

# **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**WELD\_HOWARD 9C-29HZ**

**HOWARD 9C-29HZ**

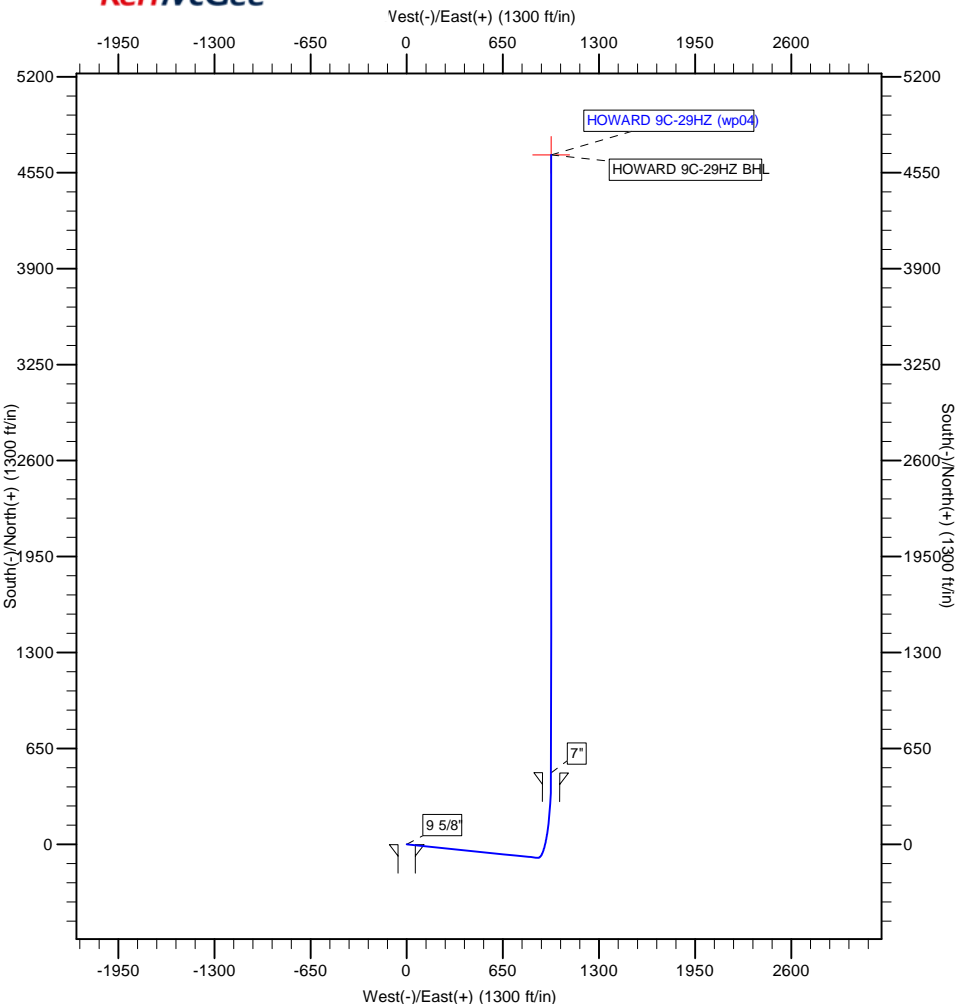
**HOWARD 9C-29HZ**

**Plan: HOWARD 9C-29HZ (wp04)**

## **Standard Planning Report**

**05 July, 2011**





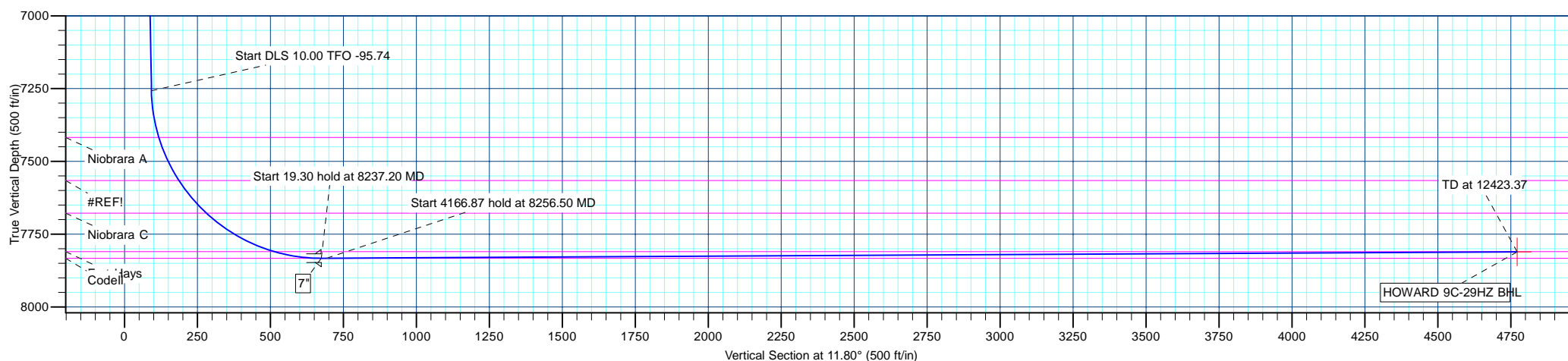
WELL DETAILS: HOWARD 9C-29HZ						
+N/-S	+E/-W	Northing	Easting	Ground Level:	Latitude	Longitude
0.00	0.00	1246309.71	3165210.07	5057.00	40.007998	-104.910214

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)						
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
HOWARD 9C-29HZ BHL	7811.00	4671.11	975.48	40.020821	-104.906731	Point

SECTION DETAILS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1250.00	0.00	0.00	1250.00	0.00	0.00	0.00	0.00	0.00	
1687.78	8.76	95.85	1686.08	-3.40	33.21	2.00	95.85	3.46	
7325.34	8.76	95.85	7257.94	-90.85	886.90	0.00	0.00	92.37	
8237.20	90.30	0.00	7833.00	485.00	975.48	10.00	-95.74	674.17	
8256.50	90.30	0.00	7832.90	504.30	975.48	0.00	0.00	693.06	
12423.37	90.30	0.00	7811.00	4671.11	975.48	0.00	0.00	4771.88	HOWARD 9C-29HZ BHL

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
4374.00	4407.40	Parkman
4909.00	4948.70	Sussex
7418.00	7489.15	Niobrara A
7566.00	7653.23	#REF!
7678.00	7799.93	Niobrara C
7810.00	8070.29	Fort Hays
7833.00	8237.20	Codell

CASING DETAILS			
TVD	MD	Name	Size
1100.00	1100.00	9 5/8"	9-5/8
7833.00	8237.20	7"	7



<b>Database:</b>	edm5000p	<b>Local Co-ordinate Reference:</b>	Well HOWARD 9C-29HZ
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	17' RKB + 5057' GL @ 5074.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	17' RKB + 5057' GL @ 5074.00ft
<b>Site:</b>	WELD_HOWARD 9C-29HZ	<b>North Reference:</b>	True
<b>Well:</b>	HOWARD 9C-29HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	HOWARD 9C-29HZ		
<b>Design:</b>	HOWARD 9C-29HZ (wp04)		

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

Site						WELD_HOWARD 9C-29HZ											
Site Position:						Northing:			1,246,309.71 ft			Latitude:			40.007998		
From:			Lat/Long			Easting:			3,165,210.07 ft			Longitude:			-104.910214		
Position Uncertainty:			0.00 ft			Slot Radius:			0 "			Grid Convergence:			0.38		

Well	HOWARD 9C-29HZ					
Well Position	+N-S	0.00 ft	Northing:	1,246,309.71 ft	Latitude:	40.007998
	+E-W	0.00 ft	Easting:	3,165,210.07 ft	Longitude:	-104.910214
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	5,057.00 ft

<b>Wellbore</b>	HOWARD 9C-29HZ				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	5/10/2011	8.92	66.71	52,917

<b>Design</b>	HOWARD 9C-29HZ (wp04)			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	11.80

<b>Plan Sections</b>										
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	
1,250.00	0.00	0.00	1,250.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,687.78	8.76	95.85	1,686.08	-3.40	33.21	2.00	2.00	0.00	95.85	
7,325.34	8.76	95.85	7,257.94	-90.85	886.90	0.00	0.00	0.00	0.00	
8,237.20	90.30	0.00	7,833.00	485.00	975.48	10.00	8.94	-10.51	-95.74	
8,256.50	90.30	0.00	7,832.90	504.30	975.48	0.00	0.00	0.00	0.00	
12,423.37	90.30	0.00	7,811.00	4,671.11	975.48	0.00	0.00	0.00	0.00	HOWARD 9C-29HZ

<b>Database:</b>	edm5000p	<b>Local Co-ordinate Reference:</b>	Well HOWARD 9C-29HZ
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	17' RKB + 5057' GL @ 5074.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	17' RKB + 5057' GL @ 5074.00ft
<b>Site:</b>	WELD_HOWARD 9C-29HZ	<b>North Reference:</b>	True
<b>Well:</b>	HOWARD 9C-29HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	HOWARD 9C-29HZ		
<b>Design:</b>	HOWARD 9C-29HZ (wp04)		

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	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"									
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,250.00	0.00	0.00	1,250.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
1,300.00	1.00	95.85	1,300.00	-0.04	0.43	0.05	2.00	2.00	0.00
1,400.00	3.00	95.85	1,399.93	-0.40	3.91	0.41	2.00	2.00	0.00
1,500.00	5.00	95.85	1,499.68	-1.11	10.84	1.13	2.00	2.00	0.00
1,600.00	7.00	95.85	1,599.13	-2.18	21.24	2.21	2.00	2.00	0.00
1,687.78	8.76	95.85	1,686.08	-3.40	33.21	3.46	2.00	2.00	0.00
Start 5637.56 hold at 1687.78 MD									
1,700.00	8.76	95.85	1,698.16	-3.59	35.06	3.65	0.00	0.00	0.00
1,800.00	8.76	95.85	1,796.99	-5.14	50.20	5.23	0.00	0.00	0.00
1,900.00	8.76	95.85	1,895.83	-6.69	65.35	6.81	0.00	0.00	0.00
2,000.00	8.76	95.85	1,994.66	-8.25	80.49	8.38	0.00	0.00	0.00
2,100.00	8.76	95.85	2,093.49	-9.80	95.63	9.96	0.00	0.00	0.00
2,200.00	8.76	95.85	2,192.33	-11.35	110.78	11.54	0.00	0.00	0.00
2,300.00	8.76	95.85	2,291.16	-12.90	125.92	13.11	0.00	0.00	0.00
2,400.00	8.76	95.85	2,390.00	-14.45	141.06	14.69	0.00	0.00	0.00
2,500.00	8.76	95.85	2,488.83	-16.00	156.20	16.27	0.00	0.00	0.00
2,600.00	8.76	95.85	2,587.67	-17.55	171.35	17.84	0.00	0.00	0.00
2,700.00	8.76	95.85	2,686.50	-19.10	186.49	19.42	0.00	0.00	0.00
2,800.00	8.76	95.85	2,785.34	-20.66	201.63	21.00	0.00	0.00	0.00
2,900.00	8.76	95.85	2,884.17	-22.21	216.78	22.58	0.00	0.00	0.00
3,000.00	8.76	95.85	2,983.01	-23.76	231.92	24.15	0.00	0.00	0.00
3,100.00	8.76	95.85	3,081.84	-25.31	247.06	25.73	0.00	0.00	0.00
3,200.00	8.76	95.85	3,180.68	-26.86	262.20	27.31	0.00	0.00	0.00
3,300.00	8.76	95.85	3,279.51	-28.41	277.35	28.88	0.00	0.00	0.00
3,400.00	8.76	95.85	3,378.34	-29.96	292.49	30.46	0.00	0.00	0.00
3,500.00	8.76	95.85	3,477.18	-31.51	307.63	32.04	0.00	0.00	0.00
3,600.00	8.76	95.85	3,576.01	-33.07	322.78	33.62	0.00	0.00	0.00
3,700.00	8.76	95.85	3,674.85	-34.62	337.92	35.19	0.00	0.00	0.00
3,800.00	8.76	95.85	3,773.68	-36.17	353.06	36.77	0.00	0.00	0.00
3,900.00	8.76	95.85	3,872.52	-37.72	368.20	38.35	0.00	0.00	0.00
4,000.00	8.76	95.85	3,971.35	-39.27	383.35	39.92	0.00	0.00	0.00
4,100.00	8.76	95.85	4,070.19	-40.82	398.49	41.50	0.00	0.00	0.00
4,200.00	8.76	95.85	4,169.02	-42.37	413.63	43.08	0.00	0.00	0.00
4,300.00	8.76	95.85	4,267.86	-43.92	428.78	44.65	0.00	0.00	0.00
4,400.00	8.76	95.85	4,366.69	-45.48	443.92	46.23	0.00	0.00	0.00
4,407.40	8.76	95.85	4,374.00	-45.59	445.04	46.35	0.00	0.00	0.00
Parkman									
4,500.00	8.76	95.85	4,465.53	-47.03	459.06	47.81	0.00	0.00	0.00
4,600.00	8.76	95.85	4,564.36	-48.58	474.21	49.39	0.00	0.00	0.00

<b>Database:</b>	edm5000p	<b>Local Co-ordinate Reference:</b>	Well HOWARD 9C-29HZ
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	17' RKB + 5057' GL @ 5074.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	17' RKB + 5057' GL @ 5074.00ft
<b>Site:</b>	WELD_HOWARD 9C-29HZ	<b>North Reference:</b>	True
<b>Well:</b>	HOWARD 9C-29HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	HOWARD 9C-29HZ		
<b>Design:</b>	HOWARD 9C-29HZ (wp04)		

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)
4,700.00	8.76	95.85	4,663.20	-50.13	489.35	50.96	0.00	0.00	0.00
4,800.00	8.76	95.85	4,762.03	-51.68	504.49	52.54	0.00	0.00	0.00
4,900.00	8.76	95.85	4,860.86	-53.23	519.63	54.12	0.00	0.00	0.00
4,948.70	8.76	95.85	4,909.00	-53.99	527.01	54.89	0.00	0.00	0.00
<b>Sussex</b>									
5,000.00	8.76	95.85	4,959.70	-54.78	534.78	55.69	0.00	0.00	0.00
5,100.00	8.76	95.85	5,058.53	-56.33	549.92	57.27	0.00	0.00	0.00
5,200.00	8.76	95.85	5,157.37	-57.88	565.06	58.85	0.00	0.00	0.00
5,300.00	8.76	95.85	5,256.20	-59.44	580.21	60.43	0.00	0.00	0.00
5,400.00	8.76	95.85	5,355.04	-60.99	595.35	62.00	0.00	0.00	0.00
5,500.00	8.76	95.85	5,453.87	-62.54	610.49	63.58	0.00	0.00	0.00
5,600.00	8.76	95.85	5,552.71	-64.09	625.63	65.16	0.00	0.00	0.00
5,700.00	8.76	95.85	5,651.54	-65.64	640.78	66.73	0.00	0.00	0.00
5,800.00	8.76	95.85	5,750.38	-67.19	655.92	68.31	0.00	0.00	0.00
5,900.00	8.76	95.85	5,849.21	-68.74	671.06	69.89	0.00	0.00	0.00
6,000.00	8.76	95.85	5,948.05	-70.29	686.21	71.46	0.00	0.00	0.00
6,100.00	8.76	95.85	6,046.88	-71.85	701.35	73.04	0.00	0.00	0.00
6,200.00	8.76	95.85	6,145.71	-73.40	716.49	74.62	0.00	0.00	0.00
6,300.00	8.76	95.85	6,244.55	-74.95	731.63	76.20	0.00	0.00	0.00
6,400.00	8.76	95.85	6,343.38	-76.50	746.78	77.77	0.00	0.00	0.00
6,500.00	8.76	95.85	6,442.22	-78.05	761.92	79.35	0.00	0.00	0.00
6,600.00	8.76	95.85	6,541.05	-79.60	777.06	80.93	0.00	0.00	0.00
6,700.00	8.76	95.85	6,639.89	-81.15	792.21	82.50	0.00	0.00	0.00
6,800.00	8.76	95.85	6,738.72	-82.70	807.35	84.08	0.00	0.00	0.00
6,900.00	8.76	95.85	6,837.56	-84.26	822.49	85.66	0.00	0.00	0.00
7,000.00	8.76	95.85	6,936.39	-85.81	837.63	87.24	0.00	0.00	0.00
7,100.00	8.76	95.85	7,035.23	-87.36	852.78	88.81	0.00	0.00	0.00
7,200.00	8.76	95.85	7,134.06	-88.91	867.92	90.39	0.00	0.00	0.00
7,300.00	8.76	95.85	7,232.90	-90.46	883.06	91.97	0.00	0.00	0.00
7,325.34	8.76	95.85	7,257.94	-90.85	886.90	92.37	0.00	0.00	0.00
<b>Start DLS 10.00 TFO -95.74</b>									
7,400.00	10.90	52.74	7,331.60	-87.15	898.19	98.30	10.00	2.88	-57.75
7,489.15	17.73	28.69	7,418.00	-70.11	911.44	117.69	10.00	7.65	-26.98
<b>Niobrara A</b>									
7,500.00	18.68	27.00	7,428.31	-67.11	913.02	120.95	10.00	8.74	-15.54
7,600.00	27.88	16.89	7,520.10	-30.38	927.12	159.78	10.00	9.20	-10.12
7,653.23	32.95	13.72	7,566.00	-4.39	934.17	186.67	10.00	9.54	-5.95
<b>#REF!</b>									
7,700.00	37.47	11.58	7,604.20	21.92	940.05	213.62	10.00	9.65	-4.57
7,799.94	47.20	8.20	7,678.00	88.15	951.41	280.77	10.00	9.74	-3.38
<b>Niobrara C</b>									
7,800.00	47.21	8.20	7,678.04	88.19	951.42	280.82	10.00	9.78	-2.81
7,900.00	57.02	5.75	7,739.39	166.44	960.88	359.35	10.00	9.81	-2.45
8,000.00	66.87	3.80	7,786.37	254.27	968.15	446.81	10.00	9.85	-1.95
8,070.29	73.81	2.60	7,810.00	320.32	971.82	512.21	10.00	9.87	-1.71
<b>Fort Hays</b>									
8,100.00	76.74	2.12	7,817.55	349.03	973.00	540.56	10.00	9.88	-1.62
8,200.00	86.62	0.56	7,832.00	447.82	975.29	637.74	10.00	9.88	-1.55
8,237.20	90.30	0.00	7,833.00	485.00	975.48	674.17	10.00	9.88	-1.52
<b>Start 19.30 hold at 8237.20 MD - Codell - 7"</b>									
8,256.50	90.30	0.00	7,832.90	504.30	975.48	693.06	0.00	0.00	0.00
<b>Start 4166.87 hold at 8256.50 MD</b>									
8,300.00	90.30	0.00	7,832.67	547.80	975.48	735.64	0.00	0.00	0.00

<b>Database:</b>	edm5000p	<b>Local Co-ordinate Reference:</b>	Well HOWARD 9C-29HZ
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	17' RKB + 5057' GL @ 5074.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	17' RKB + 5057' GL @ 5074.00ft
<b>Site:</b>	WELD_HOWARD 9C-29HZ	<b>North Reference:</b>	True
<b>Well:</b>	HOWARD 9C-29HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	HOWARD 9C-29HZ		
<b>Design:</b>	HOWARD 9C-29HZ (wp04)		

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)
8,400.00	90.30	0.00	7,832.15	647.80	975.48	833.53	0.00	0.00	0.00
8,500.00	90.30	0.00	7,831.62	747.80	975.48	931.42	0.00	0.00	0.00
8,600.00	90.30	0.00	7,831.10	847.80	975.48	1,029.30	0.00	0.00	0.00
8,700.00	90.30	0.00	7,830.58	947.80	975.48	1,127.19	0.00	0.00	0.00
8,800.00	90.30	0.00	7,830.05	1,047.80	975.48	1,225.08	0.00	0.00	0.00
8,900.00	90.30	0.00	7,829.53	1,147.79	975.48	1,322.96	0.00	0.00	0.00
9,000.00	90.30	0.00	7,829.01	1,247.79	975.48	1,420.85	0.00	0.00	0.00
9,100.00	90.30	0.00	7,828.48	1,347.79	975.48	1,518.74	0.00	0.00	0.00
9,200.00	90.30	0.00	7,827.96	1,447.79	975.48	1,616.63	0.00	0.00	0.00
9,300.00	90.30	0.00	7,827.44	1,547.79	975.48	1,714.51	0.00	0.00	0.00
9,400.00	90.30	0.00	7,826.91	1,647.79	975.48	1,812.40	0.00	0.00	0.00
9,500.00	90.30	0.00	7,826.39	1,747.79	975.48	1,910.29	0.00	0.00	0.00
9,600.00	90.30	0.00	7,825.86	1,847.78	975.48	2,008.17	0.00	0.00	0.00
9,700.00	90.30	0.00	7,825.34	1,947.78	975.48	2,106.06	0.00	0.00	0.00
9,800.00	90.30	0.00	7,824.82	2,047.78	975.48	2,203.95	0.00	0.00	0.00
9,900.00	90.30	0.00	7,824.29	2,147.78	975.48	2,301.83	0.00	0.00	0.00
10,000.00	90.30	0.00	7,823.77	2,247.78	975.48	2,399.72	0.00	0.00	0.00
10,100.00	90.30	0.00	7,823.25	2,347.78	975.48	2,497.61	0.00	0.00	0.00
10,200.00	90.30	0.00	7,822.72	2,447.78	975.48	2,595.50	0.00	0.00	0.00
10,300.00	90.30	0.00	7,822.20	2,547.77	975.48	2,693.38	0.00	0.00	0.00
10,400.00	90.30	0.00	7,821.68	2,647.77	975.48	2,791.27	0.00	0.00	0.00
10,500.00	90.30	0.00	7,821.15	2,747.77	975.48	2,889.16	0.00	0.00	0.00
10,600.00	90.30	0.00	7,820.63	2,847.77	975.48	2,987.04	0.00	0.00	0.00
10,700.00	90.30	0.00	7,820.10	2,947.77	975.48	3,084.93	0.00	0.00	0.00
10,800.00	90.30	0.00	7,819.58	3,047.77	975.48	3,182.82	0.00	0.00	0.00
10,900.00	90.30	0.00	7,819.06	3,147.77	975.48	3,280.70	0.00	0.00	0.00
11,000.00	90.30	0.00	7,818.53	3,247.77	975.48	3,378.59	0.00	0.00	0.00
11,100.00	90.30	0.00	7,818.01	3,347.76	975.48	3,476.48	0.00	0.00	0.00
11,200.00	90.30	0.00	7,817.49	3,447.76	975.48	3,574.36	0.00	0.00	0.00
11,300.00	90.30	0.00	7,816.96	3,547.76	975.48	3,672.25	0.00	0.00	0.00
11,400.00	90.30	0.00	7,816.44	3,647.76	975.48	3,770.14	0.00	0.00	0.00
11,500.00	90.30	0.00	7,815.92	3,747.76	975.48	3,868.03	0.00	0.00	0.00
11,600.00	90.30	0.00	7,815.39	3,847.76	975.48	3,965.91	0.00	0.00	0.00
11,700.00	90.30	0.00	7,814.87	3,947.76	975.48	4,063.80	0.00	0.00	0.00
11,800.00	90.30	0.00	7,814.35	4,047.75	975.48	4,161.69	0.00	0.00	0.00
11,900.00	90.30	0.00	7,813.82	4,147.75	975.48	4,259.57	0.00	0.00	0.00
12,000.00	90.30	0.00	7,813.30	4,247.75	975.48	4,357.46	0.00	0.00	0.00
12,100.00	90.30	0.00	7,812.77	4,347.75	975.48	4,455.35	0.00	0.00	0.00
12,200.00	90.30	0.00	7,812.25	4,447.75	975.48	4,553.23	0.00	0.00	0.00
12,300.00	90.30	0.00	7,811.73	4,547.75	975.48	4,651.12	0.00	0.00	0.00
12,400.00	90.30	0.00	7,811.20	4,647.75	975.48	4,749.01	0.00	0.00	0.00
12,423.37	90.30	0.00	7,811.00	4,671.11	975.48	4,771.88	0.00	0.00	0.00
TD at 12423.37 - HOWARD 9C-29HZ BHL									

<b>Database:</b>	edm5000p	<b>Local Co-ordinate Reference:</b>	Well HOWARD 9C-29HZ
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	17' RKB + 5057' GL @ 5074.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	17' RKB + 5057' GL @ 5074.00ft
<b>Site:</b>	WELD_HOWARD 9C-29HZ	<b>North Reference:</b>	True
<b>Well:</b>	HOWARD 9C-29HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	HOWARD 9C-29HZ		
<b>Design:</b>	HOWARD 9C-29HZ (wp04)		

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
HOWARD 9C-29HZ B	0.00	0.00	7,811.00	4,671.11	975.48	1,250,987.20	3,166,154.46	40.020821	-104.906731
- plan hits target center									
- Point									

Casing Points					
Measured Depth	Vertical Depth			Casing Diameter	Hole Diameter
(ft)	(ft)		Name	(")	(")
1,100.00	1,100.00	9 5/8"		9-5/8	12-1/4
8,237.20	7,833.00	7"		7	8-3/4

Formations						
Measured Depth	Vertical Depth				Dip	Dip Direction
(ft)	(ft)		Name	Lithology	(°)	(°)
4,407.40	4,374.00		Parkman		0.00	
4,948.70	4,909.00		Sussex		0.00	
7,489.15	7,418.00		Niobrara A		0.00	
7,653.23	7,566.00		#REF!		0.00	
7,799.94	7,678.00		Niobrara C		0.00	
8,070.29	7,810.00		Fort Hays		0.00	
8,237.20	7,833.00		Codell		0.00	

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates			
(ft)	(ft)	+N/-S	+E/-W	Comment	
(ft)	(ft)	(ft)	(ft)		
1,250.00	1,250.00	0.00	0.00	Start Build 2.00	
1,687.78	1,686.08	-3.40	33.21	Start 5637.56 hold at 1687.78 MD	
7,325.34	7,257.94	-90.85	886.90	Start DLS 10.00 TFO -95.74	
8,237.20	7,833.00	485.00	975.48	Start 19.30 hold at 8237.20 MD	
8,256.50	7,832.90	504.30	975.48	Start 4166.87 hold at 8256.50 MD	
12,423.37	7,811.00	4,671.11	975.48	TD at 12423.37	

# **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83  
WELD\_HOWARD 9C-29HZ  
HOWARD 9C-29HZ**

**HOWARD 9C-29HZ  
HOWARD 9C-29HZ (wp04)**

## **Anticollision Summary Report**

**05 July, 2011**





# APC

## Anticollision Summary Report



<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well HOWARD 9C-29HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	17' RKB + 5057' GL @ 5074.00ft
<b>Reference Site:</b>	WELD_HOWARD 9C-29HZ	<b>MD Reference:</b>	17' RKB + 5057' GL @ 5074.00ft
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	HOWARD 9C-29HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HOWARD 9C-29HZ	<b>Database:</b>	edm5000p
<b>Reference Design:</b>	HOWARD 9C-29HZ (wp04)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	HOWARD 9C-29HZ (wp04)		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	MD + Stations Interval 25.00ft	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 1,000.00 ft	<b>Error Surface:</b>	Elliptical Conic
<b>Warning Levels Evaluated at:</b>	2.00 Sigma		

<b>Survey Tool Program</b>	<b>Date</b>	7/5/2011		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.00	12,423.37	HOWARD 9C-29HZ (wp04) (HOWARD 9C	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
WELD_HOWARD 10C-29HZ						
HOWARD 10C-29HZ - HOWARD 10C-29HZ - HOWARD	1,250.00	1,250.00	47.90	42.54	8.943	CC, ES
HOWARD 10C-29HZ - HOWARD 10C-29HZ - HOWARD	1,300.00	1,299.17	48.76	43.20	8.766	SF
WELD_HOWARD 17-32 PAD						
David Howard #1 - David Howard #1 - David Howard #1	5,002.33	4,928.00	651.44	625.19	24.813	CC, ES
David Howard #1 - David Howard #1 - David Howard #1	5,050.00	4,928.00	653.19	626.76	24.718	SF
David Howard #2 - David Howard #2 - David Howard #2						Out of range
David Howard #4 - David Howard #4 - David Howard #4						Out of range
David Howard #5 - David Howard #5 - David Howard #5	27.00	0.00	662.44	662.43	10,000.000	CC
David Howard #5 - David Howard #5 - David Howard #5	50.00	21.38	662.47	662.41	10,000.000	ES
David Howard #5 - David Howard #5 - David Howard #5	3,225.00	3,146.23	997.06	982.79	69.908	SF
David Howard #C 1 - David Howard #C 1 - David Howard	27.00	0.00	860.32	860.31	10,000.000	CC
David Howard #C 1 - David Howard #C 1 - David Howard	50.00	20.03	860.36	860.30	10,000.000	ES
David Howard #C 1 - David Howard #C 1 - David Howard	2,575.00	2,504.21	998.44	986.69	84.997	SF
Howard 1-32 - Howard 1-32 - Howard 1-32 (wp02)	9,583.44	7,953.12	136.30	69.86	2.051	CC, ES, SF
Howard 21-32 - Howard 21-32 - Howard 21-32 (wp01)	302.64	290.64	907.14	906.06	845.609	CC
Howard 21-32 - Howard 21-32 - Howard 21-32 (wp01)	350.00	333.58	907.23	905.96	712.908	ES
Howard 21-32 - Howard 21-32 - Howard 21-32 (wp01)	1,500.00	1,381.31	999.82	992.49	136.481	SF
Howard 2-32 - Howard 2-32 - Howard 2-32 (wp02)	502.64	490.64	904.00	902.02	458.458	CC
Howard 2-32 - Howard 2-32 - Howard 2-32 (wp02)	550.00	529.03	904.19	902.02	417.803	ES
Howard 2-32 - Howard 2-32 - Howard 2-32 (wp02)	1,400.00	1,240.05	996.03	990.34	174.986	SF
Howard 24-32 - Howard 24-32 - Howard 24-32 (wp01)	4,335.50	4,433.32	328.19	301.90	12.484	CC
Howard 24-32 - Howard 24-32 - Howard 24-32 (wp01)	4,400.00	4,496.31	328.48	301.54	12.194	ES
Howard 24-32 - Howard 24-32 - Howard 24-32 (wp01)	4,825.00	4,905.07	346.03	315.07	11.179	SF
Howard 25-32 - Howard 25-32 - Howard 25-32 (wp02)	1,503.08	1,555.58	849.06	840.42	98.267	CC
Howard 25-32 - Howard 25-32 - Howard 25-32 (wp02)	1,525.00	1,576.48	849.13	840.33	96.481	ES
Howard 25-32 - Howard 25-32 - Howard 25-32 (wp02)	2,750.00	2,724.51	995.28	977.67	56.530	SF
Howard 26-32 - Howard 26-32 - Howard 26-32 (wp03)	10,193.64	8,221.21	473.44	388.87	5.598	CC
Howard 26-32 - Howard 26-32 - Howard 26-32 (wp03)	10,200.00	8,221.18	473.48	388.80	5.591	ES
Howard 26-32 - Howard 26-32 - Howard 26-32 (wp03)	10,250.00	8,220.92	476.78	391.21	5.572	SF
Howard 28-32 - Howard 28-32 - Howard 28-32 (wp01)	325.00	298.00	905.49	904.33	783.009	CC
Howard 28-32 - Howard 28-32 - Howard 28-32 (wp01)	350.00	317.89	905.55	904.30	720.478	ES
Howard 28-32 - Howard 28-32 - Howard 28-32 (wp01)	1,200.00	966.80	998.64	993.62	199.031	SF
Howard 41-32 - Howard 41-32 - Howard 41-32 (wp01)	8,923.76	8,034.08	474.36	425.09	9.629	CC
Howard 41-32 - Howard 41-32 - Howard 41-32 (wp01)	8,925.00	8,034.07	474.36	425.08	9.625	ES
Howard 41-32 - Howard 41-32 - Howard 41-32 (wp01)	9,000.00	8,033.68	480.45	430.04	9.532	SF
Howard 8-32 - Howard 8-32 - Howard 8-32 (wp02)	8,263.30	7,902.06	135.13	94.58	3.333	CC, ES, SF

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

**APC**  
Anticollision Summary Report



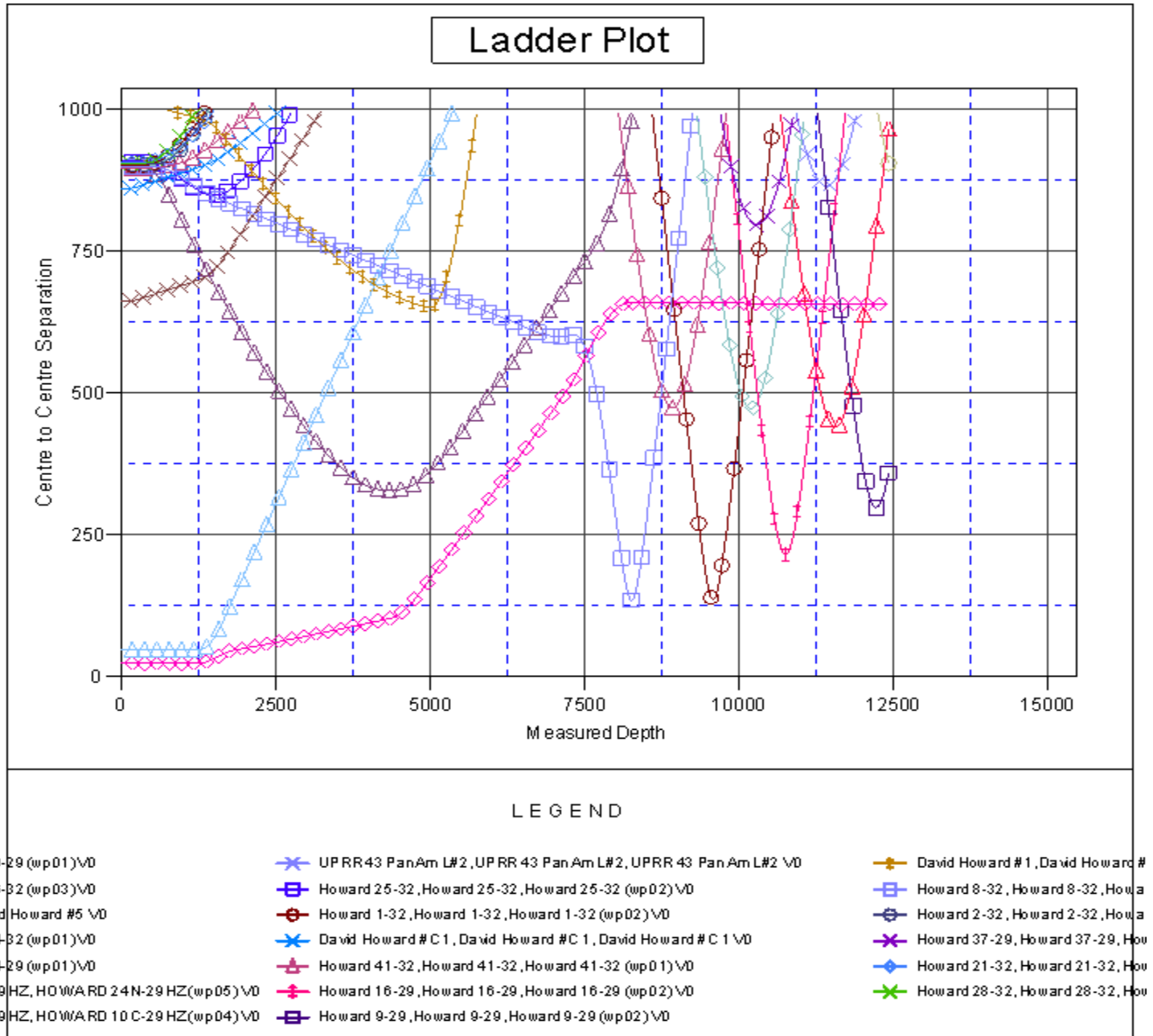
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well HOWARD 9C-29HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	17' RKB + 5057' GL @ 5074.00ft
<b>Reference Site:</b>	WELD_HOWARD 9C-29HZ	<b>MD Reference:</b>	17' RKB + 5057' GL @ 5074.00ft
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	HOWARD 9C-29HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HOWARD 9C-29HZ	<b>Database:</b>	edm5000p
<b>Reference Design:</b>	HOWARD 9C-29HZ (wp04)	<b>Offset TVD Reference:</b>	Offset Datum

Summary						
Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
WELD_HOWARD 20-29 PAD						
Howard 10-29 - Howard 10-29 - Howard 10-29 (wp02)						Out of range
Howard 15-29 - Howard 15-29 - Howard 15-29 (wp02)						Out of range
Howard 16-29 - Howard 16-29 - Howard 16-29 (wp02)	10,753.13	7,867.88	214.77	133.64	2.647	CC, ES, SF
Howard 23-29 - Howard 23-29 - Howard 23-29 (wp01)						Out of range
Howard 24-29 - Howard 24-29 - Howard 24-29 (wp01)	12,423.37	7,993.11	905.67	780.49	7.235	CC, ES, SF
Howard 37-29 - Howard 37-29 - Howard 37-29 (wp01)	10,293.04	7,901.04	797.07	719.42	10.265	CC
Howard 37-29 - Howard 37-29 - Howard 37-29 (wp01)	10,300.00	7,901.01	797.10	719.32	10.249	ES
Howard 37-29 - Howard 37-29 - Howard 37-29 (wp01)	10,450.00	7,900.22	812.37	731.78	10.080	SF
Howard 39-29 - Howard 39-29 - Howard 39-29 (wp01)	11,563.31	7,914.13	440.04	345.90	4.674	CC
Howard 39-29 - Howard 39-29 - Howard 39-29 (wp01)	11,575.00	7,914.07	440.19	345.84	4.665	ES
Howard 39-29 - Howard 39-29 - Howard 39-29 (wp01)	11,600.00	7,913.94	441.57	346.74	4.657	SF
Howard 9-29 - Howard 9-29 - Howard 9-29 (wp02)	12,223.00	7,901.66	298.82	184.69	2.618	CC
Howard 9-29 - Howard 9-29 - Howard 9-29 (wp02)	12,225.00	7,901.65	298.83	184.66	2.617	ES
Howard 9-29 - Howard 9-29 - Howard 9-29 (wp02)	12,250.00	7,901.52	300.04	185.38	2.617	SF
UPRR 43 Pan AM G1 - UPRR 43 Pan AM G1 - UPRR 43						Out of range
UPRR 43 Pan AM G11 - UPRR 43 Pan AM G11 - UPRR						Out of range
UPRR 43 Pan AM G12 - UPRR 43 Pan AM G12 - UPRR						Out of range
UPRR 43 Pan AM G4 - UPRR 43 Pan AM G4 - UPRR 43						Out of range
UPRR 43 PanAm L#2 - UPRR 43 PanAm L#2 - UPRR 43	11,415.50	7,768.72	865.82	774.31	9.462	CC
UPRR 43 PanAm L#2 - UPRR 43 PanAm L#2 - UPRR 43	11,425.00	7,768.71	865.87	774.19	9.444	ES
UPRR 43 PanAm L#2 - UPRR 43 PanAm L#2 - UPRR 43	11,575.00	7,768.56	880.39	785.80	9.308	SF
WELD_HOWARD 24N-29HZ						
HOWARD 24N-29HZ - HOWARD 24N-29HZ - HOWARD	1,250.00	1,250.00	23.81	18.45	4.445	CC, ES
HOWARD 24N-29HZ - HOWARD 24N-29HZ - HOWARD	12,423.37	12,121.53	656.87	487.79	3.885	SF

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well HOWARD 9C-29HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	17' RKB + 5057' GL @ 5074.00ft
<b>Reference Site:</b>	WELD_HOWARD 9C-29HZ	<b>MD Reference:</b>	17' RKB + 5057' GL @ 5074.00ft
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	HOWARD 9C-29HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HOWARD 9C-29HZ	<b>Database:</b>	edm5000p
<b>Reference Design:</b>	HOWARD 9C-29HZ (wp04)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to 17' RKB + 5057' GL @ 5074.00ft  
Offset Depths are relative to Offset Datum  
Central Meridian is -105.500000

Coordinates are relative to: HOWARD 9C-29HZ  
Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: 0.38°



<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well HOWARD 9C-29HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	17' RKB + 5057' GL @ 5074.00ft
<b>Reference Site:</b>	WELD_HOWARD 9C-29HZ	<b>MD Reference:</b>	17' RKB + 5057' GL @ 5074.00ft
<b>Site Error:</b>	0.00 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	HOWARD 9C-29HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HOWARD 9C-29HZ	<b>Database:</b>	edm5000p
<b>Reference Design:</b>	HOWARD 9C-29HZ (wp04)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to 17' RKB + 5057' GL @ 5074.00ft  
Offset Depths are relative to Offset Datum  
Central Meridian is -105.500000

Coordinates are relative to: HOWARD 9C-29HZ  
Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: 0.38°

