0 1607980.90

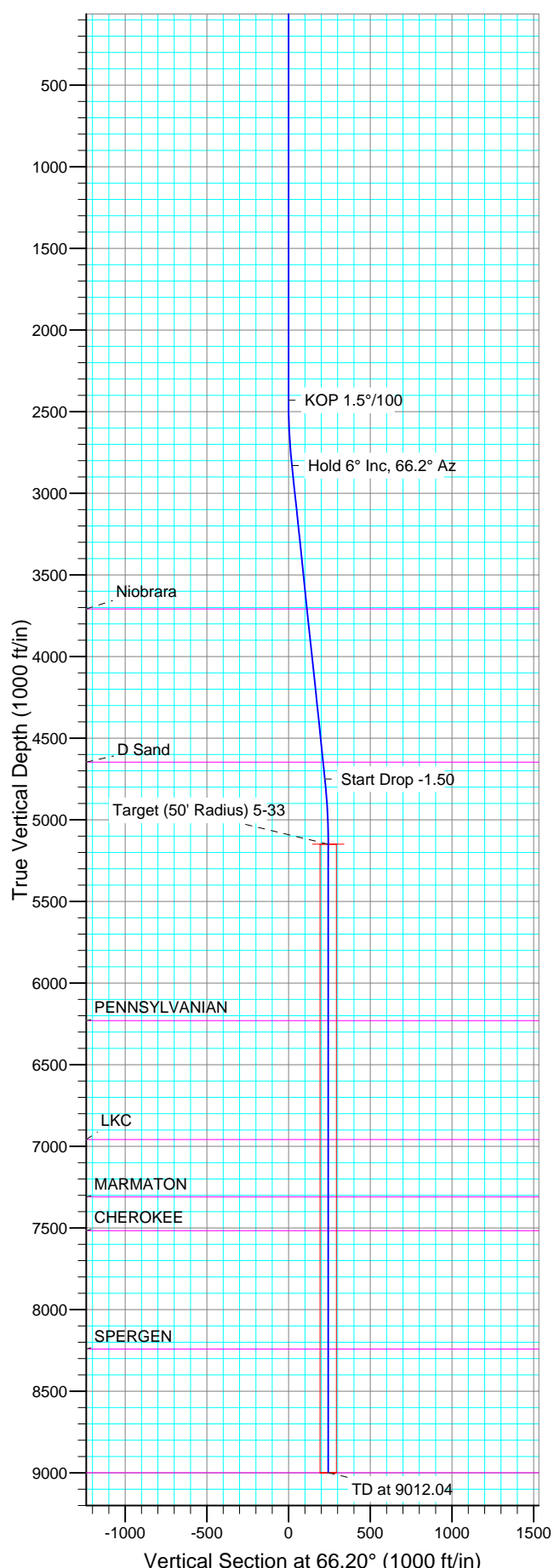
Easting
3577913.39

Latitude
39° 29' 5.280 N

Longitude
103° 27' 8.172 W

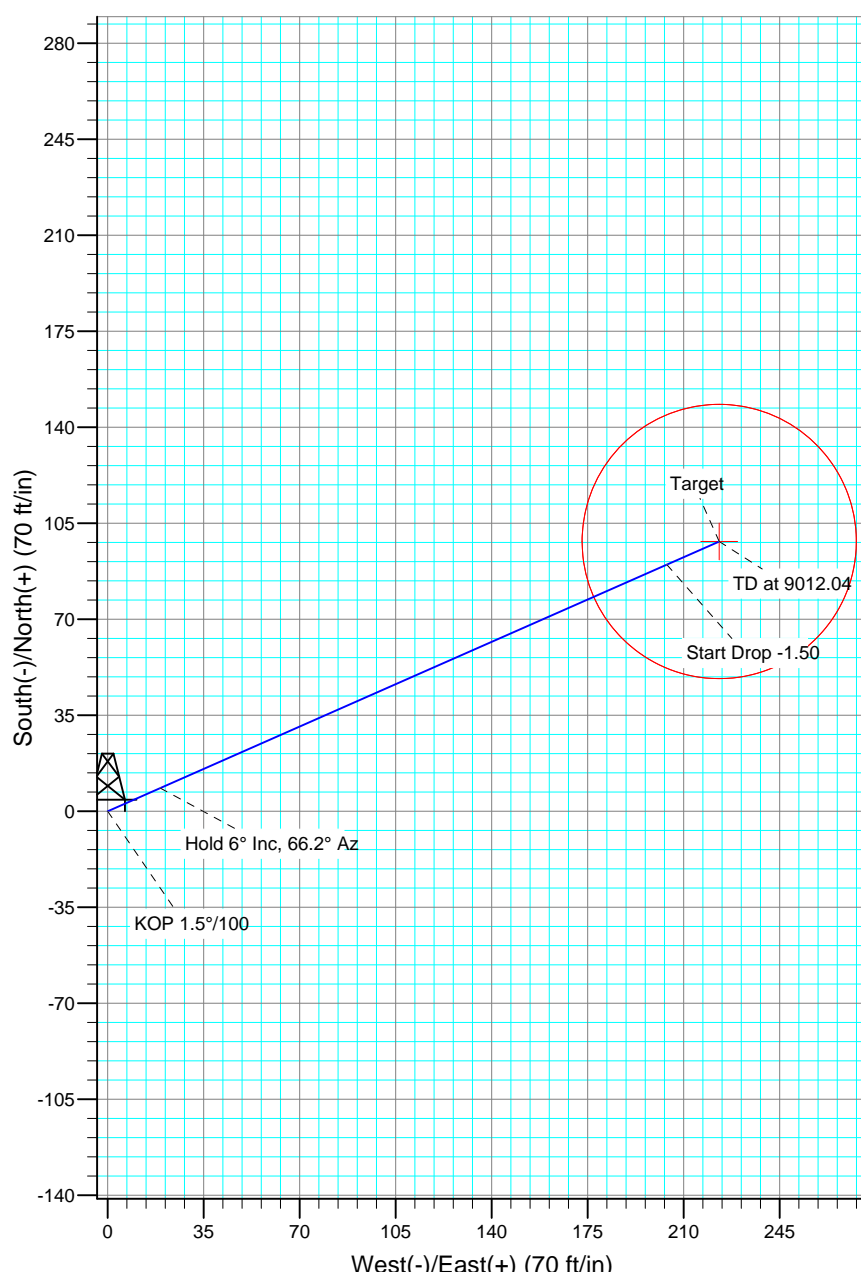
Slot

Project: Lincoln County, CO
Site: Snowking Pad
Well: Snowking 5-33
Wellbore: Wellbore #1
Design: Plan #1 26Apr14 kjs



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	2431.0	0.00	0.00	2431.0	0.0	0.0	0.00	0.00	0.0	
3	2831.0	6.00	66.20	2830.3	8.4	19.1	1.50	66.20	20.9	
4	4762.0	6.00	66.20	4750.7	89.9	203.8	0.00	0.00	222.8	
5	5162.0	0.00	0.00	5150.0	98.3	223.0	1.50	180.00	243.7	Target (50' Radius) 5-33
6	9012.0	0.00	0.00	9000.0	98.3	223.0	0.00	0.00	243.7	



FORMATION TOP DETAILS

TVDPath	MDPath	Formation
3709.0	3714.6	Niobrara
4647.0	4657.7	D Sand
6231.0	6243.0	PENNSYLVANIAN
6959.0	6971.0	LKC
7311.0	7323.0	MARMATON
7517.0	7529.0	CHEROKEE
8242.0	8254.0	SPERGEN
9000.0	9012.0	TD

