

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_UNDERHILL 16-17HZ PAD

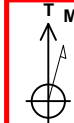
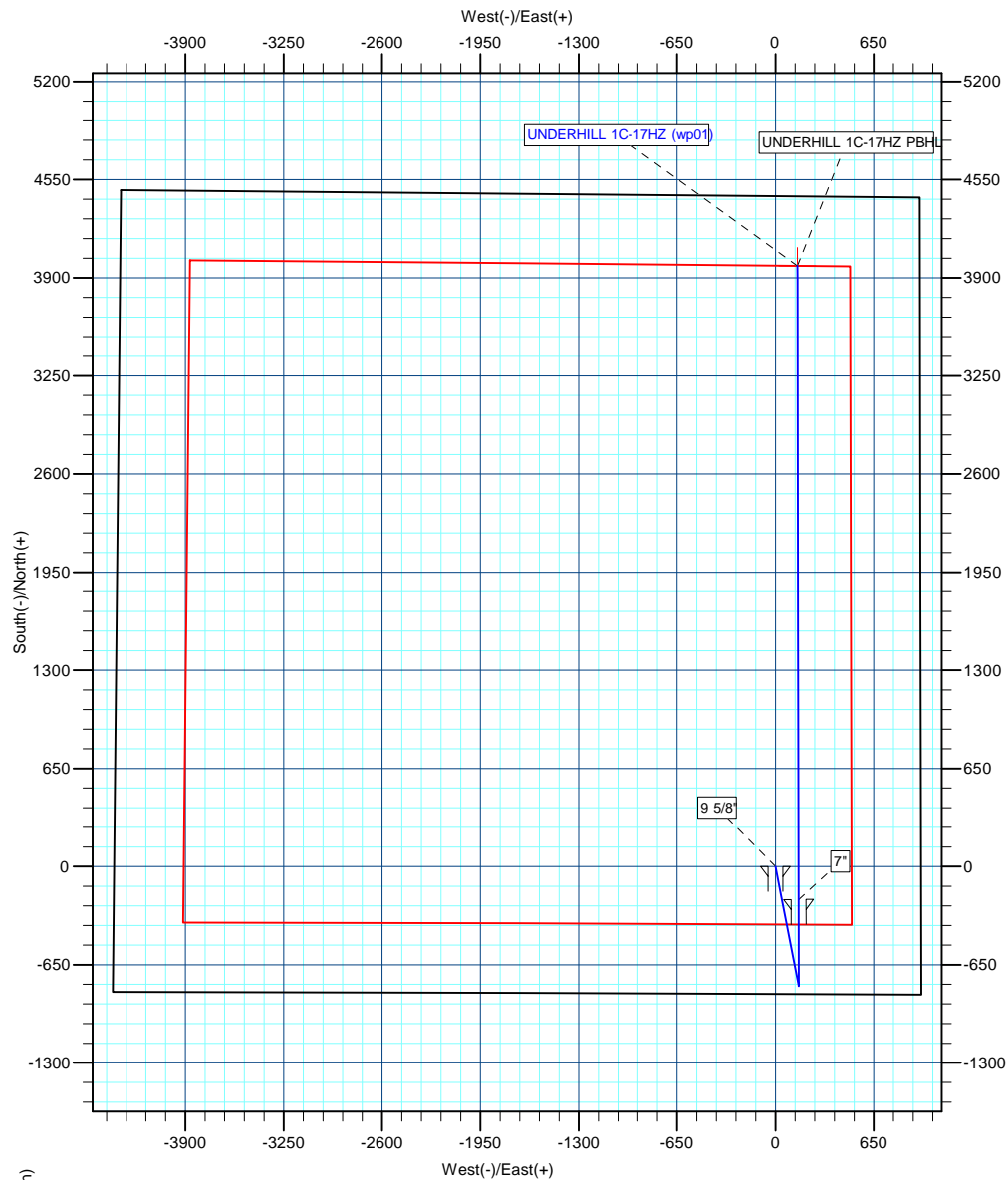
UNDERHILL 1C-17HZ

UNDERHILL 1C-17HZ

Plan: UNDERHILL 1C-17HZ (wp01)

Standard Planning Report

05 November, 2012



Azimuths to True North
Magnetic North: 8.72°
Magnetic Field
Strength: 52782.0snT
Dip Angle: 66.69°
Date: 10/31/2012
Model: IGRF2010



Project: COLORADO NORTHERN ZONE - 83
Site: WELD UNDERHILL 16-17HZ PAD
Well: UNDERHILL 1C-17HZ
Wellbore: UNDERHILL 1C-17HZ
Section: Sec. 17 T1N R67W
SHL: 843' FSL 963' FEL
Design: UNDERHILL 1C-17HZ (wp01)
Latitude: 40.046099
Longitude: -104.908497
GL: 5103.00
KB: 17' RKB + 5103' GL @ 5120.00ft

WELL DETAILS: UNDERHILL 1C-17HZ

+N/-S	+E/-W	Northing	Ground Level: Easting	5103.00 Latitude	Longitude	Slot
0.00	0.00	1260191.83	3165598.45	40.046099	-104.908497	

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
1100.00	0.00	0.00	1100.00	0.00	0.00	0.00	0.00	0.00
1738.73	12.77	169.00	1733.45	-69.61	13.53	2.00	169.00	-69.07
4746.27	12.77	169.00	4666.55	-722.39	140.47	0.00	0.00	-716.80
5385.00	0.00	0.00	5300.00	-792.00	154.00	2.00	180.00	-785.87
6385.00	0.00	0.00	6300.00	-792.00	154.00	0.00	0.00	-785.87
7294.04	0.00	0.00	7209.04	-792.00	154.00	0.00	0.00	-785.87
8194.34	90.03	359.89	7782.00	-218.74	152.90	10.00	359.89	-213.03
2392.46	90.02	359.89	7780.00	3979.37	145.00	0.00	141.43	3982.01

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

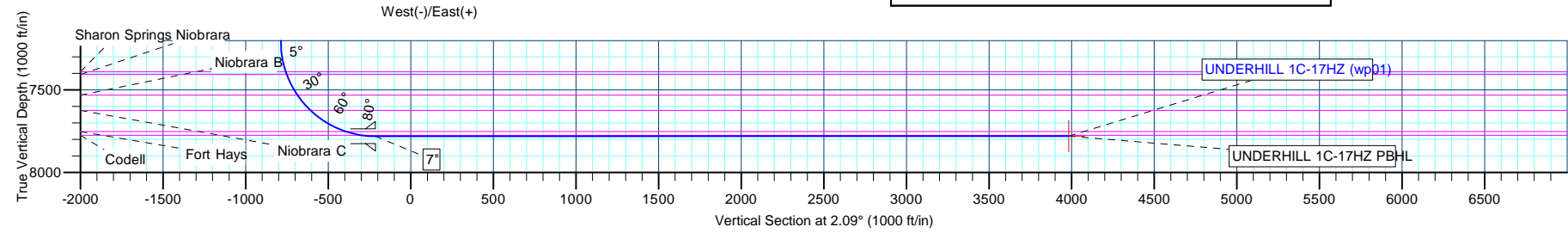
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
UNDERHILL 1C-17HZ PBHL	7780.00	3979.37	145.00	40.057023	-104.907979	Point

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
4645.00	4724.18	Sussex
5254.00	5339.00	Shannon
7390.00	7478.15	Sharon Springs
7407.00	7496.17	Niobrara
7532.00	7637.14	Niobrara B
7624.00	7758.10	Niobrara C
7753.00	8010.97	Fort Hays
7775.00	8104.40	Codell

CASING DETAILS

TVD	MD	Name	Size
917.00	917.00	9 5/8"	9-5/8
7782.00	8194.34	7"	7



Andarko Petroleum Corporation

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Well UNDERHILL 1C-17HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	17' RKB + 5103' GL @ 5120.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17' RKB + 5103' GL @ 5120.00ft
Site:	WELD_UNDERHILL 16-17HZ PAD	North Reference:	True
Well:	UNDERHILL 1C-17HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	UNDERHILL 1C-17HZ		
Design:	UNDERHILL 1C-17HZ (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_UNDERHILL 16-17HZ PAD, Sec. 17 T1N R67W			
Site Position:		Northing:	1,260,179.32 usft	Latitude: 40.046063
From:	Lat/Long	Easting:	3,165,687.56 usft	Longitude: -104.908179
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence: 0.38 °

Well	UNDERHILL 1C-17HZ			
Well Position	+N/-S	13.10 ft	Northing:	1,260,191.83 usft
	+E/-W	-89.03 ft	Easting:	3,165,598.45 usft
Position Uncertainty		0.00 ft	Wellhead Elevation:	Latitude: 40.046099
				Longitude: -104.908497
				Ground Level: 5,103.00 ft

Wellbore	UNDERHILL 1C-17HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/31/2012	8.72	66.69	52,782

Design	UNDERHILL 1C-17HZ (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	2.09

Plan Sections										
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	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,738.73	12.77	169.00	1,733.45	-69.61	13.53	2.00	2.00	0.00	169.00	
4,746.27	12.77	169.00	4,666.55	-722.39	140.47	0.00	0.00	0.00	0.00	
5,385.00	0.00	0.00	5,300.00	-792.00	154.00	2.00	-2.00	0.00	180.00	
6,385.00	0.00	0.00	6,300.00	-792.00	154.00	0.00	0.00	0.00	0.00	
7,294.04	0.00	0.00	7,209.04	-792.00	154.00	0.00	0.00	0.00	0.00	
8,194.34	90.03	359.89	7,782.00	-218.74	152.90	10.00	10.00	0.00	359.89	
12,392.46	90.02	359.89	7,780.00	3,979.37	145.00	0.00	0.00	0.00	141.43	UNDERHILL 1C-17H;

Andarko Petroleum Corporation

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Well:	UNDERHILL 1C-17HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	UNDERHILL 1C-17HZ		
Design:	UNDERHILL 1C-17HZ (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
9 5/8"									
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
Start Build 2.00									
1,200.00	2.00	169.00	1,199.98	-1.71	0.33	-1.70	2.00	2.00	0.00
1,300.00	4.00	169.00	1,299.84	-6.85	1.33	-6.80	2.00	2.00	0.00
1,400.00	6.00	169.00	1,399.45	-15.41	3.00	-15.29	2.00	2.00	0.00
1,500.00	8.00	169.00	1,498.70	-27.37	5.32	-27.16	2.00	2.00	0.00
1,600.00	10.00	169.00	1,597.47	-42.72	8.31	-42.39	2.00	2.00	0.00
1,700.00	12.00	169.00	1,695.62	-61.45	11.95	-60.98	2.00	2.00	0.00
1,738.73	12.77	169.00	1,733.45	-69.61	13.53	-69.07	2.00	2.00	0.00
Start 3007.55 hold at 1738.73 MD									
1,800.00	12.77	169.00	1,793.20	-82.91	16.12	-82.26	0.00	0.00	0.00
1,900.00	12.77	169.00	1,890.73	-104.61	20.34	-103.80	0.00	0.00	0.00
2,000.00	12.77	169.00	1,988.25	-126.32	24.56	-125.34	0.00	0.00	0.00
2,100.00	12.77	169.00	2,085.78	-148.02	28.78	-146.87	0.00	0.00	0.00
2,200.00	12.77	169.00	2,183.30	-169.73	33.00	-168.41	0.00	0.00	0.00
2,300.00	12.77	169.00	2,280.83	-191.43	37.22	-189.95	0.00	0.00	0.00
2,400.00	12.77	169.00	2,378.35	-213.14	41.44	-211.49	0.00	0.00	0.00
2,500.00	12.77	169.00	2,475.88	-234.84	45.66	-233.02	0.00	0.00	0.00
2,600.00	12.77	169.00	2,573.40	-256.55	49.88	-254.56	0.00	0.00	0.00
2,700.00	12.77	169.00	2,670.93	-278.25	54.10	-276.10	0.00	0.00	0.00
2,800.00	12.77	169.00	2,768.45	-299.96	58.32	-297.63	0.00	0.00	0.00
2,900.00	12.77	169.00	2,865.98	-321.66	62.55	-319.17	0.00	0.00	0.00
3,000.00	12.77	169.00	2,963.50	-343.37	66.77	-340.71	0.00	0.00	0.00
3,100.00	12.77	169.00	3,061.03	-365.07	70.99	-362.24	0.00	0.00	0.00
3,200.00	12.77	169.00	3,158.55	-386.78	75.21	-383.78	0.00	0.00	0.00
3,300.00	12.77	169.00	3,256.08	-408.48	79.43	-405.32	0.00	0.00	0.00
3,400.00	12.77	169.00	3,353.60	-430.19	83.65	-426.85	0.00	0.00	0.00
3,500.00	12.77	169.00	3,451.13	-451.89	87.87	-448.39	0.00	0.00	0.00
3,600.00	12.77	169.00	3,548.65	-473.60	92.09	-469.93	0.00	0.00	0.00
3,700.00	12.77	169.00	3,646.18	-495.30	96.31	-491.46	0.00	0.00	0.00
3,800.00	12.77	169.00	3,743.70	-517.01	100.53	-513.00	0.00	0.00	0.00
3,900.00	12.77	169.00	3,841.23	-538.71	104.75	-534.54	0.00	0.00	0.00
4,000.00	12.77	169.00	3,938.75	-560.42	108.97	-556.08	0.00	0.00	0.00
4,100.00	12.77	169.00	4,036.27	-582.12	113.19	-577.61	0.00	0.00	0.00
4,200.00	12.77	169.00	4,133.80	-603.83	117.41	-599.15	0.00	0.00	0.00
4,300.00	12.77	169.00	4,231.32	-625.53	121.63	-620.69	0.00	0.00	0.00
4,400.00	12.77	169.00	4,328.85	-647.24	125.85	-642.22	0.00	0.00	0.00
4,500.00	12.77	169.00	4,426.37	-668.94	130.07	-663.76	0.00	0.00	0.00
4,600.00	12.77	169.00	4,523.90	-690.64	134.29	-685.30	0.00	0.00	0.00
4,700.00	12.77	169.00	4,621.42	-712.35	138.51	-706.83	0.00	0.00	0.00

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Company:	US ROCKIES REGION PLANNING	TVD Reference:	17' RKB + 5103' GL @ 5120.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17' RKB + 5103' GL @ 5120.00ft
Site:	WELD_UNDERHILL 16-17HZ PAD	North Reference:	True
Well:	UNDERHILL 1C-17HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	UNDERHILL 1C-17HZ		
Design:	UNDERHILL 1C-17HZ (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)
4,724.18	12.77	169.00	4,645.00	-717.60	139.53	-712.04	0.00	0.00	0.00
Sussex									
4,746.27	12.77	169.00	4,666.55	-722.39	140.47	-716.80	0.00	0.00	0.00
Start Drop -2.00									
4,800.00	11.70	169.00	4,719.06	-733.57	142.64	-727.89	2.00	-2.00	0.00
4,900.00	9.70	169.00	4,817.31	-751.80	146.18	-745.97	2.00	-2.00	0.00
5,000.00	7.70	169.00	4,916.16	-766.64	149.07	-760.71	2.00	-2.00	0.00
5,100.00	5.70	169.00	5,015.47	-778.10	151.30	-772.07	2.00	-2.00	0.00
5,200.00	3.70	169.00	5,115.13	-786.14	152.86	-780.05	2.00	-2.00	0.00
5,300.00	1.70	169.00	5,215.01	-790.76	153.76	-784.64	2.00	-2.00	0.00
5,339.00	0.92	169.00	5,254.00	-791.64	153.93	-785.51	2.00	-2.00	0.00
Shannon									
5,385.00	0.00	0.00	5,300.00	-792.00	154.00	-785.87	2.00	-2.00	0.00
Start 1000.00 hold at 5385.00 MD									
5,400.00	0.00	0.00	5,315.00	-792.00	154.00	-785.87	0.00	0.00	0.00
5,500.00	0.00	0.00	5,415.00	-792.00	154.00	-785.87	0.00	0.00	0.00
5,600.00	0.00	0.00	5,515.00	-792.00	154.00	-785.87	0.00	0.00	0.00
5,700.00	0.00	0.00	5,615.00	-792.00	154.00	-785.87	0.00	0.00	0.00
5,800.00	0.00	0.00	5,715.00	-792.00	154.00	-785.87	0.00	0.00	0.00
5,900.00	0.00	0.00	5,815.00	-792.00	154.00	-785.87	0.00	0.00	0.00
6,000.00	0.00	0.00	5,915.00	-792.00	154.00	-785.87	0.00	0.00	0.00
6,100.00	0.00	0.00	6,015.00	-792.00	154.00	-785.87	0.00	0.00	0.00
6,200.00	0.00	0.00	6,115.00	-792.00	154.00	-785.87	0.00	0.00	0.00
6,300.00	0.00	0.00	6,215.00	-792.00	154.00	-785.87	0.00	0.00	0.00
6,385.00	0.00	0.00	6,300.00	-792.00	154.00	-785.87	0.00	0.00	0.00
Start 909.04 hold at 6385.00 MD									
6,400.00	0.00	0.00	6,315.00	-792.00	154.00	-785.87	0.00	0.00	0.00
6,500.00	0.00	0.00	6,415.00	-792.00	154.00	-785.87	0.00	0.00	0.00
6,600.00	0.00	0.00	6,515.00	-792.00	154.00	-785.87	0.00	0.00	0.00
6,700.00	0.00	0.00	6,615.00	-792.00	154.00	-785.87	0.00	0.00	0.00
6,800.00	0.00	0.00	6,715.00	-792.00	154.00	-785.87	0.00	0.00	0.00
6,900.00	0.00	0.00	6,815.00	-792.00	154.00	-785.87	0.00	0.00	0.00
7,000.00	0.00	0.00	6,915.00	-792.00	154.00	-785.87	0.00	0.00	0.00
7,100.00	0.00	0.00	7,015.00	-792.00	154.00	-785.87	0.00	0.00	0.00
7,200.00	0.00	0.00	7,115.00	-792.00	154.00	-785.87	0.00	0.00	0.00
7,294.04	0.00	0.00	7,209.04	-792.00	154.00	-785.87	0.00	0.00	0.00
Start Build 10.00									
7,300.00	0.60	359.89	7,215.00	-791.97	154.00	-785.84	10.00	10.00	0.00
7,350.00	5.60	359.89	7,264.91	-789.27	153.99	-783.14	10.00	10.00	0.00
7,400.00	10.60	359.89	7,314.40	-782.23	153.98	-776.10	10.00	10.00	0.00
7,450.00	15.60	359.89	7,363.08	-770.90	153.96	-764.79	10.00	10.00	0.00
7,478.15	18.41	359.89	7,390.00	-762.67	153.94	-756.56	10.00	10.00	0.00
Sharon Springs									
7,496.17	20.21	359.89	7,407.00	-756.72	153.93	-750.61	10.00	10.00	0.00
Niobrara									
7,500.00	20.60	359.89	7,410.59	-755.38	153.93	-749.27	10.00	10.00	0.00
7,550.00	25.60	359.89	7,456.57	-735.77	153.89	-729.68	10.00	10.00	0.00
7,600.00	30.60	359.89	7,500.66	-712.23	153.85	-706.16	10.00	10.00	0.00
7,637.14	34.31	359.89	7,532.00	-692.31	153.81	-686.25	10.00	10.00	0.00
Niobrara B									
7,650.00	35.60	359.89	7,542.54	-684.94	153.79	-678.88	10.00	10.00	0.00
7,700.00	40.60	359.89	7,581.88	-654.10	153.74	-648.07	10.00	10.00	0.00
7,750.00	45.60	359.89	7,618.37	-619.95	153.67	-613.94	10.00	10.00	0.00

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Company:	US ROCKIES REGION PLANNING	TVD Reference:	17' RKB + 5103' GL @ 5120.00ft
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Wellbore:	UNDERHILL 1C-17HZ		
Design:	UNDERHILL 1C-17HZ (wp01)		

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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)
7,758.10	46.41	359.89	7,624.00	-614.12	153.66	-608.12	10.00	10.00	0.00
Niobrara C									
7,800.00	50.60	359.89	7,651.76	-582.75	153.60	-576.77	10.00	10.00	0.00
7,850.00	55.60	359.89	7,681.77	-542.78	153.52	-536.83	10.00	10.00	0.00
7,900.00	60.60	359.89	7,708.19	-500.35	153.44	-494.43	10.00	10.00	0.00
7,950.00	65.60	359.89	7,730.81	-455.77	153.35	-449.89	10.00	10.00	0.00
8,000.00	70.60	359.89	7,749.45	-409.40	153.27	-403.54	10.00	10.00	0.00
8,010.97	71.69	359.89	7,753.00	-399.01	153.25	-393.17	10.00	10.00	0.00
Fort Hays									
8,050.00	75.60	359.89	7,763.99	-361.57	153.17	-355.75	10.00	10.00	0.00
8,100.00	80.60	359.89	7,774.30	-312.66	153.08	-306.88	10.00	10.00	0.00
8,104.40	81.04	359.89	7,775.00	-308.32	153.07	-302.55	10.00	10.00	0.00
Codell									
8,150.00	85.60	359.89	7,780.31	-263.04	152.98	-257.30	10.00	10.00	0.00
8,194.34	90.03	359.89	7,782.00	-218.74	152.90	-213.03	10.00	10.00	0.00
Start DLS 0.00 TFO 141.43 - 7"									
8,200.00	90.03	359.89	7,782.00	-213.08	152.89	-207.38	0.00	0.00	0.00
8,300.00	90.03	359.89	7,781.94	-113.09	152.70	-107.45	0.00	0.00	0.00
8,400.00	90.03	359.89	7,781.89	-13.09	152.50	-7.52	0.00	0.00	0.00
8,500.00	90.03	359.89	7,781.84	86.91	152.31	92.40	0.00	0.00	0.00
8,600.00	90.03	359.89	7,781.79	186.91	152.12	192.33	0.00	0.00	0.00
8,700.00	90.03	359.89	7,781.74	286.91	151.93	292.26	0.00	0.00	0.00
8,800.00	90.03	359.89	7,781.69	386.91	151.74	392.18	0.00	0.00	0.00
8,900.00	90.03	359.89	7,781.64	486.91	151.55	492.11	0.00	0.00	0.00
9,000.00	90.03	359.89	7,781.58	586.91	151.36	592.04	0.00	0.00	0.00
9,100.00	90.03	359.89	7,781.53	686.91	151.17	691.96	0.00	0.00	0.00
9,200.00	90.03	359.89	7,781.48	786.91	150.98	791.89	0.00	0.00	0.00
9,300.00	90.03	359.89	7,781.43	886.91	150.79	891.82	0.00	0.00	0.00
9,400.00	90.03	359.89	7,781.38	986.91	150.60	991.74	0.00	0.00	0.00
9,500.00	90.03	359.89	7,781.33	1,086.91	150.41	1,091.67	0.00	0.00	0.00
9,600.00	90.03	359.89	7,781.29	1,186.91	150.22	1,191.60	0.00	0.00	0.00
9,700.00	90.03	359.89	7,781.24	1,286.91	150.03	1,291.52	0.00	0.00	0.00
9,800.00	90.03	359.89	7,781.19	1,386.91	149.84	1,391.45	0.00	0.00	0.00
9,900.00	90.03	359.89	7,781.14	1,486.91	149.65	1,491.38	0.00	0.00	0.00
10,000.00	90.03	359.89	7,781.09	1,586.91	149.46	1,591.30	0.00	0.00	0.00
10,100.00	90.03	359.89	7,781.04	1,686.91	149.27	1,691.23	0.00	0.00	0.00
10,200.00	90.03	359.89	7,780.99	1,786.91	149.09	1,791.15	0.00	0.00	0.00
10,300.00	90.03	359.89	7,780.95	1,886.91	148.90	1,891.08	0.00	0.00	0.00
10,400.00	90.03	359.89	7,780.90	1,986.91	148.71	1,991.01	0.00	0.00	0.00
10,500.00	90.03	359.89	7,780.85	2,086.91	148.52	2,090.93	0.00	0.00	0.00
10,600.00	90.03	359.89	7,780.80	2,186.91	148.33	2,190.86	0.00	0.00	0.00
10,700.00	90.03	359.89	7,780.76	2,286.91	148.15	2,290.79	0.00	0.00	0.00
10,800.00	90.03	359.89	7,780.71	2,386.91	147.96	2,390.71	0.00	0.00	0.00
10,900.00	90.03	359.89	7,780.67	2,486.91	147.77	2,490.64	0.00	0.00	0.00
11,000.00	90.03	359.89	7,780.62	2,586.91	147.58	2,590.57	0.00	0.00	0.00
11,100.00	90.03	359.89	7,780.57	2,686.91	147.40	2,690.49	0.00	0.00	0.00
11,200.00	90.03	359.89	7,780.53	2,786.91	147.21	2,790.42	0.00	0.00	0.00
11,300.00	90.03	359.89	7,780.48	2,886.91	147.02	2,890.35	0.00	0.00	0.00
11,400.00	90.03	359.89	7,780.44	2,986.91	146.84	2,990.28	0.00	0.00	0.00
11,500.00	90.03	359.89	7,780.39	3,086.91	146.65	3,090.20	0.00	0.00	0.00
11,600.00	90.03	359.89	7,780.35	3,186.91	146.47	3,190.13	0.00	0.00	0.00
11,700.00	90.03	359.89	7,780.30	3,286.91	146.28	3,290.06	0.00	0.00	0.00
11,800.00	90.03	359.89	7,780.26	3,386.91	146.09	3,389.98	0.00	0.00	0.00

Andarko Petroleum Corporation

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Well UNDERHILL 1C-17HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	17' RKB + 5103' GL @ 5120.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17' RKB + 5103' GL @ 5120.00ft
Site:	WELD_UNDERHILL 16-17HZ PAD	North Reference:	True
Well:	UNDERHILL 1C-17HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	UNDERHILL 1C-17HZ		
Design:	UNDERHILL 1C-17HZ (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)
11,900.00	90.03	359.89	7,780.21	3,486.91	145.91	3,489.91	0.00	0.00	0.00
12,000.00	90.03	359.89	7,780.17	3,586.91	145.72	3,589.84	0.00	0.00	0.00
12,100.00	90.02	359.89	7,780.13	3,686.91	145.54	3,689.76	0.00	0.00	0.00
12,200.00	90.02	359.89	7,780.08	3,786.91	145.35	3,789.69	0.00	0.00	0.00
12,300.00	90.02	359.89	7,780.04	3,886.91	145.17	3,889.62	0.00	0.00	0.00
12,392.46	90.02	359.89	7,780.00	3,979.37	145.00	3,982.01	0.00	0.00	0.00
TD at 12392.46 - UNDERHILL 1C-17HZ PBHL									

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
UNDERHILL 1C-17HZ F - plan hits target center - Point	0.00	0.00	7,780.00	3,979.37	145.00	1,264,172.07	3,165,716.90	40.057023	-104.907979

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	
8,194.34	7,782.00	7"	7	7-1/2	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
4,724.18	4,645.00	Sussex				
5,339.00	5,254.00	Shannon				
7,478.15	7,390.00	Sharon Springs				
7,496.17	7,407.00	Niobrara				
7,637.14	7,532.00	Niobrara B				
7,758.10	7,624.00	Niobrara C				
8,010.97	7,753.00	Fort Hays				
8,104.40	7,775.00	Codell				

Andarko Petroleum Corporation

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Well UNDERHILL 1C-17HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	17' RKB + 5103' GL @ 5120.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17' RKB + 5103' GL @ 5120.00ft
Site:	WELD_UNDERHILL 16-17HZ PAD	North Reference:	True
Well:	UNDERHILL 1C-17HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	UNDERHILL 1C-17HZ		
Design:	UNDERHILL 1C-17HZ (wp01)		

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,100.00	1,100.00	0.00	0.00	Start Build 2.00
1,738.73	1,733.45	-69.61	13.53	Start 3007.55 hold at 1738.73 MD
4,746.27	4,666.55	-722.39	140.47	Start Drop -2.00
5,385.00	5,300.00	-792.00	154.00	Start 1000.00 hold at 5385.00 MD
6,385.00	6,300.00	-792.00	154.00	Start 909.04 hold at 6385.00 MD
7,294.04	7,209.04	-792.00	154.00	Start Build 10.00
8,194.34	7,782.00	-218.74	152.90	Start DLS 0.00 TFO 141.43
12,392.46	7,780.00	3,979.37	145.00	TD at 12392.46