

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_HOWARD 17-32 PAD

Howard 25-32

Howard 25-32

Plan: Howard 25-32 (wp02)

Standard Planning Report

12 May, 2011



Weatherford®

Project: COLORADO NORTHERN ZONE - 83
Site: WELD_HOWARD 17-32 PAD
Well: Howard 25-32
Wellbore: Howard 25-32
Section:
SHL:
Design: Howard 25-32 (wp02)
Latitude: 40.010452
Longitude: -104.910802
GL: 5047.00
KB: 15' RKB + 5047' GL @ 5062.00ft

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
3912.00	4022.18	PK Depth
4878.00	5022.99	SX Depth
7387.00	7565.50	NIO Depth
7820.00	7998.50	CD Depth
7898.00	8076.50	GH Depth
8250.00	8428.50	J Depth



Azimuths to True North
Magnetic North: 8.92°

Magnetic Field
Strength: 52918.9snT
Dip Angle: 66.71°
Date: 5/9/2011
Model: IGRF2010

WELL DETAILS: Howard 25-32

+N/-S	+E/-W	Northing	Ground Level: Easting	5047.00 Latitude	Longitude	Slot
0.00	0.00	1247202.44	3165039.42	40.010452	-104.910802	

CASING DETAILS

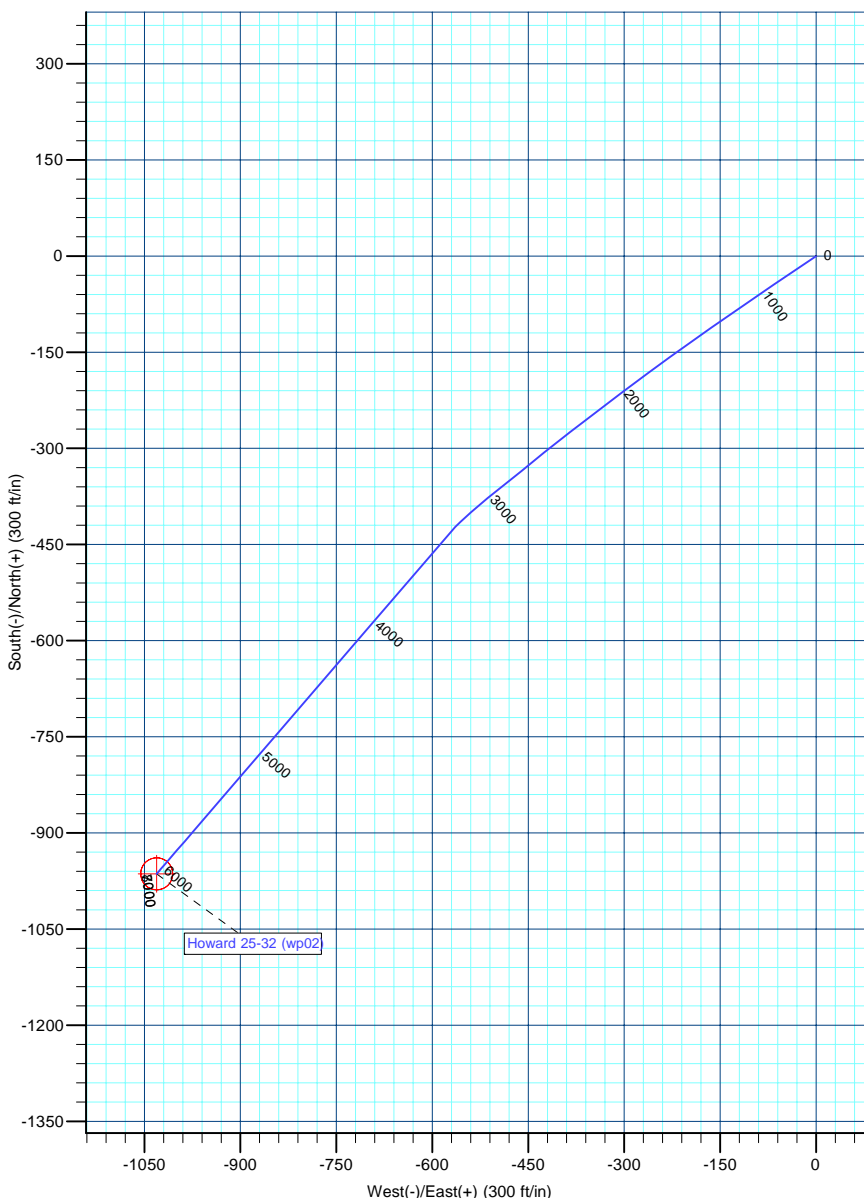
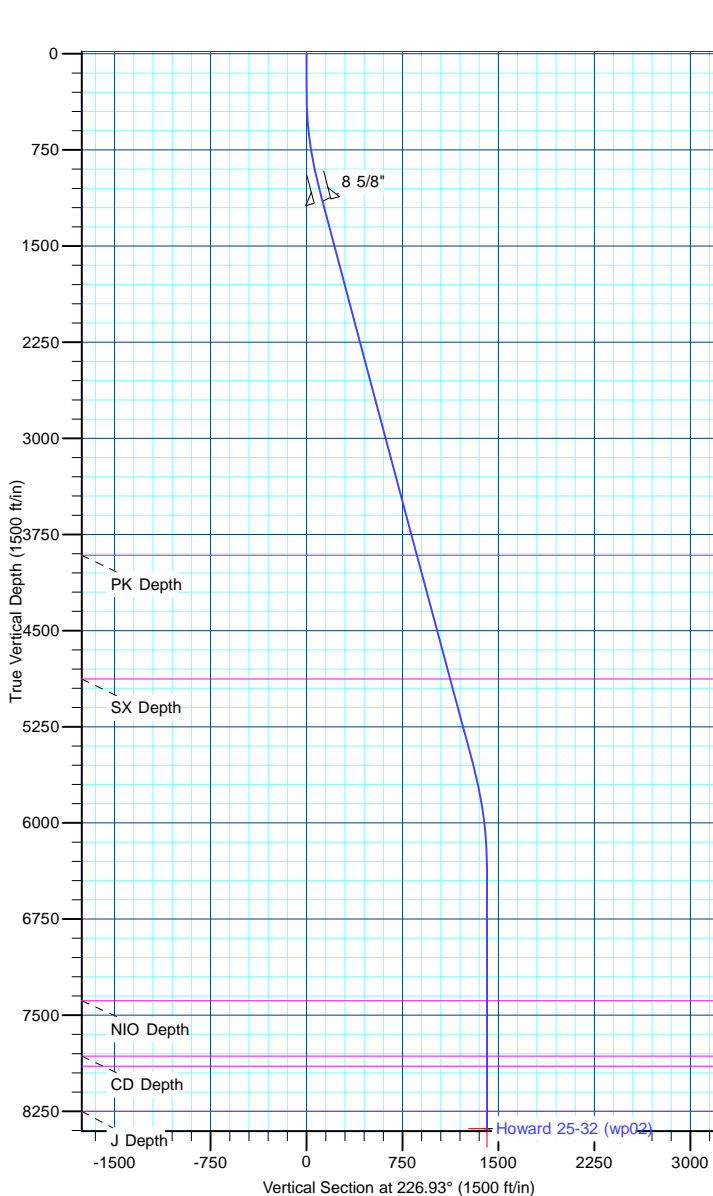
TVD	MD	Name	Size
1150.00	1162.41	8 5/8"	8-5/8

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Howard 25-32 BHL	8385.00	-963.76	-1030.85	1246231.85	3164015.00	40.007806	-104.914482	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
1048.00	15.00	236.00	1039.48	-54.44	-80.71	2.01	236.00	96.14
3300.00	15.00	230.00	3214.88	-404.76	-545.59	0.07	-92.90	674.97
3420.28	15.16	220.76	3331.04	-426.67	-567.79	2.00	-90.74	706.15
5696.98	15.16	220.76	5528.55	-877.53	-956.45	0.00	0.00	1297.97
6563.50	0.01	0.00	6385.00	-963.76	-1030.85	1.75	179.98	1411.20
6564.07	0.00	82.28	6385.57	-963.76	-1030.85	1.75	179.54	1411.20
8563.50	0.00	82.28	8385.00	-963.76	-1030.85	0.00	0.00	1411.20



Database:	edm5000p	Local Co-ordinate Reference:	Well Howard 25-32
Company:	US ROCKIES REGION PLANNING	TVD Reference:	15' RKB + 5047' GL @ 5062.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	15' RKB + 5047' GL @ 5062.00ft
Site:	WELD_HOWARD 17-32 PAD	North Reference:	True
Well:	Howard 25-32	Survey Calculation Method:	Minimum Curvature
Wellbore:	Howard 25-32		
Design:	Howard 25-32 (wp02)		

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

Well	Howard 25-32					
Well Position	+N-S	-0.09 ft	Northing:	1,247,202.44 ft	Latitude:	40.010452
	+E-W	-80.11 ft	Easting:	3,165,039.42 ft	Longitude:	-104.910802
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	5,047.00 ft

Wellbore	Howard 25-32				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/9/2011	8.92	66.71	52,919

Design	Howard 25-32 (wp02)				
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	226.93	

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	
1,048.00	15.00	236.00	1,039.48	-54.44	-80.71	2.01	2.01	0.00	236.00	
3,300.00	15.00	230.00	3,214.88	-404.76	-545.59	0.07	0.00	-0.27	-92.90	
3,420.28	15.16	220.76	3,331.04	-426.67	-567.79	2.00	0.13	-7.68	-90.74	
5,696.98	15.16	220.76	5,528.55	-877.53	-956.45	0.00	0.00	0.00	0.00	
6,563.50	0.01	0.00	6,385.00	-963.76	-1,030.85	1.75	-1.75	16.07	179.98	
6,564.07	0.00	82.28	6,385.57	-963.76	-1,030.85	1.75	-1.74	14,414.81	179.54	
8,563.50	0.00	82.28	8,385.00	-963.76	-1,030.85	0.00	0.00	0.00	0.00	Howard 25-32 BHL

Database:	edm5000p	Local Co-ordinate Reference:	Well Howard 25-32
Company:	US ROCKIES REGION PLANNING	TVD Reference:	15' RKB + 5047' GL @ 5062.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	15' RKB + 5047' GL @ 5062.00ft
Site:	WELD_HOWARD 17-32 PAD	North Reference:	True
Well:	Howard 25-32	Survey Calculation Method:	Minimum Curvature
Wellbore:	Howard 25-32		
Design:	Howard 25-32 (wp02)		

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
Start Build 2.01									
400.00	2.01	236.00	399.98	-0.98	-1.45	1.73	2.01	2.01	0.00
500.00	4.01	236.00	499.84	-3.91	-5.80	6.91	2.01	2.01	0.00
600.00	6.02	236.00	599.45	-8.80	-13.05	15.54	2.01	2.01	0.00
700.00	8.02	236.00	698.69	-15.63	-23.18	27.60	2.01	2.01	0.00
800.00	10.03	236.00	797.45	-24.40	-36.18	43.09	2.01	2.01	0.00
900.00	12.03	236.00	895.60	-35.10	-52.04	61.98	2.01	2.01	0.00
1,000.00	14.04	236.00	993.02	-47.71	-70.73	84.25	2.01	2.01	0.00
1,048.00	15.00	236.00	1,039.48	-54.44	-80.71	96.14	2.01	2.01	0.00
Start Turn -0.27									
1,100.00	15.00	235.86	1,089.71	-61.98	-91.86	109.43	0.07	0.00	-0.27
1,162.41	15.00	235.70	1,150.00	-71.06	-105.21	125.39	0.07	0.00	-0.27
8 5/8"									
1,200.00	15.00	235.60	1,186.31	-76.55	-113.24	135.00	0.07	0.00	-0.27
1,300.00	14.99	235.33	1,282.90	-91.22	-134.55	160.58	0.07	0.00	-0.27
1,400.00	14.99	235.06	1,379.50	-105.98	-155.79	186.18	0.07	0.00	-0.27
1,500.00	14.99	234.80	1,476.10	-120.84	-176.96	211.79	0.07	0.00	-0.27
1,600.00	14.99	234.53	1,572.70	-135.80	-198.06	237.42	0.07	0.00	-0.27
1,700.00	14.98	234.26	1,669.30	-150.85	-219.08	263.05	0.07	0.00	-0.27
1,800.00	14.98	234.00	1,765.90	-166.00	-240.03	288.70	0.07	0.00	-0.27
1,900.00	14.98	233.73	1,862.50	-181.24	-260.91	314.36	0.07	0.00	-0.27
2,000.00	14.98	233.46	1,959.10	-196.58	-281.71	340.04	0.07	0.00	-0.27
2,100.00	14.98	233.20	2,055.70	-212.02	-302.45	365.73	0.07	0.00	-0.27
2,200.00	14.98	232.93	2,152.30	-227.55	-323.11	391.43	0.07	0.00	-0.27
2,300.00	14.98	232.66	2,248.90	-243.18	-343.70	417.14	0.07	0.00	-0.27
2,400.00	14.98	232.40	2,345.50	-258.91	-364.21	442.87	0.07	0.00	-0.27
2,500.00	14.98	232.13	2,442.10	-274.73	-384.66	468.61	0.07	0.00	-0.27
2,600.00	14.98	231.86	2,538.70	-290.65	-405.03	494.36	0.07	0.00	-0.27
2,700.00	14.98	231.60	2,635.30	-306.66	-425.33	520.12	0.07	0.00	-0.27
2,800.00	14.99	231.33	2,731.90	-322.77	-445.55	545.90	0.07	0.00	-0.27
2,900.00	14.99	231.06	2,828.50	-338.98	-465.71	571.69	0.07	0.00	-0.27
3,000.00	14.99	230.80	2,925.10	-355.28	-485.79	597.49	0.07	0.00	-0.27
3,100.00	14.99	230.53	3,021.69	-371.67	-505.80	623.30	0.07	0.00	-0.27
3,200.00	15.00	230.27	3,118.29	-388.17	-525.73	649.13	0.07	0.00	-0.27
3,300.00	15.00	230.00	3,214.88	-404.76	-545.59	674.97	0.07	0.00	-0.27
Start DLS 2.00 TFO -90.74									
3,400.00	15.10	222.30	3,311.46	-422.71	-564.28	700.88	2.00	0.10	-7.70
3,420.28	15.16	220.76	3,331.04	-426.67	-567.79	706.15	2.00	0.26	-7.60
Start 2276.71 hold at 3420.28 MD									
3,500.00	15.16	220.76	3,407.99	-442.46	-581.40	726.87	0.00	0.00	0.00
3,600.00	15.16	220.76	3,504.51	-462.26	-598.47	752.86	0.00	0.00	0.00
3,700.00	15.16	220.76	3,601.03	-482.07	-615.54	778.86	0.00	0.00	0.00
3,800.00	15.16	220.76	3,697.55	-501.87	-632.61	804.85	0.00	0.00	0.00
3,900.00	15.16	220.76	3,794.07	-521.67	-649.68	830.85	0.00	0.00	0.00
4,000.00	15.16	220.76	3,890.59	-541.48	-666.75	856.84	0.00	0.00	0.00
4,022.18	15.16	220.76	3,912.00	-545.87	-670.54	862.61	0.00	0.00	0.00
PK Depth									
4,100.00	15.16	220.76	3,987.11	-561.28	-683.83	882.84	0.00	0.00	0.00
4,200.00	15.16	220.76	4,083.64	-581.08	-700.90	908.83	0.00	0.00	0.00

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Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	15' RKB + 5047' GL @ 5062.00ft
Site:	WELD_HOWARD 17-32 PAD	North Reference:	True
Well:	Howard 25-32	Survey Calculation Method:	Minimum Curvature
Wellbore:	Howard 25-32		
Design:	Howard 25-32 (wp02)		

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)
4,300.00	15.16	220.76	4,180.16	-600.89	-717.97	934.83	0.00	0.00	0.00
4,400.00	15.16	220.76	4,276.68	-620.69	-735.04	960.82	0.00	0.00	0.00
4,500.00	15.16	220.76	4,373.20	-640.49	-752.11	986.82	0.00	0.00	0.00
4,600.00	15.16	220.76	4,469.72	-660.30	-769.18	1,012.81	0.00	0.00	0.00
4,700.00	15.16	220.76	4,566.24	-680.10	-786.25	1,038.80	0.00	0.00	0.00
4,800.00	15.16	220.76	4,662.77	-699.90	-803.33	1,064.80	0.00	0.00	0.00
4,900.00	15.16	220.76	4,759.29	-719.70	-820.40	1,090.79	0.00	0.00	0.00
5,000.00	15.16	220.76	4,855.81	-739.51	-837.47	1,116.79	0.00	0.00	0.00
5,022.99	15.16	220.76	4,878.00	-744.06	-841.39	1,122.76	0.00	0.00	0.00
SX Depth									
5,100.00	15.16	220.76	4,952.33	-759.31	-854.54	1,142.78	0.00	0.00	0.00
5,200.00	15.16	220.76	5,048.85	-779.11	-871.61	1,168.78	0.00	0.00	0.00
5,300.00	15.16	220.76	5,145.37	-798.92	-888.68	1,194.77	0.00	0.00	0.00
5,400.00	15.16	220.76	5,241.89	-818.72	-905.75	1,220.77	0.00	0.00	0.00
5,500.00	15.16	220.76	5,338.42	-838.52	-922.82	1,246.76	0.00	0.00	0.00
5,600.00	15.16	220.76	5,434.94	-858.33	-939.90	1,272.76	0.00	0.00	0.00
5,696.98	15.16	220.76	5,528.55	-877.53	-956.45	1,297.97	0.00	0.00	0.00
Start DLS 1.75 TFO 179.98									
5,700.00	15.10	220.76	5,531.46	-878.13	-956.97	1,298.75	1.75	-1.75	0.00
5,800.00	13.35	220.77	5,628.39	-896.74	-973.01	1,323.19	1.75	-1.75	0.00
5,900.00	11.60	220.77	5,726.02	-913.11	-987.12	1,344.67	1.75	-1.75	0.00
6,000.00	9.85	220.78	5,824.27	-927.21	-999.28	1,363.18	1.75	-1.75	0.01
6,100.00	8.10	220.78	5,923.04	-939.02	-1,009.47	1,378.69	1.75	-1.75	0.01
6,200.00	6.35	220.80	6,022.24	-948.55	-1,017.69	1,391.20	1.75	-1.75	0.01
6,300.00	4.60	220.82	6,121.78	-955.78	-1,023.93	1,400.70	1.75	-1.75	0.02
6,400.00	2.85	220.87	6,221.57	-960.70	-1,028.19	1,407.16	1.75	-1.75	0.05
6,500.00	1.10	221.08	6,321.50	-963.30	-1,030.45	1,410.60	1.75	-1.75	0.21
6,563.50	0.01	0.00	6,385.00	-963.76	-1,030.85	1,411.20	1.75	-1.72	218.77
Start DLS 1.75 TFO 179.54									
6,564.07	0.00	82.28	6,385.57	-963.76	-1,030.85	1,411.20	1.75	-1.74	14,414.81
Start 1999.43 hold at 6564.07 MD									
6,600.00	0.00	82.28	6,421.50	-963.76	-1,030.85	1,411.20	0.00	0.00	0.00
6,700.00	0.00	82.28	6,521.50	-963.76	-1,030.85	1,411.20	0.00	0.00	0.00
6,800.00	0.00	82.28	6,621.50	-963.76	-1,030.85	1,411.20	0.00	0.00	0.00
6,900.00	0.00	82.28	6,721.50	-963.76	-1,030.85	1,411.20	0.00	0.00	0.00
7,000.00	0.00	82.28	6,821.50	-963.76	-1,030.85	1,411.20	0.00	0.00	0.00
7,100.00	0.00	82.28	6,921.50	-963.76	-1,030.85	1,411.20	0.00	0.00	0.00
7,200.00	0.00	82.28	7,021.50	-963.76	-1,030.85	1,411.20	0.00	0.00	0.00
7,300.00	0.00	82.28	7,121.50	-963.76	-1,030.85	1,411.20	0.00	0.00	0.00
7,400.00	0.00	82.28	7,221.50	-963.76	-1,030.85	1,411.20	0.00	0.00	0.00
7,500.00	0.00	82.28	7,321.50	-963.76	-1,030.85	1,411.20	0.00	0.00	0.00
7,565.50	0.00	82.28	7,387.00	-963.76	-1,030.85	1,411.20	0.00	0.00	0.00
NIO Depth									
7,600.00	0.00	82.28	7,421.50	-963.76	-1,030.85	1,411.20	0.00	0.00	0.00
7,700.00	0.00	82.28	7,521.50	-963.76	-1,030.85	1,411.20	0.00	0.00	0.00
7,800.00	0.00	82.28	7,621.50	-963.76	-1,030.85	1,411.20	0.00	0.00	0.00
7,900.00	0.00	82.28	7,721.50	-963.76	-1,030.85	1,411.20	0.00	0.00	0.00
7,998.50	0.00	82.28	7,820.00	-963.76	-1,030.85	1,411.20	0.00	0.00	0.00
CD Depth									
8,000.00	0.00	82.28	7,821.50	-963.76	-1,030.85	1,411.20	0.00	0.00	0.00
8,076.50	0.00	82.28	7,898.00	-963.76	-1,030.85	1,411.20	0.00	0.00	0.00
GH Depth									
8,100.00	0.00	82.28	7,921.50	-963.76	-1,030.85	1,411.20	0.00	0.00	0.00

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Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	15' RKB + 5047' GL @ 5062.00ft
Site:	WELD_HOWARD 17-32 PAD	North Reference:	True
Well:	Howard 25-32	Survey Calculation Method:	Minimum Curvature
Wellbore:	Howard 25-32		
Design:	Howard 25-32 (wp02)		

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)
8,200.00	0.00	82.28	8,021.50	-963.76	-1,030.85	1,411.20	0.00	0.00	0.00
8,300.00	0.00	82.28	8,121.50	-963.76	-1,030.85	1,411.20	0.00	0.00	0.00
8,400.00	0.00	82.28	8,221.50	-963.76	-1,030.85	1,411.20	0.00	0.00	0.00
8,428.50	0.00	82.28	8,250.00	-963.76	-1,030.85	1,411.20	0.00	0.00	0.00
J Depth									
8,500.00	0.00	82.28	8,321.50	-963.76	-1,030.85	1,411.20	0.00	0.00	0.00
8,563.50	0.00	82.28	8,385.00	-963.76	-1,030.85	1,411.20	0.00	0.00	0.00
TD at 8563.50 - Howard 25-32 BHL									

Design 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									
Howard 25-32 BHL	0.00	0.00	8,385.00	-963.76	-1,030.85	1,246,231.85	3,164,015.00	40.007806	-104.914482
- plan hits target center									
- Circle (radius 25.00)									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
1,162.41	1,150.00	8 5/8"	8-5/8	11	

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,022.18	3,912.00	PK Depth			
5,022.99	4,878.00	SX Depth			
7,565.50	7,387.00	NIO Depth			
7,998.50	7,820.00	CD Depth			
8,076.50	7,898.00	GH Depth			
8,428.50	8,250.00	J Depth			

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment
300.00	300.00	0.00	0.00	Start Build 2.01
1,048.00	1,039.48	-54.44	-80.71	Start Turn -0.27
3,300.00	3,214.88	-404.76	-545.59	Start DLS 2.00 TFO -90.74
3,420.28	3,331.04	-426.67	-567.79	Start 2276.71 hold at 3420.28 MD
5,696.98	5,528.55	-877.53	-956.45	Start DLS 1.75 TFO 179.98
6,563.50	6,385.00	-963.76	-1,030.85	Start DLS 1.75 TFO 179.54
6,564.07	6,385.57	-963.76	-1,030.85	Start 1999.43 hold at 6564.07 MD
8,563.50	8,385.00	-963.76	-1,030.85	TD at 8563.50