

# **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**WELD\_UNDERHILL 15-17HZ PAD**

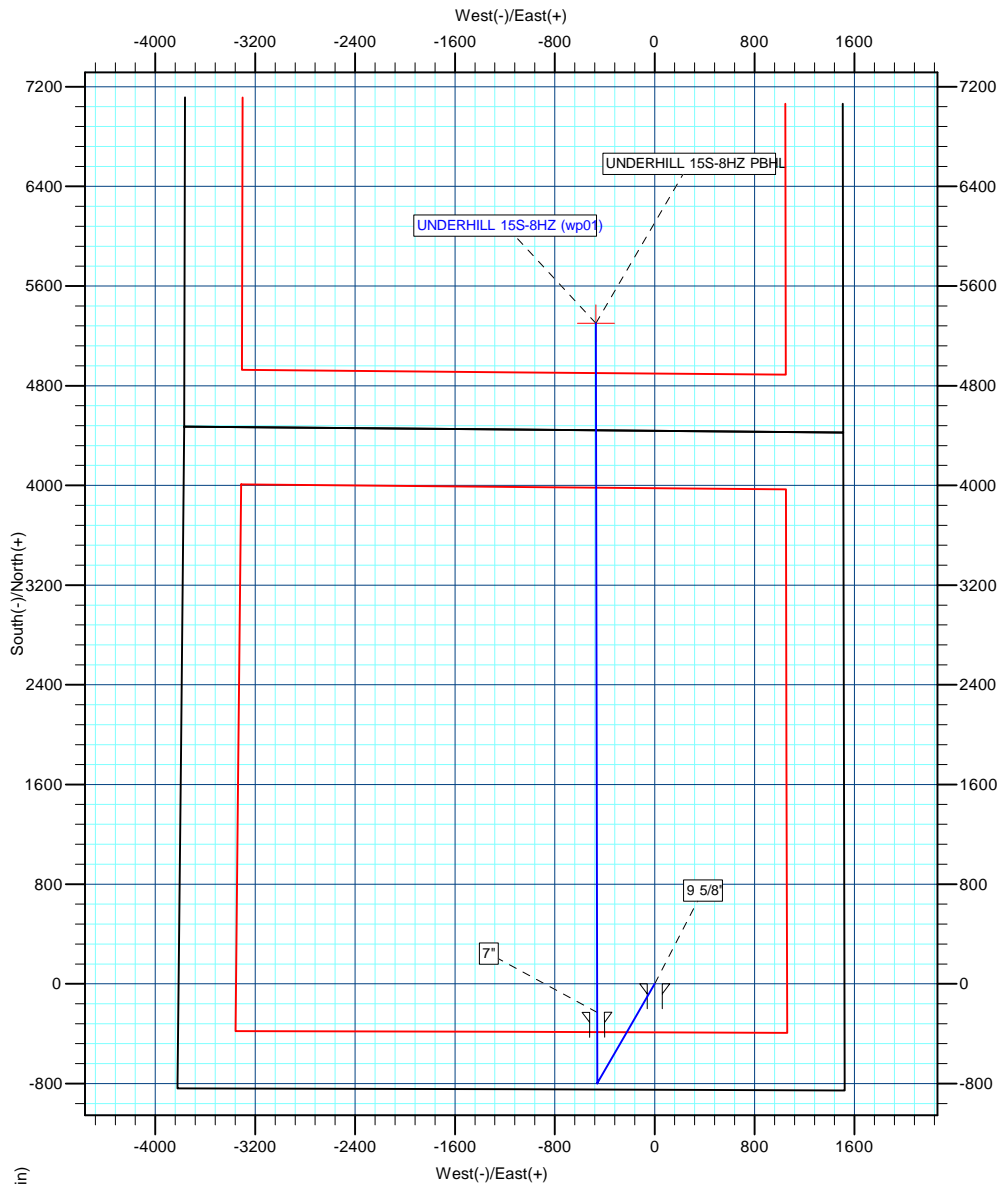
**UNDERHILL 15S-8HZ**

**UNDERHILL 15S-8HZ**

**Plan: UNDERHILL 15S-8HZ (wp01)**

## **Standard Planning Report**

**05 November, 2012**



Azimuths to True North  
Magnetic North: 8.73°

Magnetic Field  
Strength: 52781.7snT  
Dip Angle: 66.69°  
Date: 10/31/2012  
Model: IGRF2010



Project: COLORADO NORTHERN ZONE - 83  
Site: WELD UNDERHILL 15-17HZ PAD  
Well: UNDERHILL 15S-8HZ  
Wellbore: UNDERHILL 15S-8HZ  
Section: SEC. 17 T1N R67W  
SHL: 849' FSL 1520' FEL SEC 17  
Design: UNDERHILL 15S-8HZ (wp01)  
Latitude: 40.046121  
Longitude: -104.910489  
GL: 5112.00  
KB: 17' RKB + 5112' GL @ 5129.00ft

#### WELL DETAILS: UNDERHILL 15S-8HZ

+N/-S	+E/-W	Northing	Ground Level: Easting	Latitude	Longitude	Slot
0.00	0.00	1260196.14	3165040.72	40.046121	-104.910489	

#### 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
917.00	0.00	0.00	917.00	0.00	0.00	0.00	0.00	0.00
2068.15	25.90	209.96	2029.34	-221.61	-127.74	2.25	209.96	-209.44
3005.64	25.90	209.96	2872.66	-576.40	-332.26	0.00	0.00	-544.75
4156.79	0.00	0.00	3985.00	-798.00	-460.00	2.25	180.00	-754.19
4456.79	0.00	0.00	4285.00	-798.00	-460.00	0.00	0.00	-754.19
4458.85	0.00	0.00	4287.06	-798.00	-460.00	0.00	0.00	-754.19
5354.85	89.60	359.90	4860.00	-229.05	-460.99	10.00	359.90	-187.37
0886.09	89.59	359.90	4899.00	5302.05	-470.80	0.00	-158.01	5322.92

#### WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

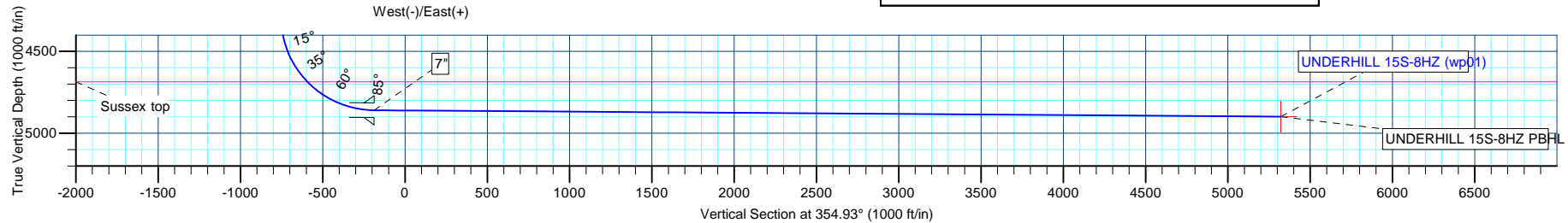
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
UNDERHILL 15S-8HZ PBHL	4899.00	5302.05	-470.80	40.060676	-104.912171	Point

#### FORMATION TOP DETAILS

TVDPath	MDPath	Formation
4315.00	4486.80	Parkman
4686.00	4900.14	Sussex top

#### CASING DETAILS

TVD	MD	Name	Size
917.00	917.00	9 5/8"	9-5/8
4860.00	5354.85	7"	7



# Andarko Petroleum Corporation

## Planning Report

<b>Database:</b>	edmp	<b>Local Co-ordinate Reference:</b>	Site WELD_UNDERHILL 15-17HZ PAD
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	17' RKB + 5112' GL @ 5129.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	17' RKB + 5112' GL @ 5129.00ft
<b>Site:</b>	WELD_UNDERHILL 15-17HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	UNDERHILL 15S-8HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	UNDERHILL 15S-8HZ		
<b>Design:</b>	UNDERHILL 15S-8HZ (wp01)		

<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_UNDERHILL 15-17HZ PAD, SEC. 17 T1N R67W			
Site Position:		Northing:	1,260,196.14 usft	Latitude:	40.046121
From:	Lat/Long	Easting:	3,165,040.72 usft	Longitude:	-104.910489
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.38 °

Well	UNDERHILL 15S-8HZ					
Well Position	+N/-S	0.00 ft	Northing:	1,260,196.14 usft	Latitude:	40.046121
	+E/-W	0.00 ft	Easting:	3,165,040.72 usft	Longitude:	-104.910489
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	5,112.00 ft

<b>Wellbore</b>	UNDERHILL 15S-8HZ				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	10/31/2012	8.73	66.69	52,782

<b>Design</b>	UNDERHILL 15S-8HZ (wp01)			
<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	354.93

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
917.00	0.00	0.00	917.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,068.15	25.90	209.96	2,029.34	-221.61	-127.74	2.25	2.25	0.00	209.96	
3,005.64	25.90	209.96	2,872.66	-576.40	-332.26	0.00	0.00	0.00	0.00	
4,156.79	0.00	0.00	3,985.00	-798.00	-460.00	2.25	-2.25	0.00	180.00	
4,456.79	0.00	0.00	4,285.00	-798.00	-460.00	0.00	0.00	0.00	0.00	
4,458.85	0.00	0.00	4,287.06	-798.00	-460.00	0.00	0.00	0.00	0.00	
5,354.85	89.60	359.90	4,860.01	-229.05	-460.99	10.00	10.00	0.00	359.90	
10,886.09	89.59	359.90	4,899.00	5,302.05	-470.80	0.00	0.00	0.00	-158.01	UNDERHILL 15S-8HZ

# Andarko Petroleum Corporation

## Planning Report

<b>Database:</b>	edmp	<b>Local Co-ordinate Reference:</b>	Site WELD_UNDERHILL 15-17HZ PAD
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	17' RKB + 5112' GL @ 5129.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	17' RKB + 5112' GL @ 5129.00ft
<b>Site:</b>	WELD_UNDERHILL 15-17HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	UNDERHILL 15S-8HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	UNDERHILL 15S-8HZ		
<b>Design:</b>	UNDERHILL 15S-8HZ (wp01)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
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
917.00	0.00	0.00	917.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.25 - 9 5/8"									
1,000.00	1.87	209.96	999.99	-1.18	-0.68	-1.11	2.25	2.25	0.00
1,100.00	4.12	209.96	1,099.84	-5.70	-3.28	-5.38	2.25	2.25	0.00
1,200.00	6.37	209.96	1,199.42	-13.61	-7.85	-12.86	2.25	2.25	0.00
1,300.00	8.62	209.96	1,298.56	-24.91	-14.36	-23.54	2.25	2.25	0.00
1,400.00	10.87	209.96	1,397.11	-39.57	-22.81	-37.39	2.25	2.25	0.00
1,500.00	13.12	209.96	1,494.92	-57.57	-33.18	-54.41	2.25	2.25	0.00
1,600.00	15.37	209.96	1,591.84	-78.88	-45.47	-74.55	2.25	2.25	0.00
1,700.00	17.62	209.96	1,687.72	-103.48	-59.65	-97.79	2.25	2.25	0.00
1,800.00	19.87	209.96	1,782.41	-131.31	-75.69	-124.10	2.25	2.25	0.00
1,900.00	22.12	209.96	1,875.77	-162.35	-93.58	-153.43	2.25	2.25	0.00
2,000.00	24.37	209.96	1,967.65	-196.54	-113.29	-185.74	2.25	2.25	0.00
2,068.15	25.90	209.96	2,029.34	-221.61	-127.74	-209.44	2.25	2.25	0.00
Start 937.49 hold at 2068.15 MD									
2,100.00	25.90	209.96	2,057.99	-233.67	-134.69	-220.83	0.00	0.00	0.00
2,200.00	25.90	209.96	2,147.95	-271.51	-156.51	-256.60	0.00	0.00	0.00
2,300.00	25.90	209.96	2,237.90	-309.35	-178.32	-292.37	0.00	0.00	0.00
2,400.00	25.90	209.96	2,327.86	-347.20	-200.14	-328.13	0.00	0.00	0.00
2,500.00	25.90	209.96	2,417.81	-385.04	-221.95	-363.90	0.00	0.00	0.00
2,600.00	25.90	209.96	2,507.77	-422.89	-243.77	-399.66	0.00	0.00	0.00
2,700.00	25.90	209.96	2,597.72	-460.73	-265.58	-435.43	0.00	0.00	0.00
2,800.00	25.90	209.96	2,687.68	-498.57	-287.40	-471.20	0.00	0.00	0.00
2,900.00	25.90	209.96	2,777.63	-536.42	-309.21	-506.96	0.00	0.00	0.00
3,005.64	25.90	209.96	2,872.66	-576.40	-332.26	-544.75	0.00	0.00	0.00
Start Drop -2.25									
3,100.00	23.78	209.96	2,958.29	-610.74	-352.05	-577.20	2.25	-2.25	0.00
3,200.00	21.53	209.96	3,050.57	-644.10	-371.28	-608.73	2.25	-2.25	0.00
3,300.00	19.28	209.96	3,144.29	-674.30	-388.69	-637.28	2.25	-2.25	0.00
3,400.00	17.03	209.96	3,239.31	-701.29	-404.25	-662.79	2.25	-2.25	0.00
3,500.00	14.78	209.96	3,335.47	-725.03	-417.93	-685.22	2.25	-2.25	0.00
3,600.00	12.53	209.96	3,432.64	-745.48	-429.72	-704.54	2.25	-2.25	0.00
3,700.00	10.28	209.96	3,530.66	-762.61	-439.59	-720.73	2.25	-2.25	0.00
3,800.00	8.03	209.96	3,629.38	-776.39	-447.54	-733.75	2.25	-2.25	0.00
3,900.00	5.78	209.96	3,728.65	-786.80	-453.54	-743.59	2.25	-2.25	0.00
4,000.00	3.53	209.96	3,828.31	-793.82	-457.59	-750.24	2.25	-2.25	0.00
4,100.00	1.28	209.96	3,928.22	-797.46	-459.68	-753.67	2.25	-2.25	0.00
4,156.79	0.00	0.00	3,985.00	-798.00	-460.00	-754.19	2.25	-2.25	0.00
Start 300.00 hold at 4156.79 MD									
4,200.00	0.00	0.00	4,028.21	-798.00	-460.00	-754.19	0.00	0.00	0.00
4,300.00	0.00	0.00	4,128.21	-798.00	-460.00	-754.19	0.00	0.00	0.00
4,400.00	0.00	0.00	4,228.21	-798.00	-460.00	-754.19	0.00	0.00	0.00
4,456.79	0.00	0.00	4,285.00	-798.00	-460.00	-754.19	0.00	0.00	0.00
Start 2.06 hold at 4456.79 MD									

# Andarko Petroleum Corporation

## Planning Report

<b>Database:</b>	edmp	<b>Local Co-ordinate Reference:</b>	Site WELD_UNDERHILL 15-17HZ PAD
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	17' RKB + 5112' GL @ 5129.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	17' RKB + 5112' GL @ 5129.00ft
<b>Site:</b>	WELD_UNDERHILL 15-17HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	UNDERHILL 15S-8HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	UNDERHILL 15S-8HZ		
<b>Design:</b>	UNDERHILL 15S-8HZ (wp01)		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,458.85	0.00	0.00	4,287.06	-798.00	-460.00	-754.19	0.00	0.00	0.00	
Start Build 10.00										
4,486.80	2.80	359.90	4,315.00	-797.32	-460.00	-753.51	10.00	10.00	0.00	
Parkman										
4,500.00	4.12	359.90	4,328.18	-796.53	-460.00	-752.71	10.00	10.00	0.00	
4,550.00	9.12	359.90	4,377.83	-790.77	-460.01	-746.98	10.00	10.00	0.00	
4,600.00	14.12	359.90	4,426.79	-780.70	-460.03	-736.95	10.00	10.00	0.00	
4,650.00	19.12	359.90	4,474.69	-766.41	-460.06	-722.71	10.00	10.00	0.00	
4,700.00	24.12	359.90	4,521.16	-748.00	-460.09	-704.37	10.00	10.00	0.00	
4,750.00	29.12	359.90	4,565.84	-725.61	-460.13	-682.06	10.00	10.00	0.00	
4,800.00	34.12	359.90	4,608.41	-699.40	-460.17	-655.96	10.00	10.00	0.00	
4,850.00	39.12	359.90	4,648.53	-669.59	-460.22	-626.26	10.00	10.00	0.00	
4,900.00	44.12	359.90	4,685.90	-636.40	-460.28	-593.19	10.00	10.00	0.00	
4,900.14	44.12	359.90	4,686.00	-636.30	-460.28	-593.09	0.00	0.00	0.00	
Sussex top										
4,950.00	49.12	359.90	4,720.23	-600.07	-460.35	-557.00	10.03	10.03	0.00	
5,000.00	54.12	359.90	4,751.27	-560.89	-460.41	-517.96	10.00	10.00	0.00	
5,050.00	59.12	359.90	4,778.77	-519.15	-460.49	-476.38	10.00	10.00	0.00	
5,100.00	64.12	359.90	4,802.54	-475.18	-460.56	-432.58	10.00	10.00	0.00	
5,150.00	69.12	359.90	4,822.38	-429.30	-460.64	-386.87	10.00	10.00	0.00	
5,200.00	74.12	359.90	4,838.14	-381.87	-460.73	-339.62	10.00	10.00	0.00	
5,250.00	79.12	359.90	4,849.71	-333.24	-460.81	-291.17	10.00	10.00	0.00	
5,300.00	84.12	359.90	4,857.00	-283.79	-460.90	-241.91	10.00	10.00	0.00	
5,354.85	89.60	359.90	4,860.01	-229.04	-460.99	-187.37	10.00	10.00	0.00	
Start DLS 0.00 TFO -158.01 - 7"										
5,400.00	89.60	359.90	4,860.32	-183.89	-461.07	-142.39	0.00	0.00	0.00	
5,500.00	89.60	359.90	4,861.02	-83.90	-461.25	-42.77	0.00	0.00	0.00	
5,600.00	89.60	359.90	4,861.72	16.10	-461.42	56.85	0.00	0.00	0.00	
5,700.00	89.60	359.90	4,862.42	116.10	-461.60	156.47	0.00	0.00	0.00	
5,800.00	89.60	359.90	4,863.12	216.09	-461.77	256.09	0.00	0.00	0.00	
5,900.00	89.60	359.90	4,863.81	316.09	-461.95	355.72	0.00	0.00	0.00	
6,000.00	89.60	359.90	4,864.51	416.09	-462.12	455.34	0.00	0.00	0.00	
6,100.00	89.60	359.90	4,865.21	516.09	-462.30	554.96	0.00	0.00	0.00	
6,200.00	89.60	359.90	4,865.91	616.08	-462.47	654.58	0.00	0.00	0.00	
6,300.00	89.60	359.90	4,866.61	716.08	-462.65	754.20	0.00	0.00	0.00	
6,400.00	89.60	359.90	4,867.32	816.08	-462.82	853.82	0.00	0.00	0.00	
6,500.00	89.60	359.90	4,868.02	916.08	-463.00	953.44	0.00	0.00	0.00	
6,600.00	89.60	359.90	4,868.72	1,016.07	-463.17	1,053.06	0.00	0.00	0.00	
6,700.00	89.60	359.90	4,869.42	1,116.07	-463.35	1,152.68	0.00	0.00	0.00	
6,800.00	89.60	359.90	4,870.12	1,216.07	-463.53	1,252.30	0.00	0.00	0.00	
6,900.00	89.60	359.90	4,870.82	1,316.07	-463.70	1,351.93	0.00	0.00	0.00	
7,000.00	89.60	359.90	4,871.52	1,416.06	-463.88	1,451.55	0.00	0.00	0.00	
7,100.00	89.60	359.90	4,872.23	1,516.06	-464.05	1,551.17	0.00	0.00	0.00	
7,200.00	89.60	359.90	4,872.93	1,616.06	-464.23	1,650.79	0.00	0.00	0.00	
7,300.00	89.60	359.90	4,873.63	1,716.06	-464.41	1,750.41	0.00	0.00	0.00	
7,400.00	89.60	359.90	4,874.33	1,816.05	-464.58	1,850.03	0.00	0.00	0.00	
7,500.00	89.60	359.90	4,875.04	1,916.05	-464.76	1,949.65	0.00	0.00	0.00	
7,600.00	89.60	359.90	4,875.74	2,016.05	-464.94	2,049.27	0.00	0.00	0.00	
7,700.00	89.60	359.90	4,876.45	2,116.05	-465.11	2,148.89	0.00	0.00	0.00	
7,800.00	89.60	359.90	4,877.15	2,216.04	-465.29	2,248.52	0.00	0.00	0.00	
7,900.00	89.60	359.90	4,877.85	2,316.04	-465.47	2,348.14	0.00	0.00	0.00	
8,000.00	89.60	359.90	4,878.56	2,416.04	-465.64	2,447.76	0.00	0.00	0.00	
8,100.00	89.60	359.90	4,879.26	2,516.03	-465.82	2,547.38	0.00	0.00	0.00	

# Andarko Petroleum Corporation

## Planning Report

<b>Database:</b>	edmp	<b>Local Co-ordinate Reference:</b>	Site WELD_UNDERHILL 15-17HZ PAD
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	17' RKB + 5112' GL @ 5129.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	17' RKB + 5112' GL @ 5129.00ft
<b>Site:</b>	WELD_UNDERHILL 15-17HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	UNDERHILL 15S-8HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	UNDERHILL 15S-8HZ		
<b>Design:</b>	UNDERHILL 15S-8HZ (wp01)		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
8,200.00	89.60	359.90	4,879.97	2,616.03	-466.00	2,647.00	0.00	0.00	0.00	
8,300.00	89.60	359.90	4,880.67	2,716.03	-466.18	2,746.62	0.00	0.00	0.00	
8,400.00	89.60	359.90	4,881.38	2,816.03	-466.35	2,846.24	0.00	0.00	0.00	
8,500.00	89.60	359.90	4,882.09	2,916.02	-466.53	2,945.86	0.00	0.00	0.00	
8,600.00	89.60	359.90	4,882.79	3,016.02	-466.71	3,045.48	0.00	0.00	0.00	
8,700.00	89.60	359.90	4,883.50	3,116.02	-466.89	3,145.11	0.00	0.00	0.00	
8,800.00	89.60	359.90	4,884.20	3,216.02	-467.07	3,244.73	0.00	0.00	0.00	
8,900.00	89.59	359.90	4,884.91	3,316.01	-467.24	3,344.35	0.00	0.00	0.00	
9,000.00	89.59	359.90	4,885.62	3,416.01	-467.42	3,443.97	0.00	0.00	0.00	
9,100.00	89.59	359.90	4,886.33	3,516.01	-467.60	3,543.59	0.00	0.00	0.00	
9,200.00	89.59	359.90	4,887.03	3,616.01	-467.78	3,643.21	0.00	0.00	0.00	
9,300.00	89.59	359.90	4,887.74	3,716.00	-467.96	3,742.83	0.00	0.00	0.00	
9,400.00	89.59	359.90	4,888.45	3,816.00	-468.14	3,842.45	0.00	0.00	0.00	
9,500.00	89.59	359.90	4,889.16	3,916.00	-468.31	3,942.08	0.00	0.00	0.00	
9,600.00	89.59	359.90	4,889.87	4,015.99	-468.49	4,041.70	0.00	0.00	0.00	
9,700.00	89.59	359.90	4,890.57	4,115.99	-468.67	4,141.32	0.00	0.00	0.00	
9,800.00	89.59	359.90	4,891.28	4,215.99	-468.85	4,240.94	0.00	0.00	0.00	
9,900.00	89.59	359.90	4,891.99	4,315.99	-469.03	4,340.56	0.00	0.00	0.00	
10,000.00	89.59	359.90	4,892.70	4,415.98	-469.21	4,440.18	0.00	0.00	0.00	
10,100.00	89.59	359.90	4,893.41	4,515.98	-469.39	4,539.80	0.00	0.00	0.00	
10,200.00	89.59	359.90	4,894.12	4,615.98	-469.57	4,639.42	0.00	0.00	0.00	
10,300.00	89.59	359.90	4,894.83	4,715.98	-469.75	4,739.05	0.00	0.00	0.00	
10,400.00	89.59	359.90	4,895.54	4,815.97	-469.93	4,838.67	0.00	0.00	0.00	
10,500.00	89.59	359.90	4,896.25	4,915.97	-470.11	4,938.29	0.00	0.00	0.00	
10,600.00	89.59	359.90	4,896.96	5,015.97	-470.29	5,037.91	0.00	0.00	0.00	
10,700.00	89.59	359.90	4,897.68	5,115.97	-470.47	5,137.53	0.00	0.00	0.00	
10,800.00	89.59	359.90	4,898.39	5,215.96	-470.65	5,237.15	0.00	0.00	0.00	
10,886.09	89.59	359.90	4,899.00	5,302.05	-470.80	5,322.92	0.00	0.00	0.00	
TD at 10886.09 - UNDERHILL 15S-8HZ PBHL										

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
UNDERHILL 15S-8HZ P	0.00	0.00	4,899.00	5,302.05	-470.80	1,265,494.94	3,164,534.68	40.060676	-104.912171
- hit/miss target									
- Shape									
- plan hits target center									
- Point									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
917.00	917.00	9 5/8"	9-5/8	12-1/4	
5,354.85	4,860.01	7"	7	7-1/2	

# Andarko Petroleum Corporation

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<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	17' RKB + 5112' GL @ 5129.00ft
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<b>Well:</b>	UNDERHILL 15S-8HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
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<b>Design:</b>	UNDERHILL 15S-8HZ (wp01)		

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,486.80	4,315.00	Parkman			
4,900.14	4,686.00	Sussex top			

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
917.00	917.00	0.00	0.00	Start Build 2.25	
2,068.15	2,029.34	-221.61	-127.74	Start 937.49 hold at 2068.15 MD	
3,005.64	2,872.66	-576.40	-332.26	Start Drop -2.25	
4,156.79	3,985.00	-798.00	-460.00	Start 300.00 hold at 4156.79 MD	
4,456.79	4,285.00	-798.00	-460.00	Start 2.06 hold at 4456.79 MD	
4,458.85	4,287.06	-798.00	-460.00	Start Build 10.00	
5,354.85	4,860.01	-229.05	-460.99	Start DLS 0.00 TFO -158.01	
10,886.09	4,899.00	5,302.05	-470.80	TD at 10886.09	