

ANADARKO PETROLEUM CORP

Project: Weld County, CO (UTM-NAD83)  
Site: Windsock 15-21HZ  
Well: Windsock 21-7HZ  
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

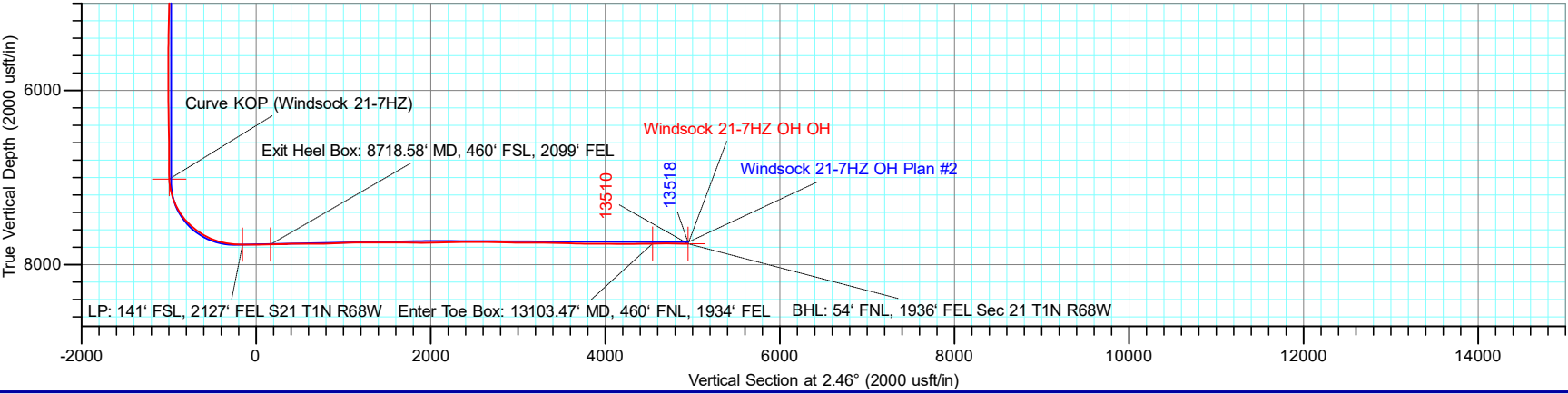
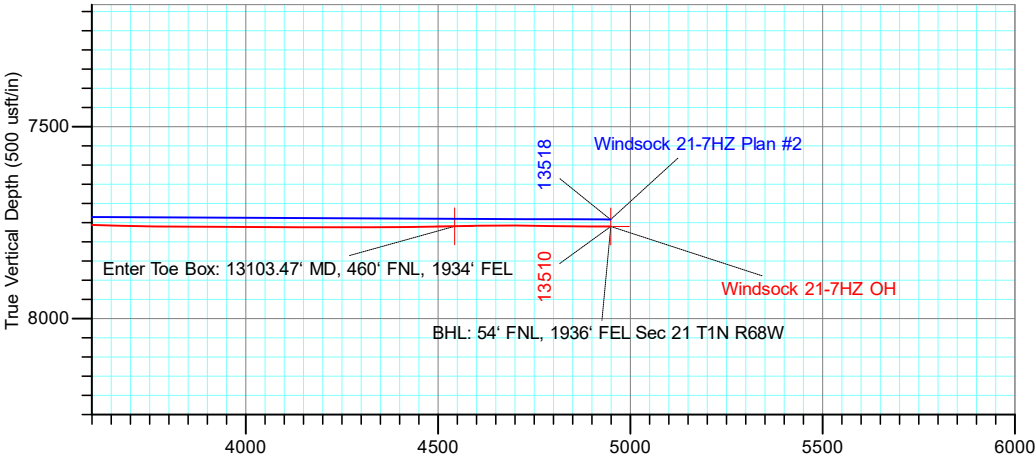
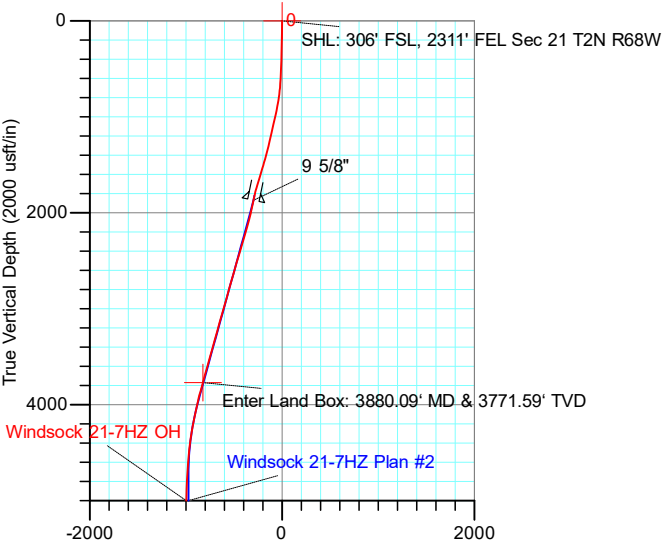
20' KB + 5222' GE @ 5242.00usft

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
BHL: 54' FNL, 1936' FEL Sec 21 T1N R68W	7760.37	4938.28	358.89	40.043767	-105.006102
Curve KOP (Windsock 21-7HZ)	7018.77	-1001.14	115.66	40.027457	-105.006971
Enter Land Box: 3880.09' MD & 3771.59' TVD	3771.59	-828.03	91.56	40.027932	-105.007057
Enter Toe Box: 13103.47' MD, 460' FNL, 1934' FEL	7759.65	4531.82	364.00	40.042651	-105.006083
Exit Heel Box: 8718.58' MD, 460' FSL, 2099' FEL	7768.44	155.58	212.02	40.030633	-105.006627
LP: 141' FSL, 2127' FEL S21 T1N R68W	7770.52	-164.00	187.46	40.029756	-105.006714
SHL: 306' FSL, 2311' FEL Sec 21 T2N R68W	0.00	0.00	0.00	40.030206	-105.007384

ACTUAL LINE CALLS

SHL: 306' FSL, 2311' FEL Sec 21 T2N R68W  
HEEL: 141' FSL, 2127' FEL S21 T1N R68W  
BHL: 54' FNL, 1936' FEL Sec 21 T1N R68W



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

Design: OH (Windsock 21-7HZ/OH)  
Windsock 15-21HZ  
Created By: Micah Ault  
Date: 21:34, February 16 2020  
Approved: \_\_\_\_\_  
Date: \_\_\_\_\_

# ANADARKO PETROLEUM CORP

Project: Weld County, CO (UTM-NAD83)  
 Site: Windsock 15-21HZ  
 Well: Windsock 21-7HZ  
 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)

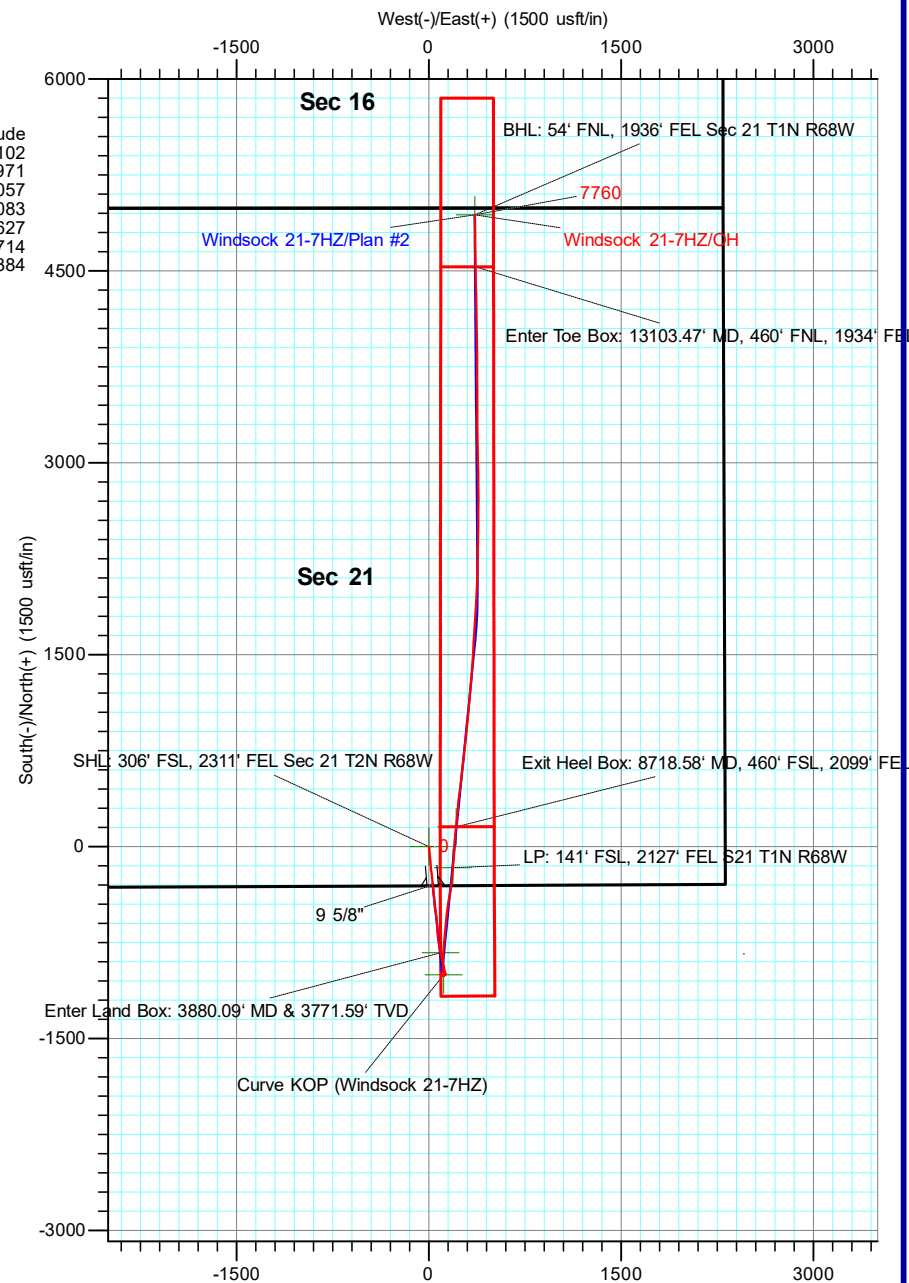
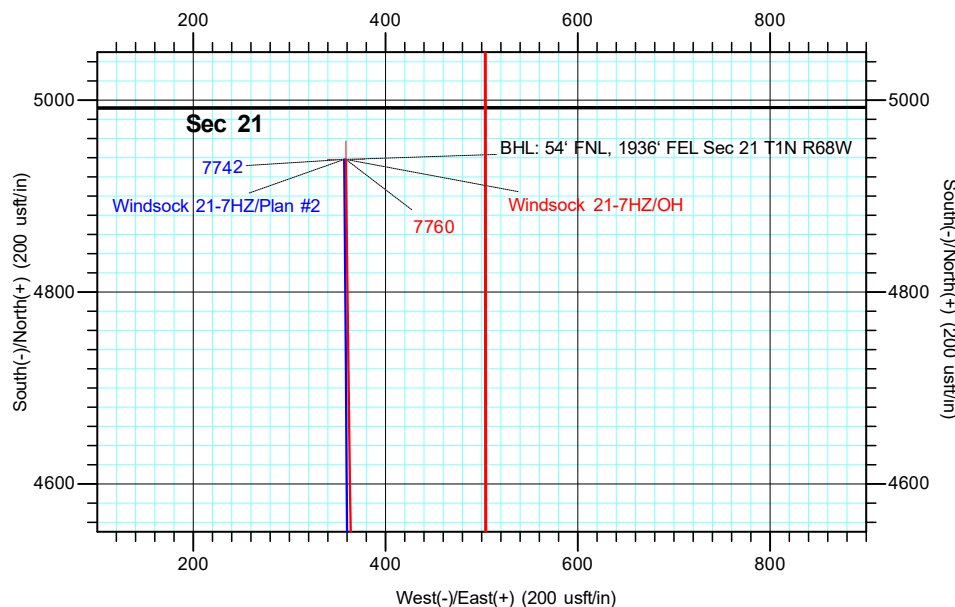


## DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
BHL: 54' FNL, 1936' FEL Sec 21 T1N R68W	7760.37	4938.28	358.89	14542671.07	1638708.98	40.043767	-105.006102
Curve KOP (Windsock 21-7HZ)	7018.77	-1001.14	115.66	14536731.67	1638465.26	40.027457	-105.006971
Enter Land Box: 3880.09' MD & 3771.59' TVD	3771.59	-828.03	91.56	14536904.78	1638441.17	40.027932	-105.007057
Enter Toe Box: 13103.47' MD, 460' FNL, 1934' FEL	7759.65	4531.82	364.00	14542264.61	1638714.06	40.042651	-105.006083
Exit Heel Box: 8718.58' MD, 460' FSL, 2099' FEL	7768.44	155.58	212.02	14537888.38	1638561.71	40.030633	-105.006627
LP: 141' FSL, 2127' FEL S21 T1N R68W	7770.52	-164.00	187.46	14537568.80	1638537.13	40.029756	-105.006714
SHL: 306' FSL, 2311' FEL Sec 21 T2N R68W	0.00	0.00	0.00	14537732.82	1638349.68	40.030206	-105.007384

## ACTUAL LINE CALLS

**SHL: 306' FSL, 2311' FEL Sec 21 T2N R68W**  
**HEEL: 141' FSL, 2127' FEL S21 T1N R68W**  
**BHL: 54' FNL, 1936' FEL Sec 21 T1N R68W**



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

Design: OH (Windsock 21-7HZ/OH)  
 Windsock 15-21HZ  
 Created By: Micah Ault  
 Date: 21:38, February 16 2020  
 Approved: \_\_\_\_\_  
 Date: \_\_\_\_\_



# **ANADARKO PETROLEUM CORP**

**Weld County, CO (UTM-NAD83)**

**Windsock 15-21HZ**

**Windsock 21-7HZ**

**OH**

**Design: OH**

## **Standard Survey Report**

**16 February, 2020**



<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well Windsock 21-7HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	20' KB + 5222' GE @ 5242.00usft
<b>Site:</b>	Windsock 15-21HZ	<b>MD Reference:</b>	20' KB + 5222' GE @ 5242.00usft
<b>Well:</b>	Windsock 21-7HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	EDM 5000.15 Single User Db

<b>Project</b>	Weld County, CO (UTM-NAD83)		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	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 21-7HZ					
Well Position	+N/-S	0.00 usft	Northing:	14,537,732.82 usft	Latitude:	40.030206
	+E/-W	0.00 usft	Easting:	1,638,349.68 usft	Longitude:	-105.007384
Position Uncertainty		3.28 usft	Wellhead Elevation:	usft	Ground Level:	5,222.00 usft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	11/25/2019	8.05	66.46	51,893.20489288

<b>Design</b>	OH				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	2.46	

<b>Survey Program</b>	<b>Date</b>	2/16/2020			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
130.00	1,854.00	Survey #1 - Surface (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
1,928.00	13,455.00	Survey #2 (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
13,510.00	13,510.00	Survey #3 (OH)	BLIND	OWSG BLIND	

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
<b>SHL (Windsock 21-7HZ) - SHL: 306' FSL, 2311' FEL Sec 21 T2N R68W</b>										
130.00	0.62	171.44	130.00	-0.70	0.10	-0.69	0.48	0.48	0.00	
225.00	1.05	167.57	224.99	-2.05	0.37	-2.04	0.46	0.45	-4.07	
320.00	1.67	171.61	319.96	-4.27	0.76	-4.24	0.66	0.65	4.25	
415.00	1.89	173.90	414.91	-7.20	1.13	-7.15	0.24	0.23	2.41	
510.00	2.37	163.00	509.85	-10.64	1.87	-10.55	0.66	0.51	-11.47	
606.00	3.38	171.53	605.73	-15.33	2.86	-15.20	1.14	1.05	8.89	
701.00	4.92	175.22	700.48	-22.16	3.62	-21.99	1.64	1.62	3.88	

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well Windsock 21-7HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	20' KB + 5222' GE @ 5242.00usft
<b>Site:</b>	Windsock 15-21HZ	<b>MD Reference:</b>	20' KB + 5222' GE @ 5242.00usft
<b>Well:</b>	Windsock 21-7HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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	8.04	177.59	794.86	-32.86	4.24	-32.65	3.30	3.28	2.49
892.00	10.85	175.57	889.55	-48.58	5.22	-48.31	2.95	2.93	-2.10
987.00	12.61	174.25	982.56	-67.82	6.95	-67.46	1.87	1.85	-1.39
1,082.00	13.49	172.41	1,075.10	-89.12	9.45	-88.63	1.02	0.93	-1.94
1,177.00	12.48	176.54	1,167.68	-110.35	11.53	-109.75	1.44	-1.06	4.35
1,273.00	13.18	175.22	1,261.28	-131.61	13.07	-130.93	0.79	0.73	-1.38
1,368.00	14.68	175.66	1,353.48	-154.41	14.88	-153.63	1.58	1.58	0.46
1,463.00	15.12	174.69	1,445.29	-178.75	16.94	-177.86	0.53	0.46	-1.02
1,558.00	17.31	172.05	1,536.50	-205.08	20.04	-204.04	2.43	2.31	-2.78
1,653.00	17.31	173.37	1,627.20	-233.12	23.63	-231.89	0.41	0.00	1.39
1,748.00	16.48	175.13	1,718.10	-260.59	26.40	-259.21	1.03	-0.87	1.85
1,844.00	13.49	173.81	1,810.83	-285.29	28.77	-283.79	3.13	-3.11	-1.38
1,854.00	13.32	175.22	1,820.55	-287.60	28.99	-286.09	3.68	-1.70	14.10
1,905.00	11.74	175.87	1,870.34	-298.63	29.85	-297.07	3.11	-3.10	1.27
9 5/8"									
1,928.00	11.03	176.22	1,892.89	-303.16	30.17	-301.59	3.11	-3.09	1.53
2,020.00	12.76	173.80	1,982.91	-322.04	31.84	-320.38	1.96	1.88	-2.63
2,114.00	15.06	171.52	2,074.15	-344.45	34.77	-342.64	2.51	2.45	-2.43
2,206.00	16.56	175.51	2,162.67	-369.34	37.56	-367.39	2.01	1.63	4.34
2,300.00	16.43	175.22	2,252.80	-395.94	39.71	-393.87	0.16	-0.14	-0.31
2,392.00	16.25	175.96	2,341.08	-421.75	41.70	-419.57	0.30	-0.20	0.80
2,485.00	16.25	175.47	2,430.37	-447.70	43.65	-445.41	0.15	0.00	-0.53
2,579.00	17.18	171.39	2,520.40	-474.54	46.77	-472.09	1.59	0.99	-4.34
2,671.00	15.61	168.96	2,608.65	-500.12	51.17	-497.47	1.86	-1.71	-2.64
2,765.00	16.33	171.84	2,699.03	-525.62	55.47	-522.75	1.14	0.77	3.06
2,858.00	16.01	174.08	2,788.35	-551.32	58.65	-548.29	0.75	-0.34	2.41
2,952.00	15.46	175.72	2,878.83	-576.70	60.92	-573.56	0.75	-0.59	1.74
3,045.00	15.53	172.91	2,968.45	-601.42	63.38	-598.15	0.81	0.08	-3.02
3,140.00	16.48	178.59	3,059.77	-627.51	65.28	-624.13	1.93	1.00	5.98
3,233.00	16.10	177.19	3,149.04	-653.58	66.24	-650.13	0.59	-0.41	-1.51
3,326.00	15.75	174.54	3,238.47	-679.02	68.07	-675.48	0.87	-0.38	-2.85
3,420.00	15.75	174.16	3,328.94	-704.42	70.58	-700.74	0.11	0.00	-0.40
3,513.00	15.86	172.71	3,418.42	-729.58	73.48	-725.75	0.44	0.12	-1.56
3,607.00	16.08	170.03	3,508.80	-755.14	77.36	-751.12	0.82	0.23	-2.85
3,699.00	15.90	170.40	3,597.24	-780.11	81.67	-775.89	0.22	-0.20	0.40
3,792.00	15.55	168.01	3,686.76	-804.87	86.39	-800.42	0.79	-0.38	-2.57
3,880.09	15.71	166.83	3,771.59	-828.03	91.56	-823.34	0.40	0.18	-1.34
Enter Land Box: 3880.09' MD & 3771.59' TVD									
3,887.00	15.72	166.74	3,778.24	-829.85	91.98	-825.14	0.40	0.18	-1.32
3,980.00	16.30	169.42	3,867.64	-854.94	97.27	-849.98	1.01	0.62	2.88
4,074.00	13.50	168.25	3,958.47	-878.66	101.93	-873.47	3.00	-2.98	-1.24
4,166.00	12.20	168.60	4,048.16	-898.70	106.04	-893.32	1.42	-1.41	0.38
4,261.00	11.83	167.55	4,141.08	-918.05	110.12	-912.48	0.45	-0.39	-1.11
4,356.00	11.02	167.89	4,234.20	-936.44	114.12	-930.68	0.86	-0.85	0.36

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<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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)
4,451.00	9.17	165.51	4,327.72	-952.65	117.92	-946.71	2.00	-1.95	-2.51
4,544.00	7.30	163.14	4,419.76	-965.48	121.49	-959.37	2.04	-2.01	-2.55
4,637.00	5.92	161.94	4,512.14	-975.69	124.69	-969.44	1.49	-1.48	-1.29
4,729.00	4.62	162.14	4,603.75	-983.73	127.30	-977.36	1.41	-1.41	0.22
4,822.00	3.80	160.83	4,696.50	-990.20	129.46	-983.74	0.89	-0.88	-1.41
4,914.00	2.88	159.87	4,788.34	-995.25	131.26	-988.70	1.00	-1.00	-1.04
5,008.00	2.13	211.12	4,882.26	-998.97	131.17	-992.42	2.41	-0.80	54.52
5,100.00	1.69	228.10	4,974.21	-1,001.34	129.27	-994.87	0.77	-0.48	18.46
5,220.00	1.64	233.68	5,094.16	-1,003.54	126.57	-997.18	0.14	-0.04	4.65
5,313.00	1.58	240.04	5,187.12	-1,004.96	124.39	-998.70	0.20	-0.06	6.84
5,406.00	2.00	242.10	5,280.07	-1,006.36	121.84	-1,000.21	0.46	0.45	2.22
5,499.00	2.22	238.13	5,373.01	-1,008.07	118.88	-1,002.04	0.28	0.24	-4.27
5,593.00	2.15	240.72	5,466.94	-1,009.90	115.80	-1,004.00	0.13	-0.07	2.76
5,685.00	0.82	285.79	5,558.91	-1,010.56	113.66	-1,004.75	1.82	-1.45	48.99
5,779.00	1.22	294.63	5,652.90	-1,009.96	112.10	-1,004.22	0.46	0.43	9.40
5,874.00	0.95	126.57	5,747.89	-1,010.01	111.81	-1,004.28	2.27	-0.28	-176.91
5,966.00	0.57	108.48	5,839.88	-1,010.61	112.86	-1,004.83	0.48	-0.41	-19.66
6,060.00	0.46	100.81	5,933.88	-1,010.83	113.67	-1,005.02	0.14	-0.12	-8.16
6,155.00	0.29	53.07	6,028.88	-1,010.76	114.24	-1,004.92	0.36	-0.18	-50.25
6,249.00	0.43	18.10	6,122.88	-1,010.28	114.54	-1,004.43	0.27	0.15	-37.20
6,341.00	0.52	7.62	6,214.87	-1,009.54	114.70	-1,003.68	0.14	0.10	-11.39
6,529.00	1.26	344.41	6,402.85	-1,006.70	114.26	-1,000.87	0.43	0.39	-12.35
6,622.00	1.63	353.17	6,495.82	-1,004.40	113.83	-998.59	0.46	0.40	9.42
6,716.00	0.06	340.25	6,589.81	-1,003.03	113.65	-997.22	1.67	-1.67	-13.74
6,809.00	0.59	43.50	6,682.81	-1,002.63	113.97	-996.82	0.61	0.57	68.01
6,902.00	0.62	161.04	6,775.80	-1,002.76	114.46	-996.93	1.11	0.03	126.39
6,997.00	0.69	65.86	6,870.80	-1,003.01	115.15	-997.15	1.02	0.07	-100.19
7,090.00	0.31	59.66	6,963.79	-1,002.66	115.88	-996.76	0.41	-0.41	-6.67
7,145.01	3.10	346.45	7,018.77	-1,001.14	115.66	-995.25	5.51	5.08	-133.10
Curve KOP (Windsock 21-7HZ)									
7,183.00	5.19	344.18	7,056.67	-998.48	114.95	-992.63	5.51	5.49	-5.97
7,277.00	13.45	355.32	7,149.35	-983.47	112.89	-977.72	8.95	8.79	11.85
7,370.00	17.62	356.97	7,238.93	-958.62	111.26	-952.96	4.51	4.48	1.77
7,464.00	27.59	0.86	7,325.61	-922.56	110.84	-916.95	10.72	10.61	4.14
7,557.00	31.72	0.11	7,406.41	-876.55	111.21	-870.97	4.46	4.44	-0.81
7,650.00	40.04	2.79	7,481.70	-822.13	112.71	-816.53	9.10	8.95	2.88
7,744.00	46.83	5.65	7,549.93	-757.73	117.57	-751.99	7.52	7.22	3.04
7,838.00	53.84	6.03	7,609.89	-685.80	124.94	-679.80	7.46	7.46	0.40
7,931.00	60.37	4.29	7,660.37	-608.07	131.91	-601.84	7.19	7.02	-1.87
8,025.00	65.40	6.05	7,703.20	-524.77	139.48	-518.30	5.60	5.35	1.87
8,119.00	74.20	9.86	7,735.64	-437.52	151.75	-430.60	10.10	9.36	4.05
8,212.00	81.29	9.86	7,755.37	-348.04	167.31	-340.54	7.62	7.62	0.00
8,304.00	85.10	5.20	7,766.27	-257.52	179.26	-249.58	6.51	4.14	-5.07

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well Windsock 21-7HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	20' KB + 5222' GE @ 5242.00usft
<b>Site:</b>	Windsock 15-21HZ	<b>MD Reference:</b>	20' KB + 5222' GE @ 5242.00usft
<b>Well:</b>	Windsock 21-7HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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)	
8,309.92	85.39	5.18	7,766.76	-251.64	179.79	-243.69	4.93	4.91	-0.40	
<b>Heel (Windsock 21-7HZ)</b>										
8,398.00	89.72	4.83	7,770.52	-164.00	187.46	-155.80	4.93	4.91	-0.39	
<b>LP: 141' FSL, 2127' FEL S21 T1N R68W</b>										
8,492.00	90.27	3.64	7,770.53	-70.25	194.40	-61.85	1.39	0.59	-1.27	
8,584.00	90.04	3.30	7,770.28	21.58	199.97	30.14	0.45	-0.25	-0.37	
8,679.00	91.19	6.20	7,769.26	116.23	207.84	125.05	3.28	1.21	3.05	
8,718.58	91.17	5.92	7,768.44	155.58	212.02	164.54	0.71	-0.04	-0.71	
<b>Exit Heel Box: 8718.58' MD, 460' FSL, 2099' FEL</b>										
8,771.00	91.15	5.55	7,767.38	207.73	217.25	216.86	0.71	-0.04	-0.71	
8,864.00	91.79	4.67	7,765.00	300.33	225.53	309.73	1.17	0.69	-0.95	
8,957.00	92.19	6.79	7,761.77	392.80	234.81	402.52	2.32	0.43	2.28	
9,051.00	89.73	7.52	7,760.19	486.05	246.52	496.18	2.73	-2.62	0.78	
9,145.00	89.64	6.86	7,760.71	579.31	258.28	589.86	0.71	-0.10	-0.70	
9,239.00	89.67	6.27	7,761.27	672.69	269.03	683.62	0.63	0.03	-0.63	
9,333.00	91.87	6.29	7,760.01	766.11	279.31	777.39	2.34	2.34	0.02	
9,426.00	92.97	5.63	7,756.08	858.52	288.96	870.14	1.38	1.18	-0.71	
9,520.00	91.99	5.38	7,752.02	952.00	297.97	963.91	1.08	-1.04	-0.27	
9,612.00	91.77	5.58	7,749.00	1,043.53	306.75	1,055.74	0.32	-0.24	0.22	
9,704.00	90.30	5.22	7,747.34	1,135.11	315.40	1,147.60	1.65	-1.60	-0.39	
9,797.00	90.88	4.54	7,746.38	1,227.76	323.32	1,240.51	0.96	0.62	-0.73	
9,891.00	89.11	4.69	7,746.39	1,321.45	330.88	1,334.44	1.89	-1.88	0.16	
9,985.00	89.60	4.28	7,747.45	1,415.16	338.23	1,428.37	0.68	0.52	-0.44	
10,079.00	90.19	3.35	7,747.62	1,508.95	344.48	1,522.35	1.17	0.63	-0.99	
10,173.00	90.56	3.15	7,747.00	1,602.80	349.81	1,616.33	0.45	0.39	-0.21	
10,267.00	89.15	4.22	7,747.24	1,696.60	355.85	1,710.31	1.88	-1.50	1.14	
10,359.00	88.30	3.36	7,749.29	1,788.37	361.93	1,802.26	1.31	-0.92	-0.93	
10,451.00	90.56	3.34	7,750.20	1,880.21	367.31	1,894.24	2.46	2.46	-0.02	
10,545.00	91.12	2.52	7,748.82	1,974.07	372.11	1,988.22	1.06	0.60	-0.87	
10,639.00	91.26	2.03	7,746.87	2,067.98	375.84	2,082.20	0.54	0.15	-0.52	
10,733.00	91.33	1.74	7,744.75	2,161.90	378.93	2,176.17	0.32	0.07	-0.31	
10,827.00	91.73	1.33	7,742.24	2,255.83	381.45	2,270.13	0.61	0.43	-0.44	
10,920.00	90.01	0.36	7,740.83	2,348.81	382.82	2,363.08	2.12	-1.85	-1.04	
11,014.00	90.01	0.78	7,740.81	2,442.80	383.76	2,457.02	0.45	0.00	0.45	
11,107.00	89.76	0.77	7,741.00	2,535.80	385.02	2,549.98	0.27	-0.27	-0.01	
11,200.00	89.40	0.41	7,741.68	2,628.79	385.97	2,642.93	0.55	-0.39	-0.39	
11,293.00	89.32	359.99	7,742.72	2,721.78	386.30	2,735.85	0.46	-0.09	-0.45	
11,388.00	88.62	359.59	7,744.42	2,816.76	385.95	2,830.73	0.85	-0.74	-0.42	
11,480.00	88.06	358.65	7,747.09	2,908.71	384.54	2,922.54	1.19	-0.61	-1.02	
11,573.00	89.89	358.77	7,748.75	3,001.67	382.44	3,015.32	1.97	1.97	0.13	
11,667.00	90.52	358.45	7,748.42	3,095.64	380.16	3,109.11	0.75	0.67	-0.34	
11,760.00	89.60	359.82	7,748.32	3,188.63	378.76	3,201.95	1.77	-0.99	1.47	
11,855.00	89.41	359.76	7,749.14	3,283.62	378.41	3,296.84	0.21	-0.20	-0.06	
11,948.00	88.65	359.65	7,750.71	3,376.61	377.93	3,389.72	0.83	-0.82	-0.12	

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well Windsock 21-7HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	20' KB + 5222' GE @ 5242.00usft
<b>Site:</b>	Windsock 15-21HZ	<b>MD Reference:</b>	20' KB + 5222' GE @ 5242.00usft
<b>Well:</b>	Windsock 21-7HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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)	
12,040.00	88.35	359.83	7,753.12	3,468.58	377.52	3,481.58	0.38	-0.33	0.20	
12,133.00	88.47	359.70	7,755.70	3,561.54	377.13	3,574.44	0.19	0.13	-0.14	
12,227.00	88.38	359.63	7,758.29	3,655.50	376.59	3,668.30	0.12	-0.10	-0.07	
12,321.00	89.50	359.75	7,760.03	3,749.48	376.08	3,762.17	1.20	1.19	0.13	
12,413.00	89.70	359.69	7,760.67	3,841.48	375.63	3,854.06	0.23	0.22	-0.07	
12,508.00	89.54	359.42	7,761.30	3,936.47	374.89	3,948.94	0.33	-0.17	-0.28	
12,602.00	89.68	359.15	7,761.94	4,030.47	373.72	4,042.79	0.32	0.15	-0.29	
12,697.00	89.96	359.08	7,762.24	4,125.45	372.25	4,137.63	0.30	0.29	-0.07	
12,791.00	89.97	358.75	7,762.29	4,219.44	370.47	4,231.45	0.35	0.01	-0.35	
12,886.00	90.04	358.83	7,762.29	4,314.42	368.46	4,326.25	0.11	0.07	0.08	
12,979.00	90.50	358.68	7,761.85	4,407.39	366.44	4,419.06	0.52	0.49	-0.16	
13,073.00	91.33	358.98	7,760.35	4,501.36	364.52	4,512.86	0.94	0.88	0.32	
13,103.47	91.29	359.06	7,759.65	4,531.82	364.00	4,543.27	0.29	-0.14	0.26	
<b>Enter Toe Box: 13103.47' MD, 460' FNL, 1934' FEL</b>										
13,167.00	91.20	359.22	7,758.27	4,595.32	363.05	4,606.67	0.29	-0.14	0.26	
13,262.00	89.26	359.32	7,757.89	4,690.31	361.84	4,701.52	2.04	-2.04	0.11	
13,357.00	89.14	359.23	7,759.22	4,785.29	360.63	4,796.36	0.16	-0.13	-0.09	
13,455.00	89.77	359.40	7,760.15	4,883.28	359.46	4,894.21	0.67	0.64	0.17	
13,509.91	89.77	359.40	7,760.37	4,938.19	358.89	4,949.05	0.00	0.00	0.00	
<b>PBHL (Windsock 21-7HZ)</b>										
13,510.00	89.77	359.40	7,760.37	4,938.28	358.89	4,949.13	0.00	0.00	0.00	
<b>BHL: 54' FNL, 1936' FEL Sec 21 T1N R68W</b>										



<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well Windsock 21-7HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	20' KB + 5222' GE @ 5242.00usft
<b>Site:</b>	Windsock 15-21HZ	<b>MD Reference:</b>	20' KB + 5222' GE @ 5242.00usft
<b>Well:</b>	Windsock 21-7HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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: 306' FSL, 2311' FE - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	14,537,732.82	1,638,349.68	40.030206	-105.007384
Enter Land Box: 3880.00 - actual wellpath hits target center - Point	0.00	0.00	3,771.59	-828.03	91.56	14,536,904.79	1,638,441.17	40.027932	-105.007057
Curve KOP (Windsock 2 - actual wellpath misses target center by 0.01usft at 7145.00usft MD (7018.77 TVD, -1001.14 N, 115.66 E) - Point	0.00	0.00	7,018.77	-1,001.14	115.66	14,536,731.68	1,638,465.25	40.027457	-105.006971
Enter Toe Box: 13103.47 - actual wellpath hits target center - Point	0.00	0.00	7,759.65	4,531.82	364.00	14,542,264.60	1,638,714.05	40.042651	-105.006084
BHL: 54' FNL, 1936' FEI - actual wellpath hits target center - Point	0.00	0.00	7,760.37	4,938.28	358.89	14,542,671.07	1,638,708.98	40.043767	-105.006102
Exit Heel Box: 8718.58'   - actual wellpath misses target center by 0.01usft at 8718.58usft MD (7768.44 TVD, 155.58 N, 212.02 E) - Point	0.00	0.00	7,768.44	155.58	212.02	14,537,888.39	1,638,561.71	40.030633	-105.006627
LP: 141' FSL, 2127' FEL - actual wellpath hits target center - Point	0.00	0.00	7,770.52	-164.00	187.46	14,537,568.81	1,638,537.12	40.029756	-105.006715

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,905.00	1,870.34	9 5/8"	9-5/8	13-1/2	

Checked By: _____	Approved By: _____	Date: _____
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