

ANADARKO PETROLEUM CORP

Project: Weld County, CO (UTM-NAD83)
Site: Windsock 15-21HZ
Well: Windsock 21-9HZ
Wellbore: OH
Design: OH



Azimuths to True North
Magnetic North: 8.05°

Magnetic Field
Strength: 51893.2nT
Dip Angle: 66.46°
Date: 11/25/2019
Model: IGRF2015

PROJECT DETAILS: Weld County, CO (UTM-NAD83)

Geodetic System: Universal Transverse Mercator (US Survey Feet)
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Zone 13N (108 W to 102 W)



1N-68W-21

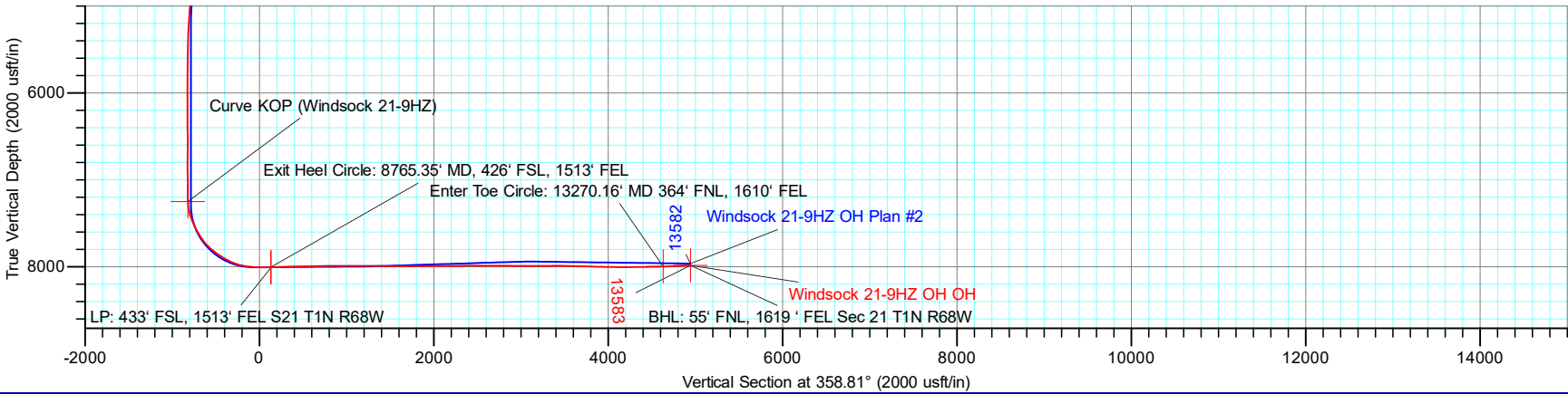
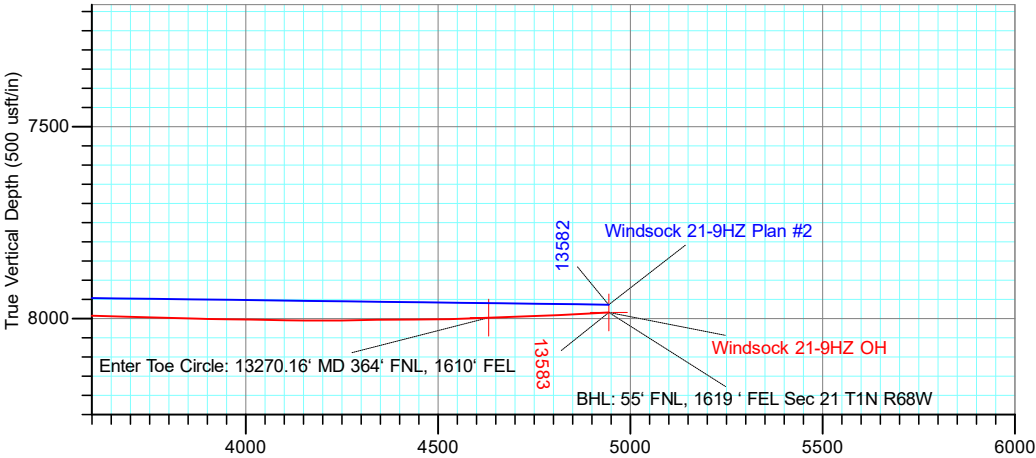
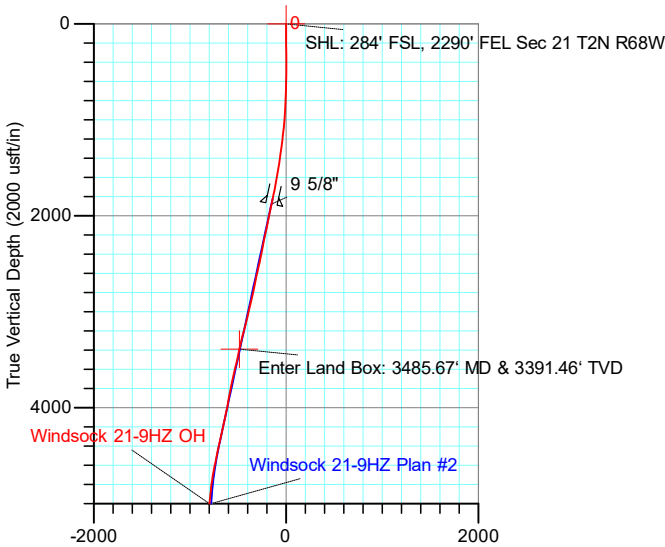
20' KB + 5222' GE @ 5242.00usft

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
BHL: 55' FNL, 1619' FEL Sec 21 T1N R68W	7984.45	4958.69	654.33	40.043765	-105.004971
Curve KOP (Windsock 21-9HZ)	7251.58	-804.85	794.12	40.027938	-105.004472
Enter Land Box: 3485.67' MD & 3391.46' TVD	3391.46	-474.69	489.92	40.028844	-105.005559
Enter Toe Circle: 13270.16' MD 364' FNL, 1610' FEL	7997.99	4646.32	664.32	40.042908	-105.004935
Exit Heel Circle: 8765.35' MD, 426' FSL, 1513' FEL	8006.72	144.47	775.07	40.030545	-105.004540
LP: 433' FSL, 1513' FEL S21 T1N R68W	8006.47	151.12	775.07	40.030563	-105.004540
SHL: 284' FSL, 2290' FEL Sec 21 T2N R68W	0.00	0.00	0.00	40.030148	-105.007309

ACTUAL LINE CALLS

SHL: 284' FSL, 2290' FEL Sec 21 T2N R68W
HEEL: 433' FSL, 1513' FEL S21 T1N R68W
BHL: 55' FNL, 1619' FEL Sec 21 T1N R68W



TOTAL DIRECTIONAL SERVICES LLC
671 Academy Ct, Windsor, CO 80550
Phone: (970) 460-9402

Design: OH (Windsock 21-9HZ/OH)
Windsock 15-21HZ
Created By: Micah Ault
Date: 21:20, February 16 2020
Approved: _____
Date: _____

ANADARKO PETROLEUM CORP

Project: Weld County, CO (UTM-NAD83)
 Site: Windsock 15-21HZ
 Well: Windsock 21-9HZ
 Wellbore: OH
 Design: OH



Azimuths to True North
 Magnetic North: 8.05°

Magnetic Field
 Strength: 51893.2nT
 Dip Angle: 66.46°
 Date: 11/25/2019
 Model: IGRF2015

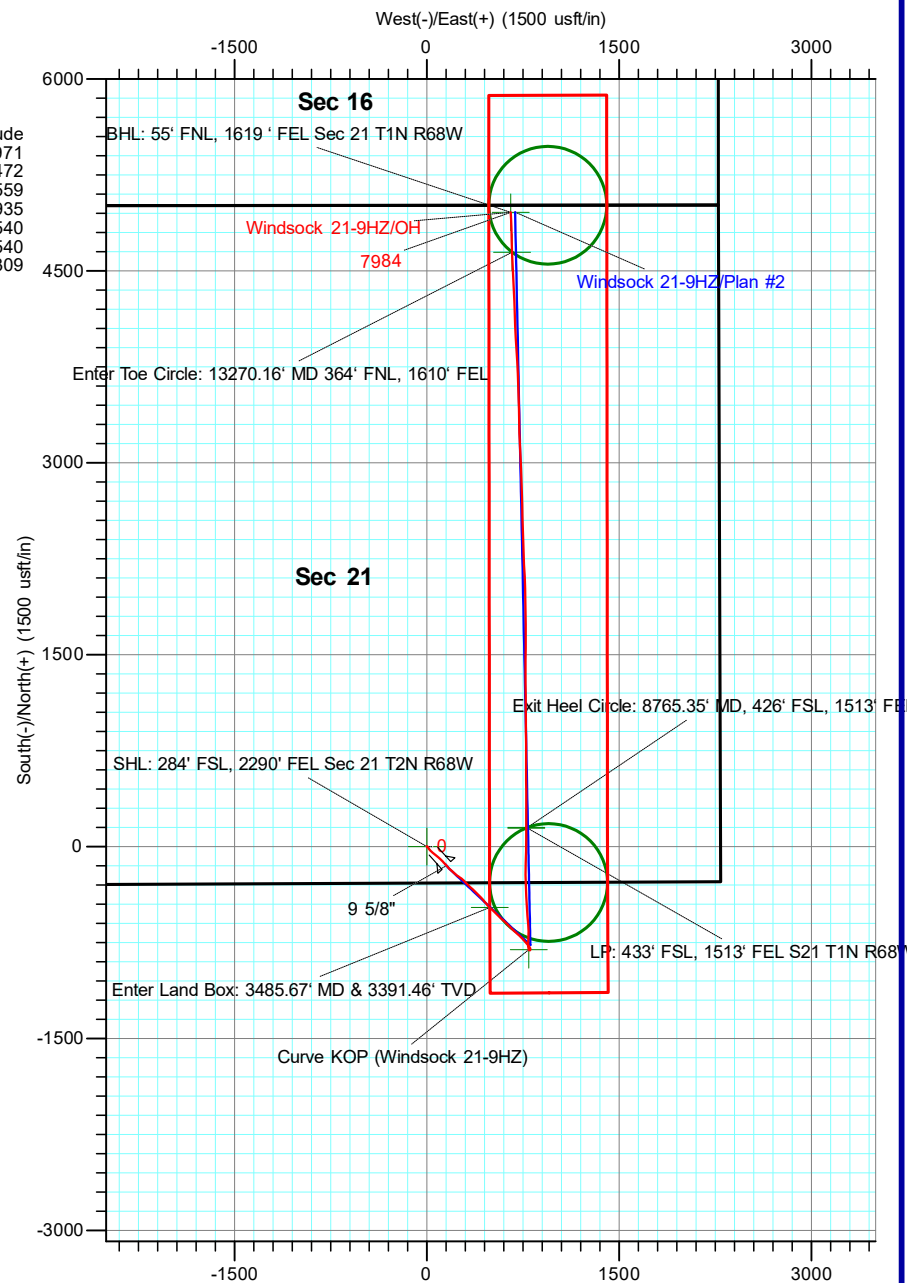
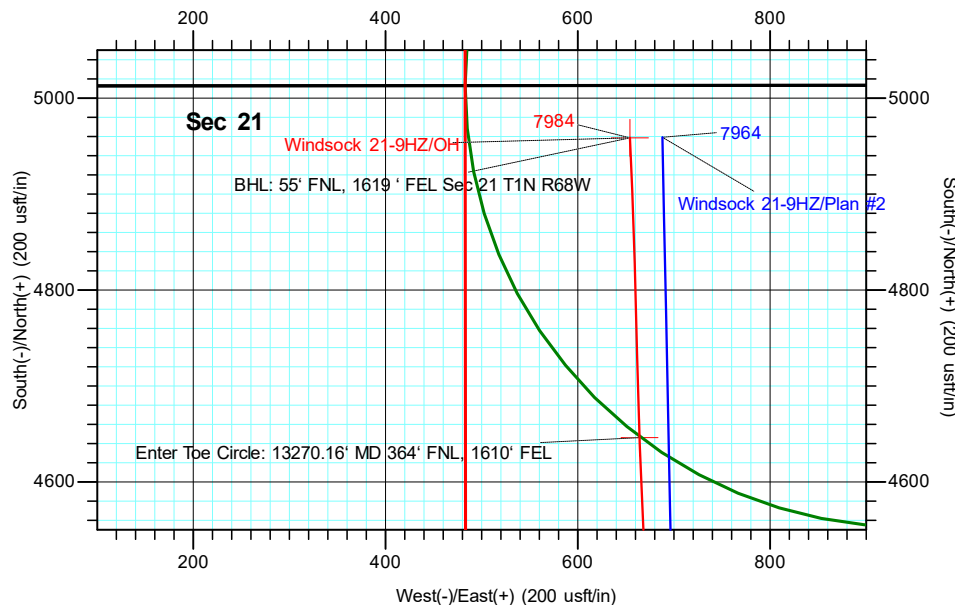
PROJECT DETAILS: Weld County, CO (UTM-NAD83)
 Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Zone 13N (108 W to 102 W)



DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
BHL: 55' FNL, 1619' FEL Sec 21 T1N R68W	7984.45	4958.69	654.33	14542670.34	1639025.41	40.043765	-105.004971
Curve KOP (Windsock 21-9HZ)	7251.58	-804.85	794.12	14536906.78	1639164.72	40.027938	-105.004472
Enter Land Box: 3485.67' MD & 3391.46' TVD	3391.46	-474.69	489.92	14537236.97	1638860.55	40.028844	-105.005559
Enter Toe Circle: 13270.16' MD 364' FNL, 1610' FEL	7997.99	4646.32	664.32	14542357.97	1639035.37	40.042908	-105.004935
Exit Heel Circle: 8765.35' MD, 426' FSL, 1513' FEL	8006.72	144.47	775.07	14537856.11	1639145.75	40.030545	-105.004540
LP: 433' FSL, 1513' FEL S21 T1N R68W	8006.47	151.12	775.07	14537862.76	1639145.75	40.030563	-105.004540
SHL: 284' FSL, 2290' FEL Sec 21 T2N R68W	0.00	0.00	0.00	14537711.70	1638370.67	40.030148	-105.007309

ACTUAL LINE CALLS
SHL: 284' FSL, 2290' FEL Sec 21 T2N R68W
HEEL: 433' FSL, 1513' FEL S21 T1N R68W
BHL: 55' FNL, 1619' FEL Sec 21 T1N R68W



TOTAL DIRECTIONAL SERVICES LLC
 671 Academy Ct, Windsor, CO 80550
 Phone: (970) 460-9402

Design: OH (Windsock 21-9HZ/OH)
 Windsock 15-21HZ
 Created By: Micah Ault
 Date: 21:23, February 16 2020
 Approved: _____
 Date: _____



ANADARKO PETROLEUM CORP

Weld County, CO (UTM-NAD83)

Windsock 15-21HZ

Windsock 21-9HZ

OH

Design: OH

Standard Survey Report

16 February, 2020



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well Windsock 21-9HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	20' KB + 5222' GE @ 5242.00usft
Site:	Windsock 15-21HZ	MD Reference:	20' KB + 5222' GE @ 5242.00usft
Well:	Windsock 21-9HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.15 Single User Db

Project	Weld County, CO (UTM-NAD83)		
Map System:	Universal Transverse Mercator (US Survey Feet)	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Zone 13N (108 W to 102 W)		

Site		Windsock 15-21HZ			
Site Position:		Northing:	14,537,796.91 usft	Latitude:	40.030382
From:	Map	Easting:	1,638,286.42 usft	Longitude:	-105.007610
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.00 °

Well	Windsock 21-9HZ					
Well Position	+N/-S	0.00 usft	Northing:	14,537,711.70 usft	Latitude:	40.030148
	+E/-W	0.00 usft	Easting:	1,638,370.67 usft	Longitude:	-105.007309
Position Uncertainty		3.28 usft	Wellhead Elevation:	usft	Ground Level:	5,222.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	11/25/2019	8.05	66.46	51,893.18262280

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	358.81	

Survey Program	Date	2/16/2020			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
130.00	1,844.00	Survey #1 - Surface (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
2,021.00	13,528.00	Survey #2 (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
13,583.00	13,583.00	Survey #3 (OH)	BLIND	OWSG BLIND	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	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	
SHL: 284' FSL, 2290' FEL Sec 21 T2N R68W - SHL (Windsock 21-9HZ)										
130.00	0.44	4.53	130.00	0.50	0.04	0.50	0.34	0.34	0.00	
225.00	0.70	328.32	224.99	1.36	-0.24	1.36	0.45	0.27	-38.12	
320.00	0.79	355.31	319.99	2.50	-0.59	2.51	0.38	0.09	28.41	
415.00	0.53	23.78	414.98	3.56	-0.47	3.57	0.43	-0.27	29.97	
510.00	1.32	133.47	509.97	3.21	0.50	3.19	1.66	0.83	115.46	
606.00	2.15	132.42	605.93	1.23	2.63	1.18	0.87	0.86	-1.09	
701.00	2.24	139.62	700.86	-1.39	5.15	-1.49	0.31	0.09	7.58	

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well Windsock 21-9HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	20' KB + 5222' GE @ 5242.00usft
Site:	Windsock 15-21HZ	MD Reference:	20' KB + 5222' GE @ 5242.00usft
Well:	Windsock 21-9HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.15 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
796.00	2.15	141.91	795.79	-4.20	7.45	-4.36	0.13	-0.09	2.41
892.00	3.96	151.75	891.65	-8.54	10.13	-8.75	1.96	1.89	10.25
987.00	4.79	143.75	986.37	-14.63	14.03	-14.92	1.08	0.87	-8.42
1,082.00	8.09	140.68	1,080.76	-23.00	20.61	-23.42	3.49	3.47	-3.23
1,177.00	9.10	135.32	1,174.69	-33.51	30.13	-34.13	1.36	1.06	-5.64
1,273.00	11.34	130.57	1,269.16	-45.05	42.64	-45.93	2.49	2.33	-4.95
1,368.00	12.13	128.46	1,362.18	-57.34	57.55	-58.52	0.95	0.83	-2.22
1,463.00	13.18	129.43	1,454.87	-70.42	73.73	-71.94	1.13	1.11	1.02
1,558.00	14.06	130.39	1,547.20	-84.78	90.89	-86.65	0.96	0.93	1.01
1,653.00	14.63	133.38	1,639.24	-100.50	108.40	-102.73	0.98	0.60	3.15
1,748.00	14.41	136.72	1,731.20	-117.34	125.22	-119.92	0.91	-0.23	3.52
1,844.00	16.30	139.53	1,823.77	-136.29	142.16	-139.21	2.12	1.97	2.93
1,901.00	15.82	138.08	1,878.55	-148.16	152.54	-151.29	1.10	-0.84	-2.55
9 5/8"									
2,021.00	14.84	134.72	1,994.28	-171.14	174.39	-174.72	1.10	-0.82	-2.80
2,114.00	16.96	131.26	2,083.72	-188.47	193.05	-192.44	2.50	2.28	-3.72
2,207.00	18.38	131.56	2,172.33	-207.14	214.22	-211.54	1.53	1.53	0.32
2,300.00	16.96	128.08	2,260.94	-225.24	235.87	-230.08	1.90	-1.53	-3.74
2,393.00	18.21	123.52	2,349.60	-241.63	258.66	-246.95	2.00	1.34	-4.90
2,485.00	16.80	131.24	2,437.35	-258.33	280.65	-264.11	2.95	-1.53	8.39
2,579.00	17.91	138.52	2,527.08	-278.12	300.44	-284.30	2.59	1.18	7.74
2,671.00	15.85	135.36	2,615.11	-297.66	318.64	-304.21	2.45	-2.24	-3.43
2,765.00	16.43	130.23	2,705.41	-315.38	337.81	-322.33	1.64	0.62	-5.46
2,858.00	17.14	134.61	2,794.45	-333.50	357.61	-340.85	1.56	0.76	4.71
2,952.00	18.51	135.38	2,883.94	-353.85	377.95	-361.62	1.48	1.46	0.82
3,046.00	18.02	133.72	2,973.20	-374.52	398.94	-382.72	0.76	-0.52	-1.77
3,140.00	18.17	136.47	3,062.55	-395.19	419.54	-403.82	0.92	0.16	2.93
3,233.00	18.10	138.91	3,150.94	-416.59	439.02	-425.62	0.82	-0.08	2.62
3,327.00	19.44	140.06	3,239.94	-439.59	458.66	-449.02	1.48	1.43	1.22
3,420.00	16.13	139.01	3,328.48	-461.22	477.08	-471.03	3.58	-3.56	-1.13
3,485.68	16.83	133.84	3,391.46	-474.69	489.92	-484.76	2.47	1.07	-7.87
Enter Land Box: 3485.67' MD & 3391.46' TVD									
3,513.00	17.16	131.82	3,417.59	-480.12	495.78	-490.31	2.47	1.20	-7.40
3,607.00	17.55	134.29	3,507.31	-499.26	516.26	-509.88	0.89	0.41	2.63
3,699.00	18.48	135.54	3,594.80	-519.35	536.40	-530.38	1.09	1.01	1.36
3,792.00	16.74	133.43	3,683.44	-539.08	556.45	-550.52	1.99	-1.87	-2.27
3,888.00	16.80	133.94	3,775.36	-558.22	576.48	-570.07	0.17	0.06	0.53
3,981.00	15.46	131.84	3,864.70	-575.81	595.39	-588.05	1.57	-1.44	-2.26
4,074.00	14.59	131.46	3,954.52	-591.83	613.41	-604.45	0.94	-0.94	-0.41
4,167.00	16.19	137.16	4,044.18	-609.10	631.00	-622.07	2.37	1.72	6.13
4,262.00	16.38	135.54	4,135.37	-628.37	649.39	-641.72	0.52	0.20	-1.71
4,357.00	16.65	134.10	4,226.45	-647.40	668.55	-661.15	0.52	0.28	-1.52
4,451.00	18.53	130.48	4,316.06	-666.47	689.58	-680.65	2.31	2.00	-3.85
4,544.00	18.33	133.48	4,404.29	-686.13	711.43	-700.76	1.04	-0.22	3.23

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well Windsock 21-9HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	20' KB + 5222' GE @ 5242.00usft
Site:	Windsock 15-21HZ	MD Reference:	20' KB + 5222' GE @ 5242.00usft
Well:	Windsock 21-9HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.15 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,637.00	14.77	132.38	4,493.42	-704.19	730.81	-719.22	3.84	-3.83	-1.18
4,730.00	16.28	140.10	4,583.04	-722.18	747.93	-737.56	2.75	1.62	8.30
4,822.00	13.14	137.24	4,672.01	-739.76	763.31	-755.45	3.50	-3.41	-3.11
4,914.00	10.47	139.93	4,762.06	-753.84	775.79	-769.79	2.96	-2.90	2.92
5,008.00	8.28	140.89	4,854.80	-765.63	785.56	-781.77	2.34	-2.33	1.02
5,100.00	6.50	142.54	4,946.03	-774.90	792.90	-791.20	1.95	-1.93	1.79
5,221.00	5.13	146.46	5,066.40	-784.85	800.06	-801.29	1.18	-1.13	3.24
5,314.00	4.35	148.06	5,159.08	-791.30	804.22	-807.84	0.85	-0.84	1.72
5,407.00	2.36	173.91	5,251.92	-796.20	806.29	-812.78	2.64	-2.14	27.80
5,500.00	1.67	175.59	5,344.87	-799.46	806.60	-816.04	0.74	-0.74	1.81
5,594.00	1.45	188.93	5,438.83	-802.00	806.52	-818.57	0.45	-0.23	14.19
5,686.00	1.32	179.60	5,530.81	-804.21	806.35	-820.78	0.28	-0.14	-10.14
5,781.00	1.03	209.80	5,625.79	-806.04	805.93	-822.61	0.71	-0.31	31.79
5,875.00	0.70	219.22	5,719.78	-807.22	805.15	-823.77	0.38	-0.35	10.02
5,967.00	0.62	222.77	5,811.77	-808.02	804.45	-824.55	0.10	-0.09	3.86
6,061.00	0.50	220.60	5,905.76	-808.71	803.84	-825.23	0.13	-0.13	-2.31
6,156.00	0.56	253.93	6,000.76	-809.15	803.13	-825.65	0.33	0.06	35.08
6,250.00	0.55	259.19	6,094.76	-809.36	802.24	-825.85	0.06	-0.01	5.60
6,343.00	0.69	294.95	6,187.75	-809.21	801.29	-825.68	0.43	0.15	38.45
6,436.00	1.34	285.47	6,280.74	-808.68	799.74	-825.12	0.72	0.70	-10.19
6,530.00	0.75	58.60	6,374.73	-808.07	799.20	-824.49	2.06	-0.63	141.63
6,623.00	1.59	7.08	6,467.71	-806.47	799.88	-822.91	1.36	0.90	-55.40
6,717.00	0.44	202.06	6,561.70	-805.51	799.91	-821.95	2.15	-1.22	-175.55
6,810.00	0.40	297.02	6,654.70	-805.69	799.48	-822.12	0.67	-0.04	102.11
6,903.00	1.65	169.49	6,747.69	-806.86	799.44	-823.29	2.06	1.34	-137.13
6,998.00	0.16	265.20	6,842.67	-808.22	799.56	-824.65	1.76	-1.57	100.75
7,091.00	2.62	321.68	6,935.64	-806.56	798.11	-822.96	2.73	2.65	60.73
7,185.00	0.36	261.28	7,029.60	-804.92	796.49	-821.29	2.62	-2.40	-64.26
7,279.00	0.54	245.03	7,123.60	-805.15	795.79	-821.51	0.23	0.19	-17.29
7,371.00	0.94	247.06	7,215.59	-805.63	794.70	-821.96	0.44	0.43	2.21
7,406.99	3.03	340.82	7,251.57	-804.85	794.12	-821.17	8.97	5.80	260.50
Curve KOP (Windsock 21-9HZ)									
7,465.00	8.15	351.54	7,309.28	-799.33	793.01	-815.63	8.97	8.83	18.47
7,558.00	15.74	355.08	7,400.20	-780.21	790.96	-796.47	8.20	8.16	3.81
7,651.00	22.76	2.47	7,487.96	-749.63	790.65	-765.89	7.98	7.55	7.95
7,745.00	28.20	2.32	7,572.79	-709.24	792.33	-725.54	5.79	5.79	-0.16
7,839.00	33.07	359.95	7,653.65	-661.37	793.21	-677.70	5.34	5.18	-2.52
7,932.00	39.78	354.43	7,728.45	-606.31	790.30	-622.59	8.02	7.22	-5.94
8,026.00	49.19	355.49	7,795.44	-540.77	784.57	-556.95	10.04	10.01	1.13
8,120.00	54.81	356.63	7,853.29	-466.90	779.51	-482.99	6.05	5.98	1.21
8,213.00	59.67	357.53	7,903.60	-388.82	775.54	-404.84	5.29	5.23	0.97
8,305.00	65.40	357.30	7,946.02	-307.30	771.86	-323.27	6.23	6.23	-0.25
8,399.00	73.83	359.51	7,978.73	-219.31	769.45	-235.24	9.23	8.97	2.35

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well Windsock 21-9HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	20' KB + 5222' GE @ 5242.00usft
Site:	Windsock 15-21HZ	MD Reference:	20' KB + 5222' GE @ 5242.00usft
Well:	Windsock 21-9HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.15 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,493.00	82.57	1.22	7,997.94	-127.39	770.06	-143.36	9.47	9.30	1.82
8,574.02	87.27	2.62	8,005.11	-46.76	772.77	-62.80	6.06	5.81	1.73
Heel (Windsock 21-9HZ)									
8,586.00	87.97	2.83	8,005.60	-34.80	773.34	-50.86	6.06	5.81	1.72
8,680.00	89.38	359.65	8,007.78	59.14	775.37	43.02	3.70	1.50	-3.38
8,765.35	92.04	359.95	8,006.72	144.47	775.07	128.34	3.14	3.12	0.35
Exit Heel Circle: 8765.35' MD, 426' FSL, 1513' FEL									
8,772.00	92.25	359.97	8,006.47	151.12	775.07	134.99	3.14	3.12	0.35
LP: 433' FSL, 1513' FEL S21 T1N R68W									
8,865.00	92.53	359.83	8,002.59	244.03	774.90	227.89	0.34	0.30	-0.15
8,958.00	90.53	0.40	8,000.11	337.00	775.09	320.83	2.24	-2.15	0.61
9,052.00	90.74	359.27	7,999.07	430.99	774.82	414.80	1.22	0.22	-1.20
9,146.00	91.16	359.93	7,997.51	524.97	774.16	508.78	0.83	0.45	0.70
9,240.00	91.33	359.52	7,995.47	618.95	773.71	602.75	0.47	0.18	-0.44
9,334.00	92.64	0.07	7,992.21	712.89	773.38	696.67	1.51	1.39	0.59
9,427.00	89.73	359.96	7,990.29	805.86	773.40	789.62	3.13	-3.13	-0.12
9,521.00	89.56	359.09	7,990.87	899.85	772.62	883.61	0.94	-0.18	-0.93
9,613.00	90.12	359.61	7,991.13	991.85	771.58	975.61	0.83	0.61	0.57
9,705.00	89.80	359.32	7,991.19	1,083.84	770.72	1,067.60	0.47	-0.35	-0.32
9,798.00	90.09	359.92	7,991.28	1,176.84	770.10	1,160.59	0.72	0.31	0.65
9,892.00	89.89	359.91	7,991.30	1,270.84	769.96	1,254.58	0.21	-0.21	-0.01
9,986.00	89.29	359.62	7,991.97	1,364.84	769.58	1,348.56	0.71	-0.64	-0.31
10,080.00	89.21	0.10	7,993.20	1,458.83	769.35	1,442.53	0.52	-0.09	0.51
10,174.00	89.94	0.94	7,993.90	1,552.82	770.20	1,536.49	1.18	0.78	0.89
10,268.00	89.32	0.58	7,994.50	1,646.81	771.45	1,630.43	0.76	-0.66	-0.38
10,360.00	88.93	358.81	7,995.91	1,738.79	770.96	1,722.41	1.97	-0.42	-1.92
10,452.00	91.00	359.62	7,995.97	1,830.78	769.70	1,814.40	2.42	2.25	0.88
10,546.00	91.43	358.25	7,993.97	1,924.74	767.95	1,908.37	1.53	0.46	-1.46
10,640.00	91.56	359.16	7,991.52	2,018.68	765.83	2,002.34	0.98	0.14	0.97
10,734.00	89.95	357.02	7,990.28	2,112.61	762.70	2,096.32	2.85	-1.71	-2.28
10,828.00	89.78	357.05	7,990.50	2,206.49	757.83	2,190.27	0.18	-0.18	0.03
10,921.00	90.35	358.01	7,990.40	2,299.40	753.83	2,283.25	1.20	0.61	1.03
11,015.00	90.62	358.04	7,989.60	2,393.34	750.59	2,377.23	0.29	0.29	0.03
11,108.00	89.56	358.50	7,989.45	2,486.30	747.78	2,470.23	1.24	-1.14	0.49
11,201.00	89.97	358.78	7,989.84	2,579.27	745.57	2,563.23	0.53	0.44	0.30
11,294.00	90.89	359.08	7,989.14	2,672.25	743.83	2,656.22	1.04	0.99	0.32
11,389.00	89.42	358.08	7,988.88	2,767.21	741.48	2,751.22	1.87	-1.55	-1.05
11,481.00	89.62	357.99	7,989.65	2,859.16	738.33	2,843.21	0.24	0.22	-0.10
11,574.00	89.18	357.40	7,990.63	2,952.08	734.59	2,936.18	0.79	-0.47	-0.63
11,668.00	90.04	357.08	7,991.27	3,045.96	730.06	3,030.15	0.98	0.91	-0.34
11,761.00	90.61	356.99	7,990.74	3,138.84	725.25	3,123.10	0.62	0.61	-0.10
11,856.00	89.91	359.06	7,990.31	3,233.77	721.98	3,218.08	2.30	-0.74	2.18
11,949.00	90.21	358.57	7,990.21	3,326.75	720.05	3,311.08	0.62	0.32	-0.53
12,041.00	90.70	358.44	7,989.48	3,418.72	717.65	3,403.08	0.55	0.53	-0.14

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well Windsock 21-9HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	20' KB + 5222' GE @ 5242.00usft
Site:	Windsock 15-21HZ	MD Reference:	20' KB + 5222' GE @ 5242.00usft
Well:	Windsock 21-9HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.15 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
12,134.00	88.36	358.72	7,990.24	3,511.68	715.35	3,496.07	2.53	-2.52	0.30	
12,228.00	88.49	358.20	7,992.83	3,605.61	712.82	3,590.03	0.57	0.14	-0.55	
12,322.00	88.57	357.21	7,995.24	3,699.50	709.06	3,683.98	1.06	0.09	-1.05	
12,414.00	88.55	357.25	7,997.55	3,791.37	704.61	3,775.92	0.05	-0.02	0.04	
12,509.00	88.07	355.33	8,000.35	3,886.12	698.47	3,870.78	2.08	-0.51	-2.02	
12,603.00	89.80	357.48	8,002.10	3,979.91	692.58	3,964.67	2.94	1.84	2.29	
12,698.00	88.44	358.08	8,003.56	4,074.83	688.90	4,059.64	1.56	-1.43	0.63	
12,792.00	89.50	357.89	8,005.25	4,168.75	685.59	4,153.61	1.15	1.13	-0.20	
12,887.00	90.72	357.76	8,005.06	4,263.68	681.99	4,248.60	1.29	1.28	-0.14	
12,980.00	91.28	357.88	8,003.44	4,356.60	678.45	4,341.57	0.62	0.60	0.13	
13,074.00	89.79	356.14	8,002.56	4,450.46	673.55	4,435.51	2.44	-1.59	-1.85	
13,168.00	91.44	357.63	8,001.55	4,544.31	668.44	4,529.45	2.37	1.76	1.59	
13,263.00	92.49	357.73	7,998.30	4,639.18	664.60	4,624.37	1.11	1.11	0.11	
13,270.16	92.43	357.81	7,997.99	4,646.32	664.32	4,631.52	1.38	-0.78	1.14	
Enter Toe Circle: 13270.16' MD 364' FNL, 1610' FEL										
13,358.00	91.75	358.81	7,994.78	4,734.07	661.73	4,719.30	1.38	-0.78	1.14	
13,452.00	92.63	358.30	7,991.19	4,827.97	659.36	4,813.23	1.08	0.94	-0.54	
13,528.00	93.08	357.59	7,987.41	4,903.82	656.64	4,889.13	1.11	0.59	-0.93	
13,583.00	93.08	357.59	7,984.45	4,958.69	654.33	4,944.03	0.00	0.00	0.00	
PBHL (Windsock 21-9HZ) - BHL: 55' FNL, 1619' FEL Sec 21 T1N R68W										

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well Windsock 21-9HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	20' KB + 5222' GE @ 5242.00usft
Site:	Windsock 15-21HZ	MD Reference:	20' KB + 5222' GE @ 5242.00usft
Well:	Windsock 21-9HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.15 Single User Db

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
SHL: 284' FSL, 2290' FE - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	14,537,711.70	1,638,370.67	40.030148	-105.007309
Enter Land Box: 3485.6i - actual wellpath hits target center - Point	0.00	0.00	3,391.46	-474.69	489.92	14,537,236.97	1,638,860.55	40.028845	-105.005559
Curve KOP (Windsock 2 - actual wellpath hits target center - Point	0.00	0.00	7,251.58	-804.85	794.12	14,536,906.79	1,639,164.72	40.027938	-105.004472
BHL: 55' FNL, 1619' FEI - actual wellpath hits target center - Point	0.00	0.00	7,984.45	4,958.69	654.33	14,542,670.33	1,639,025.40	40.043766	-105.004971
Enter Toe Circle: 13270. - actual wellpath hits target center - Point	0.00	0.00	7,997.99	4,646.32	664.32	14,542,357.96	1,639,035.37	40.042908	-105.004936
LP: 433' FSL, 1513' FEL - actual wellpath hits target center - Point	0.00	0.00	8,006.47	151.12	775.07	14,537,862.76	1,639,145.75	40.030563	-105.004540
Exit Heel Circle: 8765.3f - actual wellpath hits target center - Point	0.00	0.00	8,006.72	144.47	775.07	14,537,856.11	1,639,145.75	40.030545	-105.004540

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,901.00	1,878.55	9 5/8"	9-5/8	13-1/2	

Checked By: _____	Approved By: _____	Date: _____
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