

ANADARKO PETROLEUM CORP

Project: Weld County, CO (UTM-NAD83)  
Site: Windsock 15-21HZ  
Well: Windsock 21-11HZ  
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

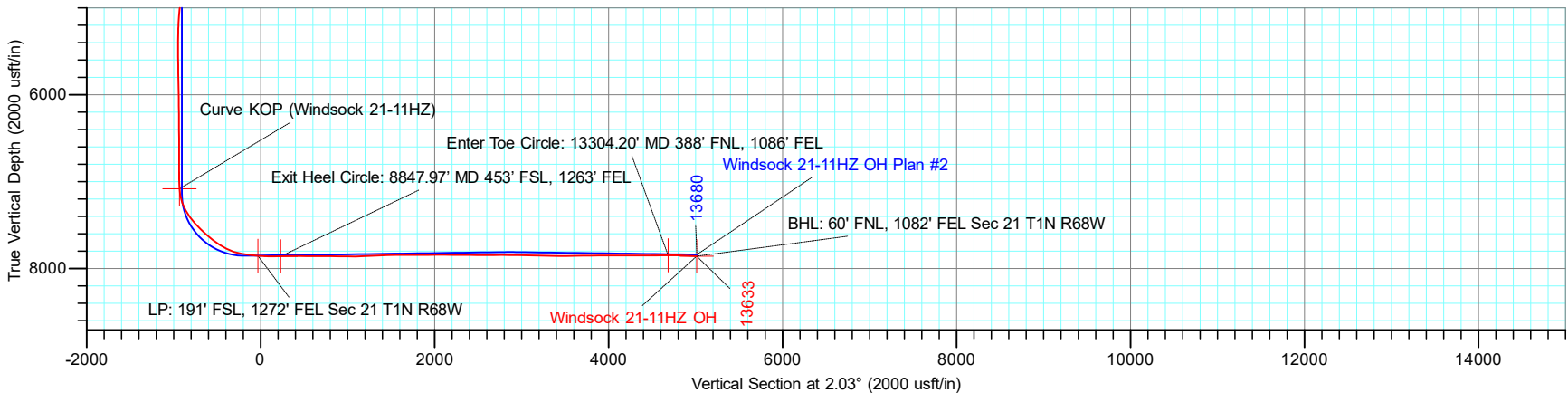
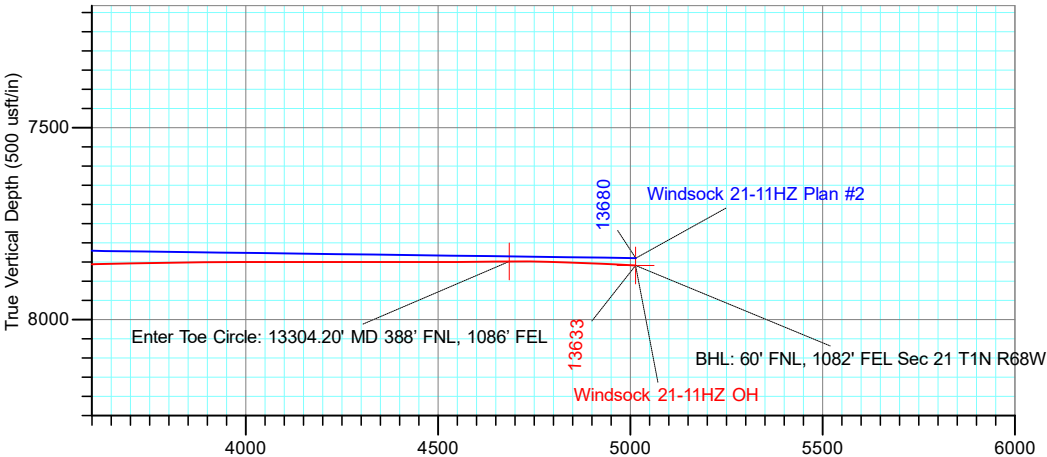
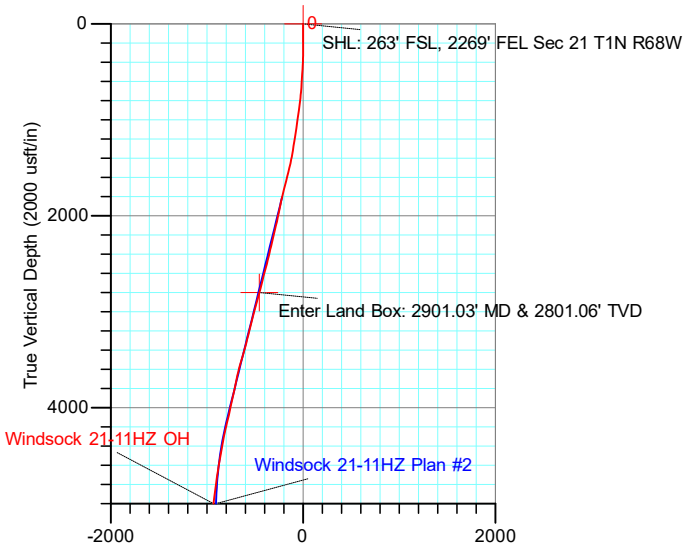
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
BHL: 60' FNL, 1082' FEL Sec 21 T1N R68W	7859.28	4975.35	1171.43	40.043752	-105.003048
Curve KOP (Windsock 21-11HZ)	7083.61	-967.34	955.44	40.027432	-105.003821
Enter Land Box: 2901.03' MD & 2801.06' TVD	2801.06	-471.27	469.01	40.028795	-105.005559
Enter Toe Circle: 13304.20' MD 388' FNL, 1086' FEL	7848.65	4646.80	1168.29	40.042850	-105.003060
Exit Heel Circle: 8847.97' MD 453' FSL, 1263' FEL	7860.10	194.75	1006.50	40.030624	-105.003638
LP: 191' FSL, 1272' FEL Sec 21 T1N R68W	7854.73	-66.83	996.42	40.029905	-105.003674
SHL: 263' FSL, 2269' FEL Sec 21 T1N R68W	0.00	0.00	0.00	40.030089	-105.007234

ACTUAL LINE CALLS

SHL: 263' FSL, 2269' FEL Sec 21 T1N R68W

HEEL: 191' FSL, 1272' FEL Sec 21 T1N R68W

BHL: 60' FNL, 1082' FEL Sec 21 T1N R68W



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

Design: OH (Windsock 21-11HZ/OH)  
Windsock 15-21HZ  
Created By: Micah Ault  
Date: 17:05, February 19 2020  
Approved: \_\_\_\_\_  
Date: \_\_\_\_\_

# ANADARKO PETROLEUM CORP

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 Site: Windsock 15-21HZ  
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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)

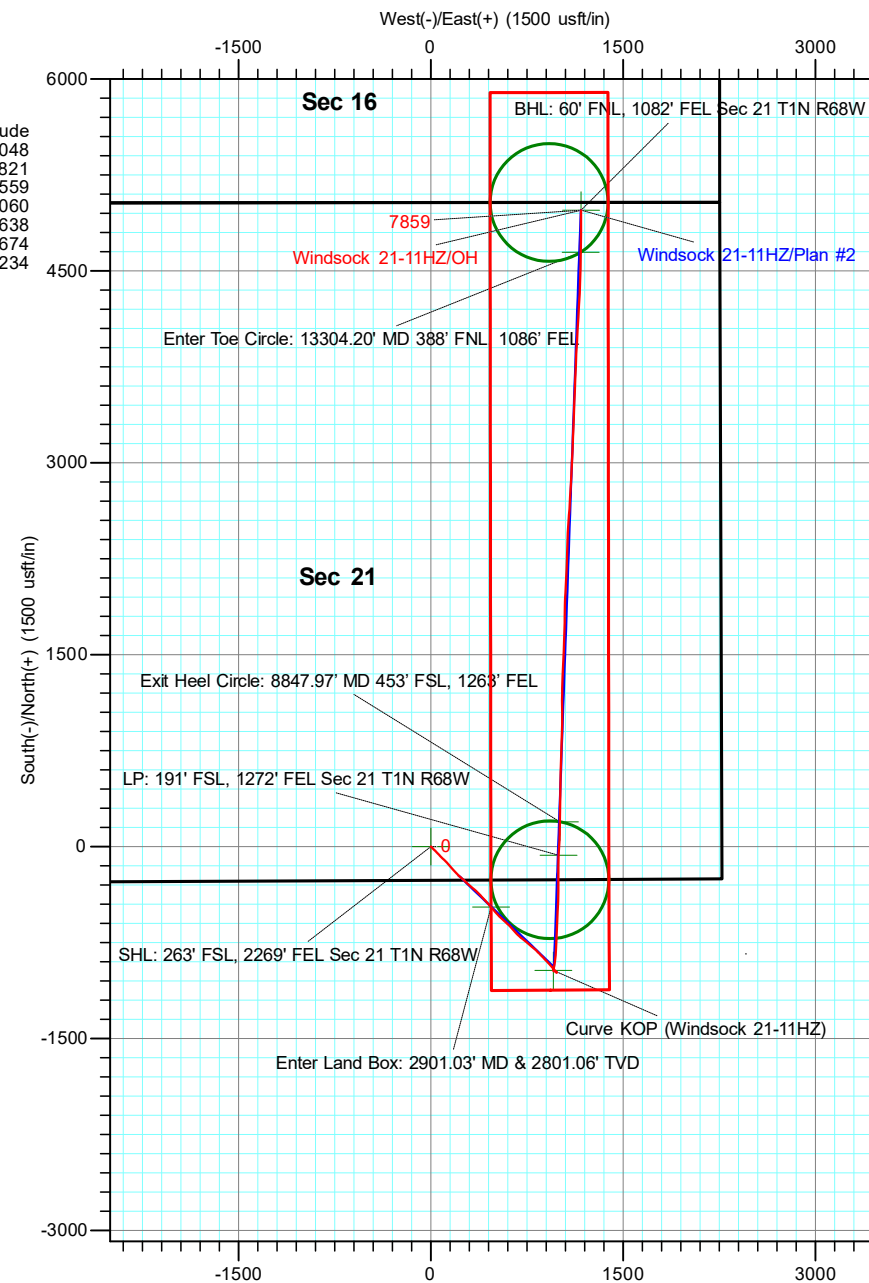
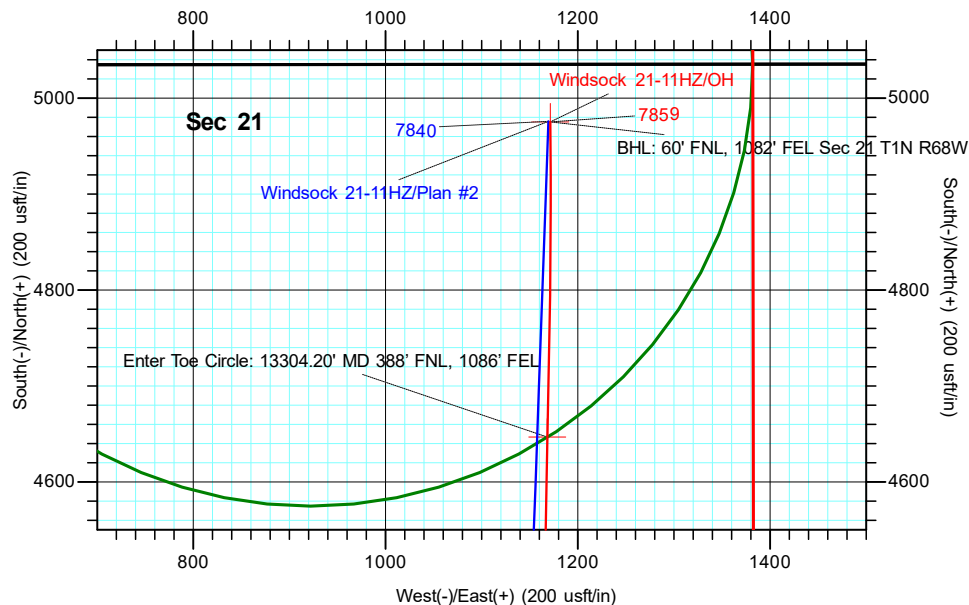


## DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
BHL: 60' FNL, 1082' FEL Sec 21 T1N R68W	7859.28	4975.35	1171.43	14542665.46	1639563.49	40.043752	-105.003048
Curve KOP (Windsock 21-11HZ)	7083.61	-967.34	955.44	14536722.79	1639347.02	40.027432	-105.003821
Enter Land Box: 2901.03' MD & 2801.06' TVD	2801.06	-471.27	469.01	14537218.90	1638860.63	40.028795	-105.005559
Enter Toe Circle: 13304.20' MD 388' FNL, 1086' FEL	7848.65	4646.80	1168.29	14542336.92	1639560.33	40.042850	-105.003060
Exit Heel Circle: 8847.97' MD 453' FSL, 1263' FEL	7860.10	194.75	1006.50	14537884.88	1639398.18	40.030624	-105.003638
LP: 191' FSL, 1272' FEL Sec 21 T1N R68W	7854.73	-66.83	996.42	14537623.30	1639388.07	40.029905	-105.003674
SHL: 263' FSL, 2269' FEL Sec 21 T1N R68W	0.00	0.00	0.00	14537690.21	1638391.66	40.030089	-105.007234

## ACTUAL LINE CALLS

**SHL: 263' FSL, 2269' FEL Sec 21 T1N R68W**  
**HEEL: 191' FSL, 1272' FEL Sec 21 T1N R68W**  
**BHL: 60' FNL, 1082' FEL Sec 21 T1N R68W**



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

Design: OH (Windsock 21-11HZ/OH)  
 Windsock 15-21HZ  
 Created By: Micah Ault  
 Date: 17:05, February 19 2020  
 Approved: \_\_\_\_\_  
 Date: \_\_\_\_\_



# **ANADARKO PETROLEUM CORP**

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

**Windsock 15-21HZ**

**Windsock 21-11HZ**

**OH**

**Design: OH**

## **Standard Survey Report**

**19 February, 2020**



<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well Windsock 21-11HZ
<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 21-11HZ	<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 21-11HZ					
Well Position	+N/-S	0.00 usft	Northing:	14,537,690.21 usft	Latitude:	40.030089
	+E/-W	0.00 usft	Easting:	1,638,391.66 usft	Longitude:	-105.007234
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	51,893.15982262

<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	2.03	

<b>Survey Program</b>	<b>Date</b>	2/19/2020			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
143.00	1,844.00	Survey #1 - Surface Surveys (OH) (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
1,928.00	13,578.00	Survey #2 (OH) (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
13,633.00	13,633.00	Survey #3 - Proj to TD (OH) (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 21-11HZ) - SHL: 263' FSL, 2269' FEL Sec 21 T1N R68W</b>										
143.00	0.48	44.03	143.00	0.43	0.42	0.45	0.34	0.34	0.00	
238.00	0.09	242.98	238.00	0.68	0.63	0.70	0.60	-0.41	-169.53	
333.00	1.10	120.64	332.99	0.18	1.34	0.23	1.21	1.06	-128.78	
428.00	4.00	141.73	427.89	-2.88	4.18	-2.73	3.16	3.05	22.20	
523.00	5.36	133.21	522.57	-8.52	9.47	-8.18	1.60	1.43	-8.97	
619.00	5.84	135.32	618.11	-15.07	16.17	-14.48	0.54	0.50	2.20	
714.00	7.16	132.68	712.50	-22.52	23.92	-21.65	1.42	1.39	-2.78	

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well Windsock 21-11HZ
<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 21-11HZ	<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)	
809.00	10.11	134.88	806.41	-32.41	34.18	-31.18	3.12	3.11	2.32	
905.00	11.03	136.99	900.78	-45.08	46.42	-43.40	1.04	0.96	2.20	
1,000.00	10.85	136.46	994.06	-58.20	58.78	-56.08	0.22	-0.19	-0.56	
1,095.00	12.44	137.51	1,087.10	-72.23	71.85	-69.64	1.69	1.67	1.11	
1,190.00	12.35	134.96	1,179.89	-86.95	85.95	-83.86	0.58	-0.09	-2.68	
1,286.00	13.36	132.50	1,273.48	-101.70	101.39	-98.05	1.20	1.05	-2.56	
1,381.00	14.55	135.23	1,365.67	-117.59	117.89	-113.34	1.43	1.25	2.87	
1,476.00	17.40	139.53	1,457.00	-136.87	135.52	-131.99	3.25	3.00	4.53	
1,571.00	18.41	138.92	1,547.40	-158.99	154.60	-153.41	1.08	1.06	-0.64	
1,666.00	19.62	137.25	1,637.21	-182.01	175.28	-175.68	1.40	1.27	-1.76	
1,761.00	20.00	137.78	1,726.59	-205.75	197.02	-198.64	0.44	0.40	0.56	
1,844.00	19.10	132.97	1,804.81	-225.52	216.50	-217.71	2.22	-1.08	-5.80	
1,928.00	17.96	130.28	1,884.45	-243.26	236.44	-234.73	1.70	-1.36	-3.20	
2,021.00	17.64	132.36	1,973.00	-262.03	257.79	-252.73	0.77	-0.34	2.24	
2,114.00	19.28	133.17	2,061.22	-282.03	279.40	-271.95	1.78	1.76	0.87	
2,207.00	20.39	132.36	2,148.70	-303.45	302.57	-292.54	1.23	1.19	-0.87	
2,300.00	20.76	129.39	2,235.77	-324.82	327.28	-313.03	1.19	0.40	-3.19	
2,393.00	20.37	132.81	2,322.84	-346.28	351.89	-333.60	1.36	-0.42	3.68	
2,485.00	18.14	135.49	2,409.69	-367.38	373.68	-353.91	2.61	-2.42	2.91	
2,579.00	20.39	137.76	2,498.43	-389.94	394.95	-375.71	2.52	2.39	2.41	
2,671.00	20.98	136.78	2,584.49	-413.81	417.00	-398.78	0.74	0.64	-1.07	
2,765.00	19.71	136.48	2,672.63	-437.57	439.44	-421.73	1.36	-1.35	-0.32	
2,858.00	18.96	139.95	2,760.39	-460.51	459.97	-443.92	1.47	-0.81	3.73	
2,901.04	19.18	139.99	2,801.06	-471.27	469.01	-454.37	0.52	0.52	0.10	
Enter Land Box: 2901.03' MD & 2801.06' TVD										
2,952.00	19.45	140.04	2,849.15	-484.19	479.84	-466.89	0.52	0.52	0.09	
3,046.00	20.95	138.03	2,937.37	-508.68	501.13	-490.61	1.76	1.60	-2.14	
3,140.00	20.07	137.94	3,025.41	-533.15	523.18	-514.29	0.94	-0.94	-0.10	
3,233.00	20.88	132.92	3,112.54	-556.29	546.01	-536.60	2.08	0.87	-5.40	
3,327.00	21.54	131.76	3,200.17	-579.19	571.15	-558.60	0.83	0.70	-1.23	
3,420.00	20.02	133.98	3,287.12	-601.62	595.34	-580.15	1.84	-1.63	2.39	
3,513.00	21.65	136.49	3,374.04	-625.12	618.61	-602.81	2.00	1.75	2.70	
3,607.00	22.48	138.16	3,461.16	-651.08	642.53	-627.91	1.11	0.88	1.78	
3,699.00	21.71	136.71	3,546.40	-676.57	665.93	-652.56	1.03	-0.84	-1.58	
3,792.00	20.63	133.29	3,633.13	-700.33	689.66	-675.46	1.76	-1.16	-3.68	
3,888.00	19.52	126.23	3,723.31	-721.41	714.91	-695.63	2.77	-1.16	-7.35	
3,981.00	18.76	131.06	3,811.17	-740.41	738.72	-713.78	1.89	-0.82	5.19	
4,074.00	19.43	130.61	3,899.05	-760.30	761.74	-732.84	0.74	0.72	-0.48	
4,167.00	19.51	130.23	3,986.73	-780.40	785.34	-752.09	0.16	0.09	-0.41	
4,262.00	19.38	130.67	4,076.32	-800.92	809.40	-771.75	0.21	-0.14	0.46	
4,356.00	19.71	134.50	4,164.90	-822.20	832.54	-792.19	1.41	0.35	4.07	
4,451.00	17.03	137.25	4,255.05	-843.64	853.41	-812.88	2.96	-2.82	2.89	
4,544.00	15.65	134.27	4,344.30	-862.40	871.64	-830.99	1.74	-1.48	-3.20	

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<b>Design:</b>	OH	<b>Database:</b>	EDM 5000.15 Single User Db

Survey										
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4,637.00	14.11	136.80	4,434.18	-879.42	888.38	-847.40	1.80	-1.66	2.72	
4,730.00	13.65	137.82	4,524.46	-895.82	903.51	-863.25	0.56	-0.49	1.10	
4,822.00	13.18	137.40	4,613.95	-911.58	917.90	-878.50	0.52	-0.51	-0.46	
4,914.00	11.77	135.80	4,703.78	-926.03	931.54	-892.45	1.58	-1.53	-1.74	
5,008.00	10.13	140.07	4,796.06	-939.25	943.53	-905.23	1.95	-1.74	4.54	
5,100.00	9.66	141.23	4,886.70	-951.47	953.56	-917.09	0.55	-0.51	1.26	
5,221.00	8.25	136.40	5,006.22	-965.67	965.91	-930.85	1.32	-1.17	-3.99	
5,314.00	6.35	137.58	5,098.46	-974.30	973.98	-939.19	2.05	-2.04	1.27	
5,408.00	3.70	132.60	5,192.09	-980.19	979.72	-944.87	2.85	-2.82	-5.30	
5,501.00	0.95	184.39	5,285.01	-982.99	981.87	-947.59	3.44	-2.96	55.69	
5,595.00	0.40	220.75	5,379.01	-984.02	981.59	-948.63	0.71	-0.59	38.68	
5,687.00	0.35	288.74	5,471.00	-984.17	981.12	-948.80	0.46	-0.05	73.90	
5,781.00	0.70	325.65	5,565.00	-983.60	980.52	-948.25	0.50	0.37	39.27	
5,875.00	0.82	327.48	5,658.99	-982.56	979.84	-947.24	0.13	0.13	1.95	
5,968.00	0.94	335.31	5,751.98	-981.31	979.16	-946.01	0.18	0.13	8.42	
6,062.00	1.29	329.08	5,845.96	-979.70	978.29	-944.43	0.39	0.37	-6.63	
6,156.00	2.28	295.62	5,939.92	-977.98	976.06	-942.80	1.49	1.05	-35.60	
6,250.00	1.63	289.29	6,033.86	-976.73	973.12	-941.65	0.73	-0.69	-6.73	
6,343.00	1.46	292.55	6,126.83	-975.84	970.77	-940.84	0.21	-0.18	3.51	
6,437.00	1.50	294.99	6,220.80	-974.86	968.55	-939.94	0.08	0.04	2.60	
6,530.00	1.49	288.85	6,313.77	-973.96	966.31	-939.12	0.17	-0.01	-6.60	
6,624.00	1.50	305.75	6,407.74	-972.85	964.15	-938.08	0.47	0.01	17.98	
6,717.00	0.64	232.52	6,500.72	-972.45	962.75	-937.74	1.56	-0.92	-78.74	
6,810.00	1.09	285.61	6,593.71	-972.53	961.49	-937.86	0.94	0.48	57.09	
6,904.00	0.84	279.53	6,687.70	-972.17	959.95	-937.56	0.29	-0.27	-6.47	
6,998.00	0.89	251.08	6,781.69	-972.30	958.57	-937.73	0.46	0.05	-30.27	
7,092.00	0.78	308.31	6,875.68	-972.14	957.38	-937.61	0.86	-0.12	60.88	
7,185.00	1.31	336.66	6,968.67	-970.77	956.46	-936.28	0.78	0.57	30.48	
7,279.00	1.90	341.98	7,062.63	-968.30	955.56	-933.84	0.65	0.63	5.66	
7,299.99	3.40	358.73	7,083.60	-967.35	955.44	-932.89	7.98	7.16	79.78	
Curve KOP (Windsock 21-11HZ)										
7,372.00	9.03	10.76	7,155.16	-959.65	956.44	-925.17	7.98	7.82	16.71	
7,466.00	21.01	9.77	7,245.78	-935.71	960.70	-901.09	12.75	12.74	-1.05	
7,558.00	29.55	10.03	7,328.89	-897.05	967.46	-862.21	9.28	9.28	0.28	
7,652.00	34.40	2.79	7,408.64	-847.65	972.79	-812.66	6.57	5.16	-7.70	
7,745.00	41.60	2.74	7,481.87	-790.50	975.55	-755.45	7.74	7.74	-0.05	
7,839.00	46.84	3.12	7,549.22	-725.05	978.91	-689.92	5.58	5.57	0.40	
7,932.00	48.03	2.72	7,612.12	-656.65	982.40	-621.43	1.32	1.28	-0.43	
8,026.00	51.06	1.54	7,673.11	-585.18	985.04	-549.92	3.36	3.22	-1.26	
8,120.00	58.54	3.07	7,727.26	-508.49	988.17	-473.17	8.07	7.96	1.63	
8,213.00	61.50	3.00	7,773.72	-428.05	992.44	-392.63	3.18	3.18	-0.08	
8,305.00	72.23	0.48	7,809.82	-343.62	994.93	-308.16	11.93	11.66	-2.74	
8,399.00	81.20	359.16	7,831.40	-252.23	994.62	-216.84	9.64	9.54	-1.40	
8,440.07	81.42	359.48	7,837.60	-211.64	994.14	-176.29	0.95	0.55	0.79	

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well Windsock 21-11HZ
<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 21-11HZ	<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)
<b>Heel (Windsock 21-11HZ)</b>									
8,494.00	81.72	359.91	7,845.51	-158.29	993.86	-122.99	0.95	0.55	0.79
8,586.00	86.78	3.28	7,854.73	-66.83	996.42	-31.49	6.60	5.50	3.66
<b>LP: 191' FSL, 1272' FEL Sec 21 T1N R68W</b>									
8,680.00	87.44	3.18	7,859.47	26.90	1,001.71	62.36	0.71	0.70	-0.11
8,772.00	90.44	1.12	7,861.17	118.80	1,005.16	154.33	3.96	3.26	-2.24
8,847.97	91.18	0.91	7,860.10	194.75	1,006.50	230.28	1.01	0.97	-0.28
<b>Exit Heel Circle: 8847.97' MD 453' FSL, 1263' FEL</b>									
8,866.00	91.35	0.86	7,859.70	212.78	1,006.78	248.30	1.01	0.97	-0.28
8,958.00	90.82	0.88	7,857.96	304.75	1,008.18	340.27	0.58	-0.58	0.02
9,052.00	89.18	1.27	7,857.96	398.73	1,009.94	434.25	1.79	-1.74	0.41
9,146.00	89.54	0.46	7,859.01	492.71	1,011.36	528.23	0.94	0.38	-0.86
9,241.00	90.83	1.05	7,858.70	587.70	1,012.61	623.20	1.49	1.36	0.62
9,334.00	89.04	1.75	7,858.81	680.67	1,014.88	716.19	2.07	-1.92	0.75
9,427.00	89.63	2.34	7,859.89	773.60	1,018.20	809.18	0.90	0.63	0.63
9,521.00	89.41	1.71	7,860.67	867.54	1,021.52	903.18	0.71	-0.23	-0.67
9,613.00	88.95	0.76	7,861.99	959.51	1,023.51	995.16	1.15	-0.50	-1.03
9,706.00	90.59	359.38	7,862.36	1,052.50	1,023.62	1,088.10	2.30	1.76	-1.48
9,799.00	92.94	0.15	7,859.50	1,145.45	1,023.24	1,180.97	2.66	2.53	0.83
9,892.00	92.39	1.40	7,855.17	1,238.34	1,024.49	1,273.85	1.47	-0.59	1.34
9,987.00	92.29	2.11	7,851.30	1,333.21	1,027.40	1,368.77	0.75	-0.11	0.75
10,080.00	91.83	2.43	7,847.95	1,426.08	1,031.08	1,461.71	0.60	-0.49	0.34
10,117.14	91.33	2.68	7,846.93	1,463.17	1,032.74	1,498.83	1.50	-1.35	0.66
<b>TGT 1 (Windsock 21-11HZ)</b>									
10,174.00	90.56	3.05	7,845.99	1,519.95	1,035.58	1,555.68	1.50	-1.35	0.66
10,268.00	89.94	1.65	7,845.58	1,613.87	1,039.43	1,649.67	1.63	-0.66	-1.49
10,360.00	90.61	1.88	7,845.14	1,705.82	1,042.26	1,741.67	0.77	0.73	0.25
10,452.00	90.14	0.55	7,844.54	1,797.80	1,044.21	1,833.66	1.53	-0.51	-1.45
10,547.00	90.30	1.48	7,844.17	1,892.78	1,045.90	1,928.64	0.99	0.17	0.98
10,640.00	90.29	3.21	7,843.69	1,985.70	1,049.70	2,021.63	1.86	-0.01	1.86
10,735.00	89.64	2.91	7,843.75	2,080.56	1,054.77	2,116.62	0.75	-0.68	-0.32
10,828.00	89.81	2.54	7,844.20	2,173.45	1,059.19	2,209.61	0.44	0.18	-0.40
10,921.00	89.39	1.06	7,844.85	2,266.40	1,062.12	2,302.60	1.65	-0.45	-1.59
11,015.00	89.41	1.85	7,845.83	2,360.37	1,064.50	2,396.59	0.84	0.02	0.84
11,108.00	89.30	2.11	7,846.88	2,453.30	1,067.72	2,489.59	0.30	-0.12	0.28
11,201.00	90.32	5.05	7,847.19	2,546.11	1,073.52	2,582.54	3.35	1.10	3.16
11,295.00	91.05	3.66	7,846.06	2,639.83	1,080.66	2,676.45	1.67	0.78	-1.48
11,390.00	89.39	2.98	7,845.70	2,734.67	1,086.16	2,771.43	1.89	-1.75	-0.72
11,482.00	89.58	3.06	7,846.53	2,826.53	1,091.01	2,863.41	0.22	0.21	0.09
11,575.00	89.27	3.04	7,847.46	2,919.40	1,095.96	2,956.39	0.33	-0.33	-0.02
11,668.00	89.14	2.72	7,848.75	3,012.27	1,100.63	3,049.37	0.37	-0.14	-0.34
11,762.00	88.96	2.60	7,850.31	3,106.16	1,104.99	3,143.35	0.23	-0.19	-0.13
11,856.00	88.33	2.10	7,852.53	3,200.05	1,108.84	3,237.32	0.86	-0.67	-0.53
11,949.00	88.94	2.21	7,854.75	3,292.96	1,112.34	3,330.29	0.67	0.66	0.12

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well Windsock 21-11HZ
<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 21-11HZ	<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)	
12,041.00	88.66	1.99	7,856.67	3,384.88	1,115.71	3,422.27	0.39	-0.30	-0.24	
12,134.00	90.88	2.19	7,857.05	3,477.81	1,119.10	3,515.27	2.40	2.39	0.22	
12,228.00	90.94	2.47	7,855.55	3,571.72	1,122.92	3,609.25	0.30	0.06	0.30	
12,322.00	90.98	2.23	7,853.98	3,665.63	1,126.78	3,703.24	0.26	0.04	-0.26	
12,415.00	90.90	2.08	7,852.45	3,758.55	1,130.27	3,796.23	0.18	-0.09	-0.16	
12,509.00	91.04	2.57	7,850.86	3,852.46	1,134.08	3,890.21	0.54	0.15	0.52	
12,604.00	89.96	3.54	7,850.03	3,947.32	1,139.15	3,985.19	1.53	-1.14	1.02	
12,698.00	89.90	3.17	7,850.15	4,041.15	1,144.65	4,079.16	0.40	-0.06	-0.39	
12,792.00	90.10	3.26	7,850.15	4,135.01	1,149.92	4,173.14	0.23	0.21	0.10	
12,887.00	89.87	2.98	7,850.17	4,229.87	1,155.09	4,268.13	0.38	-0.24	-0.29	
12,980.00	89.91	3.08	7,850.35	4,322.74	1,160.01	4,361.11	0.12	0.04	0.11	
13,074.00	89.93	1.54	7,850.48	4,416.66	1,163.80	4,455.11	1.64	0.02	-1.64	
13,169.00	90.28	1.18	7,850.31	4,511.63	1,166.05	4,550.10	0.53	0.37	-0.38	
13,264.00	91.12	0.75	7,849.15	4,606.61	1,167.65	4,645.08	0.99	0.88	-0.45	
13,304.20	90.29	1.08	7,848.65	4,646.80	1,168.29	4,685.27	2.21	-2.05	0.82	
Enter Toe Circle: 13304.20' MD 388' FNL, 1086' FEL										
13,358.00	89.19	1.52	7,848.89	4,700.58	1,169.51	4,739.06	2.21	-2.05	0.82	
13,452.00	87.99	0.75	7,851.21	4,794.53	1,171.37	4,833.02	1.52	-1.28	-0.82	
13,545.00	87.49	0.00	7,854.87	4,887.46	1,171.98	4,925.91	0.97	-0.54	-0.81	
13,578.00	87.05	359.56	7,856.45	4,920.42	1,171.86	4,958.84	1.88	-1.33	-1.33	
13,632.58	87.05	359.56	7,859.25	4,974.92	1,171.44	5,013.30	0.00	0.00	0.00	
PBHL (Windsock 21-11HZ)										
13,633.00	87.05	359.56	7,859.28	4,975.35	1,171.43	5,013.72	0.00	0.00	0.00	
BHL: 60' FNL, 1082' FEL Sec 21 T1N R68W										

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well Windsock 21-11HZ
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<b>Site:</b>	Windsock 15-21HZ	<b>MD Reference:</b>	20' KB + 5222' GE @ 5242.00usft
<b>Well:</b>	Windsock 21-11HZ	<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: 263' FSL, 2269' FE - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	14,537,690.21	1,638,391.66	40.030089	-105.007234
Enter Land Box: 2901.0' - actual wellpath misses target center by 0.01usft at 2901.04usft MD (2801.06 TVD, -471.27 N, 469.01 E) - Point	0.00	0.00	2,801.06	-471.27	469.01	14,537,218.91	1,638,860.63	40.028795	-105.005559
Curve KOP (Windsock 2 - actual wellpath misses target center by 0.01usft at 7300.01usft MD (7083.61 TVD, -967.34 N, 955.44 E) - Point	0.00	0.00	7,083.61	-967.34	955.44	14,536,722.80	1,639,347.02	40.027433	-105.003821
Enter Toe Circle: 13304. - actual wellpath hits target center - Point	0.00	0.00	7,848.65	4,646.80	1,168.29	14,542,336.91	1,639,560.32	40.042850	-105.003060
LP: 191' FSL, 1272' FEL - actual wellpath hits target center - Point	0.00	0.00	7,854.73	-66.83	996.42	14,537,623.30	1,639,388.07	40.029906	-105.003675
BHL: 60' FNL, 1082' FEL - actual wellpath misses target center by 0.01usft at 13633.00usft MD (7859.28 TVD, 4975.35 N, 1171.43 E) - Point	0.00	0.00	7,859.28	4,975.35	1,171.43	14,542,665.46	1,639,563.49	40.043752	-105.003049
Exit Heel Circle: 8847.97 - actual wellpath hits target center - Point	0.00	0.00	7,860.10	194.75	1,006.50	14,537,884.88	1,639,398.17	40.030624	-105.003639

Checked By: _____	Approved By: _____	Date: _____
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