

ANADARKO PETROLEUM CORP

Project: Weld County, CO (UTM-NAD83)
Site: MAE J 14-8HZ
Well: MAE J 8-8HZ
Wellbore: OH
Design: OH

20' KB + 5083' GE @ 5103.00usft



Azimuths to True North
Magnetic North: 8.08°

Magnetic Field
Strength: 51928.6nT
Dip Angle: 66.49°
Date: 9/19/2019
Model: IGRF2015

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

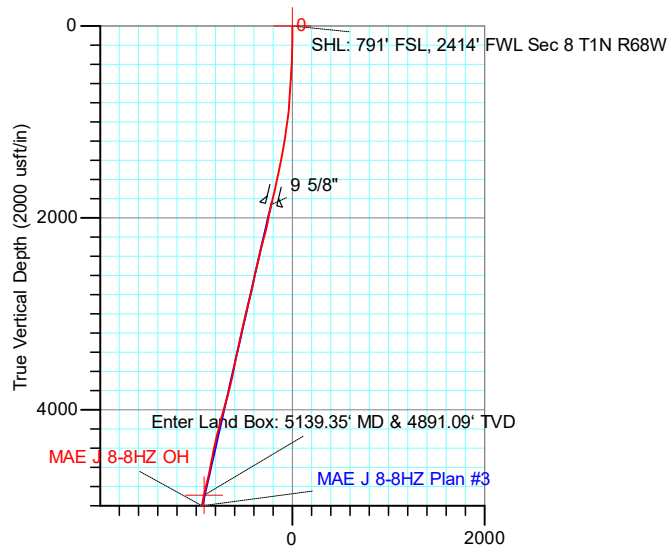
Geodetic System: Universal Transverse Mercator (US Survey Feet)
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Zone 13N (108 W to 102 W)



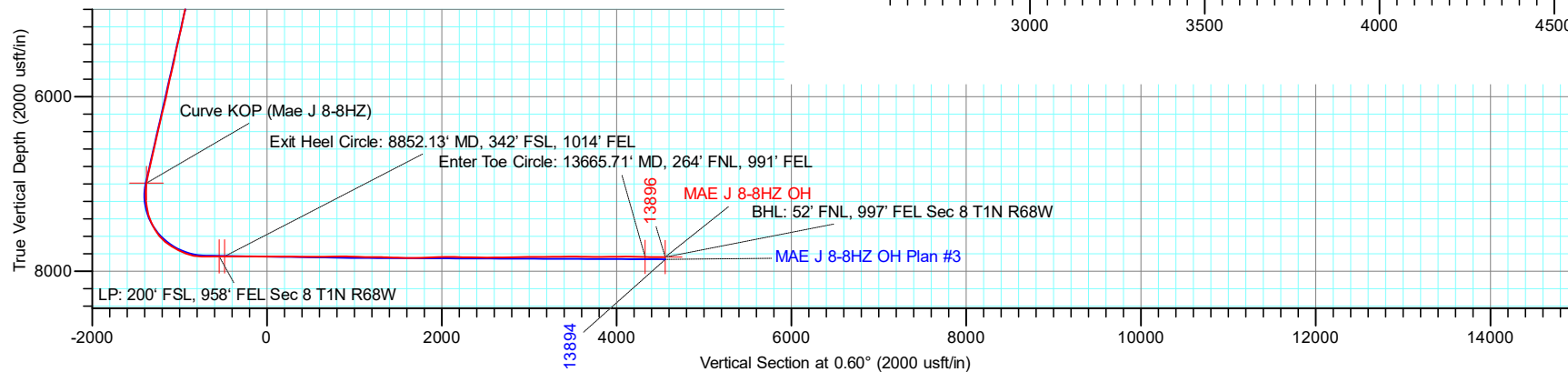
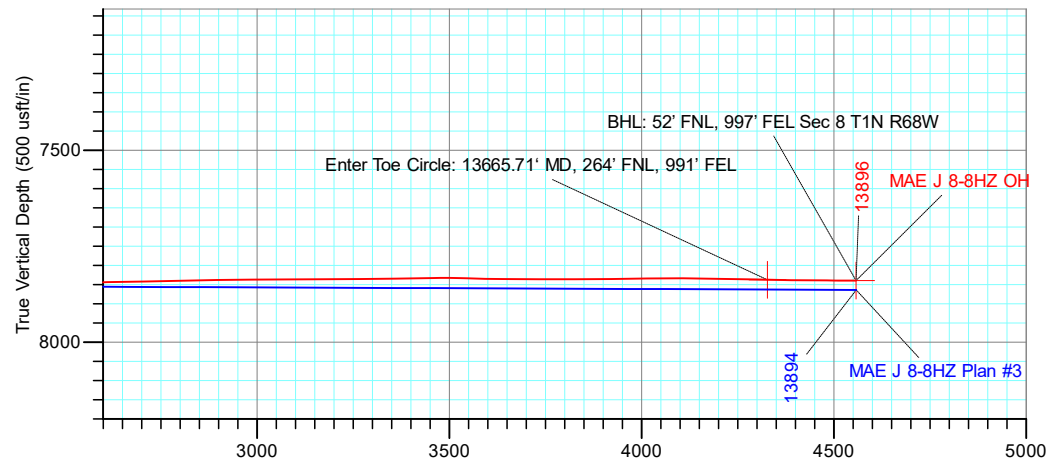
DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
BHL: 52' FNL, 997' FEL Sec 8 T1N R68W	7839.99	4536.72	2024.33	40.072881	-105.021366
Curve KOP (Mae J 8-8HZ)	6991.95	-1397.28	1716.14	40.056586	-105.022469
Enter Land Box: 5139.35' MD & 4891.09' TVD	4891.09	-929.77	1133.98	40.057870	-105.024549
Enter Toe Circle: 13665.71' MD, 264' FNL, 991' FEL	7837.53	4306.45	2025.33	40.072249	-105.021362
Exit Heel Circle: 8852.13' MD, 342' FSL, 1014' FEL	7831.84	-504.67	1968.59	40.059037	-105.021567
LP: 200' FSL, 958' FEL Sec 8 T1N R68W	7831.64	-567.65	1964.28	40.058864	-105.021582
SHL: 791' FSL, 2414' FWL Sec 8 T1N R68W	0.00	0.00	0.00	40.060423	-105.028602

1N-68W-8



ACTUAL LINE CALLS
SHL: 791' FSL, 2414' FWL Sec 8 T1N R68W
HEEL: 200' FSL, 958' FEL Sec 8 T1N R68W
BHL: 52' FNL, 997' FEL Sec 8 T1N R68W



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

Design: OH (MAE J 8-8HZ/OH)
MAE J 14-8HZ
Created By: Dustin Ault Date: 13:03, March 24 2020
Date: _____
Approved: _____ Date: _____

ANADARKO PETROLEUM CORP

Project: Weld County, CO (UTM-NAD83)
 Site: MAE J 14-8HZ
 Well: MAE J 8-8HZ
 Wellbore: OH
 Design: OH

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)



Azimuths to True North
 Magnetic North: 8.08°

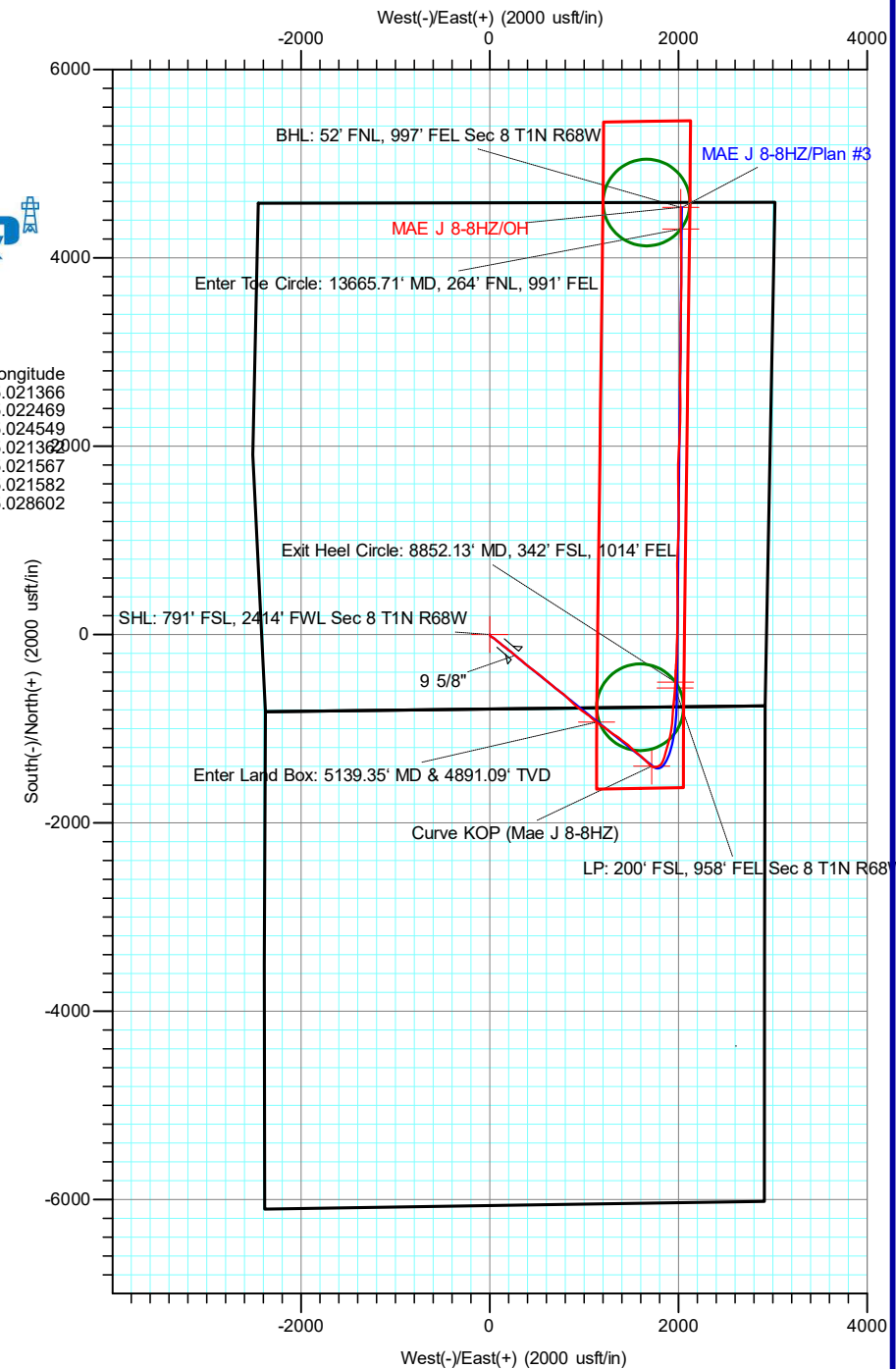
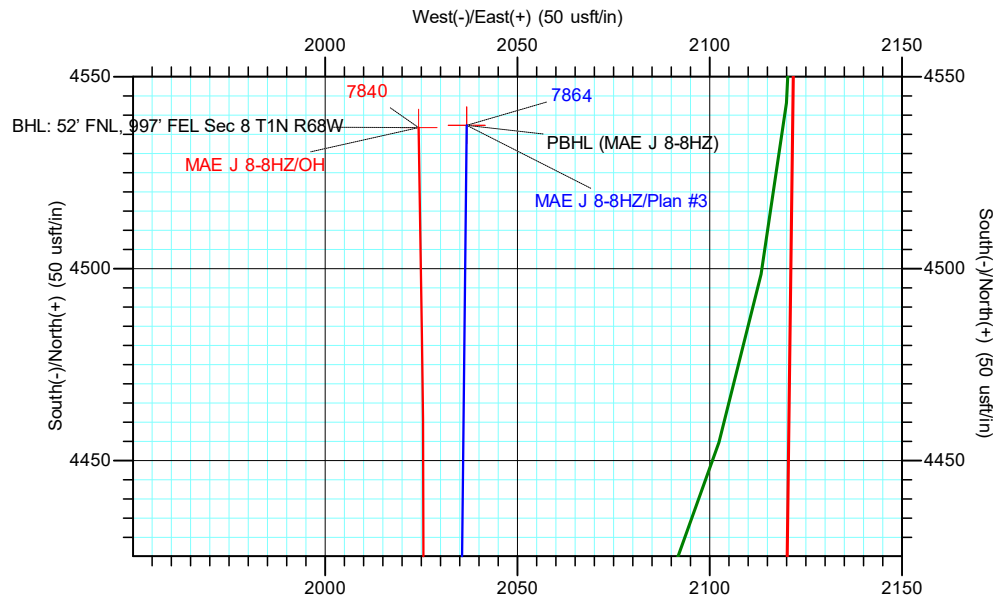
Magnetic Field
 Strength: 51928.6nT
 Dip Angle: 66.49°
 Date: 9/19/2019
 Model: IGRF2015

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
BHL: 52' FNL, 997' FEL Sec 8 T1N R68W	7839.99	4536.72	2024.33	14553273.40	1634439.50	40.072881	-105.021366
Curve KOP (Mae J 8-8HZ)	6991.95	-1397.28	1716.14	14547339.50	1634129.40	40.056586	-105.022469
Enter Land Box: 5139.35' MD & 4891.09' TVD	4891.09	-929.77	1133.98	14547807.20	1633547.39	40.057870	-105.024549
Enter Toe Circle: 13665.71' MD, 264' FNL, 991' FEL	7837.53	4306.45	2025.33	14553043.13	1634440.42	40.072249	-105.021362
Exit Heel Circle: 8852.13' MD, 342' FSL, 1014' FEL	7831.84	-504.67	1968.59	14548232.03	1634382.14	40.059037	-105.021567
LP: 200' FSL, 958' FEL Sec 8 T1N R68W	7831.64	-567.65	1964.28	14548169.05	1634377.81	40.058864	-105.021582
SHL: 791' FSL, 2414' FWL Sec 8 T1N R68W	0.00	0.00	0.00	14548737.33	1632413.71	40.060423	-105.028602

ACTUAL LINE CALLS

SHL: 791' FSL, 2414' FWL Sec 8 T1N R68W
HEEL: 200' FSL, 958' FEL Sec 8 T1N R68W
BHL: 52' FNL, 997' FEL Sec 8 T1N R68W



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

Design: OH (MAE J 8-8HZ/OH)
 MAE J 14-8HZ
 Created By: Dustin Ault
 Date: 13:06, March 24 2020
 Approved: _____
 Date: _____



ANADARKO PETROLEUM CORP

Weld County, CO (UTM-NAD83)

MAE J 14-8HZ

MAE J 8-8HZ

OH

Design: OH

Standard Survey Report

24 March, 2020



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well MAE J 8-8HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	20' KB + 5083' GE @ 5103.00usft
Site:	MAE J 14-8HZ	MD Reference:	20' KB + 5083' GE @ 5103.00usft
Well:	MAE J 8-8HZ	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	MAE J 14-8HZ		
Site Position:		Northing:	14,548,842.20 usft
From:	Map	Easting:	1,632,414.30 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	40.060711
		Longitude:	-105.028600
		Grid Convergence:	-0.02 °

Well	MAE J 8-8HZ		
Well Position	+N/-S	0.00 usft	Northing: 14,548,737.33 usft
	+E/-W	0.00 usft	Easting: 1,632,413.71 usft
Position Uncertainty	3.28 usft	Wellhead Elevation:	usft
		Latitude:	40.060423
		Longitude:	-105.028602
		Ground Level:	5,083.00 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF2015	9/19/2019	8.08
			Dip Angle (°) 66.49
			Field Strength (nT) 51,928.64814342

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)
	0.00	0.00	0.00
			Direction (°) 0.60

Survey Program	Date	3/24/2020		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
130.00	1,878.00	Survey #1 - Surface MWD (OH)	APC_ISCWSA REV 2 MWD	Fixed:v2:standard declination
2,027.00	13,842.00	Survey #2 - MWD+IFR (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination
13,896.00	13,896.00	Survey #3 - Proj to TD (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: 791' FSL, 2414' FWL Sec 8 T1N R68W - SHL (MAE J 8-8HZ)										
130.00	0.57	62.66	130.00	0.30	0.57	0.30	0.44	0.44	0.00	
225.00	1.19	164.17	224.99	-0.44	1.26	-0.42	1.49	0.65	106.85	
320.00	1.71	164.44	319.96	-2.75	1.91	-2.73	0.55	0.55	0.28	
415.00	3.69	154.33	414.85	-6.87	3.62	-6.83	2.14	2.08	-10.64	
510.00	4.57	143.87	509.60	-12.68	7.17	-12.61	1.22	0.93	-11.01	
606.00	5.80	134.47	605.21	-19.17	12.89	-19.03	1.55	1.28	-9.79	
701.00	6.42	118.12	699.68	-25.04	21.00	-24.82	1.94	0.65	-17.21	

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well MAE J 8-8HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	20' KB + 5083' GE @ 5103.00usft
Site:	MAE J 14-8HZ	MD Reference:	20' KB + 5083' GE @ 5103.00usft
Well:	MAE J 8-8HZ	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	7.38	118.56	793.99	-30.46	31.04	-30.13	1.01	1.01	0.46
891.00	9.98	125.68	887.89	-38.18	43.09	-37.72	2.96	2.74	7.49
986.00	12.48	130.16	981.07	-49.60	57.63	-48.99	2.79	2.63	4.72
1,081.00	13.10	127.96	1,073.71	-62.84	73.96	-62.07	0.83	0.65	-2.32
1,176.00	13.71	129.28	1,166.12	-76.59	91.16	-75.63	0.72	0.64	1.39
1,271.00	15.34	129.90	1,258.09	-91.78	109.52	-90.63	1.72	1.72	0.65
1,366.00	16.57	129.28	1,349.42	-108.42	129.64	-107.06	1.31	1.29	-0.65
1,462.00	18.68	127.17	1,440.91	-126.38	152.49	-124.77	2.30	2.20	-2.20
1,557.00	19.38	127.79	1,530.72	-145.23	177.07	-143.36	0.77	0.74	0.65
1,652.00	18.19	128.93	1,620.66	-164.20	201.07	-162.09	1.31	-1.25	1.20
1,746.00	20.70	128.75	1,709.29	-183.82	225.44	-181.45	2.67	2.67	-0.19
1,842.00	20.87	130.25	1,799.04	-205.49	251.72	-202.85	0.58	0.18	1.56
1,878.00	20.96	131.30	1,832.67	-213.89	261.45	-211.14	1.07	0.25	2.92
1,910.00	20.28	130.53	1,862.62	-221.27	269.97	-218.43	2.27	-2.11	-2.40
9 5/8"									
2,027.00	17.85	127.25	1,973.20	-245.31	299.66	-242.16	2.27	-2.08	-2.80
2,119.00	18.77	129.43	2,060.54	-263.24	322.32	-259.85	1.25	1.00	2.37
2,213.00	20.06	131.78	2,149.19	-283.59	346.03	-279.95	1.60	1.37	2.50
2,307.00	22.43	130.67	2,236.80	-306.02	371.65	-302.11	2.56	2.52	-1.18
2,401.00	22.84	129.39	2,323.56	-329.29	399.35	-325.09	0.68	0.44	-1.36
2,494.00	20.45	127.74	2,410.00	-350.69	426.16	-346.21	2.65	-2.57	-1.77
2,587.00	20.99	128.18	2,496.98	-370.93	452.10	-366.17	0.60	0.58	0.47
2,680.00	21.42	126.39	2,583.68	-391.30	478.86	-386.26	0.84	0.46	-1.92
2,773.00	18.82	125.78	2,671.00	-410.15	504.71	-404.84	2.80	-2.80	-0.66
2,867.00	19.53	127.98	2,759.79	-428.68	529.39	-423.12	1.08	0.76	2.34
2,960.00	21.77	132.36	2,846.81	-449.87	554.39	-444.04	2.92	2.41	4.71
3,056.00	22.61	129.99	2,935.70	-473.73	581.69	-467.61	1.28	0.88	-2.47
3,150.00	19.48	130.02	3,023.42	-495.43	607.54	-489.04	3.33	-3.33	0.03
3,246.00	19.99	128.46	3,113.78	-515.93	632.65	-509.27	0.76	0.53	-1.63
3,338.00	19.41	130.62	3,200.40	-535.66	656.57	-528.75	1.01	-0.63	2.35
3,431.00	19.17	130.82	3,288.18	-555.70	679.85	-548.55	0.27	-0.26	0.22
3,524.00	19.50	128.23	3,375.93	-575.29	703.60	-567.89	0.99	0.35	-2.78
3,619.00	18.87	127.63	3,465.66	-594.48	728.22	-586.82	0.69	-0.66	-0.63
3,713.00	18.80	123.62	3,554.63	-612.15	752.87	-604.23	1.38	-0.07	-4.27
3,806.00	18.59	127.97	3,642.73	-629.57	777.04	-621.39	1.52	-0.23	4.68
3,899.00	20.46	131.29	3,730.38	-649.41	800.94	-640.99	2.34	2.01	3.57
3,993.00	20.48	135.25	3,818.45	-671.94	824.86	-663.26	1.47	0.02	4.21
4,088.00	22.11	134.85	3,906.96	-696.35	849.24	-687.42	1.72	1.72	-0.42
4,180.00	22.38	132.97	3,992.11	-720.50	874.33	-711.30	0.83	0.29	-2.04
4,273.00	23.44	131.55	4,077.77	-744.83	901.13	-735.36	1.29	1.14	-1.53
4,366.00	19.55	130.77	4,164.29	-767.27	926.77	-757.53	4.19	-4.18	-0.84
4,458.00	23.47	127.57	4,249.87	-788.50	952.96	-778.48	4.45	4.26	-3.48
4,552.00	20.43	128.23	4,337.04	-810.08	980.69	-799.76	3.24	-3.23	0.70

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Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	20' KB + 5083' GE @ 5103.00usft
Site:	MAE J 14-8HZ	MD Reference:	20' KB + 5083' GE @ 5103.00usft
Well:	MAE J 8-8HZ	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)	
4,644.00	20.13	124.18	4,423.34	-828.91	1,006.40	-818.32	1.56	-0.33	-4.40	
4,738.00	18.40	124.81	4,512.08	-846.46	1,031.96	-835.61	1.85	-1.84	0.67	
4,832.00	17.14	129.81	4,601.60	-863.80	1,054.79	-852.71	2.10	-1.34	5.32	
4,926.00	19.79	131.62	4,690.75	-883.24	1,077.33	-871.91	2.88	2.82	1.93	
5,019.00	20.20	131.33	4,778.14	-904.30	1,101.15	-892.72	0.45	0.44	-0.31	
5,113.00	20.31	125.53	4,866.34	-924.50	1,126.62	-912.66	2.14	0.12	-6.17	
5,139.35	19.86	125.62	4,891.09	-929.77	1,133.98	-917.84	1.70	-1.69	0.35	
Enter Land Box: 5139.35' MD & 4891.09' TVD										
5,233.00	18.28	125.98	4,979.59	-947.67	1,158.80	-935.48	1.70	-1.69	0.38	
5,325.00	18.83	122.76	5,066.81	-964.18	1,182.96	-951.74	1.26	0.60	-3.50	
5,419.00	20.03	123.84	5,155.46	-981.35	1,209.09	-968.64	1.33	1.28	1.15	
5,512.00	21.36	127.34	5,242.46	-1,000.49	1,235.79	-987.50	1.95	1.43	3.76	
5,604.00	19.89	131.66	5,328.57	-1,021.06	1,260.80	-1,007.80	2.30	-1.60	4.70	
5,698.00	19.95	126.04	5,416.95	-1,041.13	1,285.72	-1,027.61	2.04	0.06	-5.98	
5,792.00	21.33	123.19	5,504.92	-1,059.92	1,312.99	-1,046.12	1.82	1.47	-3.03	
5,885.00	21.73	119.98	5,591.43	-1,077.79	1,342.06	-1,063.67	1.34	0.43	-3.45	
5,977.00	21.89	128.98	5,676.87	-1,097.09	1,370.15	-1,082.68	3.64	0.17	9.78	
6,069.00	21.03	128.28	5,762.49	-1,118.10	1,396.44	-1,103.42	0.98	-0.93	-0.76	
6,163.00	19.05	127.20	5,850.79	-1,137.83	1,421.91	-1,122.88	2.14	-2.11	-1.15	
6,256.00	19.25	126.39	5,938.65	-1,156.10	1,446.34	-1,140.89	0.36	0.22	-0.87	
6,349.00	18.79	130.79	6,026.58	-1,174.98	1,470.02	-1,159.52	1.62	-0.49	4.73	
6,442.00	20.29	135.03	6,114.22	-1,196.18	1,492.76	-1,180.48	2.22	1.61	4.56	
6,536.00	19.48	132.70	6,202.62	-1,218.34	1,515.80	-1,202.40	1.21	-0.86	-2.48	
6,629.00	20.08	134.17	6,290.13	-1,239.98	1,538.64	-1,223.80	0.84	0.65	1.58	
6,722.00	19.87	125.81	6,377.55	-1,260.35	1,562.92	-1,243.92	3.08	-0.23	-8.99	
6,815.00	19.75	128.76	6,465.05	-1,279.44	1,587.99	-1,262.74	1.08	-0.13	3.17	
6,908.00	19.11	134.45	6,552.76	-1,299.94	1,611.11	-1,283.00	2.15	-0.69	6.12	
7,001.00	18.64	130.93	6,640.77	-1,320.34	1,633.21	-1,303.16	1.32	-0.51	-3.78	
7,094.00	18.10	136.11	6,729.03	-1,340.49	1,654.45	-1,323.09	1.85	-0.58	5.57	
7,187.00	17.21	133.77	6,817.65	-1,360.42	1,674.40	-1,342.81	1.22	-0.96	-2.52	
7,281.00	18.16	133.32	6,907.21	-1,380.09	1,695.10	-1,362.26	1.02	1.01	-0.48	
7,370.00	17.48	125.02	6,991.95	-1,397.28	1,716.14	-1,379.23	2.95	-0.77	-9.32	
Curve KOP (Mae J 8-8HZ)										
7,375.00	17.45	124.54	6,996.72	-1,398.13	1,717.37	-1,380.07	2.95	-0.55	-9.66	
7,470.00	17.60	97.22	7,087.47	-1,408.03	1,743.40	-1,389.70	8.59	0.16	-28.76	
7,563.00	15.91	72.63	7,176.63	-1,405.99	1,769.55	-1,387.38	7.77	-1.82	-26.44	
7,656.00	17.50	57.77	7,265.74	-1,394.72	1,793.56	-1,375.86	4.89	1.71	-15.98	
7,750.00	19.05	43.29	7,355.04	-1,376.00	1,816.04	-1,356.91	5.09	1.65	-15.40	
7,844.00	26.99	23.50	7,441.61	-1,345.18	1,835.13	-1,325.89	11.69	8.45	-21.05	
7,937.00	31.44	16.15	7,522.79	-1,302.50	1,850.30	-1,283.05	6.14	4.78	-7.90	
8,030.00	40.41	15.94	7,598.02	-1,250.11	1,865.35	-1,230.51	9.65	9.65	-0.23	
8,123.00	51.38	16.33	7,662.65	-1,186.06	1,883.91	-1,166.27	11.80	11.80	0.42	
8,216.00	58.78	14.36	7,715.85	-1,112.57	1,904.01	-1,092.57	8.14	7.96	-2.12	
8,310.00	63.31	10.04	7,761.37	-1,032.21	1,921.32	-1,012.03	6.28	4.82	-4.60	

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well MAE J 8-8HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	20' KB + 5083' GE @ 5103.00usft
Site:	MAE J 14-8HZ	MD Reference:	20' KB + 5083' GE @ 5103.00usft
Well:	MAE J 8-8HZ	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)	
8,403.00	69.04	5.53	7,798.93	-947.97	1,932.76	-927.68	7.59	6.16	-4.85	
8,496.00	79.08	1.64	7,824.45	-858.85	1,938.27	-838.51	11.52	10.80	-4.18	
8,589.00	90.14	6.17	7,833.18	-766.65	1,944.59	-746.24	12.84	11.89	4.87	
8,641.63	90.53	6.34	7,832.87	-714.33	1,950.33	-693.87	0.81	0.74	0.32	
Prototype LP (Mae J 8-8HZ)										
8,641.76	90.53	6.34	7,832.87	-714.20	1,950.34	-693.74	0.81	0.74	0.32	
Heel (MAE J 8-8HZ)										
8,682.00	90.83	6.47	7,832.39	-674.22	1,954.83	-653.71	0.81	0.74	0.32	
8,775.00	90.08	3.99	7,831.65	-581.62	1,963.31	-561.02	2.79	-0.81	-2.67	
8,789.00	90.00	3.97	7,831.64	-567.65	1,964.28	-547.05	0.59	-0.56	-0.16	
LP: 200' FSL, 958' FEL Sec 8 T1N R68W										
8,852.13	89.65	3.87	7,831.84	-504.67	1,968.59	-484.03	0.59	-0.56	-0.16	
Exit Heel Circle: 8852.13' MD, 342' FSL, 1014' FEL										
8,869.00	89.55	3.84	7,831.95	-487.84	1,969.72	-467.18	0.59	-0.56	-0.16	
8,963.00	91.16	1.28	7,831.37	-393.94	1,973.92	-373.25	3.22	1.71	-2.72	
9,055.00	89.61	2.53	7,830.75	-302.00	1,976.98	-281.28	2.16	-1.68	1.36	
9,149.00	89.39	2.00	7,831.57	-208.08	1,980.70	-187.32	0.61	-0.23	-0.56	
9,242.00	89.67	1.86	7,832.34	-115.13	1,983.83	-94.35	0.34	0.30	-0.15	
9,336.00	89.75	1.37	7,832.81	-21.17	1,986.48	-0.37	0.53	0.09	-0.52	
9,432.00	89.44	0.91	7,833.49	74.81	1,988.39	95.62	0.58	-0.32	-0.48	
9,525.00	90.26	1.21	7,833.73	167.79	1,990.11	188.62	0.94	0.88	0.32	
9,619.00	89.74	0.02	7,833.73	261.78	1,991.12	282.62	1.38	-0.55	-1.27	
9,711.00	89.25	358.75	7,834.55	353.77	1,990.13	374.59	1.48	-0.53	-1.38	
9,805.00	89.82	0.15	7,835.31	447.76	1,989.23	468.57	1.61	0.61	1.49	
9,899.00	89.43	359.72	7,835.92	541.76	1,989.12	562.56	0.62	-0.41	-0.46	
9,993.00	91.12	359.37	7,835.47	635.75	1,988.37	656.54	1.84	1.80	-0.37	
10,087.00	91.61	359.85	7,833.23	729.72	1,987.73	750.50	0.73	0.52	0.51	
10,181.00	90.92	2.42	7,831.16	823.67	1,989.60	844.46	2.83	-0.73	2.73	
10,273.00	87.81	2.04	7,832.18	915.58	1,993.17	936.41	3.41	-3.38	-0.41	
10,337.28	88.12	2.65	7,834.46	979.77	1,995.81	1,000.62	1.07	0.48	0.96	
Interm TGT#1 (MAE J 8-8HZ)										
10,365.00	88.25	2.92	7,835.34	1,007.44	1,997.15	1,028.30	1.07	0.48	0.96	
10,459.00	88.36	2.34	7,838.12	1,101.30	2,001.46	1,122.20	0.63	0.12	-0.62	
10,552.00	90.25	359.60	7,839.25	1,194.27	2,003.04	1,215.18	3.58	2.03	-2.95	
10,645.00	89.25	359.43	7,839.65	1,287.26	2,002.25	1,308.16	1.09	-1.08	-0.18	
10,737.00	87.29	358.95	7,842.43	1,379.21	2,000.95	1,400.09	2.19	-2.13	-0.52	
10,829.00	88.39	359.43	7,845.90	1,471.13	1,999.65	1,491.99	1.30	1.20	0.52	
10,922.00	88.14	358.77	7,848.72	1,564.08	1,998.19	1,584.92	0.76	-0.27	-0.71	
11,015.00	90.89	359.08	7,849.50	1,657.05	1,996.45	1,677.86	2.98	2.96	0.33	
11,108.00	92.17	0.47	7,847.02	1,750.01	1,996.08	1,770.82	2.03	1.38	1.49	
11,202.00	92.70	2.80	7,843.02	1,843.88	1,998.76	1,864.71	2.54	0.56	2.48	
11,295.00	92.05	3.11	7,839.17	1,936.68	2,003.55	1,957.55	0.77	-0.70	0.33	
11,387.00	90.55	3.00	7,837.08	2,028.52	2,008.45	2,049.44	1.63	-1.63	-0.12	
11,482.00	88.46	2.52	7,837.90	2,123.40	2,013.03	2,144.36	2.26	-2.20	-0.51	

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well MAE J 8-8HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	20' KB + 5083' GE @ 5103.00usft
Site:	MAE J 14-8HZ	MD Reference:	20' KB + 5083' GE @ 5103.00usft
Well:	MAE J 8-8HZ	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)
11,576.00	88.85	2.30	7,840.11	2,217.29	2,016.98	2,238.29	0.48	0.41	-0.23
11,670.00	89.08	1.05	7,841.81	2,311.23	2,019.73	2,332.26	1.35	0.24	-1.33
11,764.00	89.43	0.42	7,843.03	2,405.22	2,020.93	2,426.25	0.77	0.37	-0.67
11,857.00	89.24	359.59	7,844.11	2,498.21	2,020.94	2,519.24	0.92	-0.20	-0.89
11,950.00	90.92	358.98	7,843.98	2,591.20	2,019.78	2,612.21	1.92	1.81	-0.66
12,044.00	91.20	358.61	7,842.24	2,685.16	2,017.80	2,706.14	0.49	0.30	-0.39
12,138.00	91.13	1.99	7,840.33	2,779.13	2,018.29	2,800.11	3.60	-0.07	3.60
12,232.00	91.12	1.03	7,838.48	2,873.08	2,020.77	2,894.08	1.02	-0.01	-1.02
12,325.00	90.37	1.66	7,837.28	2,966.04	2,022.95	2,987.06	1.05	-0.81	0.68
12,417.00	90.38	0.56	7,836.67	3,058.02	2,024.74	3,079.06	1.20	0.01	-1.20
12,510.00	90.07	359.46	7,836.31	3,151.02	2,024.75	3,172.05	1.23	-0.33	-1.18
12,605.00	90.54	358.93	7,835.80	3,246.01	2,023.42	3,267.02	0.75	0.49	-0.56
12,698.00	90.83	1.96	7,834.69	3,338.99	2,024.14	3,360.00	3.27	0.31	3.26
12,792.00	91.21	1.39	7,833.02	3,432.93	2,026.89	3,453.97	0.73	0.40	-0.61
12,885.00	87.90	359.97	7,833.74	3,525.91	2,027.99	3,546.95	3.87	-3.56	-1.53
12,977.00	89.50	1.16	7,835.83	3,617.87	2,028.90	3,638.92	2.17	1.74	1.29
13,071.00	89.89	0.82	7,836.33	3,711.86	2,030.52	3,732.92	0.55	0.41	-0.36
13,165.00	90.27	0.15	7,836.20	3,805.85	2,031.32	3,826.92	0.82	0.40	-0.71
13,259.00	90.54	359.51	7,835.53	3,899.85	2,031.04	3,920.90	0.74	0.29	-0.68
13,353.00	90.99	358.80	7,834.28	3,993.83	2,029.65	4,014.87	0.89	0.48	-0.76
13,446.00	89.44	359.34	7,833.93	4,086.81	2,028.14	4,107.83	1.76	-1.67	0.58
13,538.00	89.14	358.15	7,835.07	4,178.78	2,026.13	4,199.77	1.33	-0.33	-1.29
13,633.00	88.72	0.54	7,836.84	4,273.75	2,025.04	4,294.73	2.55	-0.44	2.52
13,665.71	88.86	0.46	7,837.53	4,306.45	2,025.33	4,327.42	0.50	0.44	-0.24
Enter Toe Circle - 13665.71' MD - Enter Toe Circle: 13665.71' MD, 264' FNL, 991' FEL									
13,727.00	89.13	0.31	7,838.60	4,367.73	2,025.74	4,388.71	0.50	0.44	-0.24
13,820.00	89.84	359.37	7,839.44	4,460.73	2,025.48	4,481.69	1.27	0.76	-1.01
13,842.00	89.54	359.09	7,839.56	4,482.73	2,025.18	4,503.69	1.87	-1.36	-1.27
13,896.00	89.54	359.09	7,839.99	4,536.72	2,024.33	4,557.67	0.00	0.00	0.00
PBHL (MAE J 8-8HZ) - BHL: 52' FNL, 997' FEL Sec 8 T1N R68W - Prototype PBHL (Mae J 8-8HZ)									

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well MAE J 8-8HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	20' KB + 5083' GE @ 5103.00usft
Site:	MAE J 14-8HZ	MD Reference:	20' KB + 5083' GE @ 5103.00usft
Well:	MAE J 8-8HZ	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: 791' FSL, 2414' FV - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	14,548,737.33	1,632,413.71	40.060423	-105.028602	
Enter Land Box: 5139.3f - actual wellpath hits target center - Point	0.00	0.00	4,891.09	-929.77	1,133.98	14,547,807.19	1,633,547.39	40.057870	-105.024550	
Curve KOP (Mae J 8-8H) - actual wellpath misses target center by 0.01usft at 7370.00usft MD (6991.95 TVD, -1397.28 N, 1716.14 E) - Point	0.00	0.00	6,991.95	-1,397.28	1,716.14	14,547,339.49	1,634,129.40	40.056586	-105.022469	
LP: 200' FSL, 958' FEL - actual wellpath hits target center - Point	0.00	0.00	7,831.64	-567.65	1,964.28	14,548,169.04	1,634,377.80	40.058864	-105.021582	
Exit Heel Circle: 8852.1f - actual wellpath hits target center - Point	0.00	0.00	7,831.84	-504.67	1,968.59	14,548,232.02	1,634,382.13	40.059037	-105.021567	
Enter Toe Circle: 13665. - actual wellpath hits target center - Point	0.00	0.00	7,837.53	4,306.45	2,025.33	14,553,043.12	1,634,440.42	40.072249	-105.021363	
BHL: 52' FNL, 997' FEL - actual wellpath misses target center by 0.01usft at 13896.00usft MD (7839.99 TVD, 4536.72 N, 2024.33 E) - Point	0.00	0.00	7,839.99	4,536.72	2,024.33	14,553,273.39	1,634,439.49	40.072881	-105.021366	

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,910.00	1,862.62	9 5/8"	9-5/8	13-1/2	

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
13,665.71	7,837.53	4,306.46	2,025.33	Enter Toe Circle - 13665.71' MD	

Checked By: _____	Approved By: _____	Date: _____
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