

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_HOWARD 17-32 PAD

Howard 28-32

Howard 28-32

Plan: Howard 28-32 (wp01)

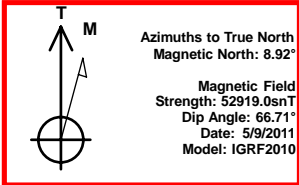
Standard Planning Report

10 May, 2011



Project: COLORADO NORTHERN ZONE - 83
Site: WELD_HOWARD 17-32 PAD
Well: Howard 28-32
Wellbore: Howard 28-32
Section:
SHL:
Design: Howard 28-32 (wp01)
Latitude: 40.010452
Longitude: -104.910730
GL: 5047.00
KB: WELL @ 5047.00ft (Original Well Elev)

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
3912.00	4114.40	PK Depth
4879.00	5148.37	SX Depth
7387.00	7706.08	NIO Depth
7820.00	8139.08	CD Depth
7898.00	8217.08	GH Depth
8250.00	8569.08	J Depth



WELL DETAILS: Howard 28-32

+N/-S	+E/-W	Northing	Ground Level: Easting	5047.00 Latitude	Longitude	Slot
0.00	0.00	1247202.60	3165059.59	40.010452	-104.910730	

CASING DETAILS

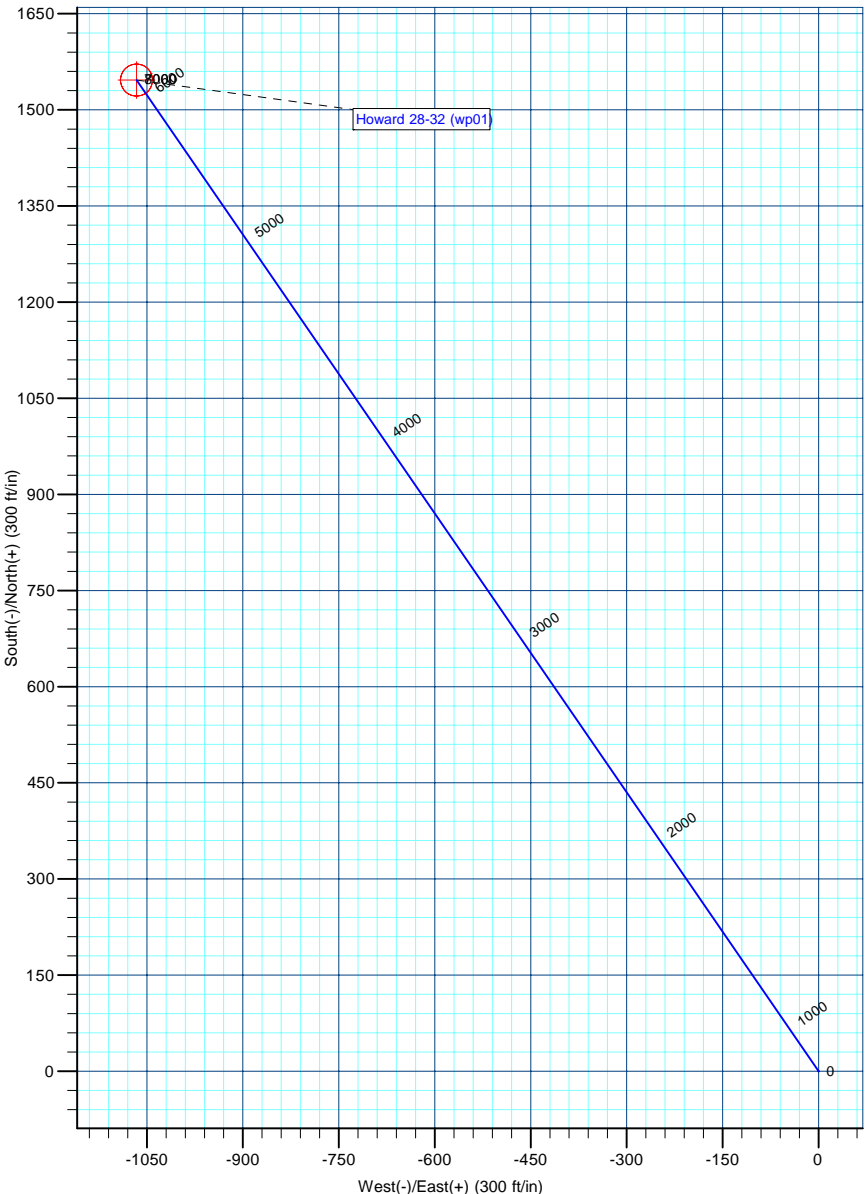
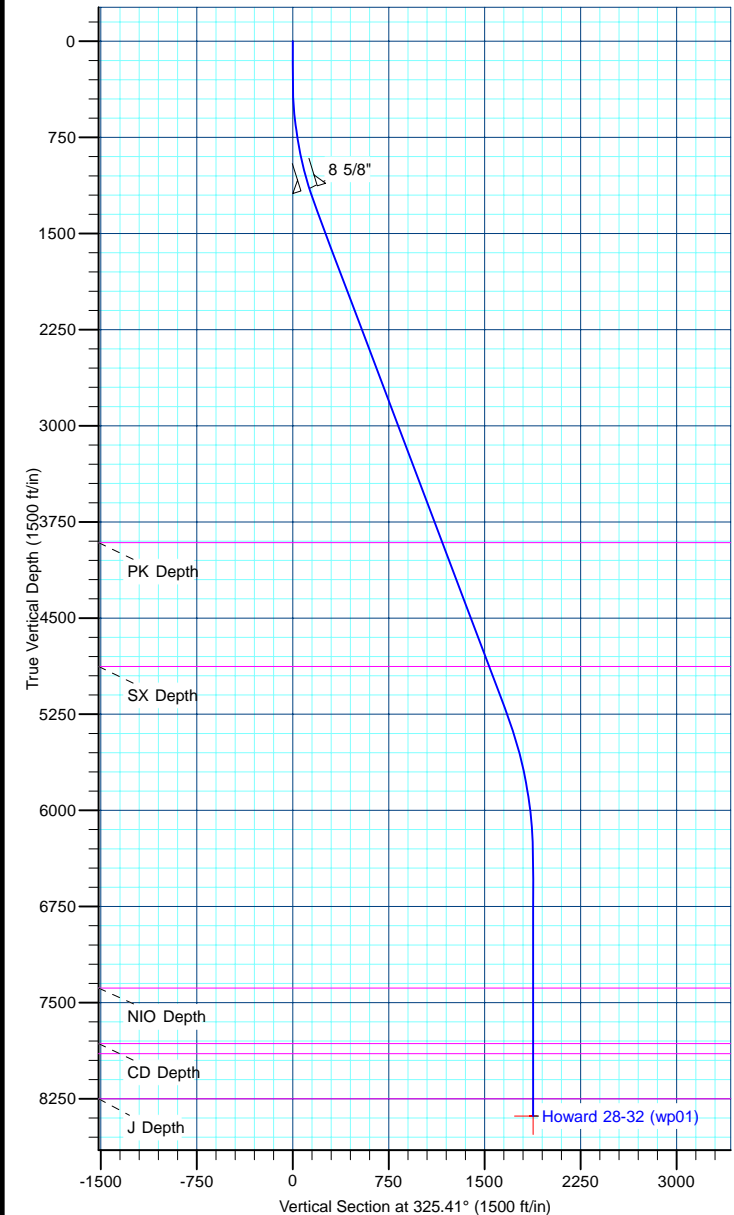
TVD	MD	Name	Size
1150.00	1162.99	8 5/8"	8-5/8

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Howard 28-32 BHL	8385.00	1546.42	-1066.31	1248741.91	3163983.02	40.014697	-104.914537	Circle (Radius: 25.00)

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00
1336.75	20.74	325.41	1314.27	152.76	-105.34	2.00	325.41	185.56
5519.23	20.74	325.41	5225.84	1371.84	-945.93	0.00	0.00	1666.35
6704.08	0.00	0.00	6385.00	1546.42	-1066.31	1.75	180.00	1878.42
8704.08	0.00	0.00	8385.00	1546.42	-1066.31	0.00	0.00	1878.42



Database:	edm5000p	Local Co-ordinate Reference:	Well Howard 28-32
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 5047.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 5047.00ft (Original Well Elev)
Site:	WELD_HOWARD 17-32 PAD	North Reference:	True
Well:	Howard 28-32	Survey Calculation Method:	Minimum Curvature
Wellbore:	Howard 28-32		
Design:	Howard 28-32 (wp01)		

Project	COLORADO NORTHERN ZONE - 83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site						WELD_HOWARD 17-32 PAD							
Site Position:						Northing:		1,247,203.06 ft		Latitude:		40.010452	
From:			Lat/Long			Easting:		3,165,119.53 ft		Longitude:		-104.910516	
Position Uncertainty:			0.00 ft			Slot Radius:		0 "		Grid Convergence:		0.38	

Well	Howard 28-32					
Well Position	+N-S	-0.05 ft	Northing:	1,247,202.60 ft	Latitude:	40.010452
	+E-W	-59.94 ft	Easting:	3,165,059.59 ft	Longitude:	-104.910730
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	5,047.00 ft

Wellbore	Howard 28-32				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/9/2011	8.92	66.71	52,919

Design	Howard 28-32 (wp01)			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	325.41

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	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	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,336.75	20.74	325.41	1,314.27	152.76	-105.34	2.00	2.00	0.00	325.41	
5,519.23	20.74	325.41	5,225.84	1,371.84	-945.93	0.00	0.00	0.00	0.00	
6,704.08	0.00	0.00	6,385.00	1,546.42	-1,066.31	1.75	-1.75	0.00	180.00	
8,704.08	0.00	0.00	8,385.00	1,546.42	-1,066.31	0.00	0.00	0.00	0.00	Howard 28-32 BHL

Database:	edm5000p	Local Co-ordinate Reference:	Well Howard 28-32
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 5047.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 5047.00ft (Original Well Elev)
Site:	WELD_HOWARD 17-32 PAD	North Reference:	True
Well:	Howard 28-32	Survey Calculation Method:	Minimum Curvature
Wellbore:	Howard 28-32		
Design:	Howard 28-32 (wp01)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	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	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	2.00	325.41	399.98	1.44	-0.99	1.75	2.00	2.00	0.00
500.00	4.00	325.41	499.84	5.75	-3.96	6.98	2.00	2.00	0.00
600.00	6.00	325.41	599.45	12.92	-8.91	15.69	2.00	2.00	0.00
700.00	8.00	325.41	698.70	22.95	-15.83	27.88	2.00	2.00	0.00
800.00	10.00	325.41	797.47	35.83	-24.71	43.52	2.00	2.00	0.00
900.00	12.00	325.41	895.62	51.54	-35.54	62.60	2.00	2.00	0.00
1,000.00	14.00	325.41	993.06	70.06	-48.31	85.10	2.00	2.00	0.00
1,100.00	16.00	325.41	1,089.64	91.36	-63.00	110.98	2.00	2.00	0.00
1,162.99	17.26	325.41	1,150.00	106.20	-73.23	129.00	2.00	2.00	0.00
8 5/8"									
1,200.00	18.00	325.41	1,185.27	115.43	-79.59	140.21	2.00	2.00	0.00
1,300.00	20.00	325.41	1,279.82	142.23	-98.07	172.77	2.00	2.00	0.00
1,336.75	20.74	325.41	1,314.27	152.76	-105.34	185.56	2.00	2.00	0.00
1,400.00	20.74	325.41	1,373.42	171.20	-118.05	207.95	0.00	0.00	0.00
1,500.00	20.74	325.41	1,466.94	200.35	-138.15	243.36	0.00	0.00	0.00
1,600.00	20.74	325.41	1,560.47	229.49	-158.24	278.76	0.00	0.00	0.00
1,700.00	20.74	325.41	1,653.99	258.64	-178.34	314.17	0.00	0.00	0.00
1,800.00	20.74	325.41	1,747.51	287.79	-198.44	349.57	0.00	0.00	0.00
1,900.00	20.74	325.41	1,841.03	316.93	-218.54	384.98	0.00	0.00	0.00
2,000.00	20.74	325.41	1,934.56	346.08	-238.64	420.38	0.00	0.00	0.00
2,100.00	20.74	325.41	2,028.08	375.23	-258.73	455.78	0.00	0.00	0.00
2,200.00	20.74	325.41	2,121.60	404.38	-278.83	491.19	0.00	0.00	0.00
2,300.00	20.74	325.41	2,215.13	433.52	-298.93	526.59	0.00	0.00	0.00
2,400.00	20.74	325.41	2,308.65	462.67	-319.03	562.00	0.00	0.00	0.00
2,500.00	20.74	325.41	2,402.17	491.82	-339.13	597.40	0.00	0.00	0.00
2,600.00	20.74	325.41	2,495.69	520.96	-359.22	632.81	0.00	0.00	0.00
2,700.00	20.74	325.41	2,589.22	550.11	-379.32	668.21	0.00	0.00	0.00
2,800.00	20.74	325.41	2,682.74	579.26	-399.42	703.62	0.00	0.00	0.00
2,900.00	20.74	325.41	2,776.26	608.41	-419.52	739.02	0.00	0.00	0.00
3,000.00	20.74	325.41	2,869.79	637.55	-439.62	774.43	0.00	0.00	0.00
3,100.00	20.74	325.41	2,963.31	666.70	-459.71	809.83	0.00	0.00	0.00
3,200.00	20.74	325.41	3,056.83	695.85	-479.81	845.24	0.00	0.00	0.00
3,300.00	20.74	325.41	3,150.35	724.99	-499.91	880.64	0.00	0.00	0.00
3,400.00	20.74	325.41	3,243.88	754.14	-520.01	916.04	0.00	0.00	0.00
3,500.00	20.74	325.41	3,337.40	783.29	-540.11	951.45	0.00	0.00	0.00
3,600.00	20.74	325.41	3,430.92	812.44	-560.20	986.85	0.00	0.00	0.00
3,700.00	20.74	325.41	3,524.44	841.58	-580.30	1,022.26	0.00	0.00	0.00
3,800.00	20.74	325.41	3,617.97	870.73	-600.40	1,057.66	0.00	0.00	0.00
3,900.00	20.74	325.41	3,711.49	899.88	-620.50	1,093.07	0.00	0.00	0.00
4,000.00	20.74	325.41	3,805.01	929.02	-640.60	1,128.47	0.00	0.00	0.00
4,100.00	20.74	325.41	3,898.54	958.17	-660.69	1,163.88	0.00	0.00	0.00
4,114.40	20.74	325.41	3,912.00	962.37	-663.59	1,168.97	0.00	0.00	0.00
PK Depth									
4,200.00	20.74	325.41	3,992.06	987.32	-680.79	1,199.28	0.00	0.00	0.00
4,300.00	20.74	325.41	4,085.58	1,016.47	-700.89	1,234.69	0.00	0.00	0.00
4,400.00	20.74	325.41	4,179.10	1,045.61	-720.99	1,270.09	0.00	0.00	0.00
4,500.00	20.74	325.41	4,272.63	1,074.76	-741.09	1,305.50	0.00	0.00	0.00
4,600.00	20.74	325.41	4,366.15	1,103.91	-761.18	1,340.90	0.00	0.00	0.00
4,700.00	20.74	325.41	4,459.67	1,133.05	-781.28	1,376.31	0.00	0.00	0.00
4,800.00	20.74	325.41	4,553.20	1,162.20	-801.38	1,411.71	0.00	0.00	0.00

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Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 5047.00ft (Original Well Elev)
Site:	WELD_HOWARD 17-32 PAD	North Reference:	True
Well:	Howard 28-32	Survey Calculation Method:	Minimum Curvature
Wellbore:	Howard 28-32		
Design:	Howard 28-32 (wp01)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,900.00	20.74	325.41	4,646.72	1,191.35	-821.48	1,447.11	0.00	0.00	0.00
5,000.00	20.74	325.41	4,740.24	1,220.50	-841.58	1,482.52	0.00	0.00	0.00
5,100.00	20.74	325.41	4,833.76	1,249.64	-861.68	1,517.92	0.00	0.00	0.00
5,148.37	20.74	325.41	4,879.00	1,263.74	-871.40	1,535.05	0.00	0.00	0.00
SX Depth									
5,200.00	20.74	325.41	4,927.29	1,278.79	-881.77	1,553.33	0.00	0.00	0.00
5,300.00	20.74	325.41	5,020.81	1,307.94	-901.87	1,588.73	0.00	0.00	0.00
5,400.00	20.74	325.41	5,114.33	1,337.09	-921.97	1,624.14	0.00	0.00	0.00
5,500.00	20.74	325.41	5,207.85	1,366.23	-942.07	1,659.54	0.00	0.00	0.00
5,519.23	20.74	325.41	5,225.84	1,371.84	-945.93	1,666.35	0.00	0.00	0.00
5,600.00	19.32	325.41	5,301.72	1,394.61	-961.63	1,694.01	1.75	-1.75	0.00
5,700.00	17.57	325.41	5,396.58	1,420.66	-979.60	1,725.65	1.75	-1.75	0.00
5,800.00	15.82	325.41	5,492.36	1,444.31	-995.90	1,754.38	1.75	-1.75	0.00
5,900.00	14.07	325.41	5,588.97	1,465.54	-1,010.55	1,780.17	1.75	-1.75	0.00
6,000.00	12.32	325.41	5,686.33	1,484.34	-1,023.50	1,803.00	1.75	-1.75	0.00
6,100.00	10.57	325.41	5,784.34	1,500.67	-1,034.77	1,822.85	1.75	-1.75	0.00
6,200.00	8.82	325.41	5,882.90	1,514.54	-1,044.33	1,839.69	1.75	-1.75	0.00
6,300.00	7.07	325.41	5,981.94	1,525.92	-1,052.18	1,853.51	1.75	-1.75	0.00
6,400.00	5.32	325.41	6,081.35	1,534.81	-1,058.30	1,864.31	1.75	-1.75	0.00
6,500.00	3.57	325.41	6,181.05	1,541.19	-1,062.71	1,872.06	1.75	-1.75	0.00
6,600.00	1.82	325.41	6,280.93	1,545.06	-1,065.38	1,876.76	1.75	-1.75	0.00
6,700.00	0.07	325.41	6,380.92	1,546.42	-1,066.31	1,878.41	1.75	-1.75	0.00
6,704.08	0.00	0.00	6,385.00	1,546.42	-1,066.31	1,878.42	1.75	-1.75	0.00
6,800.00	0.00	0.00	6,480.92	1,546.42	-1,066.31	1,878.42	0.00	0.00	0.00
6,900.00	0.00	0.00	6,580.92	1,546.42	-1,066.31	1,878.42	0.00	0.00	0.00
7,000.00	0.00	0.00	6,680.92	1,546.42	-1,066.31	1,878.42	0.00	0.00	0.00
7,100.00	0.00	0.00	6,780.92	1,546.42	-1,066.31	1,878.42	0.00	0.00	0.00
7,200.00	0.00	0.00	6,880.92	1,546.42	-1,066.31	1,878.42	0.00	0.00	0.00
7,300.00	0.00	0.00	6,980.92	1,546.42	-1,066.31	1,878.42	0.00	0.00	0.00
7,400.00	0.00	0.00	7,080.92	1,546.42	-1,066.31	1,878.42	0.00	0.00	0.00
7,500.00	0.00	0.00	7,180.92	1,546.42	-1,066.31	1,878.42	0.00	0.00	0.00
7,600.00	0.00	0.00	7,280.92	1,546.42	-1,066.31	1,878.42	0.00	0.00	0.00
7,700.00	0.00	0.00	7,380.92	1,546.42	-1,066.31	1,878.42	0.00	0.00	0.00
7,706.08	0.00	0.00	7,387.00	1,546.42	-1,066.31	1,878.42	0.00	0.00	0.00
NIO Depth									
7,800.00	0.00	0.00	7,480.92	1,546.42	-1,066.31	1,878.42	0.00	0.00	0.00
7,900.00	0.00	0.00	7,580.92	1,546.42	-1,066.31	1,878.42	0.00	0.00	0.00
8,000.00	0.00	0.00	7,680.92	1,546.42	-1,066.31	1,878.42	0.00	0.00	0.00
8,100.00	0.00	0.00	7,780.92	1,546.42	-1,066.31	1,878.42	0.00	0.00	0.00
8,139.08	0.00	0.00	7,820.00	1,546.42	-1,066.31	1,878.42	0.00	0.00	0.00
CD Depth									
8,200.00	0.00	0.00	7,880.92	1,546.42	-1,066.31	1,878.42	0.00	0.00	0.00
8,217.08	0.00	0.00	7,898.00	1,546.42	-1,066.31	1,878.42	0.00	0.00	0.00
GH Depth									
8,300.00	0.00	0.00	7,980.92	1,546.42	-1,066.31	1,878.42	0.00	0.00	0.00
8,400.00	0.00	0.00	8,080.92	1,546.42	-1,066.31	1,878.42	0.00	0.00	0.00
8,500.00	0.00	0.00	8,180.92	1,546.42	-1,066.31	1,878.42	0.00	0.00	0.00
8,569.08	0.00	0.00	8,250.00	1,546.42	-1,066.31	1,878.42	0.00	0.00	0.00
J Depth									
8,600.00	0.00	0.00	8,280.92	1,546.42	-1,066.31	1,878.42	0.00	0.00	0.00
8,700.00	0.00	0.00	8,380.92	1,546.42	-1,066.31	1,878.42	0.00	0.00	0.00
8,704.08	0.00	0.00	8,385.00	1,546.42	-1,066.31	1,878.42	0.00	0.00	0.00
Howard 28-32 BHL									

Database:	edm5000p	Local Co-ordinate Reference:	Well Howard 28-32
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 5047.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 5047.00ft (Original Well Elev)
Site:	WELD_HOWARD 17-32 PAD	North Reference:	True
Well:	Howard 28-32	Survey Calculation Method:	Minimum Curvature
Wellbore:	Howard 28-32		
Design:	Howard 28-32 (wp01)		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
- Shape									
Howard 28-32 BHL	0.00	0.00	8,385.00	1,546.42	-1,066.31	1,248,741.91	3,163,983.02	40.014697	-104.914537
- plan hits target center									
- Circle (radius 25.00)									

Casing Points					
Measured Depth	Vertical Depth	Name		Casing Diameter	Hole Diameter
(ft)	(ft)			(")	(")
1,162.99	1,150.00	8 5/8"		8-5/8	11

Formations						
Measured Depth	Vertical Depth	Name		Lithology	Dip	Dip Direction
(ft)	(ft)				(°)	(°)
4,114.40	3,912.00	PK Depth				
5,148.37	4,879.00	SX Depth				
7,706.08	7,387.00	NIO Depth				
8,139.08	7,820.00	CD Depth				
8,217.08	7,898.00	GH Depth				
8,569.08	8,250.00	J Depth				